

Graduate Course Descriptions

ACCOUNTING COURSES

ACCT 501. Accounting/Economic Decision Making. 3 Hours.

PR: Admission into the Master's of Professional Accountancy program. This course exposes students to the theory and application within the accounting profession of the topics of corporate governance, economic theory, financial management, cost accounting, and strategic planning, particularly as it relates to decision making.

ACCT 511. Financial Accounting Theory and Practice. 3 Hours.

PR: Consent. Comprehensive examination of financial accounting theory as established by the opinions, statements and interpretation of professional organizations with special emphasis on their application and problem solving.

ACCT 512. Mergers and Acquisitions. 3 Hours.

PR: Consent. Strategic perspectives of mergers and acquisitions, their valuation, and evaluation of their subsequent performance. Accounting for business combinations and foreign operations and related financial accounting and reporting issues.

ACCT 521. Information Technology Auditing. 3 Hours.

PR: Consent. Information technology auditing techniques, issues, and current topics, including risk assessment, general and application control testing, computer assisted audit tools and techniques, and testing of databases and local area networks.

ACCT 522. Electronic Commerce and Internet Security. 3 Hours.

PR: Consent. Electronic commerce business models. Real options evaluations, accounting distinctions, and case analysis of Web-based business models, with emphasis on the Internet security risks to the integrity of financial information.

ACCT 541. Federal Tax Research and Writing. 3 Hours.

PR: Consent. Study of federal tax authorities and hierarchy, the research resources available, development of federal tax research and writing skills, and the application thereof.

ACCT 551. Assurance Services and Professional Standards. 3 Hours.

PR: Consent. Professional objectives, principles, and standards for assurance services, including risk assessment, attestation reports, and related communications. Case studies covering sampling, professional ethics, legal liability and reporting.

ACCT 556. Fraud Detection and Deterrence. 3 Hours.

PR: Restricted to MPA Students. The auditor's responsibility with respect to fraud detection and investigation and management's responsibility for fraud deterrence and implementation of effective prevention measures. Identification, analysis and examination of fraud using actual and simulated data.

ACCT 561. Governmental and Not-for-Profit Accounting. 3 Hours.

PR: Consent. Theory and practice of accounting for governmental and not-for-profit entities with an emphasis on the conceptual foundation of fund accounting, budgetary control and accountability.

ACCT 571. Accounting/Business Consulting. 3 Hours.

PR: Consent. Translating complex information into critical knowledge for engagements beyond basic financial/managerial accounting, assurance, and tax services. Consulting experience examined through exposure to consulting professionals, cases and/or a business simulation.

ACCT 581. Fraud Investigation. 3 Hours.

PR: Restricted to FAFI students. Types of fraud, documents, sources of evidence, and analysis of internal and external fraud schemes with an emphasis on the skills needed to identify and investigate fraud.

ACCT 582. Fraud Data Analysis. 3 Hours.

PR: Restricted to FAFI students. Computer-aided data analysis techniques for detecting and investigating fraud cases, issues related to the collection and use of digital evidence, and collection of data from electronic devices.

ACCT 583. Fraud: Criminology/Legal Issues. 3 Hours.

PR: Consent. Theories of criminal behavior, laws, rules of evidence, rights of persons under interrogation and interviewing, report writing and ethics, as these topics relate to forensic accounting with a focus on the behavioral aspects of fraud.

ACCT 584. Advanced Fraud Investigation. 3 Hours.

PR: ACCT 581 and ACCT 582. Major fraud case investigation with an emphasis on forensic and litigation support aspects, including presentation of cases in moot court setting.

ACCT 591A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

ACCT 592A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

ACCT 593A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

ACCT 594A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

ACCT 595. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

ACCT 691A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

ACCT 692A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

ACCT 693A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

ACCT 694A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

ACCT 695. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

ACCT 696. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

ACCT 697. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

ACCT 698. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

ACCT 699. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is P/F; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

ACCT 711. Behavioral Accounting Research. 3 Hours.

This is a doctoral-level course designed to familiarize students to various behavioral topics within the accounting literature. The goal of the course is to survey some of the major theories, issues, and empirical findings within the behavioral-accounting literature. This approach is designed to build a foundation upon which the student may consider their own areas of research.

ACCT 712. Archival Accounting Research. 3 Hours.

PR: Admission to PhD program and STAT 511. This doctoral-level course is designed to familiarize students to various capital markets topics within the accounting literature. The goal of the course is to survey some of the major theories, issues, and empirical findings within the archival literature. This approach is designed to build a foundation upon which the student may consider their own areas of interest.

ACCT 794A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

ACCT 795. Independent Study. 1-9 Hours.

Faculty-supervised study of topics not available through regular course offerings.

ACCT 797. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading will be S/U.).

ADVERTISING COURSES

ADV 521. Mass Communication Research. 3 Hours.

Introduction to use of marketing research as a campaign strategy, research methodologies, and the generation, understanding, and application of marketing and advertising research findings. Lecture, in-class exercises, outside projects, individual and team assignments.

ADV 559. Advertising Campaigns. 3 Hours.

Course offers graduate students the opportunity to integrate all prior learning and apply it to an advertising campaign for a real-world client. Graduate readings and research will connect the abstract and theoretical realms of advertising.

ADV 591A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation in advanced topics that are not covered in regularly scheduled courses.

ADV 592A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

ADV 593A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

ADV 594A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

ADV 595. Independent Study. 1-6 Hours.

Faculty-supervised study of topics not available through regular course offerings.

AGRCLTURE, FORSTRY CNSMR SCI COURSES**AFCS 590. Teaching Practicum. 1-3 Hours.**

PR: Consent. Supervised practice in college teaching of agriculture, forestry and consumer sciences. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on assistantships to gain teaching experience. (Grading will be S/U.).

AFCS 591A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

AFCS 592A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

AFCS 593A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

AFCS 594A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

AFCS 595. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

AFCS 690. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of agriculture, forestry and consumer sciences. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It also provides a mechanism for students not on assistantships to gain teaching experience. (Grading will be S/U.).

AFCS 691A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

AFCS 692A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

AFCS 693A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

AFCS 694A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

AFCS 695. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

AFCS 696. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

AFCS 697. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

AFCS 698. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertation (798). Grading is normal.

AFCS 699. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use of the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is S/U; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

AFCS 790. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of agriculture, forestry and consumer sciences. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on assistantships to gain teaching experience. (Grading will be S/U.).

AFCS 791A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

AFCS 792A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

AFCS 793A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

AFCS 794A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

AFCS 795. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

AFCS 796. Graduate Seminar. 1 Hour.

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AFCS 797. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

AFCS 798. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

AFCS 799. Graduate Colloquium. 1-6 Hours.

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AGRICULTURAL BIOCHEMISTRY COURSES

AGBI 512. Nutritional Biochemistry. 3 Hours.

PR: AGBI 410 or Consent. Nutritional biochemistry of domestic animals.

AGBI 513. Nutritional Biochemistry Laboratory. 1 Hour.

PR: AGBI 410 and AGBI 411 and CONC: AGBI 412. Experiments to determine the nutritional constituents in animal and plant tissues.

AGBI 514. Animal Biotechnology. 4 Hours.

The course will introduce students to the concepts and techniques of molecular biology and the application of these technologies in animal research. It will give the students laboratory experience in many molecular biology techniques.

AGBI 591A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation in advanced topics that are not covered in regularly scheduled courses.

AGBI 592A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

AGBI 593A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

AGBI 594A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

AGBI 595. Independent Study. 1-6 Hours.

Faculty-supervised study of topics not available through regular course offerings.

AGBI 610. General Biochemistry. 4 Hours.

PR: 8 hours of Organic Chemistry. The first half of a general course of biochemistry designed for graduate students of biological sciences. The course emphasizes the chemical properties of cellular constituents.

AGBI 612. General Biochemistry. 4 Hours.

PR: AGBI 610 or Consent. The second half of a general course of biochemistry designed for graduate students of biological sciences. The course emphasizes reactions and control of intermediary metabolism.

AGBI 690. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of agricultural biochemistry. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It also provides a mechanism for students not on assistantships to gain teaching experience. (Grading will be S/U.).

AGBI 691A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

AGBI 692A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

AGBI 693A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

AGBI 694A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

AGBI 695. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

AGBI 696. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

AGBI 697. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

AGBI 698. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

AGBI 699. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use of the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is S/U; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

AGBI 791A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation in advanced topics that are not covered in regularly scheduled courses.

AGBI 792A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

AGBI 793A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

AGBI 794A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

AGBI 795. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

AGBI 796. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

AGBI 797. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis (697), problem report (697), research paper or equivalent scholarly project (697), or a dissertation (797). (Grading may be S/U.).

AGBI 798. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision is needed during the writing of student reports, theses, or dissertations. (Grading is Normal.).

AGBI 799. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium, to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is Normal; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

AGRICULTURE COURSES

AGRL 590. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of agriculture. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on assistantships to gain teaching experience. (Grading will be S/U.)

AGRL 591A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

AGRL 592A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

AGRL 593A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

AGRL 594A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

AGRL 595. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

AGRL 660. Problem Report. 1-3 Hours.

AGRL 690. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of agriculture. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It also provides a mechanism for students not on assistantships to gain teaching experience. (Grading will be S/U.)

AGRL 691A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

AGRL 692A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

AGRL 693A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

AGRL 694A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

AGRL 695. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

AGRL 696. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

AGRL 697. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.)

AGRL 698. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

AGRL 699. Graduate Colloquium. 1-6 Hours.

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AGRL 790. Teaching Practicum. 1-3 Hours.

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PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

AGRL 792A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

AGRL 793A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

AGRL 794A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

AGRL 795. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

AGRL 796. Graduate Seminar. 1 Hour.

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AGRL 797. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

AGRL 798. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

AGRL 799. Graduate Colloquium. 1-6 Hours.

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AGRICULTURE EXTENSION EDU COURSES**AGEE 591A-Z. Advanced Topics. 1-6 Hours.**

PR: Consent. Investigation in advanced topics that are not covered in regularly scheduled courses.

AGEE 592A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

AGEE 593A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

AGEE 594A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

AGEE 595. Independent Study. 1-6 Hours.

Faculty-supervised study of topics not available through regular course offerings.

AGEE 631. Planning Agricultural Programs and Courses. 3 Hours.

PR: AGEE 430 or Consent. Formulating programs and courses for schools and communities.

AGEE 642. Agriculture Education Research Methods and Design. 3 Hours.

Explores definition of the problem, identification of related literature, selection of an appropriate research design, interpretation of results from data analysis procedures, and the reporting of research findings with emphasis on agricultural education.

AGEE 644. Data Analysis/Interpretation. 3 Hours.

Explores the selection of appropriate statistical methods, use of statistical software packages to analyze data, interpretation of results from data analysis procedures, and the report of research findings with emphasis on agricultural education.

AGEE 650. Program Development in Community Education. 3 Hours.

Planning, implementation and evaluation of programs in non-formal rural and community educational settings.

AGEE 651. Program Evaluation in Comm Ed. 3 Hours.

Evaluation principals, models, designs and procedures used in developing and analyzing agricultural and extension education programs. Evaluations role in needs assessments, implementation and marketing to stakeholders.

AGEE 690. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of agricultural and environmental education. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It also provides a mechanism for students not on assistantships to gain teaching experience. (Grading will be S/U.).

AGEE 691A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

AGEE 692A-Z. Directed Study. 1-6 Hours.

Directed study, reading and/or research.

AGEE 693A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

AGEE 694A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

AGEE 695. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

AGEE 696. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

AGEE 697. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

AGEE 698. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

AGEE 699. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use of the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is S/U; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

AGEE 900. Professional Development. 1-6 Hours.

Professional development courses provide skill renewal or enhancement in a professional field or content area (e.g. education, community health, geology). The continuing education courses are graded on a pass/fail grading scale and do not apply as graduate credit toward a degree program.

AGEE 930. Professional Development. 1-6 Hours.

Professional development courses provide skill renewal or enhancement in a professional field or content area. (e.g. education, community health, geology). These tuition waived continuing education courses are graded on a pass/fail grading scale and do not apply as graduate credit toward a degree program.

AGRICULTURE RESOURCE ECON COURSES

ARE 540. Rural and Regional Development. 3 Hours.

PR: ARE 300 and ARE 321. Economic theories and quantitative techniques. Problems and goals for rural and regional planning; methods of policy analysis for community infrastructure development.

ARE 542. International Agricultural Economic Development. 3 Hours.

Current problems, theories, policies, and strategies in planning for agricultural and rural development for increased food production and to improve the well-being of rural people in the developing countries of the world.

ARE 580. Energy Industry Economics. 3 Hours.

PR: Graduate standing. Technical production and consumption methodologies, environmental concerns, and national and global economics and politics in making energy decisions.

ARE 581. Resource Appraisal and Decision Making. 3 Hours.

PR: ARE 500 or equivalent. Investment analysis, decision making under risk and uncertainty, and project analysis applied to resource exploration and utilization; mineral and energy reserve and resource estimation techniques.

ARE 591A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation in advanced topics that are not covered in regularly scheduled courses.

ARE 592A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

ARE 593A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

ARE 594A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

ARE 595. Independent Study. 1-6 Hours.

Faculty-supervised study of topics not available through regular course offerings.

ARE 600. Research Methods. 1 Hour.

Research methods in agricultural, environmental, and resource economics. The application of scientific thinking in developing research proposals and critiquing published research.

ARE 601. Applied Microeconomics. 4 Hours.

PR: ARE 401 or equiv. Consumer and production economics applied to resource, environmental, and agricultural analysis.

ARE 621. Quantitative Methods in Resource Economics. 3 Hours.

PR: ARE 601 and ECON 421 or equivalents. Optimization techniques in economic analysis of natural resources; environmental and agricultural management problems; linear, nonlinear, and dynamic programming.

ARE 624. Econometric Methods in Resource Economics. 3 Hours.

PR: ECON 425. Application methods to natural resource, environmental, and agricultural economic problems; single and simultaneous equation models, specification problems, topics in time series, and cross-sectional analysis.

ARE 632. Natural Resource and Environmental Economics. 3 Hours.

PR: ARE 600 and ARE 621 or equivalent. Theory and institutions; market failure, externalities and property rights issues; renewable and nonrenewable resources, common property, environmental and resource management, and intergenerational decisions.

ARE 633. Natural Resource Policy Analysis. 3 Hours.

PR: ARE 600 and ARE 621, or equiv. Welfare economics applied to the analysis and evaluation of natural resources, environmental, agricultural, and energy policy issues.

ARE 643. Project Analysis and Evaluation. 4 Hours.

Analysis and evaluation of investment projects; economic and financial aspects of project analysis; risk analysis; preparation of feasibility reports.

ARE 644. International Markets and Trade. 3 Hours.

PR: ARE 600 and ARE 621. Causes and consequences of international trade and investment; commodity market structures, commodity price instability and international agreements; trade barriers and protection, export promotion, and impacts on developing countries.

ARE 690. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of agriculture research economics. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It also provides a mechanism for students not on assistantships to gain teaching experience. (Grading will be S/U.)

ARE 691A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

ARE 692A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

ARE 693A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

ARE 694A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

ARE 695. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

ARE 696. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

ARE 697. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.)

ARE 698. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

ARE 699. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use of the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is P/F; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

ARE 703. Advanced Natural Resource Economic Theory. 3 Hours.

PR: ECON 710 and ARE 632. Allocation and distribution of natural resources in static and dynamic contexts; welfare economics, cost-benefit analysis, and optimal control approaches; applications to resource valuation, exhaustion, taxation, and regulation in theory and practice.

ARE 710. Advanced Environmental Economics. 3 Hours.

PR: ECON 701 and ARE 632 or Consent. Theory, efficient environmental design and analysis, modeling of economic and environmental systems, evaluation of non-market benefits and costs, and risk assessment.

ARE 729. Spatial Econometrics. 3 Hours.

Explores the various types of spatial econometric models and how they are estimated and interpreted. Maximum likelihood and Bayesian methodologies will be demonstrated both mathematically and in an applied setting.

ARE 735. Resources of Development Planning. 3 Hours.

ARE 791A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation in advanced topics that are not covered in regularly scheduled courses.

ARE 792A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

ARE 793A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

ARE 794A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

ARE 795. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

ARE 796. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate students will present at least one seminar to the assembled faculty and graduate student body of his or her program.

ARE 797. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis (697), problem report (697), research paper or equivalent scholarly project (697), or a dissertation (797). Grading may be S/U.

ARE 798. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision is needed during the writing of student reports (698), theses (698), or dissertations (798). (Grading is Normal.).

ARE 799. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium, to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is Normal; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

AGRONOMY COURSES

AGRN 516. Soil Chemistry. 3 Hours.

PR: AGRN 410. An analysis of the important reactions that occur in soils; thermodynamic and kinetic aspects of these reactions and application to modern problems in soil chemistry. (3 hr. lec.).

AGRN 525. Forage Harvesting and Storage. 3 Hours.

PR: AGRN 454 or Consent. Advanced study of processes associated with harvesting and storage of forages. (3 hr. lec.).

AGRN 552. Pedology. 3 Hours.

PR: AGRN 417 or Consent. Genesis and evolution of soils considered as natural bodies; including both macro-and micromorphological properties. Week-long field trip required at student's expense. (2 hr. lec., 1 hr. lab.).

AGRN 554. Pasture Management and Utilization. 3 Hours.

PR: AGRN 454 and ANNU 260 or consent. Advanced study of pastures and their management and utilization with emphasis on temperate species. (3 hr. lec.).

AGRN 591A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

AGRN 592A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

AGRN 593A-Z. Special Topics. 1-6 Hours.

AGRN 594A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

AGRN 595. Independent Study. 1-6 Hours.

Faculty-supervised study of topics not available through regular course offerings.

AGRN 691A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation in advanced topics that are not covered in regularly scheduled courses.

AGRN 692A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

AGRN 693A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

AGRN 694A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

AGRN 695. Independent Study. 1-6 Hours.

Faculty-supervised study of topics not available through regular course offerings.

AGRN 696. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

AGRN 697. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

AGRN 698. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision is needed during the writing of student reports (698), theses (698), or dissertations (798). (Grading is Normal.).

AGRN 699. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium, to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is Normal; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

AGRN 710. Soil Testing and Plant Analysis. 3 Hours.

PR: AGRN 210 and BIOL 350, or Consent. Influence of soil chemical and physical properties on availability of plant nutrients; intensive study of individual plant nutrients and interactions of nutrients in soils and crops; and intensive study of methods used to test soils and analyze plants for nutrients and other metals. (2 hr. lec., 1 hr. lab.).

AGRN 790. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of agronomy. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on assistantships to gain teaching experience. (Grading will be S/U.).

AGRN 791A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

AGRN 792A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

AGRN 793A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

AGRN 794A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

AGRN 795. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

AGRN 796. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

AGRN 797. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

AGRN 798. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

AGRN 799. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use of the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is S/U; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

ANESTHESIOLOGY COURSES

ANES 591A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation in advanced topics that are not covered in regularly scheduled courses.

ANES 592A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

ANES 593A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

ANES 594A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

ANES 595. Independent Study. 1-6 Hours.

Faculty-supervised study of topics not available through regular course offerings.

ANES 691A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

ANES 692A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

ANES 693A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

ANES 694A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

ANES 695. Independent Study. 1-6 Hours.

Faculty-supervised study of topics not available through regular course offerings.

ANES 696. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

ANES 697. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

ANES 698. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision is needed during the writing of student reports (698), theses (698), or dissertations (798). (Grading is Normal.).

ANES 699. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium, to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is Normal; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

ANES 701. Basic Sciences Applied to Anesthesiology. 1-6 Hours.

PR: Consent. (Not offered during summer.) Examination and evaluation of data, decision-making, discussion of special procedures. (Max. enrollment: 10.).

ANES 731. Clinical Clerkship in Anesthesiology and Acute Medicine. 0 Hours.

ANES 731. Clinical Clerkship in Anesthesiology and Acute Medicine. 0 Hr. (Third year.) CR. Preanesthetic evaluation, local and systemic anesthesia, airway management, cardiopulmonary resuscitation, respiratory care, clinical pharmacology, toxicology, fluid and blood therapy, and pain management. Seminars and practical exercises in emergency cardiac life support clinical experience in ICU or OR. (Duration: 2 weeks.).

ANES 780. Surgical Critical Care Medicine. 0 Hours.

Clinical rotation course. (See conjoined courses.).

ANES 790. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in the college teaching anesthesiology. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on assistantships to gain teaching experience. (Grading will be S/U.).

ANES 791A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

ANES 792A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

ANES 793A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

ANES 794A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

ANES 795. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

ANES 796. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

ANES 797. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

ANES 798. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

ANES 799. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use of the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is S/U; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

ANIMAL NUTRITION COURSES**ANNU 591A-Z. Advanced Topics. 1-6 Hours.**

PR: Consent. Investigation in advanced topics that are not covered in regularly scheduled courses.

ANNU 592A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

ANNU 593A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

ANNU 594A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

ANNU 595. Independent Study. 1-6 Hours.

Faculty-supervised study of topics not available through regular course offerings.

ANNU 601. Principles of Nutrition and Metabolism. 3 Hours.

PR: AGBI 410 or consent. A basic course in principles of nutrition with emphasis on the major classes of dietary nutrients and their digestion and utilization.

ANNU 602. Nutrition and Physiological Function. 3 Hours.

PR: ANNU 601 or Consent. Sequence to ANNU 601. Techniques used in nutritional studies and the relationship of nutrient requirements to physiological function in species of laboratory and domestic animals and man.

ANNU 690. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of animal nutrition. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It also provides a mechanism for students not on assistantships to gain teaching experience. (Grading will be S/U.).

ANNU 691A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

ANNU 692A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

ANNU 693A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

ANNU 694A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

ANNU 695. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

ANNU 696. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

ANNU 697. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

ANNU 698. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

ANNU 699. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use of the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is S/U; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

ANNU 794A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

ANIMAL PHYSIOLOGY COURSES

ANPH 591A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation in advanced topics that are not covered in regularly scheduled courses.

ANPH 592A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

ANPH 593A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

ANPH 594A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

ANPH 595. Independent Study. 1-6 Hours.

Faculty-supervised study of topics not available through regular course offerings.

ANPH 675. Reproduction Colloquium. 1 Hour.

PR: Graduate standing. Weekly discussions by graduate students and faculty in reproductive physiology program of current literature in the field, particularly of mammalian species.

ANPH 691A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

ANPH 692A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

ANPH 693A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

ANPH 694A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

ANPH 695. Independent Study. 1-6 Hours.

Faculty-supervised study of topics not available through regular course offerings.

ANPH 696. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

ANPH 697. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

ANPH 698. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision is needed during the writing of student reports (698). theses (698), or dissertations (798). (Grading is Normal.).

ANPH 699. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium, to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is Normal; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

ANPH 726. Endocrinology of Reproduction. 4 Hours.

(2 labs) PR: ANPH 424 or BIOL 413 or equivalent. Discussion of and laboratory experience in classical and current concepts of hormonal and neurohormonal regulations of reproductive phenomena with emphasis on species differences and similarities.

ANPH 790. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of animal physiology. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on assistantships to gain teaching experience. (Grading will be S/U.).

ANPH 791A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

ANPH 792A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

ANPH 793A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

ANPH 794A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

ANPH 795. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

ANPH 796. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

ANPH 797. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

ANPH 798. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

ANPH 799. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use of the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is S/U; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

ANIMAL PRODUCTION COURSES**ANPR 591A-Z. Advanced Topics. 1-6 Hours.**

PR: Consent. Investigation in advanced topics that are not covered in regularly scheduled courses.

ANPR 592A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

ANPR 593A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

ANPR 594A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

ANPR 595. Independent Study. 1-6 Hours.

Faculty-supervised study of topics not available through regular course offerings.

ANPR 690. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of animal production. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It also provides a mechanism for students not on assistantships to gain teaching experience. (Grading will be S/U.).

ANPR 691A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

ANPR 692A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

ANPR 693A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

ANPR 694A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

ANPR 695. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

ANPR 696. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

ANPR 697. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

ANPR 698. Thesis or Dissertation. 1-6 Hours.

ANPR 698. Thesis or Dissertation. 1-6Hr. PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

ANPR 699. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use of the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is S/U; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

ANIMAL AND VETERINARY SCIENCE COURSES

A&VS 591A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

A&VS 592A-Z. Directed Study. 1-6 Hours.

Directed Study, reading, and/or research.

A&VS 593A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

A&VS 594A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

A&VS 595. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

A&VS 690. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of agriculture, forestry, and consumer science. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It also provides a mechanism for students not on assistantships to gain teaching experience. (Grading will be S/U.).

A&VS 691A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

A&VS 692A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

A&VS 693A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

A&VS 694A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

A&VS 695. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

A&VS 696. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

A&VS 697. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

A&VS 698. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

A&VS 699. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use of the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is S/U; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

A&VS 791A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

A&VS 792A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

A&VS 793A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

A&VS 794A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

A&VS 795. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

A&VS 796. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

A&VS 797. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or dissertation. (Grading may be S/U.).

A&VS 798. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

A&VS 799. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use of the University facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is S/U; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

APPLIED ENVRNMNTL MCRBLGY COURSES**AEM 508. Applied Water Microbiology. 3 Hours.**

PR: AEM 341 or consent. Microbiology and health hazards associated with surface and ground water intended for consumption, recreation, waste disposal, and agriculture/industry applications.

AEM 545. Food Microbiology. 3 Hours.

PR: AEM 341. The relationships of micro-organisms to food-borne illness and intoxications, microbial food quality, food spoilage, food preservation and bio-processing. The emerging food preservation technologies and predictive microbiology will be introduced.

AEM 549. Food Microbiology Lab. 1 Hour.

PR: AEM 545. Laboratory training in methods used in microbiological examination of foods. This laboratory will provide hands-on experience for students who take or have taken AEM 545.

AEM 591A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

AEM 592A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

AEM 593A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

AEM 594A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

AEM 595. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

AEM 748. Sanitary Microbiology. 3 Hours.

PR: AEM 341 or Consent. Microbiology and health hazards associated with food handling, water treatment, and sanitary waste disposal.

AEM 750. Current Concepts in Microbial Ecology. 1 Hour.

Emphasis on reading, criticism, and discussion of recent journal articles from the primary literature in microbial ecology/environmental microbiology.

AEM 790. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of applied and environmental microbiology. NOTE: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on assistantships to gain teaching experience. (Grading will be S/U.).

AEM 792A-Z. Directed Study. 1-6 Hours.

Directed study, reading and/or research.

AEM 795. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

AEM 797. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

ART COURSES

ART 513. Graduate Painting. 1-15 Hours.

(May be repeated for credit) PR: Consent. Encompasses the significant issues and developments of contemporary painting, including visual resources, critical and pictorial structures, and technical proficiency to establish a coherent aesthetic vision in the medium.

ART 515. Arts Administration. 3 Hours.

This course provides a practical approach to understanding arts management in not-for-profit organizations. Topics include facilities management, leadership, programming, audience development, board relations, and fundraising.

ART 523. Graduate Graphic Design. 1-15 Hours.

(May be repeated for credit.) PR: Consent. Integration of current and historic resources leading to the development of design projects while working within the independent and existing courses. Areas of special interest include the book arts and electronic multimedia.

ART 524. Graduate Graphic Design/Professional Practice. 1-6 Hours.

(May be repeated for credit) PR: Consent. Students assist and work on projects in a model studio setting, helping to coordinate and manage communication with clients, printers, and undergraduate students in graphic design studio.

ART 526. Graduate Sculpture. 1-15 Hours.

(May be repeated for credit.) PR: Consent. Encompasses the significant issues and developments of contemporary three-dimensional form, including visual resources, critical theory, historic foundations and technical proficiency to establish a coherent comprehension of the media.

ART 530. Graduate Printmaking. 1-15 Hours.

(May be repeated for credit) PR: Consent. Encompasses the germane aspects of contemporary printmaking including visual resources, theoretical and historic structures, and comprehension technical processes, designed to establish a rigorous comprehension of the medium. Areas of specialization include lithography, intaglio, relief, serigraphy, and electronic media.

ART 532. Graduate Photography. 1-15 Hours.

(May be repeated for credit) PR: Consent. Engages the essential issues and developments of contemporary photography, from traditional to digital photo processes, theoretical and pictorial foundations, and technical proficiency designed to afford a coherent aesthetic vision in the medium.

ART 534. Alternative Media. 1-15 Hours.

(May be repeated for credit.) PR: Consent. Engages the primary issues and developments of alternative and interdisciplinary media such as installation, video, performance art, or other media along with the critical foundation and technical proficiency to establish a comprehensive utilization of chosen forms.

ART 540. Graduate Ceramics. 1-15 Hours.

(May be repeated for credit.) PR: Consent. Involves the essential concerns and developments of contemporary ceramics, including traditional and current practices. Emphasis is on technical processes designed to provide a rigorous comprehension and expression in clay. Area of specialization include both functional and sculptural ceramics.

ART 565. Graduate Studies: Art Education. 1-12 Hours.

(May be repeated for credit.) PR: Consent. Studies in art education and related areas. The development of a master's degree project in conjunction with a faculty committee.

ART 580. Art and Environment. 3 Hours.

PR: Registered graduate student. Interdisciplinary studio/seminar course investigating art's relationship to the environment through readings, field trips, presentations, and studio practice.

ART 590. Teaching Practicum/Professional Practice. 1-3 Hours.

PR: Consent. This course is designed to develop aspects of college teaching experience such as writing a syllabus, organizing a classroom, or improvising with materials or topical issues. Preparation for establishing professional practice as a studio artist will be addressed.

ART 591A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

ART 592A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

ART 593A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

ART 594A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

ART 595. Independent Study: Graduate Studio. 1-6 Hours.

PR: Consent. (May be repeated for credit.) Intensive, self-directed research involving special projects in studio production. Areas of study include, but are not limited to painting, drawing, intermedia, printmaking, sculpture, ceramics, and design.

ART 600. Graduate Exhibition and Thesis. 3-6 Hours.

PR: Consent. (May be repeated for credit.) Research will be directed towards the production of a solo exhibition and a written thesis which documents the processes and philosophical principles of the artwork.

ART 602. Master's in Art Education Project. 3-9 Hours.

PR: Consent. This course is designed to develop the master's project in art education. The in-depth project must be approved by the advising committee.

ART 691A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation in advanced topics that are not covered in regularly scheduled courses.

ART 692A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and or research.

ART 693A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

ART 694A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

ART 695. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

ART 696. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

ART 697. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper, or equivalent scholarly project, or dissertation. (Grading may be S/U.).

ART 698. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision is needed during the writing of student reports (698). theses (698), or dissertations (798). (Grading is Normal.).

ART 699. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is P/F; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

ART 930. Professional Development. 1-6 Hours.

Professional development courses provide skill renewal or enhancement in a professional field or content area (e.g., education, community health, geology). These tuition-waived continuing education courses are graded on a pass/fail grading scale and do not apply as graduate credit toward a degree program.

ART HISTORY COURSES**ARHS 501. Independent Study. 1-15 Hours.**

(May be repeated for credit) PR: Consent. Independent research, closely supervised, on topics of student's selection. Proposal must be well-defined and contain historical, critical, and theoretical issues. Contractual course.

ARHS 504. Asian Art. 3 Hours.**ARHS 507. Native American. 3 Hours.**

Advance investigation of the visual material culture of the First Peoples of North American north of the Rio Grande, pre-contract to present. Focus on formal analysis with careful contextual studies.

ARHS 510. Intro Curatorial Practice. 3 Hours.

PR: ARHS 120 and ARHS 160. Specifically the role of the curator. The objective is to assess exhibition display and develop a critical perspective on curatorial practice.

ARHS 520. Greek and Roman. 3 Hours.

PR: Consent. The architecture, sculpture, and paintings of the Aegean world, c.2000 BCE, Greece and Rome to 400 CE. Critical and historical context of this time period will be considered.

ARHS 531. Medieval. 3 Hours.

PR: Consent. The arts of Europe from c. 312 to c. 1350. The theoretical, historical, and literary contexts will be established. Architecture, sculpture, painting, and portable arts will be included.

ARHS 533. Medieval Architecture. 3 Hours.

Advanced investigation into the architecture of western Europe and its builders, from 313 through the sixteenth century: monumental buildings, architectural ornament, and the fusion of sacred and secular, in context of medieval world views.

ARHS 538. History of Stained Glass. 3 Hours.**ARHS 544. Art Theory. 3 Hours.**

PR: Consent. Examination of the development and tradition of the literature of Western art theory and its relationship to artistic practice.

ARHS 545. Modern Art Theory. 1-12 Hours.

(May be repeated for credit.) PR: Consent. Studies in art education and related areas. The development of a master's degree project in conjunction with a faculty committee.

ARHS 546. Medieval Painting. 3 Hours.**ARHS 547. Romantic Painting. 3 Hours.**

Advanced investigation into artistic movements and the underlying cultural and intellectual factors that inspire painters to use imagination and appeal to the emotions, reflecting the complexity of both the world and the self.

ARHS 548. Women in Art. 3 Hours.

Graduate-level study and research on the art of female artist and of women as subjects in art. There will be an historical view along with a strong theoretical component.

ARHS 550. Northern Renaissance. 3 Hours.

PR: Consent. The arts of Northern Europe from 1350 to 1560 will be studied in an historical and theoretical context. Painting and sculpture will be the focus of study.

ARHS 554. Italian Renaissance. 3 Hours.

PR: Consent. Early Renaissance through Mannerism. The course will emphasize both the historical context and theoretical foundation of 15th-and 16th-century Italian art and architecture.

ARHS 560. Baroque. 3 Hours.

PR: Consent. Art of the late 16th through the early 18th centuries, of both Northern and Southern Europe. Issues of historical context and theoretical interpretation will be emphasized.

ARHS 570. American. 3 Hours.

PR: Consent. The arts in the United States from the Colonial to the Modern era placed upon factors which define American art and the critical foundations for the works.

ARHS 575. Nineteenth Century. 3 Hours.

PR: ARHS 120 and ARHS 160. The course focuses upon European and American art from the late 18th century through 1900. Issues of theory, historical context, and literary foundation will be considered.

ARHS 580. Modern. 3 Hours.

PR: Consent. The revolutionary experience of visual art, from its foundation in 19th century European movements through the modern era. Critical theory and historical context will be stressed.

ARHS 581. Modern Architecture. 3 Hours.

Advanced investigation of architecture from the industrial revolution to the present. Theoretical consideration of style, form, technique, material, and meaning in the architecture of the modern and contemporary periods.

ARHS 582. Architect Frank Lloyd Wright. 3 Hours.

Advanced investigation of the life and work of America's most noted and controversial architect. Close examination of his work in the context of the development of modern architecture.

ARHS 585. Print, Propaganda and Art. 3 Hours.

Advanced investigation of the history and theoretical implications of printing, printmaking, and other forms of imaging in the western world from the earliest printed materials to present.

ARHS 588. The Art of Andy Warhol. 3 Hours.

Advanced investigation of the ground-breaking and controversial art of Andy Warhol. Examination of his work in the context of 1960's Pop Art movement and recent contemporary art.

ARHS 589. Contemporary. 3 Hours.

PR: Consent. Exploration of the various artistic movements from World War II to the present. Emphasis will be given to the change from modern to postmodern. Familiarity with images and critical texts will be expected.

ARHS 591A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation in advanced topics that are not covered in regularly scheduled courses.

ARHS 592A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

ARHS 593A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

ARHS 594A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

ARHS 595. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

ARHS 601. Thesis. 3 Hours.

PR: Consent. Topic selected by student in consultation with art history faculty. Research must indicate familiarity with primary and secondary sources and regard for evidence of art historical research, methodology, and criticism.

ARHS 602. History of Chinese Ceramics. 3 Hours.

Advanced investigation of pre-history to present with emphasis on historical development of ceramics and culture of important dynasties in Jingdenzhen, China. Students will visit historical archaeological sites, traditional production centers, and museums.

ARHS 605. Chinese Language and Cultural History. 3 Hours.

Covers basic cultural and written Chinese, an introduction to China's many cultures and customs, and a brief history of China. Field trips offer experiential learning at sites discussed in class.

ARHS 691A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation in advanced topics that are not covered in regularly scheduled courses.

ARHS 692A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

ARHS 693A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

ARHS 694A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

ARHS 695. Independent Study. 1-6 Hours.

Faculty-supervised study of topics not available through regular course offerings.

ARHS 696. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

ARHS 697. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or dissertation. (Grading may be S/U.).

ARHS 698. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision is needed during the writing of student reports (698), theses (698), or dissertations (798). (Grading is Normal.).

ARHS 699. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium, to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is Normal; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

ASTRONOMY COURSES

ASTR 591A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation in advanced topics that are not covered in regularly scheduled courses.

ASTR 592A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

ASTR 593A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

ASTR 594A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

ASTR 595. Independent Study. 1-6 Hours.

Faculty-supervised study of topics not available through regular course offerings.

ASTR 691A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation in advanced topics that are not covered in regularly scheduled courses.

ASTR 692A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

ASTR 693A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

ASTR 694A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

ASTR 695. Independent Study. 1-6 Hours.

Faculty-supervised study of topics not available through regular course offerings.

ASTR 696. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

ASTR 697. Research. 1-15 Hours.

ASTR 697. Research. I, II, S. 1-15 hr. PR: Consent. Research activities leading to thesis (697), problem report (697), research paper or equivalent scholarly project (697), or a dissertation (797). (Grading is S/U.).

ASTR 698. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision is needed during the writing of student reports (698), theses (698), or dissertations (798). (Grading is Normal.).

ASTR 699. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium, to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is normal; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

ASTR 700. Radio Astronomy. 3 Hours.

Introduction to radio astronomy theory and techniques suitable for graduate students. Topics covered include radio-wave fundamentals, antenna theory, radiation mechanisms, extragalactic sources, pulsars and cosmology.

ASTR 701. Computational Astrophysics. 3 Hours.

Introduction to C programming to solve astrophysical problems. Topics covered include hypothesis testing, Monte Carlo simulations and Fourier techniques for analysis of astronomical data.

ASTR 702. Stellar Structure and Evolution. 3 Hours.

Comprehensive discussion of birth, life cycle and end products of stars. Topics covered include main-sequence evolution, giant stars, white dwarfs, supernovae neutron stars and black holes.

ASTR 703. Galactic Astronomy. 3 Hours.

Detailed study of galactic structures. Topics covered include galactic dynamics, rotation and spiral density waves, the interstellar medium and supernova remnants.

ASTR 704. General Relativity. 3 Hours.

Innovative 'physics- first' introduction to Einstein's relativistic theory of gravity. Topics covered include special relativity, curved space time, gravitational collapse and black holes.

ASTR 791A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation in advanced topics that are not covered in regularly scheduled courses.

ASTR 792A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

ASTR 793A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

ASTR 794A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

ASTR 795. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

ASTR 796. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

ASTR 797. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis (697), problem report (697), research paper or equivalent scholarly project (697), or a dissertation (797). (Grading May be S/U).

ASTR 798. Thesis or Dissertation. 2-4 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision is needed during the writing of student reports (698), theses (698), or dissertations (798). (Grading is Normal.).

ASTR 799. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium, to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is normal; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

ATHLETIC COACHING EDUCATION COURSES**ACE 591A-Z. Advanced Topics. 1-6 Hours.**

PR: Consent. Investigation in advanced topics that are not covered in regularly scheduled courses.

ACE 592A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

ACE 593A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

ACE 594A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

ACE 595. Independent Study. 1-6 Hours.

Faculty-supervised study of topics not available through regular course offerings.

ACE 602. Action-based Research for Coaching. 3 Hours.

Examination of action based research as applied to sport studies. Emphasis placed on learning the skills of disciplined inquiry to inform and change ones practices in the future.

ACE 610. Training Theories for Coaches. 3 Hours.

This course is designed to promote critical thinking, problem solving and use of current training theories for best practice in coaching across all levels to develop and nurture talent.

ACE 618. Psychology of Coaching. 3 Hours.

In-depth understanding of the psychology of coaching athletes and application of this knowledge into coaching practices for optimal athlete development and performance. Contemporary issues also covered.

ACE 630. Coaching Education Administration. 3 Hours.

An administrative focus on leadership, finance, fundraising, planning, facility development, personnel supervision, public relations, rules and regulations, purchase and care of equipment and the conducting of athletic events.

ACE 639. Create Healthy Competitive Environments. 3 Hours.

PR: ACE 602 and ACE 610. Course explores topics related to techniques of training, ergogenic aids, performance enhancement, and the coach roles and responsibilities in designing, creating and maintaining a safe and healthy environment.

ACE 641. Positive Youth Development in Sport. 3 Hours.

PR: ACE 688. Review literature and outreach programs in positive youth development. Emphasis on development of psychosocial assets in youth such as life skills and character.

ACE 645. Contemporary Issues in Sport. 3 Hours.

Contemporary issues in sport; to make you a more successful coach, expose you to situations in today's coaching profession, and prepare you to plan for situations that may arise.

ACE 650. Sport Movement Analysis. 3 Hours.

This course applies the laws of physics to sport activities with the objective of finding the most efficient use of the human body to achieve the highest levels of performance.

ACE 661. Strength and Conditioning Methods for Coaches. 3 Hours.

Present basic exercise performance methodologies to assist in coaching athletes. Types of training include speed drills, agility drills, conditioning workouts, flexibility exercises, balance-improvement drills, and proper training- environment safety techniques.

ACE 663. Advanced Strength and Conditioning Coaching Techniques. 3 Hours.

PR: ACE 661. Present various exercises in hands-on setting to utilize in training. Proficiency is taught in Olympic movements, free weights, machine weights, and plyometrics. Speed and agility track exercises will be included.

ACE 665. Strength and Conditioning Program Design Coach. 3 Hours.

PR: ACE 661. Students in this course will learn to design programs in athletic resistance training, plyometrics, conditioning, and agility, and students will learn to handle detraining, sports specificity, and periodization for offseason and competition programs.

ACE 671. Women in Sport. 3 Hours.

ACE Graduate: Study the history of women in sport, and investigate issues that are directly related to women in sport as participants, coaches, administration, parents and fans.

ACE 685. Coaching Internship. 1-6 Hours.

Students will complete a contract detailing terms of the learning experience. The levels of coaching include but are not limited to elementary schools, little league, secondary schools, and collegiate levels.

ACE 688. Coaching Techniques. 1-6 Hours.

Students will complete a contract detailing terms of coaching technique topics relevant to their individual coaching experience.

ACE 691A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

ACE 692A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

ACE 693A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

ACE 694A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

ACE 695. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

ACE 696. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

ACE 697. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

ACE 698. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision as needed during the writing of student reports, theses, or dissertations. (Grading is Normal).

ACE 699. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate student not seeking coursework credit but who wish to meet residency requirements, use the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is Normal; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

ACE 900. Professional Development. 1-6 Hours.

Professional development courses provide skill renewal or enhancement in a professional field or content area (e.g. education, community health, geology.) The continuing education courses are graded on a pass/fail grading scale and do not apply as graduate credit toward a degree program.

ACE 930. Professional Development. 1-6 Hours.

Professional development courses provide skill renewal or enhancement in a professional field or content area (e.g. education, community health, geology.) These tuition-waived, continuing education courses are graded on a pass/fail grading scale and do not apply as graduate credit toward a degree program.

ATHLETIC TRAINING COURSES**ATTR 595. Independent Study. 1-6 Hours.**

Faculty supervised study of topics not available through regular course offerings.

ATTR 618. Anatomy Laboratory. 3 Hours.

Cadaver laboratory dissection involving an anatomical analysis of the trunk and extremities.

ATTR 620. Athletic Training Practicum 1. 1 Hour.

PR: Admittance into graduate athletic training program. Understanding of the different members of the sports medicine community; incorporating viewpoints into the process of making decisions about the care of an injured athlete.

ATTR 621. Athletic Training Practicum 2. 1 Hour.

PR: ATTR 620. Clinical experience in athletic training that allows students to broaden their exposure to administrative duties.

ATTR 622. Athletic Training Practicum 3. 1 Hour.

PR: ATTR 621. Clinical experience in athletic training that allows students to broaden their experience and to develop advanced clinical and writing skills.

ATTR 623. Athletic Training Practicum 4. 1 Hour.

PR: ATTR 622. Clinical experience in athletic training that allows students to broaden their clinical thinking and problem solving abilities.

ATTR 625. Science and Theory of Rehabilitation. 3 Hours.

This course will present the current theory of therapeutic exercise techniques as they relate to the rehabilitation of the physically active individual.

ATTR 626. Low Back and Overuse Pathology. 3 Hours.

This course will present evidence based and best clinical practice for low back and overuse pathology related to the assessment, treatment, and rehabilitation of the physically active individual.

ATTR 627. Biomechanics. 3 Hours.

To provide the athletic trainer with an understanding of applied clinical biomechanics and its relationship to specific joints, sports and pathologies.

ATTR 640. Critical Thinking in Injury Assessment. 3 Hours.

A course designed to demonstrate knowledge in critical thinking skills and evidence-based clinical practice guidelines as they relate to the evaluation process.

ATTR 650. Medical and Surgical Aspects of Athletic Training. 3 Hours.

Variety of current medical and surgical procedures commonly performed on athletic populations.

ATTR 655. Integrated Functional Human Performance. 3 Hours.

A course designed to instruct the student in the theory of integrated functional human performance and design application of the material to integrate knowledge learned with professional experience and prior learning in fitness and rehabilitation.

ATTR 685. Field Concentration 1. 2 Hours.

A course designed to enhance knowledge and field experience in specialized areas of athletic training practice.

ATTR 686. Field Concentration 2. 2 Hours.

PR: ATTR 685. A course designed to continue knowledge and field experience in specialized areas of athletic training practice gained in ATTR 685.

ATTR 691A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

ATTR 693A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

ATTR 695. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

ATTR 697. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

ATTR 698. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

BEHAVIOR MEDICINE PSYCHIATRY COURSES

BMP 691A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

BMP 697. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

BMP 741. Clinical Clerkship in Psychiatry. 6 Hours.

This is a clinical rotation course required for all third-year medical students. Students will be assigned to work with both in- and out-patient psychiatric care. Focus will be on making psychiatric diagnoses and implementing appropriate treatments. Students will become familiar with various types of psychiatric disorders as well as their treatment. Students will learn about psychopharmacology, psychotherapy, and other biological treatments. Students will also be on call for and involved in the treatment of emergency department psychiatric patients.

BMP 790. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of behavior medicine and psychiatry. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on assistantships to gain teaching experience. (Grading may be S/U.).

BMP 791A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

BMP 792A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

BMP 793A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

BMP 794A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

BMP 795. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

BMP 796. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

BMP 797. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

BMP 798. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

BMP 799. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is P/F; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

BMP 930. Professional Development. 1-6 Hours.

Professional development courses provide skill renewal or enhancement in a professional field or content area (e.g., education, community health, geology). These tuition-waived continuing education courses are graded on a satisfactory or unsatisfactory grading scale and do not apply as graduate credit toward a degree program.

BIBLIOGRAPHY COURSES

BIBY 590. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of bibliography. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on assistantships to gain teaching experience. (Grading will be S/U.)

BIBY 591A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

BIBY 592A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

BIBY 593A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

BIBY 594A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

BIBY 595. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

BIBY 615. Methods of Research. 3 Hours.

BIBY 690. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of bibliography. Note: This course is intending to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It also provides a mechanism for students not on assistantships to gain teaching experience. (Grading will be S/U.)

BIBY 691A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

BIBY 692A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

BIBY 693A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

BIBY 694A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

BIBY 695. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

BIBY 696. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

BIBY 697. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.)

BIBY 698. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

BIBY 699. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use of the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is S/U; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

BIBY 791A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

BIBY 797. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.)

BIOCHEMISTRY COURSES

BIOC 531. General Biochemistry. 4 Hours.

PR: General chemistry, organic chemistry. (For pharmacy students; others by consent.) Consisting of the lecture portion of BIOC 705, this course is designed to be a general introduction to biochemical compounds, processes and concepts for students in the pharmacy program. Master's program students and others by consent. Four lectures per week.

BIOC 551. Cell and Molecular Biochemistry 1. 4 Hours.

PR: General Chemistry and Organic Chemistry. Part I of a two-semester graduate-level course that instills comprehension of biochemistry, molecular biology and cell biology necessary for bio-medical research. This course covers biochemical principles, proteins, and molecular biology.

BIOC 552. Cell and Molecular Biochemistry 2. 4 Hours.

PR: BIOC 351. Part II of a two-semester graduate-level course that instills comprehension of biochemistry, molecular biology and cell biology necessary for bio-medical research. This course covers metabolism, metabolic regulation, cell structure and cellular communication.

BIOC 595. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

BIOC 650. Supervised Teaching. 1-6 Hours.

PR: Consent. Supervised college teaching of biochemistry.

BIOC 652. Journal Club. 1-6 Hours.

Discussions of recent important topics in scientific literature.

BIOC 690. Teaching Practicum. 1-3 Hours.

PR: Consent of chairperson. Supervised practice in college teaching of biochemistry. (Graded as S/U.).

BIOC 693A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

BIOC 697. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper, or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

BIOC 698. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

BIOC 699. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is P/F; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

BIOC 705. General Biochemistry. 5 Hours.

PR: General chemistry, organic chemistry. (For dental students.) General introduction to biochemical compounds, processes and concepts as part of the training for the practice of dentistry, including passage of the Dental Board Exam. Four lectures and one clinical correlation or small group discussion per week.

BIOC 750. Protein Chemistry/Enzymology. 4 Hours.

PR: Consent. Advanced topics in protein structure function relationships and enzymology. Emphasis is placed on emerging topics in the literature.

BIOC 751. Advanced Molecular Biology. 4 Hours.

PR: Consent. A study of contemporary topics in molecular biology. This is an advanced seminar-style class using material from the current literature.

BIOC 785. Biochemistry and Molecular Biology Journal Club. 1 Hour.

(May be repeated for a maximum of 16 credit hours.) Guided reading and critiquing of the current scientific literature for graduate students in the Biochemistry and Molecular Biology Graduate Programs.

BIOC 790. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of biochemistry. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on assistantships to gain teaching experience. (Grading will be S/U.).

BIOC 791A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

BIOC 792A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

BIOC 793A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

BIOC 794A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

BIOC 796. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

BIOC 797. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

BIOC 798. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

BIOC 799. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use the University's facilities, and participate in its academic and cultural programs. Note: graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is P/F; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

BIOLOGY COURSES**BIOL 576. Computational Neuroscience. 4 Hours.**

PR: Consent. This course focuses on the tools and concepts used to probe and characterize the dynamics of neurons, neural networks and neural coding mechanisms. Lectures introducing concepts and discussion sessions of the current research literature complement computer laboratories where the student learns programming skills, analytical tools and neural modeling methods used in computational neuroscience research.

BIOL 577. Central Nervous System Evolution and Development. 3 Hours.

PR: BIOL 219 and BIOL 348 or equivalent. Origin and evolution of the animal nervous system, focusing on developmental and genetic mechanisms underlying structural modifications that serve as the basis for the evolution of behavioral repertoires.

BIOL 579. Advances in Systems Neuroscience. 3 Hours.

PR: BIOL 348 or Consent. Fundamental principles of nervous system organization with an emphasis on interactions between neurons and the consequences for behavior. There will be a focus on recent advances in our understanding of each organizational principle.

BIOL 593A-Z. Special Topics. 0-6 Hours.

A study of contemporary topics selected from recent developments in the field.

BIOL 615. Microbial Symbiosis. 3 Hours.

Molecular techniques used towards identifying the composition, structure and functions of microbial communities in various ecological contexts will be discussed. An understanding of the significance of microbial symbioses towards ecological and health processes will be developed. (Also listed as BIOL 456.).

BIOL 620. Genomics. 3 Hours.

PR: BIOL 219 or consent. Advanced elective examining biology and evolution on a genome-wide scale. Topics include fields of study and methods of DNA sequence acquisition and annotation, including exploration of the human genome and its contribution to disease discovery.

BIOL 651. Evolution of Infectious Diseases. 3 Hours.

The application of phylogenetics, microbiology, immunology, and epidemiology towards comprehending the evolution of infectious diseases. Students will develop a fundamental understanding of the significance of evolution and ecology towards infectious disease emergence and control.

BIOL 690. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of biology. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It also provides a mechanism for students not on assistantships to gain teaching experience. (Grading will be S/U.).

BIOL 691A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

BIOL 692A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

BIOL 693A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

BIOL 695. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

BIOL 697. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

BIOL 698. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

BIOL 711. Molecular Basis of Virology. 3 Hours.

PR: BIOL 219 or equivalent or consent. Lectures on bacterial, animal, and plant viruses; their structure, replication, and interaction with host cells. Discussion of the contributions virology has made to the understanding of molecular mechanisms in biology.

BIOL 714. Advances in Protein Science. 3 Hours.

An examination of proteins from a structural, functional, and biological perspective. Discussions will include biochemical, genetic, phylogenetic, structural, computational, and proteomic approaches.

BIOL 715. Extracellular Matrix in Cell Signaling. 3 Hours.

The course emphasizes the fundamental role that that extracellular matrix plays in the process of morphogenesis, differentiation, development and maintenance of the differentiated state.

BIOL 737. Developmental Biology. 3 Hours.

PR: BIOL 336 or equiv., organic chemistry or biochemistry, or consent. The molecular and cellular basis of differentiation and morphogenesis. (Offered in fall of odd years.).

BIOL 738. Fundamentals of Gerontology. 3 Hours.

PR: MDS 212 or consent. An advanced multidisciplinary examination of current research in biological, psychological, and sociological issues of human aging and the ways in which these impinge on the individual to create both problems and new opportunities. (Also listed as PSYC 524.).

BIOL 752. Physiological Plant Ecology. 3 Hours.

PR: BIOL 350 and consent. Advanced studies on the interactions between plants and their environment focusing on whole-plant carbon exchange, water relations, and nutrient uptake, with reference to specific biomes.

BIOL 753. Water and Nutrient Relations of Plants. 3 Hours.

PR: BIOL 350 and consent. Advanced studies on water and nutrient acquisition, use, and transformation in plants with focus on plant-soil interactions, symbiotic associations, and acclimation and adaption mechanisms operating in plants.

BIOL 754. Plant Growth and Development. 3 Hours.

PR: BIOL 350 and consent. Advanced studies of the mechanisms and patterns underlying growth and development, with emphasis on hormonal regulation and molecular processes in plants.

BIOL 761. Ecosystem Dynamics. 3 Hours.

PR: Consent. A survey of our current understanding of the biogeochemistry that occurs at and near the surface of the Earth. Emphasis is placed on the biogeochemical cycles of carbon, nitrogen, phosphorus, and sulfur. The origin and dynamics of the atmosphere, lithosphere and hydrosphere are also considered. (Offered in even-numbered years).

BIOL 762. Plant Population Biology. 3 Hours.

PR: Graduate status or undergraduate status with the completion of BIOL 221 and the instructor's permit. Plant population biology exams the interplay of ecological theory and the real world of experimental ecology of natural populations using a case study approach. Each student will research a current topic in greater depth.

BIOL 790. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of biology. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on assistantships to gain teaching experience. (Grading will be S/U.).

BIOL 791A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

BIOL 792A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

BIOL 793A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

BIOL 794A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

BIOL 795. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

BIOL 796. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

BIOL 797. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper, or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

BIOL 798. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

BIOL 799. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use of the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is P/F; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

BIOL 930. Professional Development. 1-6 Hours.

Professional development courses provide skill renewal or enhancement in a professional field or content area (e.g., education, community health, geology.) These tuition-waived continuing education courses are graded on a pass or fail grading scale and do not apply as graduate credit toward a degree program.

BIOMEDICAL SCIENCES COURSES**BMS 694A-Z. Seminar. 1-6 Hours.**

Special seminars arranged for advanced graduate students.

BMS 695. Independent Study. 1-6 Hours.

Faculty-supervised study of topics not available through regular course offerings.

BMS 700. Scientific Integrity. 1 Hour.

A course in scientific ethics that is led by individual faculty and incorporates small and large group discussions of ethical issues in science presented as case studies.

BMS 705. Cell Structure and Metabolism. 1-4 Hours.

This course emphasizes general principles of cell biology, membrane structure and transport, and signaling, proliferation, death and structure of cells and incorporates a literature-based journal club.

BMS 706. Cellular Methods. 1 Hour.

A lecture-based survey of research techniques used in contemporary studies of cells, ranging from the imaging of cells and tissues by microscopy and fluorescence techniques to the purification and characterization of protein structure and function.

BMS 710. Fundamentals of Integrated Systems. 1-4 Hours.

This course emphasizes four areas of integrated biology - endocrinology, neurobiology, immunology and microbial pathogenesis, with an overview of pharmacology and incorporates a literature-based journal club.

BMS 715. Molecular Genetics. 1-3 Hours.

This course emphasizes general principles of molecular biology (the progression of information from the gene to the production of the active protein or the active RNA) and incorporates a literature-based journal club.

BMS 720. Scientific Writing. 2 Hours.

This course introduces students to scientific writing and requires them to write a journal article and a pre-doctoral grant proposal, based on the format used by NIH.

BMS 730. Cancer Cell Biology. 2-3 Hours.

This course emphasizes the cellular signals that direct tumor growth and invasive potential and explores how these same signals can be targeted for intervention to block tumor progression.

BMS 732. Introduction to Physiological Systems and Disease. 3 Hours.

This course provides students with an introduction to cellular and molecular physiology. It enables students to investigate normal and pathologic pathways and examine common diseases and injuries that alter organ systems. Students considering any research path directed toward human health and disease will find that this course provides a foundation in the study of human form and function.

BMS 734. Cell Signaling Metabolism. 3 Hours.

This course emphasizes the pathways involved in energy metabolism in living cells and introduces hormonal and nutritional signal transduction systems that control metabolic pathways.

BMS 736. Immunology and Microbial Pathogenesis. 3 Hours.

PR: BMS 710. An expansion of the concepts and mechanisms of basic immunology and microbial pathogenesis previously introduced in Fundamentals of Integrated Systems BMS 710.

BMS 738. Muscle Structure and Function. 2-3 Hours.

This course examines in-depth the concepts in muscle structure and function with emphasis on normal physiology and applications to overload/exercise and disuse or aging.

BMS 740. Neuroscience 2. 2-3 Hours.

This course provides a background in neuroscience, emphasizing cellular neurobiology, neurochemistry, learning and memory, sensory systems, neural development, autonomic nervous system, neuroendocrinology, and consciousness.

BMS 791A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation in advanced topics that are not covered in regularly scheduled courses.

BMS 793A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

BMS 795. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

BMS 796. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

BMS 797. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

BMS 799. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate student not seeking coursework credit but who wish to meet residency requirements, use the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's Graduate Colloquium, to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Colloquium credit may not be counted against credit requirements for graduation. Registration of one credit hour of graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

BIOMETRIC SYSTEMS COURSES

BIOM 693A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

BIOSTATISTICS COURSES

BIOS 601. Applied Biostatistics 1. 3 Hours.

CoReq: BIOS 602. Introduces parametric and nonparametric statistical methodology, including descriptive measures, elementary probability, estimation, hypothesis testing, confidence intervals, common nonparametric methods, and base contingency table analysis. Empirically demonstrates underlying theory.

BIOS 602. Applied Biostatistics Lab. 1 Hour.

PR or CONC: BIOS 601. This course, taken concurrently with BIOS 601, introduces students to the use of statistical software (SAS, R) to perform basic analyses.

BIOS 603. Applied Biostatistics 2. 3 Hours.

PR: BIOS 601 and BIOS 602. Addresses estimation and hypothesis testing within the context of the generalized linear model. Examines multiple linear regression, logistic regression, survival analysis, and select advanced techniques. Emphasis on applied data analysis of health care studies.

BIOS 604. Applied Biostatistics 3. 3 Hours.

PR: BIOS 602 and BIOS 603. Focus on advanced methodological tools important in public health contexts. Topics include structural equation models and hierarchical linear models (mixed models, random-effect models), categorical methods, survival analysis and clinical trials.

BIOS 605. Applied Biostatistics Capstone. 2 Hours.

PR: BIOS 601 and BIOS 602 and BIOS 603 and BIOS 604 and consent. Students will work on a dedicated data analysis stemming from their own research or the work of others, culminating in a final research paper.

BIOS 610. Intermediate Biostatistics. 4 Hours.

Designed for students advanced mathematical background, focus is on mathematically sophisticated principles and methods of hypothesis testing, associations, one- and two-sample parametric and non-parametric tests. Includes real data set analyses on public health datasets.

BIOS 611. Data Management and Reporting. 3 Hours.

Introduction to statistical software for data management and analysis. Focus is on SAS for data management and analysis.

BIOS 612. Public Health Statistical Inference 1. 3 Hours.

Fundamental applications used in the field of public health including, probability, discrete and continuous distributions, functions, of random variables, descriptive statistics, fundamentals of statistical inference, including estimation and hypothesis testing.

BIOS 620. Applied Linear Models HS. 3 Hours.

PR: BIOS 611 and BIOS 612. Mathematically sophisticated introduction to the analysis of continuous data using applications related to public health, including multiple linear regression (selection of predictor variables, diagnostics), analysis of variance, and mixed models.

BIOS 621. Categorical Data Analysis HS. 3 Hours.

PR: BIOS 610 and BIOS 611. Introduction to the analysis of categorized data with a Health Sciences-Epidemiologic focus: rates, ratios, and proportions; relative risk and odds ratio; Mantel-Haenszel methods; logistic regression, Poisson regression, and other models for categorical data.

BIOS 622. Analysis of Time-to-Event Data. 3 Hours.

PR: BIOS 610 and BIOS 611. Introduction to modern methods for the analysis of time-to-event data (eg. survival, cessation, and recidivism). Theory and application are emphasized; covering survival functions, hazard rates, inference, regression, model construction, stratification, time-dependent covariates, and clinical trials.

BIOS 623. Biostatistical Consulting. 1 Hour.

PR: BIOS 610 and BIOS 611. Focuses on the responsibilities of the biostatistician as a consultant. Discussion topics include consulting models, interpersonal communication, ethics, common client types, time management, and other issues.

BIOS 624. Consulting Experience. 2 Hours.

PR: BIOS 623. Students will gain practical experience in the Biostatistics Consulting Group, under the guidance of the faculty director of the group, to assist with general consulting for the HSC.

BIOS 628. Biostatistics Practicum. 3 Hours.

PR: Consent. Students will work in a collaborative setting for a minimum of 180 hours, applying sophisticated biostatistical principles and skills learned in classes to address research questions that arise in that setting.

BIOS 629. Application of Biostatistics to Public Health Data: Capstone. 3 Hours.

PR: PUBH 622 and BIOS 628. Students will develop research question(s) pertaining to an available public health related data set, determine the public health relevance of that question, plan analyses and implement that plan, and determine public health impact of analysis results. Students will gain practical experience integrating biostatistics concepts within a public health issue.

BIOS 660. Applied Bioinformatics 1. 3 Hours.

PR: BIOS 610 and BIOS 611. Foundational methodological tools for analyzing molecular and population genetics are discussed in detail including methods for modeling genetic inheritance, linkage analysis, genetic association studies, family designs, SNPs analysis, gene interactions, and genome wide association studies.

BIOS 661. Applied Bioinformatics 2. 3 Hours.

PR: BIOS 612 and BIOS 660. The course will cover the fundamental methods that have been successfully applied in bioinformatics, such as supervised learning, unsupervised learning and multiple testing. Students will learn relevant programming languages and software.

BIOS 662. Statistics in Clinical Trials. 3 Hours.

PR: BIOS 610 and BIOS 611. Introduces concepts relevant to the design and analysis of clinical trials. Topics covered include protocol development, quality control, ethical considerations, adherence, randomization, power analysis, and interim analysis.

BIOS 663. Introduction to Meta-Analysis. 3 Hours.

PR: BIOS 603. An introduction to the quantitative analysis (meta-analysis) of data from systematic reviews, including (1) effect size and precision, (2) fixed versus random-effects models, (3) heterogeneity, (4) complex data structures, and (5) bias.

BIOS 691A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

BIOS 693A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

BIOS 695. Independent Study. 1-6 Hours.

Faculty-supervised study of topics not available through regular course offerings.

BIOS 696. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

BIOS 697. Research. 1-15 Hours.

PR: Consent. Research Activities leading to thesis, problem report, research paper or equivalent scholarly project, or dissertation. (Grading will be S/U.)

BIOS 698. Thesis. 1-6 Hours.

PR: Consent. This is an optional course for programs that believe that this level of control and supervision is needed during the writing of student's reports, theses, or dissertations.

BIOS 700. Foundations of Modern Statistical Inference. 3 Hours.

PR: Consent. The foundations and application of advanced statistical theory used in the field of biostatistics will be presented, including likelihood theory with related estimation, asymptotic and inferential theory, and theoretical and computational procedures for missing data.

BIOS 701. Modern Statistical Inference. 3 Hours.

PR: BIOS 700 or Consent. Advanced statistical theory for biostatistics will be presented, including estimation theory, semi-parametric theory, asymptotic and inferential theory, and algorithmically based estimators and inference.

BIOS 720. Theory and Application of Linear Models. 4 Hours.

PR: BIOS 700 or Consent. This is a theoretical course in linear models for continuous responses and their applications. Topics include matrix theory, the multivariate normal distribution, multivariate quadratic forms, estimability, reparameterization, linear restrictions, estimation theory, weighted least squares, multivariate tests of linear hypotheses, multiple comparisons, confidence regions, and missing data.

BIOS 721. Advanced Categorical Data Analysis for Health Sciences. 4 Hours.

PR: BIOS 700 or consent. This course offers an advanced examination of statistical theory and application of methods for models with categorical response data; concepts include likelihood theory and application, general linear models theory and application, estimating equations and contingency table methods.

BIOS 740. Advanced Longitudinal Data Analysis. 3 Hours.

PR: BIOS 720 or consent. This course gives an advanced understanding and approach to the analysis of longitudinal data; concepts include linear mixed effects models, generalized linear models for correlated data (including generalized estimating equations), computational issues and methods for fitting models, and dropout or other missing data. Knowledge of an appropriate software package and basic matrix algebra is assumed.

BIOS 745. Advanced Application of Linear Models. 1 Hour.

PR or CONC: STAT 645 or Consent. This course offers an understanding of advanced linear models as utilized in practice. Application of linear models across a range of research areas will be emphasized, covering computational techniques, practical issues that arise in utilizing linear models, and interpretation of results.

BIOS 764. Bayesian Biostatistics. 3 Hours.

PR: BIOS 700 or consent. This course examines fundamental aspects of the Bayesian paradigm and will focus on Bayesian inferential methods with emphasis on biostatistics applications. Topics covered include: principles of Bayesian statistics; single-parameter and multi-parameter models; Bayesian linear and generalized linear models; Monte Carlo approaches to model fitting; Prior elicitation, with illustrations of a variety of computational methods.

BIOS 765. Advanced Structural Equation Models. 3 Hours.

PR: (BIOS 610 and BIOS 611) or Consent. This course will focus on advanced structural equation modeling techniques important in public health contexts. Topics include basic psychometrics, path analysis and advanced structural equation modeling techniques, using relevant software packages.

BIOS 788. Biostatistical Grant Writing. 2 Hours.

This course gives an advanced conceptual and applied understanding of writing external grants in Biostatistics. Topics include writing grants as a principal investigator and assisting others in grant-writing as a co-investigator, with a focus on NIH grants.

BIOS 790. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of BIOS. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It also provides a mechanism for students not on assistantships to gain teaching experience.

BIOS 796. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

BIOS 797. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading will be S/U.).

BIOS 798. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that believe that this level of control and supervision is needed during the writing of students' reports, theses, or dissertations.

BUSINESS ADMINISTRATION COURSES**BADM 511. Managerial Economics. 3 Hours.**

Survey of microeconomic markets in the U.S. economy. Provides a foundation of economic understanding for use in managerial decision-making. Topics covered include supply, demand, markets, pricing practices, and firm strategies in contestable markets.

BADM 512. Law, Ethics and Diversity. 3 Hours.

An overview of the impact of legal, societal, and ethical considerations on business decision-making and strategic planning.

BADM 521. Global Environment. 2 Hours.

Insight into the major current global economic and business issues, challenges, and opportunities facing the United States and the rest of the world; acquaints students with the dynamic forces that will shape the future.

BADM 522. Business Research and Statistics. 3 Hours.

Survey of major statistical methods used in business and economic research including descriptive statistics, probability, sampling distributions, hypothesis testing, estimation, linear regression, time series, and forecasting.

BADM 523. Decision Analysis. 3 Hours.

Quantitative course utilizing and building upon applied mathematical skills in solving managerial business problems and decision-making situations.

BADM 524. Financial Accounting. 3 Hours.

Covers the accounting principles underlying financial statements and their evaluation for planning, decision making, and control, and the basic functioning of capital markets.

BADM 525. Marketing Management. 3 Hours.

Introduction to the marketing environment with emphasis on the process of planning and executing the conception, pricing, promotion, and distribution of ideas, goods, and services to create exchanges that satisfy individual and organizational objectives.

BADM 526. Marketing and Business Research. 2 Hours.

Examination of primary research techniques including sampling theory, qualitative methodologies, data collection, and analysis. Emphasis placed on consumer research.

BADM 527. Macroeconomic. 3 Hours.

Explores how monetary and fiscal policies influence macroeconomic performance, and how macroeconomics issues affect business profitability and success. Multi-disciplinary approach that synthesizes macroeconomic, business strategy, and management perspectives.

BADM 528. Managerial Accounting. 3 Hours.

Builds upon the financial management and accounting concepts with new topics in valuation, capital budgeting, performance measurement, working capital management, and capital structure.

BADM 531. Operation/Supply Chain. 3 Hours.

Acquaints students with the concepts of supply chain and the design/operation of productive systems. Emphasizes quality, competitiveness, and their implications for strategy and the use of analysis tools of management science and statistics.

BADM 532. Corporate Finance. 3 Hours.

Deals with the financial management of commercial firms. Topics include how assets should be managed, what assets should be purchased, and how these purchases should be financed.

BADM 533. Global Marketing Strategy. 4 Hours.

Emphasizes the formulation of both global and domestic marketing strategies and the development of analytical and decision-making capabilities. Research projects and simulations will be used to illustrate specific business situations.

BADM 534. Information Systems. 3 Hours.

Basic information systems and basic application tools are covered as well as their application to pertinent health science topics.

BADM 535. Organizational Behavior. 3 Hours.

Provides students with an understanding of the behavior of individuals, groups, and formal organizations. Emphasis in employee performance satisfaction and in applying theories of human behavior to solving problems in organizational administration.

BADM 536. Leadership/Organization Change. 3 Hours.

Topics include leadership concepts and practices designed to motivate and support an organization's workforce. Students discuss principles of leadership and explore how these principles affect traditional human resource management topics and organizational change.

BADM 541. Business Strategy. 3 Hours.

Considers the business organization as a whole from a general management perspective to strategy making. Provides analytical tools and frameworks used for identifying and analyzing key strategic issues facing firms today.

BADM 542. Personal Financial Planning. 3 Hours.

Detailed review of the planning areas: budgeting, insurance, investment, credit management, retirement, and estate planning.

BADM 543. Seminar on Leadership. 2 Hours.

The nature of leadership in complex organizations. Students discuss the purpose of leadership, examples of leadership skills, and the methods used by influential leaders in society.

BADM 551. Global Planning and Strategy. 3 Hours.

Designed to give insight into the current economic, business and political issues, challenges, and opportunities facing the world - to acquaint students with strategies, trends, and forces that shape the 21st century.

BADM 552. Global Accounting and Finance. 2 Hours.

Introduces fundamentals of global financial management for corporations. Currency risk is explored in the short and medium term framework and exposure management strategies are considered.

BADM 553. Service Learning. 2 Hours.

Topics included in this course are federal employment law, job analysis, HR planning, recruitment/selection, performance appraisal and compensation.

BADM 561. Readings in Global Business. 3 Hours.

Students examine current issues in international business pertaining to regions of their interest. The effect of the legal environment, regulatory issues, and cultural differences are examined.

BADM 561A. Readings in Global Business-Travel. 1 Hour.

Travel portion of BADM 561. See 561 for complete description.

BADM 562. International Business. 3 Hours.

Course discusses various international cultures, concepts, and business practices and is often followed by a trip to a foreign country (e.g., Germany, China) that includes seminars by business leaders and trips to business and historic sites.

BADM 562A. International Business-Travel. 1 Hour.

Travel portion of BADM 562. See 562 for complete description.

BADM 563. Essentials of Business. 2-4 Hours.

The course develops the leadership capacity of the individual by strengthening critical thinking skills, executive analysis ability, and decision-making processes.

BADM 571. Professional Development Practicum 1. 1 Hour.

PR: Acceptance to the MBA program. This course is one of a two-course sequence that offers practicum experiences that provide professional and career development opportunities. The course is designed to build career management skill sets that will assist the student in obtaining a professional position. Particular emphasis is placed on the development of a resume, job search skills and a career brand management plan.

BADM 572. Professional Development Practicum 2. 1 Hour.

This is the second course in a two-course sequence. The course offers additional practicum experiences that provide professional and career development opportunities that are designed to build career management skills that will assist the student in obtaining a professional position and be utilized throughout the student's career. Particular emphasis is placed on resume refinement and interviewing and networking skill development.

BADM 591A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

BADM 592A-Z. Directed Study. 1-6 Hours.

Directed study, reading and/or research.

BADM 595. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

BADM 611. Management Information Systems. 3 Hours.

This course focuses on the management of information and technology in business, and uses lectures, case analysis, and hands-on exercises to explore software tools used in business decision-making.

BADM 612. Managerial and Team Skills. 3 Hours.

Introduces, develops, and enhances managerial skills for complex organizations. Explores managerial philosophies, one's own managerial style, and the dynamics of working groups and teams.

BADM 613. Macroeconomics. 3 Hours.

Explores how monetary and fiscal policies influence macroeconomic performance, and how macroeconomics impacts business profitability and success. Multi-disciplinary approach that synthesizes macro-economic, business strategy, and management perspectives.

BADM 614. Health Services Management. 3 Hours.

This course offers students an introduction to environmental issues, organizational structures, and financial control mechanisms that affect the healthcare management process.

BADM 615. Applied Business and Economics Statistics. 3 Hours.

Survey of major statistical methods used in business, economic, and medical research including descriptive statistics, probability, sampling distributions, hypothesis testing, estimation, linear regression, time series, and forecasting.

BADM 621. Business Research. 3 Hours.

Develops skills in data- driven, fact-based decision making; develops the ability to critically evaluate research proposals and studies which rely on business research; provides a basic understanding of reading and conducting empirical research.

BADM 622. Financial Statements Analysis. 3 Hours.

Provides an overview of the current financial reporting process. Includes discussion of the respective reporting vehicles, financial statements, and the alternatives available which affect the reporting process.

BADM 623. Strategy. 3 Hours.

Considers the relationship between the individual firm and the forces of the global economy; market research and strategy. Provides analytical tools and frameworks used for identifying and analyzing key strategic issues facing firms today.

BADM 624. Economic Decision-Making. 2 Hours.

A microeconomic survey of markets designed to prepare students for further work in the area of health economics.

BADM 625. Financial Statements. 2 Hours.

Examines financial management and accounting concepts and techniques applicable to health care organizations, including financial accounting and financial statement analysis.

BADM 626. Health Economics. 4 Hours.

The context of health care; the use of economic methods to understand the organization of the industry and the behaviors of its participants (consumers, producers, and regulators.).

BADM 627. Organization Behavior in Health Services. 2 Hours.

Examines behavioral issues confronted in health care organizations. Addresses both managerial and employee perspectives and explores such issues as power sharing, motivation, decision making, empowerment, change, and organizational renewal.

BADM 631. Managerial Economics. 3 Hours.

Provides a solid foundation of economic understanding for use in managerial decision-making. Topics covered include supply, demand, markets, pricing practices, and firm strategies in contestable markets.

BADM 632. Corporate Finance. 3 Hours.

Examines the capital decisions of the firm. This includes a review of the major funding sources for the firm and the elements of the decision-making, planning, and the interface between business, government, and society.

BADM 633. Leadership. 3 Hours.

Topics include leadership concepts and practices designed to motivate and support an organization's workforce. Students discuss principles of leadership and explore how these principles affect traditional human resource management topics.

BADM 634. Health Services Marketing. 2 Hours.

This course offers students an introduction to marketing concepts and tools and an understanding of how to use these tools in analyzing and addressing healthcare marketing issues.

BADM 635. Database Management. 1 Hour.

Covers basic database design concepts for relational databases in a personal computer environment. Students get hands-on experience designing and using tables, queries, reports, and forms.

BADM 636. Managerial Accounting. 3 Hours.

Builds upon the financial management and accounting concepts with new topics in valuation, capital budgeting, performance measurement, working capital management, and capital structure in health services.

BADM 637. Organizational Processes and Medical Ethics. 4 Hours.

Behavioral and ethical issues confronted in health service organizations. Explores the changing organizational landscapes, group and team processes, organizational and medical ethics, and organizational change.

BADM 638. Operation and Supply Chain Management. 3 Hours.

Considers the concepts of supply chain management and the design/operation of productive systems. Emphasizes quality, competitiveness, and their implications for strategy and the use of analysis tools of management science and statistics.

BADM 641. Decision Analysis for Executives. 3 Hours.

Applied mathematical course in solving business problems and decision making issues from a general managerial perspective with particular emphasis on the operations management area of the organization.

BADM 642. Managerial Cost Accounting. 2 Hours.

An introduction to internal accounting techniques used by an organization's managers when they are faced with planning, directing, controlling, or decision-making in their organizations.

BADM 643. Working Capital Management. 2 Hours.

Relates the long-term strategy to the short-term requirements of the firm. Topics include cash management, inventory management, receivables management, leasing, and the distribution of gains to shareholders.

BADM 644. Legal Environment and Ethics. 3 Hours.

An overview of the legal system and the legal and ethical issues relevant to business decision-making, planning, and the interface between business, government, and society.

BADM 645. Corporate Control. 4 Hours.

Builds upon accounting and finance foundations by applying the methods and techniques to various health care related cases.

BADM 646. Management Science and Health Services. 3 Hours.

A quantitative course utilizing and building upon applied mathematical skills in solving managerial business problems and decision-making situations in a health service environment.

BADM 647. Market Strategies and Health Services. 3 Hours.

The application of marketing concepts to problems in health services management. Uses a computer simulation requiring sound creation, analysis, and implementation of marketing plans with a strong emphasis on thinking and analytical skills.

BADM 651. Personal Financial Planning. 3 Hours.

Discussion of individual financial situations in the following areas: budgeting, insurance coverage, investment planning, credit management, retirement planning and estate planning.

BADM 652. Marketing Strategy. 3 Hours.

Application of marketing concepts to a business environment to enhance understanding of market-driven organizations with emphasis on the process of planning and executing then conception, pricing, promotion, and distribution of ideas, goods and services.

BADM 653. Integrated Global Business. 3 Hours.

Explores the various strategic planning options available to companies in order to compete in the global marketplace.

BADM 654. Advanced Topics Seminar. 2 Hours.

Focuses on topics of current interest in business and economics to meet student and programmatic needs.

BADM 655. Health Services Strategy. 3 Hours.

Course on strategic management and planning with a focus on the formulation, implementation, and evaluation of strategic decisions in health care organizations.

BADM 656. Law and Medicine. 2 Hours.

An overview of general principles of law applicable to the delivery of financing in health care and an analysis of specific applications to those principles.

BADM 657. Seminar: Not-for-Profit Issues. 3 Hours.

Advanced topics seminar covering up-to-date issues in the not-for-profit sectors of health services.

BADM 661. Executive Project 1. 1 Hour.

This course provides an opportunity to develop and demonstrate project management skills through the preparation and presentation of a feasibility study of a proposed project/business implementation plan.

BADM 662. Executive Project 2. 2 Hours.

This course provides an opportunity to develop and demonstrate project management skills through the preparation and presentation of a full and complete project/business implementation plan.

BADM 691A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

BADM 694A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

BADM 695. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

BADM 711. Qualitative/Quantitative Research Methods. 3 Hours.

PR: BADM 710. Graduate-level introduction to critical issues in research methodology relevant to the social sciences. Emphasis on theory-driven, qualitative and quantitative approaches to research.

BADM 712. Linear Statistical Models. 3 Hours.

PR: BADM 710. Students learn to analyze data in the performance of research on business problems using techniques based on linear models including multiple regression, analysis of variance, and the design of experiments.

BADM 750. International Marketing. 3 Hours.

PR: BADM 710. Graduate-level introduction to international marketing. Emphasis on major theories, issues, and literature regarding all aspects of marketing in regional and international contexts.

BADM 900. Professional Development. 1-6 Hours.

Course provides skill renewal or enhancement in a professional field or content area (e.g., education, community health, geology). The continuing education courses are graded on a satisfactory or unsatisfactory grading scale and do not apply as graduate credit toward a degree program.

BADM 930. Professional Development. 1-6 Hours.

Professional development courses provide skill renewal or enhancement in a professional field or content area (e.g., education, community health, geology). The continuing education courses are graded on a satisfactory or unsatisfactory grading scale and do not apply as graduate credit toward a degree program.

BUSINESS LAW COURSES**BLAW 690. Teaching Practicum. 1-3 Hours.**

PR: Consent. Supervised practice in college teaching of business law. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It also provides a mechanism for students not on assistantships to gain teaching experience. (Grading will be S/U.)

CELL CANCER BIOLOGY COURSES**CCB 700. Selected Topics in Cancer Cell Biology. 3 Hours.**

PR: BMS 730 or consent. This course is designed for upper level graduate students. An expansion of the concepts and mechanisms of cancer biology through review of selected topics including cellular signals and tumor microenvironment, as well as diagnostics and therapeutic strategies.

CCB 701. Biochemical and Oncogenic Signaling. 3 Hours.

This advanced course is designed for upper level graduate students. It will focus on the biochemical and oncogenic mechanisms of cellular signaling. Students will explore the experimental methodologies needed to understand the scientific literature in biochemistry and cancer.

CCB 702. Cancer Pharmacologic and Therapeutics. 3 Hours.

PR: BMS 730 or PCOL 761 or consent. This course is designed for upper level graduate students. Course will focus on the pharmacologic, diagnostic, and therapeutic basis of cancer care including therapeutic strategies, drug resistance/design and clinical trials.

CCB 705. Journal Club. 1 Hour.

PR: Consent. A study of contemporary topics selected from recent developments in the field of cancer research.

CCB 796. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

CCB 797. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

CHEMICAL ENGINEERING COURSES**CHE 531. Mathematical Methods in Chemical Engineering. 3 Hours.**

PR: MATH 261 and consent. Classification and solution of mathematical problems important in chemical engineering. Treatment and interpretation of engineering data. Analytical methods for ordinary and partial differential equations, including orthogonal functions and integral transforms. Vector calculus. (3 hr. lec.).

CHE 565. Corrosion Engineering. 3 Hours.

PR: CHE 320 or CHEM 341 or equivalent. Basic mechanisms of various types of corrosion such as galvanic corrosion, pitting corrosion and stress corrosion cracking; methods of corrosion prevention such as cathodic and anodic prevention, by using coatings and inhibitors, and by selecting proper alloys. (3 hr. lec.).

CHE 566. Electronic Materials Processing. 3 Hours.

PR: Graduate standing in Engineering, Physics, Chemistry, or instructor consent. Design and application of thermal, plasma, and ion assisted processing methodologies; design and function of key process tools and components; vacuum technology; solid state, gas phase, surface, and plasma chemistry underpinnings; thin film nucleation, growth, and etching; effects of processing methods and conditions on materials properties.

CHE 580. Advanced Cellular Machinery. 3 Hours.

PR: Consent. Coverage and application of principles of cellular biology to enable the integration of cell components into biotechnological applications.

CHE 591A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

CHE 593A-Z. Special Topics. 1-6 Hours.

PR: Consent. A study of contemporary topics selected from recent developments in the field.

CHE 610. Fluidization Engineering. 3 Hours.

PR: Consent. Fundamentals of fluidization, two-phase flow theory and powder characteristics, structure and property of the emulsion phase and bubbles, mass and heat-transfer in fluidized beds with and without chemical reaction. (3 hr. lec.).

CHE 611. Powder Technology. 3 Hours.

PR: Consent. Characterization of powders, structure of powders, powders in two-phase flow, measurement techniques, static and dynamic behavior of powders, grinding and agglomeration, chemistry of powders. (3 hr. lec.).

CHE 615. Transport Phenomena. 3 Hours.

PR: Consent. Introduction to equations of change (heat, mass, and momentum transfer) with a differential-balance approach. Use in Newtonian flow, turbulent flow, mass and energy transfer, radiation, convection. Estimation of transport coefficients. (3 hr. lec.).

CHE 620. Thermodynamics. 3 Hours.

PR: Consent. Logical development of thermodynamic principles. These are applied to selected topics including development and application of the phase rule, physical and chemical equilibria in complex systems, and nonideal solutions. Introduction to nonequilibrium thermodynamics. (3 hr. lec.).

CHE 625. Chemical Reaction Engineering. 3 Hours.

PR: Consent. Homogeneous and heterogeneous reaction systems, batch and flow ideal reactors, macro- and micro-mixing, non-ideal reactors, diffusion and reaction in porous catalysts, reactor stability analysis, special topics. (3 hr. lec.).

CHE 687. Materials Engineering. 3 Hours.

A study of materials engineering fundamentals emphasizing semiconductor, polymer, metal, and ceramic/cementitious material systems. Mechanical and physical properties, theoretical aspects, testing, design criteria, manufacturing, and economics of material systems. Laboratory testing and evaluation. (Equivalent to CE 687, EE 687, MINE 687, IMSE 687 and MAE 687.) (3 hr. lec.).

CHE 693A-Z. Special Topics. 0-6 Hours.

A study of contemporary topics selected from recent developments in the field.

CHE 694A-Z. Seminar. 1-6 Hours.

Seminars on current research by visitors and graduate students.

CHE 697. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

CHE 716. Advanced Fluid Dynamics. 3 Hours.

PR: Consent. Analysis of flow of fluids and transport of momentum and mechanical energy. Differential equations of fluid flow; potential flow, laminar boundary-layer theory, and non-Newtonian fluids. (3 hr. lec.).

CHE 717. Advanced Heat Transfer. 3 Hours.

PR: Consent. Theory of transport of thermal energy in solids and fluids as well as radiative transfer. Steady state and transient conduction; heat transfer to flowing fluids; evaporation; boiling and condensation; packed- and fluid-bed heat transfer. (3 hr. lec.).

CHE 718. Advanced Mass Transfer. 3 Hours.

PR: Consent. Theory of diffusion, interphase mass-transfer theory, turbulent transport, simultaneous mass and heat transfer, mass transfer with chemical reaction, high mass-transfer rates, and multicomponent macroscopic balances. (3 hr. lec.).

CHE 720. Applied Statistical and Molecular Thermodynamics. 3 Hours.

PR: CHE 620 and consent. The connection between macroscopic phenomena (thermodynamics) and microscopic phenomena (statistical and quantum mechanics). Thermodynamics modeling for process analysis. Equations of state, perturbation theories, mixing rules, computer simulation, group-contribution models, and physical-property prediction. (3 hr. lec.).

CHE 726. Catalysis. 3 Hours.

PR: CHE 625 or consent. Physical and chemical properties of catalytic solids, nature and theories of absorption, thermodynamics of catalysis, theories of mass and energy transport, theoretical and experimental reaction rates, reactor design, and optimization. (3 hr. lec.).

CHE 730. Advanced Numerical Methods. 3 Hours.

PR: CHE 230 or consent. Methods for nonlinear algebraic equations, methods for initial and boundary value ordinary differential equations, methods for parabolic, hyperbolic, and elliptical partial differential equations, numerical stability and methods for stiff equations, optimization techniques. (3 hr. lec.).

CHE 731. Optimization of Chemical Engineering Systems. 3 Hours.

PR: Consent. Optimization in engineering design, unconstrained optimization and differential calculus, equality constraints optimization, search technique, maximum principles, geometric and dynamic programming, linear and nonlinear programming, and calculus of variations. (3 hr. lec.).

CHE 761. Polymer Rheology. 3 Hours.

Qualitative behavior of polymeric liquids; Rheometry; stress, strain and rate of strain tensors; equations of motion; Hookean solids and Newtonian liquids, linear viscoelasticity; constitutive equations for solutions and melts. (3 hr. lec.).

CHE 790. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of chemical engineering. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on assistantships to gain teaching experience. (Grading may be S/U.).

CHE 791A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

CHE 792A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

CHE 793A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

CHE 794A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

CHE 795. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

CHE 796. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

CHE 797. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

CHE 798. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

CHE 799. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is S/U; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirements of registration in the semester in which graduation occurs.

CHEMISTRY COURSES**CHEM 512. Environmental Chemistry. 3 Hours.**

PR: CHEM 215 and CHEM 234 and CHEM 348. Study of the nature, reactions, transport and fate of chemical species in the environment.

CHEM 514. Mass Spectrometry Principles and Practices. 3 Hours.

PR: CHEM 310. Fundamental principles underlying modern mass spectrometry. Gas phase chemistry related to the formation and fragmentation of ions. The design of instrumental systems for mass spectrometry. Application of mass spectrometric techniques to multidisciplinary problems of current interest. (3 hr. lec.).

CHEM 516. Bioanalytical Chemistry. 3 Hours.

PR: (CHEM 310 and AGBI 410) or equivalent. Analytical principles and instrumental methods as they are applied to biochemical questions. Students are taught to evaluate and formulate methods and approaches for biochemical analyses.

CHEM 521. Organometallic Chemistry. 3 Hours.

PR: Graduate standing in chemistry or consent. Syntheses, structure, and reactivity of organometallic compounds. Applications of organometallic compounds to catalysis and organic synthesis. (3 hr. lec.).

CHEM 531. Advanced Organic Chemistry 1. 3 Hours.

PR: CHEM 234. Structural concepts, bonding, tautomerism, static and dynamic stereochemistry, mechanistic classifications of reagents, and reactions including some applications. (3 hr. lec.).

CHEM 532. Advanced Organic Chemistry 2. 3 Hours.

PR: CHEM 531. Continuation of CHEM 531 with emphasis upon synthetic methods and reaction mechanisms. (3 hr. lec.).

CHEM 540. Bonding and Molecular Structure. 3 Hours.

PR: CHEM 348. Introduction to the quantum theory of chemical bonding. Atomic structure, theoretical spectroscopy, predictions of molecular structures and bond properties. (3 hr. lec.).

CHEM 541. Chemical Thermodynamics. 3 Hours.

PR: CHEM 348. Principles of classical and statistical thermodynamics and their application to chemical problems. (3 hr. lec.).

CHEM 542. Computational Chemistry. 3 Hours.

PR: CHEM 348 or consent. Introduction to the use of quantum mechanical-based computational techniques to study molecular structure, bonding, and reactivity, and their relationship to experimental techniques.

CHEM 547. Chemical Crystallography. 3 Hours.

PR or Conc: (CHEM 346 and CHEM 348) or CHEM 341 or consent. Applications of X-ray diffraction of crystals to the study of crystal and molecular structure. Includes diffraction theory, space group symmetry, and crystallographic methods of analysis. (3 hr. lec.).

CHEM 548. Biophysical Chemistry. 3 Hours.

Biophysical Chemistry lies at the interface between physics, chemistry and biology, applying theories and methods of the physical sciences toward understanding biological systems. This course focuses on the physical chemistry of biological macromolecules. Topics to be covered include protein structure formation and stability, forces/interactions in biological molecular systems, bio-macromolecule folding dynamics, phase transitions in proteins, and membrane physics.

CHEM 549. Proximal Probe Techniques. 3 Hours.

Proximal probe techniques rely on the use of nanoscale probes, positioned and scanned in the immediate vicinity of surfaces. Their development is often viewed as a first step towards nanotechnology, since they demonstrate the feasibility of building purposeful structures one atom or one (macro) molecule at a time. This course provides thorough physical background of scanning probe microscopy techniques.

CHEM 552. Biochemical Toxicology. 3 Hours.

Introduction to the principles of toxicology, with a focus on the processes that occur at the cellular and molecular levels when chemicals interact with living organisms.

CHEM 591A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

CHEM 593A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

CHEM 697. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

CHEM 713. Electrochemistry and Instrumentation. 3 Hours.

PR: CHEM 310. Electronic instrumentation applied to study of mass transfer kinetics of electrode reactions, voltammetry, and high-frequency methods. (3 hr. lec.).

CHEM 714. Analytical Atomic Spectrometry. 3 Hours.

PR: CHEM 450. Theory of atomic spectroscopy relevant to elemental analysis. Considerations in the design and use of modern optical spectrometry systems. (3 hr. lec.).

CHEM 715. Chemical Separations. 3 Hours.

PR: CHEM 215 and CHEM 233, and physical chemistry. Fundamentals of transport and flow processes underlying all separation techniques. Empirical coverage of chromatographic and electrophoretic methods for analytical separations. (3 hr. lec.).

CHEM 723. Physical Methods in Inorganic Chemistry. 3 Hours.

PR: CHEM 422. Symmetry, vibrational spectroscopy, theory and applications of NMR and EPR methods, magnetism, optical activity, dynamic processes and fluxional behavior. (3 hr. lec.).

CHEM 724. Coordination Chemistry. 3 Hours.

PR: CHEM 422. Symmetry, hybridization, ligand field theory, molecular orbital theory, metal-ligand bonding in coordination complexes and organometallics. (3 hr. lec.).

CHEM 725. Inorganic Reactions and Mechanisms. 3 Hours.

PR: CHEM 422. Inorganic reactions (ligand substitution aquation, organometallic reactions, electron transfer;) kinetics and mechanistic studies. (3 hr. lec.).

CHEM 727. Bioinorganic Chemistry. 3 Hours.

PR: CHEM 422 or consent. Metal ions in biological systems; proteins, nucleic acids, and cofactors as ligands; metal uptake, storage, and regulation; structural and catalytic roles; substance activation, electron transfer, and group transfer reactions; metals in medicine.

CHEM 733. Physical Organic Chemistry. 3 Hours.

PR: CHEM 531. Theoretical considerations of organic molecules, kinetics, and other methods used in the study of organic structure and reaction mechanisms; linear free energy relationship and other related topics. (3 hr. lec.).

CHEM 743. Chemical Kinetics. 3 Hours.

PR: CHEM 348. Theories and applications of kinetics in gaseous state and in solution. (3 hr. lec.).

CHEM 744. Statistical Mechanics. 3 Hours.

PR: CHEM 746. Theory and application of statistical mechanics to chemical systems. (3 hr. lec.).

CHEM 745. Theoretical Chemistry 1. 3 Hours.

PR: Differential equations. Theoretical background for quantum mechanics. (3 hr. lec.).

CHEM 746. Theoretical Chemistry 2. 3 Hours.

PR: CHEM 745. Theories and applications of quantum mechanics in chemistry. (3 hr. lec.).

CHEM 747. Molecular Spectroscopy and Structure. 3 Hours.

PR: CHEM 450 or graduate standing in chemistry, or consent. Advanced applications of spectral methods to the study of molecular structure. (3 hr. lec.).

CHEM 750. Introduction to Proteomics. 3 Hours.

Introduction to protein separations and sequencing by modern mass spectrometry, and the application of these methods to the study of biological systems in health and environmental sciences.

CHEM 789. Research Seminar. 1 Hour.

PR: Graduate student in chemistry. Research seminars by visiting lecturers.

CHEM 790. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of chemistry. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on assistantships to gain teaching experience. (Grading will be P/F.).

CHEM 791A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

CHEM 792A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

CHEM 793A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

CHEM 794A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

CHEM 795. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

CHEM 796. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

CHEM 796A. Graduate Seminar. 1 Hour.

PR: Consent. It is anticipated that each graduate student will present at least one seminar to the assembled faculty and graduate student body of his/her program.

CHEM 796B. Graduate Seminar. 1 Hour.

PR: Consent. It is anticipated that each graduate student will present at least one seminar to the assembled faculty and graduate student body of his/her program.

CHEM 796C. Graduate Seminar. 1 Hour.

PR: Consent. It is anticipated that each graduate student will present at least one seminar to the assembled faculty and graduate student body of his/her program.

CHEM 797. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, program report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

CHEM 798. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

CHEM 799. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use of the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is P/F; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

CHILD DEV / FAMILY STUDIES COURSES**CDFS 541. Cognitive Development of the Child. 3 Hours.**

Piaget's basic theory, including his view of perceptual, symbolic, motor and logico-mathematical development, across the life span.

CDFS 591A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

CDFS 593A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

CDFS 595. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

CDFS 640. Survey of Family Studies. 3 Hours.

Comprehensive overview of theoretical and empirical literature of the family.

CDFS 645. Socio-Emotional Development of Children. 3 Hours.

A study and examination of contemporary theory and research into various facets of the socialization process in infancy and childhood.

CDFS 647. Comparative Study of Family. 3 Hours.

Family diversity and multiculturalism in an ever-changing U.S. society is examined using the comparative method for analysis.

CDFS 648. Theories of Child and Adolescent Development. 3 Hours.

Examination and comparison of theoretical perspectives of child and adolescent development including traditional and newly emerging theories.

CDFS 649. Socialization Processes. 3 Hours.

Examination of the contexts that affect infant, child, and adolescent development, including family, peers, schools, neighborhood, media, and large societal influences.

CDFS 690. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of child development and family studies. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It also provides a mechanism for students not on assistantships to gain teaching experience. (Grading will be S/U.).

CDFS 693A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

CDFS 696. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

CDFS 697. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

CDFS 698. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

CDFS 930. Professional Development. 1-6 Hours.

Professional development courses provide skill renewal or enhancement in a professional field or content area (e.g., education, community health, geology). These tuition-waived continuing education courses are graded on a pass/fail grading scale and do not apply as graduate credit toward a degree program.

CIVIL ENGINEERING COURSES**CE 511. Pavement Design. 3 Hours.**

PR: CE 451 or consent. Effects of traffic, soil, environment, and loads on the design and behavior of pavement systems. Design of pavement systems. Consideration of drainage and climate. Pavement performance and performance surveys. (3 hr. rec.).

CE 515. Flexible Pavements. 3 Hours.

Design, construction and mathematics of flexible pavements, including material characterization, mix design, construction methods, pavement design and evaluation, and maintenance procedures.

CE 520. Groundwater Dynamics. 3 Hours.

PR: Consent. Introduction to groundwater, formulation of equations for saturated and unsaturated flow, analytical solutions for steady and transient cases, transport of pollutants, and numerical techniques. (3 hr. lec.).

CE 522. Free Surface Hydrodynamics. 3 Hours.

PR: CE 322 or consent. The dynamics of liquid flow with a free surface under the influence of gravity; open channel hydraulics, wave motion, and buoyancy effects. (3 hr. lec.).

CE 524. Groundwater Engineering. 3 Hours.

PR: CE 322 or consent. Introduction to the nature, hydrology, mechanics, technology, and quality of groundwater. Well solutions in confined, leaky, and unconfined aquifers. Modeling concepts and public-domain computer programs.

CE 530. Probability, Reliability, and Statistical Methods in Engineering Design. 3 Hours.

PR: Consent. Accounting for influence of uncertainty and reliability in analysis and design of Civil Engineering systems.

CE 531. Pedestrian/Bike Transportation. 3 Hours.

Planning, design, operation and maintenance of pedestrian and bicycle facilities, including multi-use trail, and in-depth examination of policies, programs and design principles to encourage non-motorized travel.

CE 533. Geometric Design of Highways. 3 Hours.

PR: Consent. The theory and practice of geometric design of modern highways, horizontal and vertical alignment, cross-slope, design speed, sight distances, interchanges, and intersections. Critical analysis of design specifications. (2 hr. lec., 3 hr. lab.).

CE 534. Introduction to Traffic Engineering. 3 Hours.

PR: CE 332 or consent. The purpose, scope, and methods of traffic engineering. Laboratory devoted to conducting simple traffic studies, solving practical problems, and designing traffic facilities. (2 hr. lec., 3 hr. lab.).

CE 538. Highway Safety Engineering. 3 Hours.

PR: CE 431 or consent. Relationship between human, vehicular, and roadway factors which impact safety; functional requirements of highway safety features; legal aspects; accident analysis; evaluation of highway safety projects. (3 hr. lec.).

CE 539. Traffic Engineering Operations. 3 Hours.

PR: CE 534. Theory and practice of application of traffic engineering regulations; traffic control concepts for urban street systems and freeways; freeway surveillance and incident management; driver information systems; traffic control system technology and management. (3 hr. rec.).

CE 540. Environmental Chemistry and Biology. 3 Hours.

PR: CE 322 or consent. Study of physical and chemical properties of water. Theory and methods of chemical analysis of water, sewage, and industrial wastes. Biological aspects of stream pollution problems. (2 hr. lec., 3 hr. lab.).

CE 542. Physicochemical Treatment. 3 Hours.

PR: CE 347 or consent. Engineering topics on water and wastewater treatment based on pollutant's physical and chemical characteristics will be presented, including human health concerns related to water, regulations, reactor theory, transport phenomena, and various treatment technologies.

CE 543. Water Quality Modeling and Analysis. 3 Hours.

PR: CE 347 or consent. Theories, methodologies and data analyses will be presented for water quality modeling in surface and groundwater, and for determining water quality distributions, trends, and compliance with regulatory standards.

CE 546. Principles of Biological Waste Treatment. 3 Hours.

PR: CE 540 or consent. Examination of biological treatment systems related to microbiology and function. Models used to describe system behavior and kinetics are developed. Laboratory and field experiments are performed to understand the relation between operation and design. (2 hr. lec, 3 hr. lab.).

CE 547. Applied Wetlands Ecology and Management. 3 Hours.

The management and ecology of wetland vegetation, soils, hydrology, and wildlife. (Offered in fall of odd years. Also listed as WMAN 547 and PLSC 547.).

CE 549. Solid and Hazardous Waste Management. 3 Hours.

PR: Consent. Patterns and problems of solid waste storage, transport, and disposal. Examinations of various engineering alternatives with appropriate consideration for air and water pollution control and land reclamation. Analytical approaches to recovery and reuse of materials. (2 hr. lec., 3 hr. lab.).

CE 550. Soil Properties and Behavior. 3 Hours.

PR: CE 451 or consent. Soil mineralogy and the physicochemical properties of soils and their application to an understanding of permeability, consolidation, shear strength, and compaction. Prediction of engineering behavior of soils in light of physicochemical concepts. (3 hr. lec.).

CE 551. Soil Testing. 3 Hours.

PR: CE 351 or consent. Experimental evaluation of soil properties and behavior. Emphasis is placed on the proper interpretation of experimental results and application of such results to practical problems. (1 hr. lec., 6 hr. lab.).

CE 552. The Finite Element Method. 3 Hours.

PR: Graduate standing in CE or MAE or consent. Introductory treatment of theoretical basis of finite element method, mathematical formulation, different types of elements, stress analysis in solids, applications, and computer implementation.

CE 553. Advanced Finite Element Methods. 3 Hours.

PR: Consent. Formulation procedures and applications of finite element methods to two- and three-dimensional problems, techniques for nonlinear analysis, computer implementation, applications in field problems, flow, and dynamics.

CE 561. Statically Indeterminate Structures. 3 Hours.

PR: CE 461 or consent. Force and displacement methods of analysis; energy principles and their application to trusses, frames, and grids; effects of axial forces; influence lines for frames, arches, and trusses; secondary stress analysis. (3 hr. lec.).

CE 563. Introduction to Structural Dynamics. 3 Hours.

PR: CE 561 PR: CE 561. General theory for dynamic response of systems having one or several degrees of freedom. Emphasis on the application of dynamic response theory to structural design. (3 hr. lec.).

CE 564. Nondestructive Material and Structural Evaluations. 3 Hours.

PR: Consent. Nondestructive evaluation (NDE) using techniques based on mechanical and electromagnetic wave propagation; theory and applications of various NDE techniques including infrared thermography, dynamic characterization, seismic reflection and refraction, ultrasonics, acoustic emission, and radar. (3 hr. lec.).

CE 566. Advanced Materials for Infrastructure. 3 Hours.

PR: CE 462 and CE 463. Introduction to principles of material science; material structure, characterization at coupon and component level, practical information on fiber-reinforced shapes; establishment of failure analysis and standardization. (3 hr. lec.).

CE 567. Prestressed Concrete. 3 Hours.

PR: CE 461 and CE 462 or consent. Behavior and design of prestressed concrete members. Materials, bending, shear, torsion, methods of prestressing, prestress losses, deflections, compression members, composite members, and indeterminate structures. (3 hr. lec.).

CE 591A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

CE 593A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

CE 594A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

CE 693A-Z. Special Topics. 0-6 Hours.

A study of contemporary topics selected from recent developments in the field.

CE 695. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

CE 697. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

CE 721. Environmental Fluid Mechanics. 3 Hours.

PR: Consent. Equations of motion including buoyancy and Coriolis force; mechanics of jets and plumes; diffusion, dispersion, and mixing in rivers, lakes, reservoirs, and estuaries. (3 hr. lec.).

CE 722. Deterministic Hydrology. 3 Hours.

PR: Consent. An in-depth treatment of the dynamics of the accumulation of runoff, including the formulation of the unsteady surface flow equations and the unsteady saturated-unsaturated subsurface flow equations. Both analytical and numerical solutions are presented with applications. (3 hr. lec.).

CE 732. Transportation Systems Analysis. 3 Hours.

PR: Consent. Systematic examination of the interaction between transport technology, activity systems, and traffic flows. Quantitative analysis of the relationship among vehicle cycles, networks, congestion, choice behavior, cost functions, and resulting travel-market equilibration. (3 hr. lec.).

CE 744. Industrial and Advanced Waste Treatment. 3 Hours.

PR or Conc: CE 540 or consent. Basic physical and chemical unit operations used in industrial and advanced waste treatment; applications for waste water reclamation and reuse; study of industrial wastes from standpoint of process, source, and treatment. (2 hr. lec., 3 hr. lab.).

CE 751. Advanced Mechanics of Soils. 3 Hours.

PR: CE 351 and CE 551 and MAE 640 or consent. Stress invariants, stress history and stress path, elastic and quasi-elastic models for soils; soil plasticity, failure theories for soils; critical state soil mechanics, and determination of construction parameters. (3 hr. lec.).

CE 752. Advanced Foundation Analysis. 3 Hours.

PR: CE 451 or consent. Study of soil-structure interaction. Applications of principles of soil mechanics and numerical methods for analysis and design of geotechnical structures: strip footings, axially and laterally loaded piles, braced excavations, sheet pile walls, tunnel lining, and buried pipes and culverts. (3 hr. lec.).

CE 753. Advanced Earthwork Design. 3 Hours.

PR: CE 453 or consent. Application of the principles of theoretical soil mechanics to the design of embankments of earth and rock. In-depth study of compaction theory, and stability of natural and man-made slopes by limit equilibrium and deformation considerations. (3 hr. lec.).

CE 754. Groundwater and Seepage. 3 Hours.

PR: Consent. Flow of groundwater through soils and its application to the design of highways and dams and to construction operations. Emphasis is placed on both the analytical and classical flow net techniques for solving seepage problems. (3 hr. lec.).

CE 756. Soil Dynamics. 3 Hours.

PR: CE 550 and consent. Consideration of the simple damped oscillator, wave propagation in elastic media, dynamic field and laboratory tests, dynamic soil properties, and foundation vibrations. Introduction to geotechnical aspects of earthquake engineering. (3 hr. lec.).

CE 760. Finite Element Methods in Structural Analysis. 3 Hours.

PR: CE 561 or consent. Relationships of elasticity theory; definitions and basic element operations; direct and variational methods of triangular and rectangular elements related to plane stress, plane strain, and flat plates in bending; variational principles in global analysis. (3 hr. lec.).

CE 761. Bridge Engineering. 3 Hours.

PR: CE 561 or consent. Statically indeterminate trusses, continuous trusses; steel and concrete arches; long-span and suspension bridges; secondary stresses. (3 hr. lec.).

CE 763. Behavior of Steel Members. 3 Hours.

PR: CE 463 or consent. Elastic behavior of steel members subjected to axial load, bending, and torsion. Elastic and inelastic response of beams, columns, and beam-columns to load and the resulting design implications. Comparison with standard steel codes and specifications. (3 hr. lec.).

CE 765. Structural Design for Dynamic Loads. 3 Hours.

PR: CE 563 or consent. Nature of dynamic loading caused by earthquakes and nuclear weapons blasts; nature of dynamic resistance of structural elements and structural systems; criteria for design of blast-resistance and earthquake-resistant structures; simplified and approximate design methods. (3 hr. lec.).

CE 767. Behavior of Reinforced Concrete Members. 3 Hours.

PR: CE 462 or consent. Studies of actual member behavior; members in flexure, combined flexure, shear, and torsion; bond and anchorage; combined axial load and flexure; slender columns; deep beams; derivation of current code provisions. (3 hr. lec.).

CE 768. Behavior and Design of Fiber Reinforced Polymer Members. 3 Hours.

PR: Consent. Studies of fiber reinforced polymer (FRP) composite member behavior including rebars and wraps for concrete, under flexure, axial, shear forces, and combined effects; design, durability, and rehabilitation of FRP members and systems including field applications.

CE 790. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of civil engineering. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on assistantships to gain teaching experience. (Grading will be S/U.).

CE 791A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

CE 792A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

CE 793A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

CE 794A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

CE 795. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

CE 796. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

CE 797. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project or dissertation. (Grading may be S/U.).

CE 798. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

CE 799. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is S/U; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

CE 900. Professional Development. 1-6 Hours.

Professional development courses provide skill renewal or enhancement in a professional field or content area (e.g., education, community health, geology). The continuing education courses are graded on a pass/fail grading scale and do not apply as graduate credit toward a degree program.

CLASSICS COURSES

CLAS 590. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of classics. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on assistantships to gain teaching experience. (Grading will be S/U.).

CLAS 591A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

CLAS 592A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

CLAS 593A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

CLAS 594A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

CLAS 595. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

CLAS 690. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of classics. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It also provides a mechanism for students not on assistantships to gain teaching experience. (Grading will be S/U.).

CLAS 691A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

CLAS 692A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

CLAS 693A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

CLAS 694A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

CLAS 695. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

CLAS 696. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

CLAS 697. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

CLAS 698. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

CLAS 699. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use of the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is S/U; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

CLAS 791A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

COMMUNICATION SCIENCES AND DISORDERS COURSES**CSAD 602. Communication Disorders. 3 Hours.**

Survey of normal processes and communication disorders of speech, language, and hearing in children and adults; professions of speech language pathology and audiology; and job opportunities, designed for students not majoring in speech pathology and audiology.

CSAD 604. Seminars Clinical Practice 1. 1 Hour.

PR: Consent. Includes topics necessary for successful completion of clinical practicum.

CSAD 605. Seminars Clinical Practice 3. 1 Hour.

Examines professional issues in Speech-Language pathology. Will be graded on a Pass/Fail basis.

CSAD 606. Seminars Clinical Practice 2. 1 Hour.

PR: Consent. Includes topics to enhance clinical skills of the beginning clinician.

CSAD 607. Seminars Clinical Practice 4. 1 Hour.

Explores employment settings and service delivery in Speech- Language pathology including medical and educational settings. Will be graded on a Pass/Fail basis.

CSAD 608. Audiological Foundations. 2 Hours.

Study of the knowledge and skills in audiology that speech-language pathologists need to treat individuals with hearing impairment.

CSAD 610. Advanced Practice Speech-Language Disorders 1. 1,2 Hour.

PR: Consent. Supervised clinical practicum that concerns the evaluation and treatment of children and adults with speech-language disorders.

CSAD 611. Advanced Practice/Audiology 1. 1,2 Hour.

PR: Consent. Supervised clinical practicum that concerns the evaluation and treatment of children and adults with hearing disorders.

CSAD 612. Advanced Practice Speech-Language Disorders 2. 1-3 Hours.

PR: CSAD 610 or consent. Supervised clinical practicum that concerns the evaluation and treatment of children and adults with speech language disorders.

CSAD 613. Advanced Practice/Audiology 2. 3 Hours.

PR: CSAD 611 or consent. Supervised clinical practicum that concerns the evaluation and treatment of children and adults with speech-language disorders.

CSAD 614. Advanced Practice Speech-Language Disorders 3. 1-4 Hours.

PR: CSAD 612 or consent. Supervised clinical practicum that concerns the evaluation and treatment of children and adults with speech-language disorders.

CSAD 615. Advanced Practice/Audiology 3. 4 Hours.

PR: CSAD 613 or consent. Supervised clinical practicum that concerns the evaluation and treatment of children and adults with hearing disorders.

CSAD 616. Advanced Practice Speech-Language Disorders 4. 1-4 Hours.

PR: CSAD 614 or consent. Supervised clinical practicum that concerns the evaluation and treatment of children and adults with speech- language disorders.

CSAD 617. Advanced Practice/Audiology 4. 4 Hours.

PR: CSAD 615 or consent. Supervised clinical practicum that concerns the evaluation and treatment of children and adults with hearing disorders.

CSAD 618. Evidence-Based Practice in Communication Sciences and Disorders. 3 Hours.

An overview of evidence-based clinical practice in communication sciences and disorders with strategies for implementation. Application of the scientific method to clinical practice and critical review of the research literature is emphasized.

CSAD 620. Neurophysics of Speech and Language. 3 Hours.

PR: CSAD 320 and CSAD 424 or consent. General and typographic anatomy and physiology of CNS, with special attention to motor and sensory systems as they apply to speech, hearing, and language.

CSAD 622. Advanced Voice Disorders. 3 Hours.

PR: CSAD 422 or consent. Advanced study of the vocal and respiratory mechanisms; epidemiology, classification, etiology, symptomatology, assessment, prevention, and remediation of voice disorders.

CSAD 624. Phonological Disorders. 3 Hours.

PR: CSAD 326 or consent. Advanced study of the etiology, assessment, and treatment of phonological disorders in children and adults.

CSAD 625. Child Language and Literacy Disorders. 3 Hours.

Course provides skills to characterize, prevent, evaluate, and manage childhood communication disorders in collaboration with families, educators, and other service providers. Application of evidence-based practice and implementation of appropriate care to enhance language and literacy development is emphasized. Family, cultural, and linguistic diversity are addressed.

CSAD 626. Experimental Phonetics. 3 Hours.

PR: CSAD 320 and CSAD 340 or consent. Discussion of contemporary topics in the speech and hearing sciences, including acoustic, physiological, and perceptual phonetics.

CSAD 628. Advanced Stuttering Disorders. 3 Hours.

PR: CSAD 422 or consent. Advanced study of the symptomatology, epidemiology, etiology, research findings, assessment, prevention, and remediation of stuttering and related fluency disorders.

CSAD 630. Adult Neurogenic Communication Disorders. 3 Hours.

PR: CSAD 620. Explores normal adult language processes and the effect of normal aging on communication. Advanced investigation of the etiology, diagnosis, nature, and therapeutic approaches of aphasia, agnosia, apraxia, dysarthria, dementia, right hemisphere impairment, and traumatic brain injury.

CSAD 632. Craniofacial Anomalies. 3 Hours.

PR: CSAD 624 or consent. Investigation of the etiology, diagnosis, nature, and therapy approaches of communicative disorders in persons with cleft palate.

CSAD 634. Language Disorders in Children: Assessment. 2 Hours.

PR: CSAD 324. Assessment procedures utilized to identify children with language disorders. Standardized tests and non-standardized analysis procedures are introduced.

CSAD 635. Language Disorders in Children: Treatment. 2 Hours.

PR: CSAD 634 or consent. Treatment procedures for children with language disorders are presented. Clinician- oriented and client-oriented approaches are emphasized.

CSAD 636. Augmentative/Alternative Communication. 3 Hours.

Discussion of augmentative/alternative communication options for persons who are unable to meet their daily needs through natural modes of verbal, manual, or written communication. Demographics, assessment, and treatment of candidates for AAC interventions.

CSAD 648. Central Auditory Disorders. 3 Hours.

PR: CSAD 642 or consent. Pathology and audiometric site-of-lesion testing of the central auditory nervous system.

CSAD 658. Auditory Processing Disorders. 3 Hours.

PR: Consent. A transdisciplinary approach to evaluation and management of auditory processing disorders in children and adults is presented. This course is for graduate students in speech- language pathology and audiology and professional speech- language pathologists and audiologists.

CSAD 660. Neuropathology of Speech and Language. 3 Hours.

PR: CSAD 620. Explores methods of identifying and treating speech and language problems associated with nonprogressive and progressive neurological disorders.

CSAD 662. Dysphagia. 3 Hours.

PR: Must be CSAD major. Assessment and treatment of feeding and swallowing disorders in children and adults.

CSAD 664. Diagnostics in Speech Language Pathology. 3 Hours.

PR: Consent. Discussion of issues related to the diagnosis of speech and language disorders, including interviewing, etiological factors, and the assessment process. Supervised clinical practicum that concerns the diagnosis of speech and language disorders.

CSAD 666. Updating Trends in Augmentative and Alternative Communication. 2 Hours.

Recent research in augmentative and alternative communication assessment and intervention.

CSAD 668. Clinical Experience in AAC. 2 Hours.

Hands on AAC and AAC assessment and intervention experience at Camp Gizmo in Romney, West Virginia.

CSAD 691A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

CSAD 692A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

CSAD 693A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

CSAD 694A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

CSAD 695. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

CSAD 696. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

CSAD 697. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

CSAD 698. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

CSAD 702. Anatomy/Physiology of the Ear. 3 Hours.

PR: Consent. Detailed study of the anatomy and physiology of the auditory and vestibular systems, and detailed investigation of physiological aspects of auditory and vestibular sensitivity.

CSAD 704. Instrumentation in Audiology. 3 Hours.

PR: Consent. A study of instrumentation utilized in the evaluation of hearing disorders, including calibration, maintenance, minor repair, and use of such instrumentation. The course includes foundational study of electricity and electrical components.

CSAD 706. Advanced Audiological Assessment 1. 4 Hours.

PR: CSAD 440 or consent. Audiological test procedures utilized in the evaluation of hearing loss including differential diagnosis, test administration and interpretation.

CSAD 709. Audiology Clinic 1. 2 Hours.

PR: Consent. Supervised clinical practicum that concerns the evaluation and treatment of children and adults with hearing disorders.

CSAD 710. Psychoacoustics. 3 Hours.

PR: Consent. Advanced study of the psychology of hearing.

CSAD 711. Audiological Assessment 2. 4 Hours.

PR: CSAD 706. An advanced study of evaluation procedures utilized in the evaluation of hearing disorders, including adaptation of test procedures for varying clinical populations.

CSAD 713. Advanced Audiological Rehabilitation. 3 Hours.

PR: CSAD 442 or consent. Identification of candidates for aural rehabilitation; evaluating degree of handicap; introduction to speech, language, education, and academic achievement of hearing impaired children; auditory, visual, and combined methods of rehabilitation; aural rehabilitation counseling.

CSAD 714. Neuroanatomy and Physiology. 3 Hours.

PR: CSAD 702. Advanced study of the structures of the auditory system and their function.

CSAD 715. Amplification 1. 3 Hours.

PR: CSAD 706 and Coreq: CSAD 716. A study of amplification systems including assistive listening devices, hearing aid evaluation procedures, and outcome measures.

CSAD 716. Amplification Lab 1. 1 Hour.

PR: CSAD 706 and Coreq: CSAD 715. Demonstration and introductory experience selecting, fitting and servicing basic hearing aids for individuals with hearing impairment.

CSAD 717. Pathology of the Auditory System. 3 Hours.

PR: CSAD 702. Detailed study of the nature and etiology of auditory system pathologies from the external ear to the auditory cortex and their audiological manifestation.

CSAD 718. Externship in Speech Pathology/Audiology. 1-9 Hours.

Supervised clinical practicum experience in selected work settings to provide students with a concentrated orientation to the professional work place. Coordination and evaluation is under the direction of faculty.

CSAD 720. Audiology Communication Skills. 3 Hours.

PR: CSAD 711 or consent. Introduction to communicating within the discipline of audiology. Emphasis is placed in treating special needs individuals with hearing/balance disorders and their families/caregivers.

CSAD 721. Amplification 2. 3 Hours.

PR: CSAD 715 and Coreq: CSAD 722. Advanced study of the structures of the operation, selection, fitting, and use of amplification systems for individuals with hearing disability.

CSAD 722. Amplification Lab 2. 1 Hour.

PR: CSAD 715 and CSAD 716 and Coreq: CSAD 721. Demonstrations and introductory experience selecting and fitting amplification systems for individuals with hearing impairment.

CSAD 723. Pediatric Audiology. 3 Hours.

PR: CSAD 706 or consent. A study of the development of the auditory response and hearing problems of early childhood. Students will learn the construction and application of specialized assessment techniques suitable for the pediatric patient.

CSAD 725. Physiological Measures. 3 Hours.

PR: CSAD 702 and CSAD 711 and CSAD 714 and Coreq: CSAD 726. Advanced study of the principles, methods and applications of otoacoustic emission and evoked potential measurements of auditory function.

CSAD 726. Physiological Measures Lab. 1 Hour.

PR: CSAD 711 and CSAD 714 and Coreq: CSAD 725. Demonstration and introductory experiences with otoacoustic emissions and evoked potential test procedures.

CSAD 729. Audiology Clinic 2. 2 Hours.

PR: Consent. Supervised clinical practicum that concerns the evaluation and treatment of children and adults with hearing disorders.

CSAD 731. Developmental Effects of Hearing Loss. 1 Hour.

This course addresses developmental speech, language, and other communicative disorders caused by hearing impairment. The role of the audiologist in the diagnosis and treatment of children with hearing loss is discussed.

CSAD 734. Auditory Processing Disorders. 3 Hours.

PR: CSAD 725. A study of auditory processing disorders, including evaluation methods and procedures, remediation theories and practices, as well as collaboration with other professions in management of the disorders.

CSAD 736. Vestibular Evaluation and Rehabilitation. 3 Hours.

PR: CSAD 702 and CSAD 714 and Coreq: CSAD 737. Advanced study of balance system function and dysfunction, the principles and methods of evaluating balance, and rehabilitation techniques.

CSAD 737. Vestibular Evaluation and Rehabilitation Lab. 1 Hour.

CSAD 737. Vestibular Evaluation and Rehabilitation Lab. 1 HR. PR: CSAD 702 and CSAD 714 and Coreq: CSAD 736. Demonstration and introductory experience performing balance system evaluation and rehabilitation techniques.

CSAD 738. Professional Issues. 2 Hours.

PR: Consent. Discussion of contemporary professional issues in audiology.

CSAD 739. Audiology Clinic 3. 2 Hours.

PR: CSAD 729. Supervised clinical practicum that concerns the evaluation and treatment of children and adults with hearing disorders.

CSAD 741. Audiology Business Management Practices. 3 Hours.

PR: Consent. This course is intended to provide an overview of concepts involved in the development and management of audiology practices. Specific attention will be paid to business planning, financial and managerial accounting, marketing, human resources management, and other audiology practice management topics involved in daily operations.

CSAD 743. Industrial Audiology. 3 Hours.

PR: CSAD 704. A study of various noise parameters and measurement techniques. Industrial hearing conservation procedures and the effects of noise on man.

CSAD 745. Clinic Supervision Seminar. 2 Hours.

An investigation into methods and techniques for clinical supervision in audiology.

CSAD 747. Cochlear and Brainstem Implants. 3 Hours.

PR: CSAD 711 and CSAD 722 and admission to the audiology program. This course includes information related to the role and responsibilities of the audiologist on the cochlear and auditory brainstem implants team, including theoretical principles, pre-implant assessments, programming, implant orientation and troubleshooting, and other follow-up services.

CSAD 749. Audiology Clinic 4. 3 Hours.

PR: CSAD 739. Supervised clinical practicum that concerns the evaluation and treatment of children and adults with speech-language disorders.

CSAD 750. Information Literacy in Communication Sciences and Disorders. 3 Hours.

PR: Consent. Practical and theoretical issues in the use of the professional literature to advance research and practice in audiology and speech-language pathology.

CSAD 752. Research Design in Communication Sciences and Disorders. 3 Hours.

PR: Consent. Practical and theoretical issues in the selection and implementation of quantitative and qualitative research designs common in communication sciences and disorders.

CSAD 754. Teaching and Supervision in Communication Sciences and Disorders. 3 Hours.

PR: Consent. Principles, concepts, and processes involved in effective classroom instruction and clinical supervision of students in audiology and speech-language pathology programs.

CSAD 759. Audiology Clinic 5. 5 Hours.

PR: CSAD 749. Supervised clinical practicum that concerns the evaluation and treatment of children and adults with hearing disorders.

CSAD 769. Audiology Clinic 6. 5 Hours.

PR: CSAD 759. Supervised clinical practicum that concerns the evaluation and treatment of children and adults with hearing disorders.

CSAD 770. Cultural Diversity in Communication Sciences and Disorders. 1 Hour.

PR: Consent and Suggested as CoReq: CSAD 771. Issues and differences related to communication sciences and disorders within diverse subcultures in the USA and Canada.

CSAD 771. Cultural Diversity Lab. 1 Hour.

PR: Consent. Suggested CoReq: CSAD 770. Hands-on experience related to practice in communication sciences and disorders within diverse cultural settings in the USA and Canada.

CSAD 779. Audiology Clinic 7. 6 Hours.

PR: CSAD 769. Supervised clinical practicum that concerns the evaluation and treatment of children and adults with hearing disorders.

CSAD 780. Global Initiatives in Communication Sciences and Disorders. 1 Hour.

PR: Consent and Suggested CoReq: CSAD 781. Issues and differences related to communication sciences and disorders in settings outside the United States and Canada.

CSAD 781. Global Initiatives Lab. 1 Hour.

PR: Consent and Suggested CoReq: CSAD 780. Hands-on experiences related to professional practices and perspectives in communication sciences and disorders outside the United States and Canada.

CSAD 789. Audiology Residency. 6-9 Hours.

PR: CSAD 779. A semester placement in a clinical facility supervised by a certified audiologist, performing all aspects of audiology as applicable to the facility.

CSAD 793A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

CSAD 794A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

CSAD 795. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

CSAD 797. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U).

CSAD 799. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is S/U; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

CSAD 900. Professional Development. 1-6 Hours.

Professional development courses provide skill renewal or enhancement in a professional field or content area (e.g. education, community health, geology.) The continuing education courses are graded on a pass/fail grading scale and do not apply as graduate credit toward a degree program.

CSAD 930. Professional Development. 1-6 Hours.

Professional development courses provide skill renewal or enhancement in a professional field or content area (e.g., education, community health, geology.) These tuition-waived continuing education courses are graded on a pass/fail grading scale and do not apply as graduate credit toward a degree program.

COMMUNICATION STUDIES COURSES

COMM 509. Health Comm Dissemination. 1-3 Hours.

PR: COMM 409. Focus on effective dissemination of health messages. Students communicate outcomes of health communication campaigns conducted in previous classes to diverse external publics; could include presentations to conferences, community groups, schools, workshops.

COMM 591A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of topics not covered in regularly scheduled courses.

COMM 593A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

COMM 600. Communication in the Classroom. 3 Hours.

PR: Teaching experience or consent. Role of interpersonal communication in classroom environment with particular emphasis on communication between students and teachers. Recommended for elementary, secondary, and college teachers in all fields.

COMM 601. Instructional Communication. 3 Hours.

Survey of the theory and research in instructional communication. Emphasis is placed on the study of instructional communication behaviors and the role instructor-student communication plays in the instructional setting.

COMM 602. Interpersonal Communication: Theory and Research. 3 Hours.

Survey of the theory and research in interpersonal communication. Emphasis upon relational communication and intimate communication in interpersonal relationships.

COMM 603. Communication Training and Development. 3 Hours.

This applied graduate course provides the student, who has a background in human communication theory and research, an introduction to communication training and development issues, procedures, assessment, and presentational skills.

COMM 604. Theory and Research in Persuasion. 3 Hours.

Various theories and principles of persuasion with emphasis on contemporary research literature.

COMM 605. Theory and Research in Mass Communication. 3 Hours.

Mass communication from a consumer's viewpoint. Use of consumer-oriented mass media research also stressed.

COMM 606. Theory and Research in Organizational Communication. 3 Hours.

Contemporary research linking communication variables and networks to organizational change, effectiveness, leadership, power, and management practices. Analysis of communication problems within a variety of organizations.

COMM 607. Theory and Research in Language. 3 Hours.

Study of verbal interactions and language from source and perceived perspectives.

COMM 608. Nonverbal Communication. 3 Hours.

Examines the impact of nonverbal communication on the communication process. Attention is given to research on non-language aspects of communication and their application to various contexts.

COMM 609. Communication Apprehension and Avoidance. 3 Hours.

Theory and research related to individuals' predispositional and situational tendencies to approach or avoid communication. Emphasis on work in the areas of willingness to communicate, communication apprehension, reticence, and shyness.

COMM 610. Family Communication. 3 Hours.

This course addresses the communication that exists within and about families. We address various family structures, and employ various theoretical frameworks to explain, predict, and control family communication and its correlates with socio-cultural, relational and individual wellbeing.

COMM 611. Intergroup Communication. 3 Hours.

This course focuses on intergroup communication and the reciprocal nature between identity and pro/anti-social interaction. Moving beyond the popular individualized communication perspective, intergroup theories and research allow us to explore the prominence of social group memberships (e.g., age, race, religion, gender, value orientations) in our everyday communication and cognitions.

COMM 612. Small Group Theory and Practice. 3 Hours.

Specific research areas in interpersonal communication with emphasis on small groups.

COMM 615. Media in Communication and Education. 3 Hours.

Use of the media in educational and other communication environments with emphasis on communication processes and principles relevant to television and film.

COMM 616. Communication in the Educational Organization. 3 Hours.

Problems of communication within educational organizations with emphasis on elements that impact educational change, conflict management, and interpersonal influence. Recommended for elementary, secondary, and college teachers in all fields.

COMM 617. Communication Problems of Children. 3 Hours.

(Primarily for elementary and secondary school teachers and language arts supervisors.) Normal maturational development of listening and speaking skills, their relationships to language acquisition, and influence upon achievement.

COMM 619. Communication and Affect in Instruction. 3 Hours.

PR: Graduate status. This advanced graduate course examines the influence of teachers' communicative behaviors on student learning, student communication, and the classroom climate.

COMM 622. Gender and Communication. 3 Hours.

This graduate course will review contemporary and historical communication issues about sex, gender, and communication. Nonverbal communication, friendship, romantic family, educational, organizational, and media impacts will be reviewed.

COMM 623. Leadership. 3 Hours.

Leadership styles, models and theories in classical and contemporary settings are covered. Emphasis is given to leadership in groups and organizations.

COMM 624. Communication Ethics. 3 Hours.

This course focuses on communication ethics with a particular emphasis on communication ethics in the organizational context. Communication issues and situations are explored from various ethical perspectives.

COMM 625. Computer Mediated Communication. 3 Hours.

This course explored the relationships between CMC and various aspects of human activity. This course investigates established and emerging CMC-based social, cultural, organizational, and instructional activities.

COMM 626. Intercultural Communication: Theory and Research. 3 Hours.

Advanced seminar in communication of various cultures. Special emphasis on research in diffusion of innovations.

COMM 627. Teachers in Film. 3 Hours.

This course focuses on how teachers and schools are portrayed in film. Students will use course readings and personal experiences to offer critical analysis of these films.

COMM 629. Health Communication. 3 Hours.

Overview of essential concepts and theories needed to understand and evaluate health-related messages in patient-provider relationships, between workers in health care organizations, and in medial related applications.

COMM 660. Communication in the Organization. 3 Hours.

This course exposes students to the role of communication in organizational environment with particular emphasis on its social science roots.

COMM 691A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

COMM 693A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

COMM 694A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

COMM 695. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

COMM 697. Research. 1-15 Hours.

PR: Consent. Research activities leading to a thesis, problem report, research paper, or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

COMM 700. Survey of Human Communication Theory. 3 Hours.

Broad overview of contemporary theories in human communication. Should be taken the first semester of graduate study.

COMM 701. Graduate Research Methods. 3 Hours.

Major emphasis on designing and conducting experimental and laboratory research in human communication. Computer applications to social science research also given consideration. Should be taken the first semester of graduate study.

COMM 702. Advanced Interpersonal Communications. 3 Hours.

PR: COMM 602. This course examines how interpersonal communication patterns are linked to relational processes, both as influences and outcomes. Emphasis is on in-depth analysis of social science interpersonal research.

COMM 706. Advanced Organizational Communications. 3 Hours.

PR: COMM 606. This course provides an overview of the history and development of organizational communication. Additionally, current organizational theories and perspectives are investigated.

COMM 711. Advanced Seminar in Research Methods. 3 Hours.

PR: COMM 701. Research techniques necessary to conduct original communication research. Emphasis on advanced statistical techniques.

COMM 712. Communication Measurement. 3 Hours.

PR: COMM 701. This course investigates measures and instruments used in the field of communication studies. Focus is placed on the creation and validation of communication measures.

COMM 713. Qualitative Research Methods. 3 Hours.

Qualitative research methods in human communication and related professional areas with major emphasis on conducting and evaluation qualitative research procedures. Special focus on practical application.

COMM 719. Advanced Instructional Communications. 3 Hours.

Examination of issues surrounding instructional communication. Topics include study of history, paradigms, and programmatic areas of research of instructional communication.

COMM 790. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of communication studies. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students on assistantships to gain teaching experience. (Grading will be P/F.).

COMM 791A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

COMM 792A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

COMM 793A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

COMM 794A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

COMM 795. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

COMM 796. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

COMM 797. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

COMM 798. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

COMM 799. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use of the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is P/F; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

COMM 930. Professional Development. 1-6 Hours.

Professional development courses provide skill renewal or enhancement in a professional field or content area (e.g., education, community health, geology). These tuition-waived, continuing education courses are graded on a pass/fail grading scale and do not apply as graduate credit toward a degree program.

COMMUNITY HEALTH PROMOTION COURSES

CHPR 507. Community Health: Human Sexuality. 3 Hours.

PR: Consent. Analysis of sex-related issues including parenting, sex education, sexual sanctions, pornography, sexual dysfunction, and sexual variance. Designed for teachers, health professionals, and interested lay people.

CHPR 509. Community Health: Drug Education. 3 Hours.

PR: Consent. Designed to help students learn appropriate components of a drug education program, gain an understanding of drug taking in this society, and acquire insights into dependent behaviors.

CHPR 600. Foundations of Public Health for School Health Educators. 3 Hours.

This course provides an overview of the five core public health disciplines with an emphasis on school health promotion and child and adolescent health. Course materials will help students develop the theoretical background, philosophical approach, and professional skills required to effectively serve as a public health promotion professional in the school setting.

CHPR 601. Emerging Research in Elementary School Health. 3 Hours.

This course provides a critique of contemporary research in children's health and evaluates its influence on current and emerging elementary school health promotion practice. Additionally, it emphasizes building the skills required to properly evaluate the quality of health and educational research articles and reports, as well as those required to properly apply research findings in elementary school settings.

CHPR 602. Emerging Research in Secondary School Health. 3 Hours.

This course provides a critique of contemporary research in adolescent health and evaluates its influence on current and emerging secondary school health promotion practice. Additionally, it emphasizes building the skills required to properly evaluate the quality of health and educational research articles and reports, as well as those required to properly apply research findings in secondary school settings.

CHPR 604. Advanced School Health. 3 Hours.

PR: Admission to the school health master's program. Course addresses the teacher's role in organizing and implementing comprehensive school health programs at the elementary and secondary levels. Additional attention is paid to providing instruction specific to the health educator skills and standards.

CHPR 613. Certified Health Education Specialist. 1 Hour.

This course addresses competencies of a certified health education specialist (CHES), and prepares students for the national credentialing exam.

CHPR 614. Injury Prevention and Control. 3 Hours.

The injury control problem is examined as a public health concern. Strategies and programs for injury prevention are studied for implementation with target groups who are overrepresented within the injury problem.

CHPR 640. School Health Program Design. 3 Hours.

PR: Admission to school health master's program. Course provides a practical application experience for students to design a health education course curriculum, demonstrate classroom teaching, and self-evaluate their own teaching.

CHPR 645. Evaluating School Health Programs. 3 Hours.

Provides students with the theoretical background and practical skills required to conduct meaningful school-based, health-focused, student assessments and program evaluations. Specifically, students will develop the skills necessary to evaluate and improve elementary and secondary health promotion initiatives, including health education lessons, health promotion programs, and effective implementation of the Coordinated School Health model, including school climate and community collaboration.

CHPR 650. Practicum. 1-12 Hours.

PR: Consent. Students are assigned to a field placement based on prior health promotion work experience. Under the supervision of faculty, students assume major responsibility for a program with a community health promotion organization. (Grading may be S/U.)

CHPR 671. Community and Context in School Health. 3 Hours.

This course addresses public health in the U.S. with a special emphasis on schools as an important community in which health promotion takes place. Additionally, we discuss the major structural and social forces that influence school and student health outcomes and consider the unique needs of diverse communities of children, adolescents, and families represented within the broader school organization.

CHPR 675. Leadership and Advocacy in School Health. 3 Hours.

This course focuses on building the leadership and advocacy skills required to promote health in the school setting. These skills include being able to describe the value of the school health program, enlist the assistance of school and community partners, understand and respond to community concerns, build consensus regarding controversial issues, and anticipate and meet future needs in school health.

CHPR 680. School Health Concepts. 3 Hours.

Addresses content areas for health education, the national health education standards, the CDC adolescent risk factors, and healthy people 2010 objectives as applicable to: emotional health, injury prevention, disease and nutrition, and physical activity.

CHPR 690. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of community health promotion. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It also provides a mechanism for students not on assistantships to gain teaching experience. (Grading will be P/F.)

CHPR 691A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

CHPR 693A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

CHPR 695. Independent Study. 1-6 Hours.

Faculty supervised topics not available through regular course offerings.

CHPR 697. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or dissertation. (Grading may be S/U.)

CHPR 782. Supervised Applied Health Education Project. 1 Hour.

PR: Advanced graduate standing or consent. Doctoral students only. Plan and conduct a health education intervention in other than a classroom setting, i.e., a defined community.

CHPR 783. Supervised Health Education Research Report. 1 Hour.

PR: Advanced graduate standing and consent. Doctoral students only. A written report of empirical research of either a survey or an experiment.

CHPR 790. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of health-related learning experiences. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on assistantships to gain teaching experience. (Grading will be P/F.)

CHPR 791A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses. Study may be independent or through specially scheduled lectures.

CHPR 792A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

CHPR 793A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

CHPR 794A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

CHPR 795. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

CHPR 796. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

CHPR 797. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis (697), problem report (697), research paper or equivalent scholarly project (697), or a dissertation (797). (Grading will be S/U.).

CHPR 798. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

CHPR 799. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use of the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is P/F; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

CHPR 900. Professional Development. 1-6 Hours.

Professional development courses provide skill renewal or enhancement in a professional field or content area (e.g., education, community health, geology.) These continuing education courses are graded on a pass/fail grading scale and do not apply as graduate credit toward a degree program.

CHPR 930. Professional Development. 1-6 Hours.

Professional development courses provide skill renewal or enhancement in a professional field or content area (e.g., education, community health, geology.) These tuition-waived continuing education courses are graded on a pass/fail grading scale and do not apply as graduate credit toward a degree program.

COMMUNITY MEDICINE COURSES**CMED 691A-Z. Advanced Topics. 1-6 Hours.**

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

CMED 695. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

CMED 697. Research. 1-15 Hours.

PR: Consent. Research activities leading to a thesis, problem report, research paper, or equivalent scholarly project.

CMED 698. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

CMED 699. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use of the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is S/U; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

CMED 712. Medical Aspects of Environmental Health. 1 Hour.

PR: MD degree or consent. A review of issues illustrating the responsibilities and professional interaction of physicians in indentifying, managing, and preventing casualties from environmental causes in air, water, soil, food, pesticides, and related subjects. (1 hr. lec.).

CMED 750. Statistics Biomedical Sciences. 1 Hour.

This introductory biostatistics course for biomedical graduate students covers variables and descriptive statistics as well as parametric and non-parametric statistics.

CMED 790. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of anatomy. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It also provides a mechanism for students not on assistantships to gain teaching experience. (Grading will be P/F.).

CMED 791A-Z. Advanced Topics. 1-6 Hours.

CMED 791. Advanced Topics. 1-6 Hr. PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

CMED 792A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

CMED 793A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

CMED 794A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

CMED 795. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

CMED 796. Graduate Seminar. 1 Hour.

PR: Consent. A one credit hour seminar is designed to assist students in identifying their career objectives and exploring opportunities to achieve their career objectives.

CMED 797. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project or a dissertation. (Grading may be S/U.).

CMED 798. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

CMED 799. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework but who wish to meet residency requirements, use of the University's facilities, and participate in its academic and cultural programs. Note: graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is P/F; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

COMPUTER ENGINEERING COURSES**CPE 520. Application of Neural Networks. 3 Hours.**

PR: Consent. Theories, principles, techniques, and procedures used in design implementation of supervised and unsupervised neural networks. Algorithms and computer programming for software realization with engineering applications.

CPE 521. Applied Fuzzy Logic. 3 Hours.

PR: Consent. Theory and applications of fuzzy logic, fuzzy fundamentals, fuzzy rules, decision-making systems, control systems, pattern recognition systems, and advanced topics. Algorithms and computer programming for software realization with engineering applications.

CPE 536. Computer Data Forensics. 3 Hours.

PR: CPE 310 and CPE 435 or Consent. Provides students with a comprehensive overview of collecting, investigating, preserving, and presenting evidence of cybercrime; introduces topics of forensic data examination of computers and other digital storage devices.

CPE 538. Intro Computer Security Management. 3 Hours.

Develops management tools to build and maintain a secure enterprise. Includes policies, procedures, and the various management and auditing processes that are needed in a networked enterprise.

CPE 568. Computer Network Forensics. 3 Hours.

PR: CS 450 and CS 453 or consent. Introduction to threat assessment in modern networked computer systems. Techniques, methodologies and technologies for preventing, detecting, recovering from and collecting evidence of intrusions, with the intent of prosecuting the offending parties.

CPE 585. Concurrent Programming in Java. 3 Hours.

PR: CS 110 and CS 111 and CS 415 or consent. This is a project-based laboratory-oriented course aimed at learning the fundamentals of component-based software development (CBD) and object-oriented concurrent programming. (OOCB) in Java.

CPE 591A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

CPE 595. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

CPE 643. Fault Tolerant Computing. 3 Hours.

PR: CPE 310 or Consent. Introduction to reliability analysis and Markov modeling. Computer system reliability modeling. Fault tolerant design of computer systems. Reconfiguration strategies in VLSI and WSI arrays.

CPE 664. Sensor Actuator Networks. 3 Hours.

PR: Graduate standing in CS, CPE, EE or SENG. Introduces students to the state of the art in wireless sensor actuator networks. Provides hands on training in programming these networks.

CPE 670. Switching Circuit Theory 1. 3 Hours.

PR: CPE 271 or equivalent. Course presumes an understanding of the elements of Boolean or switching algebra. Study of both combinational and sequential switching circuits with emphasis on sequential networks. Advanced manual design and computer-aided design techniques for single and multiple output combinational circuits. Analysis and design of sequential circuits. Detection and prevention of undesired transient outputs. (3 hr. rec.).

CPE 684. Advanced Real-Time Systems. 3 Hours.

PR: CS 415 and CPE 484 or consent. Project-based course focused on analysis and design of real-time systems using the unified modeling language. Object-oriented development process based on design patterns and frameworks is described.

CPE 691A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

CPE 694A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

CPE 695. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

CPE 697. Research. 1-15 Hours.

PR:Consent. Research activities leading to thesis, problem report, research paper, equivalent scholarly project, or dissertation. (Grading may be S/U.).

CPE 699. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is S/U; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

CPE 790. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of computer engineering. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on assistantships to gain teaching experience. (Grading will be S/U.).

CPE 791A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

CPE 792A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

CPE 793A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

CPE 794A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

CPE 795. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

CPE 796. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

CPE 797. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper, or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

CPE 798. Thesis or Dissertation. 1-6 Hours.

PR:Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698) or dissertations (798). Grading is normal.

CPE 799. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is S/U; colloquium credit may not count against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

COMPUTER SCIENCE COURSES

CS 510. Formal Specification of Language. 3 Hours.

PR: CS 410. Specifications of language syntax and semantics by grammars and automata and by attribute grammars, denotational semantics, and action equations; algebraic, denotational, and operational semantics; application of formal specifications to construction of software tools.

CS 520. Advanced Analysis of Algorithms. 3 Hours.

PR: CS 320. Analysis and design techniques for efficient sequential and parallel algorithm design; NP-completeness, advanced analysis techniques, advanced algorithms, and parallel algorithms.

CS 525. Computational Complexity. 3 Hours.

PR:CS 422. Introduction to the theory of computational complexity. Topics include: turning machines, computability, complexity classes P, NP, and co-NP, the theory of NP-completeness, randomized complexity classes, inapproximability, and complexity classes beyond NP.

CS 530. Formal Methods in Software Engineering. 3 Hours.

PR: CS 430. Principles of rigorous specification, designing, implementation, and validation of sequential, concurrent, and real-time software; emphasis on reading current papers on these topics.

CS 533. Developing Portable Software. 3 Hours.

PR: CS 330 and CS 450 or Consent. Issues, problems, and techniques in the practical development of portable software and in the adaptation of programs to new environments; development of a simple interactive application; porting to several diverse computing platforms.

CS 539. Computer Forensics and the Law. 3 Hours.

PR: CPE 435. Surveys the emerging field of computer law and how it applies to businesses and law enforcement, both to aid and to circumscribe the policies and procedures to tackle computer crime.

CS 540. Theory of Database Systems. 3 Hours.

PR: CS 440. Abstract and newer database models; introduction to database design techniques in the context of semantic data modeling; equivalence of different relational models; object-oriented databases.

CS 550. Theory of Operating Systems. 3 Hours.

PR: CS 450. Theoretical analysis of selected aspects of operating system design; topics include interaction of concurrent processes; scheduling and resource allocation; virtual memory management; access control; and distributed and real-time system issues.

CS 554. Network Computing. 3 Hours.

PR: CS 540 or Consent. An in-depth study of the Internet, networking fundamentals, protocols, algorithms, and principles of distributed computing, introduction to network security and management.

CS 555. Advanced Computer Systems Architecture. 3 Hours.

PR: CS 455 or CPE 442. High performance techniques, pipelined and parallel systems, and high-level architectures; comparative evaluation of architectures for specific applications; emphasis on software implications of hardware specifications.

CS 556. Distributed and Pervasive Comput. 3 Hours.

PR: CS 350 or consent. An in-depth study of distributed computing paradigms, standards, and applications that can exploit this paradigm and the emerging pervasive computing infrastructure.

CS 558. Multimedia Systems. 3 Hours.

PR: CS 350 or EE 465 or consent, requirements and QOS; multimedia data acquisition, object decomposition, multimedia storage servers; multimedia communications-networking, traffic characterizations, traffic scheduling, multicasting; compression of images, video and audio; multimedia information systems-indexing and retrieval of multimedia data.

CS 568. Computer Network Forensics. 3 Hours.

PR: CS 450 and CS 453 or consent. Introduction to threat assessment in modern networked computer systems. Techniques, methodologies and technologies for preventing, detecting, recovering from, and collecting evidence of intrusions, with the intent of prosecuting the offending parties.

CS 570. Interactive Computer Graphics. 3 Hours.

PR: CS 320. Viewing in three dimensions, projections, rendering of surfaces and solids, illumination and shading, interaction handling, display processors and programming systems, and graphics system organization.

CS 572. Advanced Artificial Intelligence Techniques. 3 Hours.

PR: CS 472. Reasoning under uncertainty; nonmonotonic reasoning, statistical reasoning, fuzzy logic; planning, parallel, and distributed AI, natural language processing, learning, connectionist models, temporal logic, common sense knowledge and qualitative reasoning, AI techniques and robotics.

CS 573. Advanced Data Mining. 3 Hours.

PR: CS 230 and CS 350 or equivalent. We present the theory practice of industrial data mining. Combining pragmatics with theory, students will learn to select appropriate data mining methods for individual applications. Graduate students will learn to conduct data mining experiments.

CS 576. Design of Immersive Media Systems. 3 Hours.

PR: Graduate student status in CS, or consent. Team-based development of a video game, demo reel, or other project demonstrating expertise in game development.

CS 578. Medical Image Analysis. 3 Hours.

PR: EE 465 or equivalent. Advanced topics in medical image analysis, with focus on image restoration, segmentation, registration and visualization.

CS 589. Game Seminar. 1 Hour.

(May be repeated for a maximum of 3 credit hours.) A discussion of current topics in video game development.

CS 591A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

CS 593A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

CS 594A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

CS 595. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

CS 601. Foundations of Software Engineering. 3 Hours.

For CS provisional graduate students only. Object-oriented programming concepts applied to data structures such as queues, lists, trees, techniques, and methods of developing software.

CS 602. Foundations of Algorithms. 3 Hours.

For CS provisional graduate students only. Topics from discrete mathematics including sets, relations, functions, counting principles, graphs and trees, topics from analysis of algorithms including recurrences, sorting, graph and greedy algorithms, and advanced data structures.

CS 604. Semantics of Programming Languages. 3 Hours.

For CS provisional graduate students only. Operating systems, machine organization, number systems and the theoretical and practical aspects of assembler and other programming languages.

CS 623. String Algorithms. 3 Hours.

PR: CS 221 or Consent. Algorithms on strings from traditional combinatorial pattern matchup to recent problems such as suffix sorting and string embeddings. Emphasis is on the data structures and algorithms required, their analysis, and optimal constructions.

CS 630. Empirical Methods in Software Engineering and Computer Science. 3 Hours.

An in-depth study of the scientific process and guidelines for empirical research. Particularly addressing surveys, case studies, and controlled experiments. Covers in detail the qualitative and quantitative data analysis methods commonly used in empirical investigations.

CS 665. Computer System Security. 3 Hours.

PR: CS 465 or Consent. Course describes modern approaches to information and system security including encryption techniques, secure communication protocols, operating system security principles, and network intrusion detection techniques.

CS 677. Pattern Recognition. 3 Hours.

PR: Consent. Covers salient topics in statistical pattern recognition, including Bayesian decision theory, Bayesian learning and density estimation, linear discriminant functions, multilayer neural networks, support vector machines, and unsupervised learning. Working knowledge of Matlab is essential.

CS 689. Graduate Internship. 1-3 Hours.

PR: Completion of a minimum of 18 degree applicable graduate credit hours with an overall GPA of 3.0 or better. Employments in industry related to degree program. (Graded P/F. May be repeated twice. Cannot be counted toward graduation requirements.)

CS 690. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of computer science. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It also provides a mechanism for students not on assistantships to gain teaching experience. (Grading will be S/U.)

CS 691A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

CS 693A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

CS 695. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

CS 696. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

CS 697. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.)

CS 699. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is S/U; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

CS 726. Algorithmic Graph Theory. 3 Hours.

PR: CS 520 or consent. Introduction to algorithmic graph theory with emphasis on special classes of graphs, graph structure, efficient combinatorial algorithms, graph compositions/ decompositions, and graph representations, current research development trends and open questions on structured families and graphs.

CS 727. Information Dissemination. 3 Hours.

PR: CS 520. Research issues in information dissemination in graphs; emphasis on broadcasting and gossiping algorithms, including identification and solution of open research questions.

CS 736. Software Performance Engineering. 3 Hours.

PR: CS 330 or Consent. A systematic, quantitative approach to cost- effectively constructing software systems that meet performance models; effective data gathering and performance measurement techniques.

CS 740. Advanced Databases Theory. 3 Hours.

PR: CS 540. Design theory for relational databases; functional dependencies; multivalued dependencies and normal forms; projection mappings, tableaux and the chase; representation theory.

CS 750. Secure and Survivable Systems. 3 Hours.

PR: CS 680 or Consent. An in-depth study of principles, standards, practices, and architectures in the area of secure and survivable systems. Case studies, simulations, and games will be used to gain deep understanding of the issues.

CS 751. Digital Enterprises. 3 Hours.

PR: CS 680 or Consent. An in-depth study of principles, standards, practices, and architectures in the area of digital enterprise. Case studies and simulations will be used to gain deep understandings of the issues.

CS 757. Distributed Systems and Algorithms. 3 Hours.

PR: CS 320 and CS 550. Distributed and networked operating systems and the algorithms necessary to achieve such goals as transparency, sharing, fault tolerance, and efficient process and task scheduling.

CS 772. Global Knowledge Networks. 3 Hours.

PR: CS 572. Representational formalisms and effective retrieval techniques to obtain information from international knowledge repositories connected via high-speed networks.

CS 778. Medical Image Analysis. 3 Hours.

Advanced topics in medical image analysis, with focus on image restoration, segmentation, registration and visualization.

CS 790. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of computer science. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on assistantships to gain teaching experience. (Grading will be S/U.).

CS 791A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses. Study may be independent or through specially scheduled lectures.

CS 792A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

CS 793A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

CS 794A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

CS 795. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

CS 796. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

CS 797. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper, or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

CS 798. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

CS 799. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is S/U; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

CS 900. Professional Development. 1-6 Hours.

Professional development courses provide skill renewal or enhancement in a professional field or content area (e.g., education community health, geology). The continuing education courses are graded on a pass/fail grading scale and do not apply as graduate credit toward a degree program.

CS 930. Professional Development. 1-6 Hours.

Professional development courses provides skill renewal or enhancement in a professional field or content area (e.g., education, community health, geology). These tuition-waived, continuing education courses are graded on a pass/fail grading scale and do not apply as graduate credit toward a degree program.

CONJOINED COURSES COURSES**CCMD 701. Problem-Based Learning. 2 Hours.**

(May be repeated for a maximum of 8 credit hours.) Students work in facilitated groups to apply basic science concepts/principles to solve problems pertaining to clinical cases. Students are expected to develop/demonstrate independent learning/group communication skills. Students will also explore the roles of other health care practitioners, and learn to work in healthcare teams through the use of inter-professional education.

CCMD 712. Public Health. 3 Hours.

Introduction to causal inference, study design, common statistical tests, interpretation of epidemiological studies (chance, bias, confounding), occupational health, health care systems, administrative aspects of health care, preventive medicine, social influences on health, and international health.

CCMD 713. Health of the Public. 2 Hours.

PR: Medical student or consent. An introduction to public health with an emphasis on West Virginia. Topics include occupational and environmental health, preventive medicine, social and behavioral aspects of health, and health services administration and management.

CCMD 721. Physical Diagnosis/Clinical Integration 2. 4 Hours.

This course will introduce clinical medicine topics, organized by organ system, as well as emphasize history and physical exam skills. Students will begin to use clinical reasoning techniques, integrating basic science and clinical knowledge. (Grading will be Pass/Fail.).

CCMD 722. Physical Diagnosis and Clinical Integration 2. 5 Hours.

This course will introduce clinical medicine topics, organized by organ system, as well as emphasize history and physical exam skills. Students will begin to use clinical reasoning techniques, integrating basic science and clinical knowledge. (Grading will be Pass/Fail.).

CCMD 725. Health Care Ethics. 2 Hours.

For medical students only. Integrated approach to medical-ethical, legal, and spiritual aspects of health care. Includes lectures about basic principles and concepts, small-group discussion of cases, and large-group interactive case discussions.

CCMD 730. Human Function. 16 Hours.

PR: For medical students and selected graduate students with instructor consent. Integrated approach combining biochemistry, genetics and physiology of the human body. Includes molecular, subcellular, and cellular components of the body, organ systems and whole body functions. Application of basic sciences to human health and disease. (Lec. 14 hr., other 2 hr., contact 16 hr.).

CCMD 740. Behavioral Science and Psychopathology. 4 Hours.

This course will introduce students to the biological, psychological, social, and spiritual dimensions of health care. Normal and abnormal human development. Psychopathology, ethical, legal, and spiritual aspects of health care will be explored in the content of health care decision making. (Grading will be Pass/Fail.).

CCMD 741. Behavioral Science and Psychopathology. 2 Hours.

PR: CCMD 741. Continuation of CCMD 740. Students will build on skills and techniques learned in CCMD 740.

CCMD 745. Physical Diagnosis/Clinical Integration 1. 3 Hours.

This course will introduce the student to persons with health concerns. Students will begin development of skills of medical communication, data gathering, and physical examination techniques. (Lec. 5 hr., other 2 hr., contact 7 hr.).

CCMD 746. Physical Diagnosis and Clinical Integration. 4 Hours.

This course will introduce the student to persons with health concerns. Students will begin development of skills of medical communication, data gathering, and physical examination techniques.

CCMD 750. Radiation Safety and Radionuclide Usage. 1,2 Hour.

PR: PHYS 101 and PHYS 102, CHEM 115 and CHEM 116, or consent. Chemical, physical, and biological aspects of radiation; safety; handling and storage of radioactive materials; NRC and WVU regulations and licensing; detection and instrumentation, research, and clinical use of radioisotopes.

CCMD 770. Medical Genetics. 2-4 Hours.

PR: Second-year medical student standing; graduate student in genetics and developmental biology; others by consent. Introduction to clinical genetics including molecular, biochemical, and cytogenetic aspects of human biology. Application of genetic principles to human health and disease. (Also listed as GEN 570.).

CCMD 775. Neurobiology. 7 Hours.

Introduction to basic structure and function of the human nervous system with a focus on clinical application of basic information. The course emphasizes the normal neurobiology (at the cell and system level) essential to understanding human behavior and to recognizing abnormality seen in clinical practice. (Grading will be Pass/Fail.).

CCMD 776. Step-One Board Preparation. 3 Hours.

The USMLE Step 1 is the first step in the licensure of becoming a physician and is a graduation requirement of the WVU School of Medicine. The comprehensive exam assesses students' overall knowledge of the basic sciences critical to the practice of medicine. (Grading will be Pass/Fail.).

CCMD 777. Step-2 Board Prep. 2 Hours.

Student prepares for USMLE Step 3, requirement for medical licensure and graduation. Passing course requires USMLE Step 2 passing score. National Board of Medical Examiners requires to be enrolled to take USMLE.

CCMD 778. Basic Medical Science Exam. 2 Hours.

The NBME Comprehensive Basic Medical Science exam assesses second-year medical students' preparedness to sit for the USMLE Step 1. The comprehensive exam assesses students' overall knowledge of the basic sciences critical to the practice of medicine. (Grading will be Pass/Fail.).

CCMD 779. Clinical Performance Examination. 1 Hour.

The Clinical Performance Examination (CPX) assesses the clinical competency of fourth-year medical students based on the first three years of the curriculum. Successful completion of the CPX is a graduation requirement of the MD degree.

CCMD 780. Hospital Care. 4 Hours.

PR: 4th year status. Required for week rotation serving as a sub-intern in either Medicine, Surgery, Family Medicine, or Pediatrics. Competency is assessed in medical knowledge, patient care, practice-based learning, interpersonal and communication skills, professionalism, and systems-based practice.

CCMD 781. Rural Health. 4 Hours.

PR: 4th year status. Required four week non-campus based clinical rotation at an approved WV rural health clinic site. Competency is assessed in medical knowledge, patient care, practice-based learning, interpersonal and communication skills, professionalism, and systems-based practice.

CCMD 782. Critical Care. 4 Hours.

PR: 4th year status. Supervised 4 week sub-intern rotation with 2 weeks in Anesthesiology and 2 weeks in Intensive Care. Competency assessed in medical knowledge, patient care, practice-based learning, interpersonal and communication skills, professionalism, and systems-based practice.

CCMD 788. Selective Experiences in Medicine. 1-6 Hours.

PR: Satisfactory completion of the first three years of medical curriculum. The fourth year offers a wide range of opportunities. A one-month rotation in critical care, surgical subspecialty either a medicine, family medicine, or a pediatric subinternship and two months of a rural primary care rotation are all required in the fourth year. The student works with an advisor to select the remainder of the individual program. This program must also be approved by the associate dean in the Office of Student and Curricular Affairs. The year is composed of ten one-month blocks, four months of which must be spent in programs in West Virginia. Selections are available in all departments within the School of Medicine. A catalog is available that lists the specific guidelines for the fourth-year curriculum.

CCMD 790. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of conjoined courses. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on assistantships to gain teaching experience. (Grading may be S/U.).

CCMD 791A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

CCMD 792A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

CCMD 793A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

CCMD 794A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

CCMD 795. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

CCMD 796. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

CCMD 796A. Graduate Seminar. 1 Hour.

CCMD 796. Graduate Seminar. I,II, S. 1Hr. PR:Consent It is anticipated that each graduate student will present at least one seminar to the assembled faculty and graduate student body of his/her program.

CCMD 797. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

CCMD 798. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

CCMD 799. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use of the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is S/U; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

COUNSELING COURSES**COUN 501. Counseling Theory and Techniques 1. 3 Hours.**

PR: Consent. Development and application of basic counseling skills including interviewing, clinical observations, and a general orientation to counseling theory and settings. Evaluation will be based on strengths and deficits in intra- and interpersonal skills and on demonstration of counseling skills in checkout situations. In-setting laboratory experience required.

COUN 505. Theory and Practice of Human Appraisal. 3 Hours.

An overview of standardized evaluation methods commonly utilized in educational and rehabilitation settings. Experience is provided in selection, administration, ethical standards, and interpretation of selected instruments.

COUN 536. Theories of Human Development. 3 Hours.

Theory and research on emotional, social, and intellectual development over the life span. Emphasis on application of developmental theories within educational and therapeutic settings.

COUN 606. Counseling Theory and Techniques 2. 3 Hours.

PR: COUN 501 and consent. A study of counseling approaches commonly used in public schools, colleges, and rehabilitation agencies. Application of theory emphasized.

COUN 608. School Counseling Services. 3 Hours.

PR: Consent. Applications of counseling theories and techniques appropriate to the school counseling setting will be explored. Students will develop needs assessments, review legal and ethical issues related to schools, and develop a professional school counseling portfolio.

COUN 609. Group Counseling Theory and Techniques. 3 Hours.

PR: COUN 606 and consent. Theories of group counseling and demonstrations of specific group techniques. Ethical standards. Evaluation will be based on expertise in group facilitation.

COUN 620. Lifespan Career Counseling. 3 Hours.

PR: COUN 505. Principles and methods involved in career counseling with diverse populations. Emphasis on theories of career development and life-style planning, career choices, and lifelong work adjustment.

COUN 622. Introduction to Clinical Mental Health. 3 Hours.

PR or CONC: COUN 501 or consent. Role and function of the clinical mental health counselor; DSM categories and ethical standards, cognitive skills and practical experience necessary to understand client populations served by community agencies.

COUN 630. Children/Adolescents/Parents. 3 Hours.

PR: COUN 501. Practical application of the principles of counseling children, adolescents, and parents.

COUN 634. Cultural Issues. 3 Hours.

PR: Program major or consent. The impact of cultural differences on the counseling process including gender, race, ethnicity, socioeconomic status, and counseling styles will be discussed. Racial identity development models will be discussed. Group and experiential activities are required.

COUN 640. Addictions Counseling. 3 Hours.

PR: COUN 501 and PR or CONC: COUN 606 or Consent. Specific techniques and models that apply to counseling the addicted client will be explored. Chemical addictions, food addictions, relationship addictions, sexual addictions, and ethics will be addressed. Demonstration of counseling clients with various addictions is required.

COUN 645. Couples and Family Counseling. 3 Hours.

PR: COUN 501, COUN 606 or Consent. Techniques and methods of couples and family counseling. Emphasis on ethics, diversity, theory and practice of couples and family counseling. Demonstration of counseling skills for couples and families is required.

COUN 660. Field Experience in School Counseling. 3 Hours.

PR: COUN 606 and COUN 630 and COUN 632 and PR or CONC: COUN 685 and consent and course enrollment in the Alternate School Counseling Program. Classroom-based field experience for school counseling majors enrolled in alternative certification programs. A review of classroom curriculum for elementary and secondary grades. Course will be graded on a satisfactory/unsatisfactory basis.

COUN 663. Counseling with Sexual Orientation. 1 Hour.

PR: Graduate standing. An overview of psychological, sociological and political aspects of sexual orientation as they impact counseling. Particular attention will be given to awareness and sensitivity toward gay and lesbian clients and effective intervention and education. Course will be graded on a satisfactory/unsatisfactory basis.

COUN 664. Ethical Issues in Counseling. 3 Hours.

PR: COUN 501 and COUN 606. Surveys the legal and ethical issues and professional ethics codes in the counseling profession. Ethical principles applied to schools, agencies, and private practice. Meets ethics content requirement for the LPC.

COUN 665. Diagnosis and Treatment Planning. 3 Hours.

PR: COUN 536 and COUN 606. Framework for exploring the range of personality and behavioral disorders as described in the DSM. Focus on: descriptive criteria, etiology, assessment, diagnosis, multicultural considerations, psychotropic treatments of, and understanding of the major diagnostic categories.

COUN 668. Crisis Trauma Grief Counseling. 3 Hours.

PR: COUN 501. Application of theories and techniques related to crisis, trauma, suicide, childhood trauma, disaster mental health issues, and all aspects of grief counseling will be explored.

COUN 684. Supervision Models/Counseling. 3 Hours.

PR: COUN 606. The current models of supervision that are commonly utilized by supervisors in the field and the techniques associated with the different models will be investigated.

COUN 685. Practicum. 1-12 Hours.

PR: Preregistration; liability insurance; cleared for internship at close of semester, or a M.A. degree, and consent of department practicum evaluation committee. An intensive supervised practical experience in public schools or agencies, in counseling with individual critique and appropriate small-group experiences. Demonstration of high professional standards, counseling skills, and personal characteristics appropriate to the counseling relationship are essential. (Due to the limited number of summer sites, there can be no guarantee of summer practicum placement.)(Practicum is a prerequisite for internship placement. Internship is a one-semester, minimum four-day per week field experience following practicum. This two-semester sequence replaces the previous one-semester practicum.).

COUN 686. Counseling Internship. 1-12 Hours.

PR: Preregistration, completion of COUN 585 Practicum and consent of department field work coordinator. A full-time supervised field experience. Demonstration of counseling program management skills and ethical conduct is required- ACA Ethical Behavior Standards will be used to determine appropriate professional conduct.

COUN 691A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

COUN 693A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

COUN 695. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

COUN 697. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/ U.).

COUN 900. Professional Development. 1-6 Hours.

Professional development courses provide skill renewal or enhancement in a professional field or content area (e.g., education, community health, geology.) The continuing education courses are graded on a pass/fail grading scale and do not apply as graduate credit toward a degree program.

COUN 930. Professional Development. 1-6 Hours.

Professional development courses provide skill renewal or enhancement in a professional field or content area (e.g., education, community health, geology.) These tuition-waived continuing education courses are graded on a satisfactory or unsatisfactory grading scale and do not apply as graduate credit toward a degree program.

COUNSELING PSYCHOLOGY COURSES

CPSY 701. Advanced Counseling Psychology Interventions. 3 Hours.

PR: Advanced standing and COUN 501 and COUN 606 and COUN 685 or equiv and Consent. Comprehensive development of counseling psychology techniques related to generic and specific theoretical models. In-setting laboratory experience and demonstration of therapy techniques required.

CPSY 709. Advanced Group Counseling / Therapeutic Interventions. 3 Hours.

PR: COUN 609 or equiv and consent. An overview of the formation, leadership techniques, research and ethical issues associated with group counseling and psycho-therapy in general and for specific populations. (Lec.).

CPSY 710. Cognitive-Affective Behavior. 3 Hours.

Review of contemporary theories of learning, memory, motivation, and emotion. Critical review of research and counseling practice. Increased understanding of self-behaviors.

CPSY 734. Multicultural Psychology. 3 Hours.

PR: CPSY advanced standing and CPSY 701. Interactive effects of cultural factors (race, ethnicity, gender, sexual orientation, social status, religious affiliation) as they relate to counseling psychology practice, competencies and roles. (Alternate years.).

CPSY 735. Social Psychology. 3 Hours.

Classic and contemporary readings/research in social psychology emphasizing the interface of social and counseling psychology and integrating social psychology and counseling psychology practice. Uses a student-centered model with emphasis on student-led discussion and demonstrations.

CPSY 738. Life Span Psychology. 3 Hours.

PR: CPSY 763. Overview of developmental psychology focusing on the physical, cognitive, emotional and social domains applied to the professional practice of psychology across the lifespan.

CPSY 740. Assessment of Psychopathology. 3 Hours.

PR: CPSY 701 and CPSY 769. Assessment and diagnosis of psychopathology, integration of case data, treatment planning from a developmental, multicultural perspective with emphasis on ethical and socially responsible interventions and collaboration of counseling psychology with other health care providers.

CPSY 745. History and Systems of Psychology. 3 Hours.

PR: CPSY 701 and CPSY 760. History of modern psychological thought and methodology including the social, political, philosophical, and cultural factors influencing the major schools and systems of psychology, particularly in relationship to counseling psychology.

CPSY 750. Physiological Psychology. 3 Hours.

PR: CPSY 701 and CPSY 760. Survey of neuroanatomical, neuroendocrinological mechanisms underlying psychological and behavioral processes. Motor, sensory, perceptual, behavioral, cognitive, and affective functional systems will be studied. Relevance to normal and pathological development will be reviewed.

CPSY 755. Applied Psychopharmacology. 3 Hours.

PR: CPSY 701 and CPSY 750 and CPSY 760. Review of contemporary theory and practice of psychopharmacology, diagnoses and syndromes warranting medication drug selection, putitive mechanisms of action, dosage, side-effects, toxicity, contra-indications, and use of multiple medications. Critical research reviews and outcome comparisons with psychological treatment.

CPSY 760. Introduction to Counseling Psychology. 3 Hours.

PR: Consent. Overview of history, current status, and future trends associated with counseling psychology as a specialty area. Includes an introduction to counseling psychology research topics and practices.

CPSY 763. Advanced Theories of Counseling Psychology. 3 Hours.

PR: COUN 606 and COUN 685, or equivalent, admission to post-master's graduate study; and consent. A comprehensive study of the theoretical issues in contemporary counseling.

CPSY 764. Intellectual Assessment. 4 Hours.

PR: Advanced standing, COUN 505 and pre-registration with instructor. Administering, scoring, and interpreting individual intelligence tests.

CPSY 766. Vocational Theory and Assessment. 3 Hours.

PR: COUN 620 or equivalent, advanced standing, or Consent. Advanced study of theory development and research in vocational psychology and counseling; emphasis on counseling psychology, women's issues, and cross-cultural counseling.

CPSY 769. Personality Testing and Interpretation. 3 Hours.

PR: COUN 505 and Consent. Advanced study in the application of personality assessment procedures and consideration of alternative methods for measuring human behavior.

CPSY 770. Doctoral Practicum in Counseling Psychology. 1-9 Hours.

PR: CPSY 701 and CPSY 769 and CPSY 780 or equivalent and completed doctoral practicum application (due by March 1 of semester year preceding initial semester), and consent. Intensive clinical experience in which students, under supervision, see clients for individual and group counseling and psychotherapy. Offered at a variety of approved field-based sites. (Practicum).

CPSY 772. Internship. 1-12 Hours.

PR: Written approval from the Department Internship Committee, satisfactory completion of written doctoral comprehensive exams and approval of research prospectus. Full-time supervised practice in an approved counseling psychology internship training program; minimum duration one academic year.

CPSY 780. Professional and Ethical Issues in Counseling Psychology. 3 Hours.

PR: Advanced standing and consent. Overview of current ethical, legal, and professional issues in counseling psychology. Readings, discussion, and a written literature review of a topic related to the practice of counseling psychology.

CPSY 781. Research Practicum. 1 Hour.

Ninety clock-hours of documented hands-on research activity. Activity must be supervised by faculty, or in conjunction with faculty supervision.

CPSY 782. Research Methods and Design. 3 Hours.

An overview of research methods and design, statistical procedures and potential violations of ethical principles in the conduct of research in Counseling Psychology.

CPSY 783. Consultation and Supervision. 3 Hours.

PR: CPSY 701 and CPSY 780; one semester of CPSY 770 or equivalent, consent. Assumptions and techniques of consultation/ supervision include demonstrations of the models and relevant critical analysis.

CPSY 790. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of counseling psychology. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on assistantships to gain teaching experience. (Grading will be S/U.).

CPSY 791A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

CPSY 792A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

CPSY 793A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

CPSY 794A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

CPSY 795. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

CPSY 796. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

CPSY 797. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

CPSY 798. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

CPSY 799. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is S/U; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

CURRICULUM AND INSTRUCTION COURSES

C&I 501. Essential Topics for Teaching. 3 Hours.

This course provides an initial exposure for undergraduate and graduate students to themes in education to foster appreciation of the classroom experience by empowering teachers to be classroom leaders.

C&I 524. Middle School Number/Algebra Teaching 1. 1 Hour.

PR or CONC: MATH 524. Issues involved with sets of numbers as examples of algebraic systems, properties of groups, rings and fields. Properties of polynomials and polynomial rings. Mathematical modeling with finite differences and least squares. Applications in model curricula.

C&I 525. Middle School Number/Algebra Teaching 2. 1 Hour.

PR or CONC: MATH 525. Continuation of C&I 524. Issues involved with sets of numbers as examples of algebraic systems, properties of groups, rings, and fields. Properties of polynomials and polynomial rings. Mathematical modeling with finite differences and least squares.

C&I 528. Middle School Function/Change Teaching 1. 1 Hour.

PR or CONC: MATH 528. Teaching and Learning function concept operations on functions, limits, continuity, Intermediate Value Theorem, families of curves, optimization and area. Classroom applications, current research in learning. Applications in model curricula.

C&I 529. Middle School Functions/Change Teaching 2. 1 Hour.

PR or CONC: MATH 529. Continuation of C&I 528. Teaching and learning function concept, operations on functions, limits, continuity, Intermediate Value Theorem, families of curves, optimization, and area. Classroom applications, current research in learning. Applications in model curricula.

C&I 530. Mathematics in the Elementary School. 3 Hours.

PR: Consent. Addresses current issues and trends in elementary mathematics education. Designed for the practicing elementary teacher.

C&I 533. Corrective Techniques in Mathematics Education. 3 Hours.

PR: Consent. Materials and methods used in diagnosis and remediation of learning difficulties in mathematics.

C&I 581. Independent Research in Curriculum Studies. 1-6 Hours.

Faculty-supervised study of topics not available through regular course offerings.

C&I 584. Student Teaching: Elementary-Early Childhood. 2-12 Hours.

PR: For elementary and early childhood undergraduates who meet eligibility requirements and other guidelines. (Applicable to preschool, nursery, day care, child care, kindergarten, primary grade, or elementary school.).

C&I 585. Student Teaching: Secondary Education. 2-12 Hours.

PR: Students enrolled in secondary education undergraduate programs who meet eligibility requirements and other guidelines.

C&I 587. Advanced Clinical Experience. 1-6 Hours.

PR: Consent. Clinical experience in teaching-learning situations at any level.

C&I 588. Professional Field Experience. 2 Hours.

Students are placed in classroom settings where they are required to observe classroom teachers and engage in instructional and non-instructional programming.

C&I 591A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

C&I 592A-Z. Directed Study. 1-6 Hours.

Directed Study, reading, and/or research.

C&I 593A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

C&I 594A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

C&I 600. United States Education for International Students. 3 Hours.

PR: International students with graduate status and developing oral and written English skills. To assist international students in understanding the U.S. system of education. Included: dominant U.S. values related to education, structure of U.S. education at all levels, models and strategies, field trips, and international comparisons.

C&I 601. The Elementary-School Curriculum. 3 Hours.

PR: 20 hours of undergraduate credit in elementary education, or consent. Analysis of curriculum designs in elementary education with emphasis on methods and techniques of development.

C&I 602. Curriculum and Teaching Principles. 3 Hours.

This course will give the student a basic foundation in the principles, development, and design of curriculum and teaching models.

C&I 604. School Curriculum. 3 Hours.

PR: Teaching experience or consent. Emphasizes socioeconomic and cultural influences on curriculum; principles of curriculum development; curriculum building in various teaching fields; and techniques of experimentation and evaluation.

C&I 605. Twenty-First Century Teaching and Learning. 3 Hours.

Interdisciplinary content if a 3 credit hour course. This course examines new and emerging technologies as they relate to classroom integration and pedagogy.

C&I 606. Curriculum for Middle Childhood. 3 Hours.

Survey course which includes: historical, social, and cultural influences on the curriculum; the learner characteristics; curriculum and instructional organization and their relationship to facilities available; and evaluation and implementation of middle childhood curriculum.

C&I 608. Introduction to Alternative Learning Environments. 3 Hours.

This course will provide opportunities for educators to explore and analyze the trends and issues in alternative learning environments in public education.

C&I 609. Experiences in Alternative Learning Environments. 6 Hours.

PR: C&I 608 and SCFD 620 and consent. This course helps teachers to learn and practice skills that are needed to be an effective teacher in an alternative teaching environment. (Alternate years.)

C&I 612. Early Childhood Curriculum. 3 Hours.

PR: C&I 410 and C&I 411 or consent. Curriculum development for early childhood education Pre-K to 4th grade, including social, creative, cognitive, physical, and academic goals. Societal, historical, and theoretical influences on early childhood curriculum are examined.

C&I 614. Early Childhood Instruction. 3 Hours.

PR: C&I 410 and C&I 411 or consent. Design of instruction for continuous improvement toward mastery of curriculum goals for early childhood education Pre-K to 4th grade.

C&I 615. Issues in Holocaust Education. 3 Hours.

Course examines important issues related to the Holocaust, and their implications for inclusion in curriculum. It examines instructional procedures helpful to youth in trying to comprehend the Holocaust's meaning for living in the 21st century.

C&I 616. Early Childhood Program Development and Evaluation. 3 Hours.

PR: C&I 410 and C&I 411 or consent. Development, administration, and evaluation of facilities, programs, and support systems for early childhood education Pre-K to 4th grade. Includes a focus on family connections and support systems related to early childhood classrooms.

C&I 617. Language Arts in Early Childhood. 3 Hours.

Designing instruction for an integrated development of writing, reading, speaking and listening with an emphasis on literacy acquisition in early childhood education pre-K to 4th grade.

C&I 618. Storytelling in Early Childhood. 3 Hours.

This course will assist students in telling, reading, and creating stories for children. Techniques, methods, and research effective in the art of storytelling will be examined and applied as they relate to total child development.

C&I 623. Contemporary Issues in English Education. 3 Hours.

PR: Graduate standing. Provides the student with a knowledge of several contemporary issues in English teaching which have immediate and long-range ramifications for secondary-school English instruction. (1 hr. lec., 2 hr. sem.).

C&I 624. Advanced Methods in English Education. 3 Hours.

PR: C&I 602 and EDP 600 and Graduate standing. (For classroom teachers of English.) Analysis of recent trends and innovations in methodology. Readings and discussions will lead to the development of instructional strategies and units for secondary English classrooms. (1 hr. lec., 1 hr. lab., 1 hr. sem.).

C&I 630. Problem Solving in Math. 3 Hours.

PR: C&I 602 and EDP 600. A capstone course designed to further develop student's conceptual understanding of mathematics.

C&I 631. Mathematics in the Elementary School. 3 Hours.

PR: Consent. Addresses current issues and trends in elementary mathematics education. Designed for the practicing elementary teacher.

C&I 632. Research in Math Curriculum and Technology. 3 Hours.

This graduate level course is designed to focus on research and trends associated with applications of technology and curriculum in mathematics settings. Class topics will span curriculum, technology, and assessment in math education.

C&I 633. Mathematics in the Junior High School and Middle School. 3 Hours.

A methods course designed to teach selected topics including lesson planning, developing appropriate teaching/learning methods, and evaluations from middle school mathematics.

C&I 634. Mathematics in the Secondary School. 3 Hours.

PR: C&I 602 and EDP 600 and Consent. Patterns of mathematics curriculum in the secondary school; practices in teaching mathematics; preparation, selection and use of instructional materials. Designed for the practicing secondary mathematics teacher.

C&I 639. Science Research and Technology Ethics. 3 Hours.

PR: Graduate Standing. Students learn basic concepts of responsible research conduct, public communication and teaching research ethics by way of on-line discussions, and peer-review of case-solutions/reasoning and application projects.

C&I 640. Science in the Elementary School. 3 Hours.

PR: 20 hours of undergraduate credit in elementary education or consent. Analysis of methods, curriculum patterns, and trends in elementary school science. Understanding and development of scientific attitudes appropriate at the elementary-school level.

C&I 643. Brain-Based Teaching and Learning. 3 Hours.

This course provides an integrative, interactive, and collaborative introduction to the emerging interdisciplinary field of brain-based teaching and learning. Through synchronous and asynchronous classroom discussions and applied exercises, students will draw on knowledge from neuroscience, cognitive psychology, biology, and education to explore the theoretical foundations, methods, and applications of teaching and learning from a brain-based perspective.

C&I 644. Science in the Secondary School. 3 Hours.

PR: C&I 602 and EDP 600 or appropriate professional experience. Nature and function of science in secondary schools supported by current research and development; includes analysis of structure and practice of science curriculum and instruction issues.

C&I 645. Global Climate Change. 3 Hours.

A graduate-level web-based course that presents the scientific evidence related to global climate change and the implications for science, technology and society.

C&I 646. Science: Native American Views. 3 Hours.

This course examines the science and non-scientific views in areas of health and healing, environment, and technological applications in traditional Native American and Western cultures.

C&I 647. Science and Mathematics Applications for Nutrition and Energy Content. 3 Hours.

This course is designed for teachers (4-12) of science or math. The course integrates nutrition and physical activity content applicable to students' lives.

C&I 648. Science/Technology: Society Perspectives. 3 Hours.

Course provides students with an understanding of the characteristic relationships between science, technology, and society. Course examines impacts of these relationships on social and natural communities.

C&I 649. History/Philosophy of Science. 3 Hours.

Examines the nature of science and how social forces have interacted with the process of science to promote the dynamic development of the current body of scientific knowledge.

C&I 650. Social Studies in the Elementary School. 3 Hours.

PR: C&I 602 and EDP 600 or consent. Comprehensive consideration of objectives, content, methods, including unit procedures; materials including objects, models, exhibits, and museum items, as well as textbooks, collateral reading, maps, and graphs; means of evaluating social growth and development.

C&I 654. Social Studies in the Secondary School. 3 Hours.

PR: C&I 602 and EDP 600 or consent. Nature and function of social studies in the secondary school; utilization of community, state, national, and world resources in teaching; selection of content for teaching purposes; curriculum construction with emphasis on resource and teaching units.

C&I 656. Challenges in Teaching History. 3 Hours.

This course will provide an initial exposure for pre-service social studies teachers to address the challenge of teaching controversial public issues of recent history.

C&I 657. Principles of Economic Education. 3 Hours.

Workshop for principals, teachers, and supervisors with emphasis on the economic structure of our society and methods of integrating economics into the school program. (Sponsored jointly by College of Human Resources and Education and College of Business and Economics.)

C&I 660. Classroom Simulation Techniques. 3 Hours.

To provide experience in the use of learning games and simulations as an instructional technique and simulated activities and games to be used in a variety of learning environments. (Alternate years.)

C&I 661. Computers in the Content Areas. 3 Hours.

Development of extensive curriculum units on the use of computers and other technologies in teaching and learning. Students will inform one another of various uses of computers in learning.

C&I 662. Hypermedia in Learning. 3 Hours.

Survey of theory, research, and application of hypermedia and the authoring language - Authorware.

C&I 663. Software Development. 3 Hours.

Principles and models of software design and the authoring language-HyperCard.

C&I 671. Assessing the Impact of Computer-Based Learning. 3 Hours.

Survey of the current findings in computer-based learning; couples statistical features and design scenarios.

C&I 677. Children's Television: Problems and Potentials. 4 Hours.

PR: Consent. Provides parents and teachers with strategies for monitoring, evaluating, and directing television viewing habits of youth; pertinent research studies, school and community action programs, and home and school education programs are discussed and practiced.

C&I 680. Technology Integration Through Capstone Experience. 3 Hours.

Capstone for elementary and secondary education programs.

C&I 681. Independent Research in Curriculum and Instruction. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

C&I 685. Supervision of Student Teachers. 3 Hours.

PR: Consent. For persons working or intending to work with education students in field experiences. Course focuses on the development and application of supervisory skills in effective guidance of student teachers and education students.

C&I 686. Teaching Strategies for Middle Childhood. 3 Hours.

Surveys instructional strategies appropriate for facilitating preadolescent learning. Includes the role of the teacher and how the teacher uses resources within and outside the classroom as they relate to instruction of the learner, age 10-14 years.

C&I 687. Advanced Teaching Strategies. 3 Hours.

PR: Graduate standing. Deals with methods as one critical variable in teaching. Examines ways and means to describe, plan the use of, implement, and evaluate teaching methods. Analysis and implementation of teaching methods and component skills of teaching.

C&I 688. Classroom Organization and Management. 3 Hours.

Discusses research identifying components of classroom organization and environment which influence learning; reviews teacher behaviors and learning activities which research indicates lead to more effective teaching. Stresses implementation strategies relevant to classroom settings.

C&I 689. Cultural Diversity in the Classroom. 3 Hours.

PR: Graduate standing or consent. Provides opportunities for educators to increase awareness of their own ethnic backgrounds, foster understandings of the inter-active effects of gender, race, ethnicity and socio-economic status, and develop appropriate teaching materials and methods.

C&I 691A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

C&I 692A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

C&I 693A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

C&I 694A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

C&I 695. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

C&I 696. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

C&I 697. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

C&I 701. Curriculum Development. 3 Hours.

PR: Consent. The study of the concepts underlying school curriculum.

C&I 707. Theories, Models and Research of Teaching. 3 Hours.

PR: SCFD 620 or consent. The theories behind selected models of teaching as well as research in teaching and best practices.

C&I 708. Contemporary Determinants of Curriculum. 3 Hours.

PR: C&I 701 and SCFD 640 or consent. Contemporary determinants of curriculum development.

C&I 709. Curriculum Theories. 3 Hours.

PR: C&I 708 or consent. Theories underlying curriculum from the past to the present and projected to the future.

C&I 710. Advanced Supervision. 3 Hours.

PR: Consent. Exploring theories, research, and practices of pre-service and in-service instructional supervision in the classrooms of novice and mature teachers. (Also listed as EDLS 701).

C&I 719. Behavior Modification in Early Childhood Education. 3 Hours.

Application of behavior modification principles to classroom management in early childhood education Pre-K to 4th grade.

C&I 738. Survey of Major Issues in Mathematics Education. 3 Hours.

PR: Consent. Individual and group research on selected topics in mathematics education.

C&I 757. Social Studies Curriculum Development, K-12. 3 Hours.

PR: C&I 601 or C&I 604 and C&I 650 or C&I 654. Stresses the application of principles and procedures pertinent to the development of social studies programs in elementary and secondary schools. Strong emphasis will be placed on the analysis of current social studies curriculum materials.

C&I 786. Curriculum Evaluation. 3 Hours.

This course enables students to develop skills and strategies necessary for curriculum evaluation and improvement of programs. Included will be a historical review of evaluation and analysis of approaches to curriculum evaluation.

C&I 787. Professional Development for Teaching Effectiveness. 3 Hours.

PR: Advanced graduate standing or consent. Explores professional learning tools that lead to effective teaching; investigates the conditions that facilitate professional learning and effective teaching by examining the teacher, learner, content and environment; examines how educators study and resolve problems.

C&I 788. Higher Education Curriculum. 3 Hours.

Analysis and evaluation of post-secondary curriculum with emphasis on organizing, translating, and applying findings. Topics include curriculum shaping forces; institutional patterns; policy, components and change; and principles and techniques of development, experimentation, and evaluation.

C&I 789. Teaching in Higher Education. 3 Hours.

PR: Graduate standing. A general methods course involving instructional concepts and strategies for present/prospective faculty in higher education. Comprehensive consideration of objectives, planning criteria and methods, teaching strategies, and evaluation in meeting the needs of adult learners.

C&I 790. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of curriculum and instruction. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on assistantships to gain teaching experience. (Grading will be S/U.).

C&I 791A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

C&I 792A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

C&I 793A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

C&I 794A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

C&I 795. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

C&I 796. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

C&I 797. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

C&I 798. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

C&I 799. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is S/U; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

C&I 930. Professional Development. 1-6 Hours.

Professional development courses provide skill renewal or enhancement in a professional field or content area (e.g., education, community health, geology). These tuition-waived continuing education courses are graded on a pass or fail grading scale and do not apply as graduate credit toward a degree program.

C&I 931. Professional Development. 1-6 Hours.

Professional development courses provide skill renewal or enhancement in a professional field or content area (e.g., education, community health, geology). These tuition-waived continuing education courses are graded on a pass/fail grading scale and do not apply as graduate credit toward a degree program.

C&I 932. Profession Development. 1-6 Hours.

Professional development courses provide skill renewal or enhancement in a professional field or content area (e.g. education, community health, geology). These tuition-waived continuing education courses are graded on a pass/fail grading scale and do not apply as graduate credit toward a degree program.

DANCE COURSES**DANC 591A-Z. Advanced Topics. 1-6 Hours.**

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

DANC 697. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project or dissertation. (Grading may be S/U.).

DATA SCIENCE COURSES**DSCI 501. Data Analysis. 3 Hours.**

Basic statistical principles, probability rules, R programming, probability distributions, estimation and testing related to binomial and Poisson distributions, goodness-of-fit test, contingency-table models, the normal distribution, sampling distributions, simulations, one- and two-sample inferences, bootstrap inferences, nonparametric tests, simple linear regression, one-way analysis of variance, model assessment, and multiple testing. R is used for modeling and plotting data based examples and exercises.

DSCI 502. Data Modeling. 3 Hours.

PR: DSCI 501 or Consent. Matrix algebra using R, analysis of covariance, least squares means, model assessment, multi-way analysis of variance, fixed, random, and mixed effects models, expected mean squares, variance components, unbalanced models, multiple comparisons, nested and block designs, multilevel models, multiple regression, transformations, polynomial and nonlinear regression, logistic regression, and Poisson regression. R is used in data based examples and exercises.

DSCI 503. Data Science Processes. 3 Hours.

PR: DSCI 500. Basic data science algorithms. Data science processes, including workflows to build data products based on data collection and processing, machine learning algorithms, and statistical models using R and Python. Reproducible project reports, including data visualizations.

DSCI 591A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation in advanced topics that are not covered in regularly scheduled courses.

DSCI 695. Independent Study. 1-6 Hours.

Faculty-supervised study of topics not available through regular course offerings.

DENTAL HYGIENE COURSES**DTHY 678. Dental Hygiene Teaching Methods. 2 Hours.**

PR: Consent. Concepts and principles of administration, curriculum, and classroom teaching unique to dental auxiliary education. Emphasis on overall role of the dental hygiene educator.

DTHY 679. Clinical Evaluation. 2 Hours.

PR: DTHY 678. Preparation for clinical instruction and evaluation. Emphasis is placed on clinical evaluation procedures, proper instrumentation and the skills/strategies utilized to promote affective and psychomotor skill development in students.

DTHY 680. Dental Hygiene Seminar and Practice 1. 3 Hours.

PR: Graduate standing and consent. Examination of the critical environmental issues affecting the future of health care; particular impact on oral health care trends will form major focus. Dental hygiene clinical practice is also included.

DTHY 681. Dental Hygiene Seminar and Practice 2. 3 Hours.

Expanded services for the dental hygienist with emphasis on restorative and periodontal functions.

DTHY 685. Research Methods for the Dental Hygienist. 3 Hours.

PR: EDP 613. Methods and techniques of research in dental hygiene. Major emphasis on planning and evaluating health programs, conducting oral health surveys, designing experiments and critically analyzing research results.

DTHY 690. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of dental hygiene. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It also provides a mechanism for students not on assistantships to gain teaching experience. (Grading will be P/F.).

DTHY 691A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

DTHY 695. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

DTHY 697. Research. 1-15 Hours.

PR: Consent. Research activities leading to a thesis, problem report, research paper, or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

DTHY 698. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

DTHY 699. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is P/F; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

DENTISTRY COURSES

DENT 600. Advanced Oral Surgery. 1-12 Hours.

PR: Consent. Advanced study of therapeutics, hospital protocol, and surgical aspects of oral surgery involving lectures, seminars, demonstrations, and clinical applications. (Grading may be P/F.).

DENT 601. Advanced Oral Microbiology. 1-3 Hours.

PR: Consent. Oral microbiology for dental specialties correlates science with evidence-based practice. Patient care is the primary focus linking oral health to systemic disease.

DENT 687. Research Methods. 1 Hour.

PR: Consent. Methods and techniques of research in dentistry. Major emphasis on conducting oral health surveys, designed experiments, and critically analyzing results and development of a thesis.

DENT 690. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of dentistry. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It also provides a mechanism for students not on assistantships to gain teaching experience. (Grading may be P/F.).

DENT 697. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper, or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

DENT 700. Anesthesiology. 1 Hour.

Lectures on local anesthesia, including types, modes of action, indications, and contraindications for use. Premedication, toxic effects, and technics of administration are discussed.

DENT 701. Arts & Sciences of Preventive Dentistry. 2 Hours.

Lectures dealing with the philosophy and techniques of preventive dentistry.

DENT 703. Introduction to Patient Care. 3 Hours.

Lectures, laboratory, and clinical experiences designed to develop skill in performing thorough clinical assessments, defining ethical/legal issues in patient care, and performing procedures to prevent and control disease.

DENT 704. Operative Dentistry. 4 Hours.

PR: DENT 710. Preclinical course in principles of cavity preparation, manipulation of plastic restorative materials, and related instrumentation. Characteristics and treatment of caries emphasized.

DENT 707. Introduction to Clinical Dentistry. 2 Hours.

Observing, assisting and actively participating in the provision of limited care to patients assigned to the student clinics in the School of Dentistry.

DENT 710. Dental Anatomy and Occlusion. 4 Hours.

Anatomy of individual teeth, both permanent and primary, in regard to form and function.

DENT 711. Periodontics. 2 Hours.

Introduction to periodontal diseases, their diagnosis and treatment. Laboratory instruction is included.

DENT 712. Dental Materials. 3 Hours.

Composition, physical, chemical, mechanical, and manipulative properties, and technical uses of dental restorative materials as related to dentistry.

DENT 715. Introduction to Community Dentistry. 2 Hours.

PR: DENT 701. Preparation to conduct needs assessment of individuals and groups, and perform program planning, implementation and evaluation. Field experiences are included.

DENT 719. Pedodontics. 1 Hour.

PR: Consent. Normal growth and development presented from physical, intellectual, psychological, and oral perspectives. Behavior of children in dental environment reviewed and strategies for management examined.

DENT 721. Endodontics. 2 Hours.

Preclinical lectures and laboratory exercises on basic technical and biological requisites in the treatment of diseases of the dental pulp and the periapical tissues.

DENT 722. Tooth-Colored Restorations. 4 Hours.

PR: DENT 710 and DENT 704. Preclinical course to include a variety of esthetic dental procedures. Teeth will be prepared for insertion of tooth colored restorations.

DENT 725. Practice Management. 1 Hour.

A lecture course designed to prepare dental students in the concepts of four-handed dentistry.

DENT 726. Removable Partial Dentures. 7 Hours.

A didactic and laboratory course that provides the fundamental knowledge and psychomotor skills necessary for the treatment of the partially edentulous patient with a removable partial denture by the general dentist.

DENT 727. Dental/Maxillofacial Radiology. 2 Hours.

Radiographic modalities to make diagnostic images of the dentition and oromaxillofacial region, principles of x-ray generation, x-ray machine function, quality assurance, radiation safety and biology, and radiographic interpretation.

DENT 729. Indirect Restorations. 3 Hours.

Lectures related to standard clinical procedures and laboratory instruction in direct and indirect cast gold restorations.

DENT 730. Community Dentistry. 2 Hours.

Lectures provide the student with a basic knowledge of the principles of dental public health practice. Emphasis is placed on preparing students for their rural site rotation(s).

DENT 731. Occlusion. 2 Hours.

PR: Consent. Didactic and clinic/laboratory instruction in the basic techniques and procedures associated with the treatment of conditions related to faulty occlusion.

DENT 732. Periodontics. 1 Hour.

Lectures in the advanced theory and practice of preventive dentistry with emphasis on nutrition.

DENT 733. Advanced Endodontic Theory and Practice. 1 Hour.

PR: DENT 721. Lecture and discussion concerning recognition and diagnosis of complex endodontic problems, emergency treatment, assessment of prognosis, and appropriateness for referral for specialty treatment.

DENT 734. Complete Dentures. 6 Hours.

Didactic and laboratory course which identifies, discusses, and develops the fundamental knowledge and psychomotor skills necessary for the treatment of the edentulous patient by the general dentist.

DENT 735. Pediatric Dentistry. 1 Hour.

PR: Consent. Didactic instruction foundational to the dental care to children presented in the following modules of instruction: oral diagnosis/treatment, planning/case presentation, prevention, restorative dentistry, pulpal therapy, management of the developing occlusion and trauma to the dentition and oral structures.

DENT 737. Treatment Planning. 2 Hours.

Introduction to the universal principles of professional treatment planning for adult patients.

DENT 739. Oral Surgery. 1 Hour.

Didactic instruction in basic surgical principles as applied to the extraction of teeth and Dentoalveolar-surgery.

DENT 740. Periodontics. 1 Hour.

Intermediate didactic instruction in periodontal therapy including basic surgery and post-operative care.

DENT 744. Diagnosis and Treatment Planning. 1 Hour.

Analysis of orthodontic diagnostic records, diagnostic skills for various malocclusions, and formulation of a treatment plan for orthodontic cases.

DENT 745. Principles of Orthodontics. 1 Hour.

Facial growth and development, the development of occlusion, and etiology and classification of malocclusions.

DENT 746. Orthodontic Techniques. 1 Hour.

Technical instruction in taking diagnostic records and constructing basic orthodontic appliances.

DENT 747. Management of Medical and Dental Emergencies. 1 Hour.

Assessment and treatment of the medical risk patient as related to the practice of dentistry. CPR instruction included.

DENT 750. Global Outreach in Dentistry. 1 Hour.

DENT 750. Global Outreach in Dentistry. 1 HR. Provides dental students with diverse experiences managing the oral health needs of patients from other cultures very different than their own.

DENT 751. Occlusion. 1 Hour.

PR: Consent. Advanced study of the science of occlusion with particular attention to its impact on the clinical diagnosis and treatment of occlusal disorders.

DENT 752. Community Dentistry. 2 Hours.

Seminars, pro-seminars, and field experience in selected topics of professional communication, health education, and the sociology and psychology of community health.

DENT 754. Introduction to Dental Implantology. 2 Hours.

PR: Consent. Implant diagnosis, treatment planning, selection, placement, restoration, and maintenance are discussed utilizing a multidisciplinary team approach. Surgical and prosthetic experiences are gained during the laboratory sessions.

DENT 755. Clinico-Pathologic Correlation Conference. 1 Hour.

PR: PATH 738 and PATH 753 or consent. Histopathologic correlation with clinical case histories and presenting signs and symptoms presented in a case-based learning format.

DENT 756. Fixed Prosthodontics: Part 1. 4 Hours.

PR: DENT 704 and DENT 712 and DENT 731. Lectures and laboratory exercises introduce students to the techniques of preparing and restoring teeth with single unit crowns. This includes areas of patient assessment and treatment planning.

DENT 757. Fixed Prosthodontics: Part 2. 4 Hours.

PR: DENT 756. Lectures and Laboratory exercises introduce students to the techniques of preparing and restoring teeth with fixed partial dentures. This includes assessment, planning, impression making, laboratory procedures and cementation procedures.

DENT 758. Senior Seminar. 2 Hours.

More complex and advanced techniques for clinical practice in all disciplines in dentistry with emphasis on new developments in oral surgery and endodontics.

DENT 759. Oral Surgery. 2 Hours.

PR: Consent. Didactic instruction in patient evaluation, complicated exodontia, pre-prosthetic surgery, diagnosis, surgical and adjunctive treatment of disease, injuries, and defects of human jaws and associated structures.

DENT 761. Pediatric Dentistry. 1 Hour.

PR: Consent. Continued didactic instruction in dentistry for the child patient with the following learning packages programmed: abnormal dental development, oral habits, and adolescent dentistry.

DENT 763. Periodontics. 2 Hours.

Advanced didactic instruction in periodontal therapy including special surgical procedures.

DENT 765. Orthodontics. 1 Hour.

Introduction to clinical orthodontics; lectures on case analysis, treatment planning, and clinical procedures involved in interceptive, preventive, and adjunctive treatment of malocclusions.

DENT 766. Applied Pediatric Dentistry. 2 Hours.

PR: DENT 719 and DENT 735. Didactic and pre-clinical instruction in the treatment of children's oral health. Includes treatment planning/case presentations, general restorative procedures, management of developing occlusion, and trauma to dentition and oral structures.

DENT 767. Community Dentistry. 1-15 Hours.

Field experience in various aspects of community health.

DENT 770. Clinical Oral Radiology. 0-6 Hours.

Clinical application of principles presented in DENT 703 and DENT 727 with additional instruction in techniques and interpretation of radiographs with special emphasis to role played in oral diagnosis.

DENT 771. Practice Management. 2 Hours.

PR: DENT 725. A lecture series on the fundamentals of practice management, including the organization and development of the practice, personnel and financial management, and the introduction to TEAM dentistry.

DENT 772. Case Based Treatment Planning. 1 Hour.

This course will involve the comprehensive analysis of complex cases in order to formulate an appropriate ideal treatment plan with suitable alternatives. The student must assimilate patient information into the S.O.A.P format and present the case before faculty and peers.

DENT 773. Composite Restorations. 1 Hour.

This course will provide theory and preclinical instruction in the selection and fabrication of optimal composite restorations that satisfy biologic, mechanical and esthetic requirements.

DENT 774. Principles of Medicine. 2 Hours.

General diseases about which the dental student should have intelligent working knowledge. Students are assigned to specific hospitalized patients to review their findings with the class.

DENT 775. Practice Management. 0-6 Hours.

PR: Consent. Clinical practice using auxiliaries, including those trained in expanded functions.

DENT 776. Removable Prosthodontics. 0-6 Hours.

Continued application of the theory and practice of removable prosthodontics.

DENT 777. Periodontics. 0-6 Hours.

Clinical experience in the diagnosis and treatment of periodontal diseases.

DENT 778. Law & Ethics in Dentistry. 2 Hours.

Select legal concepts and the process of ethical decision making as related to the practice of dentistry. Case analysis is the primary method of instruction.

DENT 780. Endodontics. 0-6 Hours.

Clinical endodontic instruction in order to develop the skills and judgment necessary to treat diseases of the dental pulp and their sequelae.

DENT 781. Patient Management 1. 0-4 Hours.

This four semester course in the first year of the clinic curriculum develops professional responsibility and time management through monitoring of patient care activity, which includes treatment, diagnostic reviews and clinic service assignments. (Grading will be Pass/Fail).

DENT 782. Clinical Patient Management 2. 0-2 Hours.

PR: DENT 781. This two-semester course develops professional responsibility and time management through monitoring of patient care activity, which includes treatment, case presentations, diagnostic reviews and clinic service assignments.

DENT 783. Operative Dentistry. 0-6 Hours.

Instruction in the clinic setting includes comprehensive diagnosis and treatment planning, computer assisted records, plaque control, caries control, and single tooth restorations. Sufficient variety and depth of experience occurs to obtain competence for independent practice of operative dentistry.

DENT 784. Oral Surgery. 0-6 Hours.

Clinical instruction in outpatient and inpatient oral surgery necessary to provide comprehensive care for the dental patient.

DENT 785. Orthodontics. 0-6 Hours.

Clinical management of selected malocclusion problems.

DENT 786. Pediatric Dentistry. 0-6 Hours.

Instruction in the clinical setting with the goal of developing the psychomotor skills and judgment necessary to provide comprehensive care for the child patient.

DENT 787. Clinical Oral Diagnosis. 0-6 Hours.

Clinical application of principles presented in DENT 303 and DENT 337, providing opportunities for observation and analysis of clinical problems.

DENT 788. Clinic Completion Practicum. 0-15 Hours.

Supervised patient care in selected clinical areas specified for each individual student according to their clinical competency requirements. (Grading will be S/U.).

DENT 789. Fixed Prosthodontics. 0-6 Hours.

PR: Consent. Clinical application of the theory and practice of crown and bridge dentistry.

DENT 790. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of dentistry. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on assistantships to gain teaching experience. (Grading will be P/F.).

DENT 791A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

DENT 792A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

DENT 793A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

DENT 794A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

DENT 795. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

DESIGN AND MERCHANDISING COURSES

DSM 535. Visual 3D Modeling and Rendering. 3 Hours.

PR: Consent. Develops students' abilities to apply digital three-dimensional instruments and techniques to effectively visualize and communicate the physical characteristics and phenomenal effects of existing and projected physical artifacts.

DSM 550. Precision Drawing and Modeling. 3 Hours.

PR: Consent. Develops student's working knowledge of the opportunities and constraints associated with using advanced digital representational instruments for precise design, visualization and construction of architectural environments.

DSM 593A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

DSM 620. Creativity, Innovation, and Design. 3 Hours.

Introduces students to the main concepts of creativity and innovation as related to design through experiential learning and theory evaluation.

DSM 650. The Creative Economies. 3 Hours.

PR: Consent. Provides theoretical underpinnings of the emerging creative economies and introduces analytical frameworks and models to evaluate the impact of creative industries and activities on sustainable economic development at community and regional levels.

DSM 673. Professional Development. 1-6 Hours.

DSM 673A. Professional Development. 1-6 Hours.

DSM 673B. Professional Development. 1-6 Hours.

DSM 673C. Professional Development. 1-6 Hours.

DSM 673D. Professional Development. 1-6 Hours.

DSM 673E. Professional Development. 1-6 Hours.

DSM 673F. Professional Development. 1-6 Hours.

DSM 673G. Professional Development. 1-6 Hours.

DSM 673H. Professional Development. 1-6 Hours.

DSM 673I. Professional Development. 1-6 Hours.

DSM 673J. Professional Development. 1-6 Hours.

DSM 673K. Professional Development. 1-6 Hours.

DSM 673L. Professional Development. 1-6 Hours.

DSM 673M. Professional Development. 1-6 Hours.

DSM 673N. Professional Development. 1-6 Hours.

DSM 673O. Professional Development. 1-6 Hours.

DSM 673P. Professional Development. 1-6 Hours.

DSM 673Q. Professional Development. 1-6 Hours.

DSM 673R. Professional Development. 1-6 Hours.

DSM 673S. Professional Development. 1-6 Hours.

DSM 673T. Professional Development. 1-6 Hours.

DSM 673U. Professional Development. 1-6 Hours.

DSM 673V. Professional Development. 1-6 Hours.

DSM 673W. Professional Development. 1-6 Hours.

DSM 673X. Professional Development. 1-6 Hours.

DSM 673Y. Professional Development. 1-6 Hours.

DSM 673Z. Professional Development. 1-6 Hours.

DSM 684. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of agriculture, forestry, and consumer sciences. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on assistantships to gain teaching experience. (Grading will be S/U.).

DSM 689. Research Methods in Family Resources. 3 Hours.

PR: Introductory statistics or written consent. Research methodology, experimental design, and statistical analysis as relevant to problems in family resources.

DSM 690. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of agriculture, forestry, and consumer sciences. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It also provides a mechanism for students not on assistantships to gain teaching experience. (Grading will be S/U.).

DSM 691A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

DSM 692A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

DSM 693A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

DSM 694A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

DSM 695. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

DSM 696. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

DSM 697. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

DSM 699. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use of the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is S/U; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

DSM 930. Professional Development. 1-6 Hours.

Professional development courses provide skill renewal or enhancement in a professional field or content area (e.g., education, community health, geology). These tuition-waived continuing education courses are graded on a pass/fail grading scale and do not apply as graduate credit toward a degree program.

DISABILITY STUDIES COURSES**DISB 580. Disability and the Family. 3 Hours.**

This course is designed to familiarize students with developmental disabilities and their impact on families. Interdisciplinary, family-centered care is emphasized, along with how to access resources to meet the needs of children and families.

DISB 581. Lifespan Disability Policy. 3 Hours.

Overview of health, education, financial and related policies impacting individuals with disabilities across the lifespan and at the federal, state, and local levels.

DISB 585. Disability and Society. 3 Hours.

This course provides a global, interdisciplinary overview of issues and policies that are the concern of individuals with disabilities (e.g., public policy, health-related issues, employment, and social benefits).

DISB 682. Disability in the Community. 2 Hours.

This course offers service learning experience in the community with persons who have a disability. (Grading will be Pass/Fail).

DISB 686. Graduate Capstone: Disability. 1 Hour.

This capstone experience for the certificate in disability studies at the graduate level culminates with an essay, a presentation, and a portfolio. (Grading will be Pass/Fail).

DISB 693A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

ECONOMICS COURSES**ECON 501. Economic Decision Making. 3 Hours.**

PR: ECON 201 and ECON 202. Theory of demand and supply including cost determination, markets and pricing, regulatory economics, national income accounting, the assessment of economics impacts via the multiplier principle, monetary policy, and taxation policy.

ECON 590. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of economics. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on assistantships to gain teaching experience. (Grading will be P/F.).

ECON 591A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

ECON 595. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

ECON 693A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

ECON 695. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

ECON 697. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

ECON 701. Advanced Micro-Economic Theory 1. 4 Hours.

PR: Consent. Theory of production and allocation, utility theory, theory of the firm, pricing in perfect and imperfect markets, models of firm's operations.

ECON 702. Advanced Macro-Economic Theory 1. 3 Hours.

PR: Consent. Classical, Keynesian and modern macroeconomic theories.

ECON 706. History of Economic Doctrines and Analysis. 3 Hours.

PR: ECON 701 and graduate standing or consent. Writings of the major figures in the development of economic doctrines and analysis.

ECON 709. Research Design and Methodology. 1-3 Hours.

PR: Consent. Basic research approaches based on examples from the student's own work, papers presented at the departmental research seminar series, and economics literature in general.

ECON 711. Advanced Micro-Economic Theory 2. 4 Hours.

PR: ECON 701. General equilibrium analysis, distribution economics.

ECON 712. Advanced Macro-Economic Theory 2. 3 Hours.

PR: ECON 702. Models of economic growth and fluctuations, and other advanced topics in macroeconomic theory.

ECON 721. Mathematical Economics. 3 Hours.

PR: Consent. Mathematics used in economics.

ECON 723. Dynamic Methods of Economics. 1 Hour.

PR: ECON 721. This course covers the basic techniques of dynamic economic analysis that economics graduate students will be working with in advanced economic theory and field courses.

ECON 725. Econometrics 1. 3 Hours.

PR: ECON 721. Mathematical statistics, including probability, mathematical expectation, distributions. Linear regression, ordinary least squares and simple extensions. Students will use a computer to analyze data.

ECON 726. Econometrics 2. 3 Hours.

PR: ECON 725. Econometric methods used by practicing economist. Includes simultaneous equations, asymptotic properties of estimators, and generalizations of and alternatives to least squares estimation. Also may include qualitative response, panel data, nonlinear, spatial, and time series models.

ECON 727. Econometrics 3. 3 Hours.

PR: ECON 726. Completes the graduate econometrics sequence. Topics may include computational methods and time series, spatial, nonlinear, qualitative response, and panel data models.

ECON 729. Spatial Econometrics. 3 Hours.

Explores the various types of spatial econometric models and how they are estimated and interpreted. Maximum likelihood and Bayesian methodologies will be demonstrated both mathematically and in an applied setting.

ECON 731. Monetary Economics 1. 3 Hours.

PR: ECON 702. Sources and determinants of supply of money; demand for money for transactions and speculative purposes; general equilibrium of money, interest, prices, and output; role of money in policy.

ECON 732. Monetary Economics 2. 3 Hours.

PR: ECON 731. Further topics in monetary economics.

ECON 739. Seminar in Financial Economics. 3 Hours.

PR: ECON 735 and ECON 736 or consent. Covers advanced topics in financial economics such as pricing of derivatives and issues in corporate finance.

ECON 741. Public Economics 1. 3 Hours.

PR: ECON 701. Economic role of government in a mixed economy with regard to topics such as resource allocation and distribution of income; social choice mechanisms; fiscal federalism; and revenue.

ECON 742. Public Economics 2. 3 Hours.

PR: ECON 741. Continuation of public economics.

ECON 743. State and Local Public Economics. 3 Hours.

PR: ECON 741 and ECON 742 or consent. Economic roles of state and local governments emphasizing empirical research and policy implications. Particular attention to intergovernmental competition, government performance, service provision, and revenue sources.

ECON 751. International Trade. 3 Hours.

PR: ECON 701. Contemporary theories of international trade; analysis of current problems in world trade.

ECON 752. International Macro-Economics. 3 Hours.

PR: ECON 702. Current theories and policies concerning balance of payments, international capital movements, and foreign exchange, and their relation to the macro economy.

ECON 754. Comparative Economic Systems. 3 Hours.

PR: ECON 701. Comparative study of economic systems, including planned and market socialism and capitalism and the experience of countries in transition from socialism to capitalism.

ECON 755. Development Economics. 3 Hours.

PR: ECON 701. This course explores why some countries are rich and others are poor. Class examines the major phases of thinking in development economics and themes in the contemporary development literature.

ECON 761. Advanced Regional Economics. 3 Hours.

PR: ECON 701 and graduate standing or consent. Regional income and flow of funds estimation, regional cyclical behavior and multiplier analysis, industrial location and analysis, techniques of regional input-output measurement, impact of local government reorganization on regional public service and economic development.

ECON 762. Advanced Urban Economics. 3 Hours.

PR: ECON 701. Theory, policy, and empirical research regarding growth and decline of cities, urban spatial structure and land-use patterns, intrametropolitan employment location, urban transportation, housing, housing market discrimination, local government structure, fiscal problems, and urban redevelopment.

ECON 764. Seminar in Regional Economics. 3 Hours.

PR: Consent.

ECON 791A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

ECON 792A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

ECON 793A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

ECON 794A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

ECON 795. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

ECON 796. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

ECON 797. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

ECON 798. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

ECON 799. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use of the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is P/F; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

ECON 930. Professional Development. 1-6 Hours.

Professional development courses provide skill renewal or enhancement in a professional fields or content area (e.g., education, community health, geology). These tuition-waived continuing education courses are graded on a pass/fail grading scale and do not apply as graduate credit toward a degree program.

EDUCATION COURSES

EDUC 600. Teacher as Researcher. 3 Hours.

PR: Consent, EDUC 612. Preparation for action research; documentation of observations of researchable topics in school settings and completion of an extended classroom-based study.

EDUC 601. Context of Education. 3 Hours.

PR: Grade of C or better in EDUC 612. Critical, analytical, and reflective thinking on schooling through the integration of social, cultural, historical, philosophical, and political perspectives; examination of the contexts of students' own educational practice.

EDUC 602. Professional Identity: Teacher as Leader. 3 Hours.

PR: Grade of C or better in EDUC 612. Preparation for professional development as educational leaders. Examination, synthesis, and application of literature on teacher development, autonomy and school reform.

EDUC 605. Instructional Design and Technology Professional Practice. 3 Hours.

An introduction to the instructional design and technology program, providing curriculum and learning perspectives, addressing legal and ethical issues, describing hardware and software configurations, and presenting various occupational options for instructional technologists.

EDUC 612. Professional Internship/Technology Applications. 1-12 Hours.

PR: EDUC 411 and (EDUC 401 or SPED 203). Full-time professional internship in public school teaching including the integration of instructional technologies in teaching: satisfactory completion is required for recommendation for professional licensure and graduation with an educational degree.

EDUC 672. Instructional Design and Technology: Professional Internship. 4-6 Hours.

PR: EDUC 674. This course provides students a supervised learning experience central to applied roles in instructional design and technology. Experience will focus on: communication technology, education and corporate training, distance education, and multimedia design/production.

EDUC 674. Instructional Design and Technology Research and Development Seminar 1. 2 Hours.

PR: EDUC 605. The purpose of this seminar is to prepare effective instructional design consultants capable of identifying instructional problems, determining alternative solutions, and implementing appropriate changes within organizational systems.

EDUC 675. Instructional Design Technology Research and Design Seminar 2. 2 Hours.

PR: EDUC 394. This course provides participants with practice writing, presenting, and critiquing research. learn and practice professional skills including creating portfolios, constructing vitas or resumes, and interviewing.

EDUC 687. Instructional Practicum/Technology Application. 3 Hours.

PR: EDUC 612 and EDUC 600. Teaching and mentoring in public schools and university settings; collaborative design of individualized practicum contracts on topics of mutual interest and need including the exploration of instructional technologies.

EDUC 692A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

EDUC 693A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

EDUC 930. Professional Development. 1-6 Hours.

Professional development course providing skill renewal or enhancement in a professional field or content area (e.g., education, community health, geology). These tuition-waived, continuing education courses are graded on a pass/fail grading scale and do not apply as graduate credit toward a degree program.

EDUCATION LEADERSHIP STUDIES COURSES**EDLS 601. Dynamics of Educational Organizations. 3 Hours.**

A foundation course which introduces students to school cultures, systems theory, hierarchy of school organizations, impact of global issues and forces, strategic planning, and the expanding role of technology as a learning and management tool.

EDLS 602. Human Resources Dynamics. 3 Hours.

An overview of personnel functions with a focus on recruitment, selection, orientation, evaluation, and development; interpersonal skills; motivational theories; and the utilization of technology in the personnel process.

EDLS 603. Principles of Educational Leadership. 3 Hours.

An exploration of the role of leadership in modern education. Topics and simulations include group processes, verbal and non-verbal communication, leadership styles, team building, interpersonal relations, conflict management, and ethical practices.

EDLS 610. School Business Administration. 3 Hours.

Efficient and effective operational procedures at the school and district level relating to the fiscal, spatial, physical conditions, safety and security, and information management systems are explored, including the use of technology.

EDLS 611. Principles of Supervision. 3 Hours.

Students develop instructional leadership skills in working with teachers to understand and improve classroom instruction. Topics include: developing a learning culture, supervisory theories and models, and integration of technology and best instructional practices.

EDLS 612. School: Policies, Politics and Laws. 3 Hours.

An overview of statutes, common law and court decisions. Topics include the politics of education, due process, policy development, the role of federal, state, and local government in public education, and the issues of diversity and equity in a school setting.

EDLS 613. Research-Evaluation-Assessment. 3 Hours.

PR: Consent. Research, evaluation, and assessment procedures related to administrative decision making and problem solving to increase the general effectiveness of educational institutions.

EDLS 614. Community and Media Relations. 3 Hours.

This course will explore community attitudes, cultures, and communication strategies. It will provide students with resources to understand, evaluate and improve internal and external school-community relations.

EDLS 620. Site-Based Leadership. 3 Hours.

PR: Consent. An overview course that focuses on the principal's active role of applying theory to practice with a special emphasis on emerging trends and issues, goal setting, testing, curricular alignment with goals, facilities management, and the change process.

EDLS 625. Topics in Supervision. 3 Hours.

Special knowledge and skills for supervisors K-12 including media, computers, reading, multicultural education, testing, and special education.

EDLS 691A-Z. Advanced Topics. 1-6 Hours.

Investigation of advanced topics not covered in regularly scheduled courses.

EDLS 693A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

EDLS 695. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

EDLS 697. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

EDLS 702. Superintendency: Role and Responsibilities. 3 Hours.

PR: M.A. in education leadership or equivalent or consent. This course is designed to examine the concepts of effective school district leadership. Students will examine the roles, relationship behaviors, and competencies which characterize an effective educational organization.

EDLS 703. Economics and Education Funding. 3 Hours.

PR: M.A. in education leadership or equivalent or consent. This course will focus on the macro and micro economics concepts and their application to financing education and its infra-structure. The content will incorporate forces of economic change, development of new societal and educational infra-structures, and implications for social spending.

EDLS 704. Education Facilities: Planning and Evaluation. 3 Hours.

PR: M.A. in education leadership or equivalent or consent. The planning, evaluation, and management of current and future school facilities.

EDLS 705. Public Education: Ethics/Laws/Policies. 3 Hours.

PR: M.A. in education leadership or equivalent or consent. This course will focus on ethics, educational responsibility, and the legal concepts relating to human resources management and student rights. The content is designed to develop an understanding of the judicial process and its effect on public school law and to understand the legal parameters within which the educational CEO operates.

EDLS 706. Learning Organizations: Culture, Technology and Change. 3 Hours.

PR: M.A. in education leadership or equivalent or consent. This course will focus on the concepts of results-based strategic planning, critical inquiry, and new assessment paradigms. The content will emphasize beginning where we are, authentic assessment of learning and horizontal assessment of processes, and broadening the base of responsibility for processes and results (outcomes). New knowledge about and use of information systems, integrating technology and high performance learning expectations, and the CEO's role in the process will be addressed.

EDLS 707. Politics and Education. 3 Hours.

PR: M.A. in education administration or equivalent or consent. The purpose of this course is to raise the student's awareness and comprehension of the role political processes play in shaping the fundamental governance and organizational structures of American education. A special emphasis will be placed on the role of the state and national government.

EDLS 708. Changing Organizations. 3 Hours.

PR: M.A. in educational leadership or equivalent or consent. Interdisciplinary study of the major concepts of educational administration theory and its application to educational settings. Topics include organizational change, understanding of organizational dynamics and relationships, motivation, empowerment, and responding to human resource needs.

EDLS 761. Prospectus Development in Higher Education. 3 Hours.

Students review an array of instruments designed to assess college students' perceptions, satisfaction, and learning. They will also critique these instruments to determine their quality.

EDLS 785. Education Administration Internship. 1-6 Hours.

(May be repeated for credit.) PR: Consent. Practical experiences in the administration of an organizational unit under the supervision of an administrator within the unit. (Grading is P/F).

EDLS 790. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of education leader-ship studies. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on assistantships to gain teaching experience. (Grading will be S/U.).

EDLS 791A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

EDLS 792A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

EDLS 793A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

EDLS 794A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

EDLS 795. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

EDLS 796. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

EDLS 797. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

EDLS 798. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

EDLS 799. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is S/U; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in which graduation occurs.

EDLS 930. Professional Development. 1-6 Hours.

Professional development courses provide skill renewal or enhancement in a professional field or content area (e.g., education, community health, geology.) These tuition-waived, continuing education courses are graded on a pass/fail grading scale and do not apply as graduate credit toward a degree program.

EDUCATIONAL PSYCHOLOGY COURSES

EDP 600. Educational Psychology. 3 Hours.

Designed for beginning graduate students. Psychological principles of learning and development as they relate to processes of instruction.

EDP 610. Measurement/Assessment for the Classroom Teacher. 3 Hours.

An examination and application of classroom testing and measurement principles in the assessment and evaluation of student performance.

EDP 611. Measurement/Evaluation in Educational Psychology. 3 Hours.

An introductory course in measurement and evaluation in educational psychology with an emphasis on the principles and procedures in conducting and analyzing educational measurement.

EDP 612. Introduction to Research. 3 Hours.

Basic concepts, strategies, methodologies, designs, and procedures of research in education. Major emphasis on integrating research designs, measurements, and statistics for initiating research projects, collecting and analyzing data, and interpreting and reporting findings.

EDP 613. Statistical Methods 1. 3 Hours.

PR: MATH 126. Basic concepts of statistical models, distributions, probability, random variables, tests of hypotheses, confidence intervals, regressions, correlation, transformation, F and chi-square distributions, and analysis of variance and sample size.

EDP 614. Statistical Methods 2. 3 Hours.

PR: STAT 511. Extension of basic concepts of statistical models, design of experiments, multiway classification models, factorials, split plot design, simple covariance, orthogonal comparisons, multiple linear and nonlinear regression and correlation analysis, chi-square and nonparametric statistics.

EDP 616. Non-parametric Statistics. 3 Hours.**EDP 617. Program Evaluation. 3 Hours.**

An awareness of the purposes, ethics, issues of design, methods, and models of program evaluation.

EDP 618. Mixing Research Methodologies. 3 Hours.

PR: EDP 612 or equivalent. Students will focus on choices available for and processes involved in mixing qualitative and quantitative research and evaluation methodologies.

EDP 619. Survey Research Methods. 3 Hours.

PR: EDP 612 or EDP 613. Course addresses how to design, implement, and analyze surveys for the purposes of social sciences research.

EDP 621. Applied Behavior Analysis. 3 Hours.

PR: EDP 620 or equivalent. Application of reinforcement theory as an instructional technique in changing human behavior. Analysis of problems in terms of behavior and the design of instruction and treatment programs to produce desired change.

EDP 640. Instructional Design. 3 Hours.

PR: Graduate standing. Introduces the major components of the instructional design process, from needs analysis through evaluation and implementation. Students will demonstrate the elements of the process with a design plan for an instructional project.

EDP 685. Practicum. 1-12 Hours.

PR: Consent.

EDP 691A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

EDP 693A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

EDP 695. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

EDP 697. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

EDP 698. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

EDP 700. Psychological Foundations of Learning. 3 Hours.

Psychological foundations of major learning theories and their implications for instructional procedures.

EDP 701. Memory. 3 Hours.

Short-term memory, long-term memory, memory networks, and memory problems as they relate to school learning, strategies for instruction, and lifelong adaptation in a dynamic society.

EDP 702. Human Development and Behavior. 3 Hours.

Contemporary psychological literature on human development examined and analyzed. Research and theory are examined with emphasis on the implications for classroom behavior and the educational process. It is recommended that students complete EDP 600 prior to registering for this course.

EDP 703. The Adult Learner. 3 Hours.

Analysis of significant characteristics of adult behavior to be considered in planning for adult learning. Contemporary theories are analyzed with emphasis on their implications for the educational process. It is recommended that students complete EDP 600 prior to registering for this course.

EDP 710. Seminar. 3 Hours.

PR: EDP 613 and consent. Identification of research problems in education, consideration of alternative designs and methods of investigation, and development of a research proposal at the advanced graduate level.

EDP 711. Multivariate Methods 1. 3 Hours.

PR: STAT 511 or equivalent. Basic matrix operations, multiple regression analysis, discriminant analysis for two groups, multivariate analysis of variance for one and two-way designs, and analysis of covariance involving multiple covariates. Applying SPSS Procedure Matrix for data analyses.

EDP 712. Multivariate Methods 2. 3 Hours.

PR: STAT 511 or equivalent. Matrix operations, multivariate multiple regression analysis, canonical correlation analysis, discriminant analysis for multiple groups, qualitative discriminant analysis applying Bayes' theorem, principle component analysis, and fundamentals of common factor analysis. Data analyses with SAS Procedure Matrix. (Alternate years.).

EDP 721. Verbal Behavior 1. 3 Hours.

PR: EDP 621. Behavioral analysis of complex verbal behavior in person-to-person contacts in text materials and in instructional systems. (Alternate years.).

EDP 730. Cognition and Learning. 3 Hours.

Theories of knowledge representation including information processing models, learning strategies across content areas and transfer of learning strategies; additional focus on problem-solving, expertise, strategic reading, and strategy instruction.

EDP 731. Cognition in Social Contexts. 3 Hours.

PR: EDP 730. Application of social learning theory in current literature and practice. Emphasis on theory in application in cooperative and group learning situations.

EDP 740. Principles of Instruction. 3 Hours.

Basic principles of teaching-learning process implied in major learning theories; study of factors in learning, variables in instructional programming, and principles of instructional design.

EDP 790. Teaching Practicum. 1-3 Hours.

Supervised practice in college teaching of education psychology. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on assistantships to gain teaching experience. (Grading will be S/U.).

EDP 791A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

EDP 792A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

EDP 793A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

EDP 794A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

EDP 795. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

EDP 796. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

EDP 797. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

EDP 798. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations). Grading is normal.

EDP 799. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is S/U; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

ELECTRICAL ENGINEERING COURSES**EE 513. Stochastic Systems Theory. 3 Hours.**

PR: Consent. Probability distribution and density functions. Bayes rule and conditional probability. Stochastic process and linear systems. Gauss-Markov Process. Optimal linear estimation. Introduction to Wiener and Kalman filtering. Decision theory fundamentals. (3 hr. rec.).

EE 515. Linear Control Systems. 3 Hours.

PR: Consent. Basic concepts in the theory of linear control systems, state variable representation, solution of state equations, controllability, observability, stability, transfer function descriptions, and design of controllers and observers. (3 hr. rec.).

EE 517. Optimal Control. 3 Hours.

PR: Consent. Methods of direct synthesis and optimization of feedback systems; Wiener theory; Pontryagin's maximum principle; dynamic programming; adaptive feedback systems. (3 hr. rec.).

EE 519. Digital Control. 3 Hours.

PR: EE 411 or Consent. Sampling of continuous-time signals. Transform analysis of discrete-time systems. Translation of analog design. Controllability and observability. State-space design methods and introduction to optimal control for discrete systems. (3 hr. rec.).

EE 528. Biomedical Microdevices. 3 Hours.

Fundamentals of micro-manufacturing and micro-fluidics, microfluidic platforms and components, biosensors, drug-delivery systems, lab-on-a-chip devices, DNA microarrays, emerging applications in biomedicine and tissue engineering, and photolithography and soft lithography lab demonstration.

EE 531. Advanced Electrical Machinery. 3 Hours.

PR: Consent. Theory and modeling of synchronous, induction, and direct-current machines, and their steady-state and transient analysis. (3 hr. rec.).

EE 533. Computer Applications in Power System Analysis. 3 Hours.

PR: EE 436 or Consent. Steady state analysis by digital computers of large integrated electrical power systems. Bus admittance and impedance matrices, load flow studies, economic dispatch and optimal power flow, steady state security analysis, and fault studies. (3 hr. rec.).

EE 535. Power System Control and Stability. 3 Hours.

PR: EE 515. Review of stability theory, classical transient analysis, dynamical models of synchronous machines, power system stability under small and large perturbations, dynamic, and simulation of power systems. (3 hr. rec.).

EE 550. Advanced Semiconductor Electronics. 3 Hours.

PR: EE 450 or equivalent. Theory of electronic and photonic device. Semiconductors properties and their impact on devices behavior - p-n junctions, bipolar transistors, and MOS transistors. Quantum mechanical effects introduced. Development of models to simulate devices and simple circuits.

EE 551. Linear Integrated Circuits. 3 Hours.

PR: EE 355 and EE 356 and EE 450 or equivalent. Design and analysis of analog integrated circuits. Both linear and nonlinear transistor models are covered. Applications focus on linear analog circuits including simple amplifiers, operational amplifiers, and reference circuits. This course focuses on CMOS technology.

EE 561. Communication Theory. 3 Hours.

PR: EE 461 or Consent. Detailed study of probability theory and its use in describing random variables and stochastic processes. Emphasis on applications to problems in communication system design. (3 hr. rec.).

EE 562. Wireless Communication System. 3 Hours.

PR: EE 461 and EE 513. Architecture and design of cellular and wireless communication networks, electromagnetic effects of the wireless channel and corresponding statistical models, implementation and performance of diversity reception techniques, and multiple-access.

EE 565. Advanced Image Processing. 3 Hours.

PR: EE 465 or equivalent. Covers the theory of statistically modeling image source, algorithms for analysis and processing of image signals, new applications of image processing into computer vision and biomedical imaging, and MATLAB based image processing.

EE 567. Coding Theory. 3 Hours.

PR: MATH 375 or consent. Design, analysis, and implementation of codes for error detection and correction.

EE 568. Information Theory. 3 Hours.

PR: STAT 215 or equivalent, or consent. Information measures and mutual information; noiseless coding theorem, construction of compact codes and universal codes; channel coding theorem and error correcting codes; cryptography and information theory; algorithmic information theory, and rate distortion theory.

EE 569. Digital Video Processing. 3 Hours.

PR: EE 465. Covers basic theory and algorithmic aspects of digital video processing, along with latest video coding standards, multimedia streaming, security video, and biometrics. Hands-on experience in processing video signals under MATLAB in team-based projects.

EE 591A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

EE 595. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

EE 613. Detection and Estimation Theory. 3 Hours.

PR: EE 513 or equivalent. Study of detection, estimation, and signal representation, detection of signal in noise, estimation of signal parameters, linear estimation theory. Performance bounds on Estimation and Detection. Kalman-Bucy and Wiener filters. Modern optimal estimation and detection.

EE 625. Advanced Signal Processing. 3 Hours.

PR: EE 513 or consent. Statistical aspects of signal processing. Includes advanced techniques, such as autocorrelation/ cross-correlation, autoregressive models, linear prediction, power spectral density, and other topics. Course will contain significant student-driven application component using biomedical, communication, and/or other signals. (3 hr. lec.).

EE 650. Optoelectronics. 3 Hours.

PR: EE 450 or PHYS 471 or consent. Semiconductor physics theory of light-emitting diodes, homojunction lasers, single and double heterojunction lasers, separate confinement quantum well lasers, p-i-n and photo detectors and avalanche photo detectors. Optical and electrical analysis of epitaxial and device designs.

EE 689. Graduate Internship. 1-3 Hours.

PR: Completion of a minimum of 18 degree applicable graduate credit hours with a minimum GPA of 3.0 or better. Employment in industry related to degree program. (Graded P/F. May be repeated twice. Cannot be counted toward graduation requirements.).

EE 691A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

EE 695. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

EE 697. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

EE 699. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is S/U; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

EE 713. Large-Scale System Modeling. 3 Hours.

PR: EE 515. Characterization of large-scale systems, model simplification through aggregation and perturbation methods, optimal and chained aggregation, balanced realization and cost component procedures, optimal model reduction, simplification effects, decentralized control, and feasibility and design. (3 hr. lec.).

EE 731. Real Time Control of Power System. 3 Hours.

PR: EE 515 and EE 517 and EE 533. Application of computers to modern control theory for reliable and economic real-time operation of integrated power systems. (3 hr. rec.).

EE 733. Protection of Power Systems. 3 Hours.

PR: EE 436 or Consent. Principles of relay protection for faults on transmission lines and other devices. Use of overcurrent, differential distance, and pilot relaying systems. Special relay applications. Determination of short-circuit currents and voltages from system studies. (3 hr. rec.).

EE 735. HVDC Transmission. 3 Hours.

PR: EE 435 and EE 533. Line-commutated converter analysis, operation of two terminal and multiterminal dc systems, harmonics and filters, modeling of ac/dc system, and design of modulation controllers.

EE 790. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of electrical engineering. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on assistantships to gain teaching experience. (Grading will be S/U.).

EE 791A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

EE 792A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

EE 793A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

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Special seminars arranged for advanced graduate students.

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Faculty supervised study of topics not available through regular course offerings.

EE 796. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

EE 797. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

EE 798. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

EE 799. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is S/U; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

EMERGENCY MEDICINE CERT PROGRAM COURSES**EMCP 501. Cardio/Hematologic Emergencies. 2 Hours.**

PR: PA-C, NP, DO, MD degree or by permission of the instructor. Clinical presentation, diagnostic evaluation, and management of cardiovascular and hematologic emergencies are covered.

EMCP 502. Neurologic, Psychiatric, Ophthalmologic, and Otolaryngologic Emergency. 2 Hours.

PR: PA-C, NP, DO, MD degree, or by permission of instructor. Emergency management of neurologic, psychiatric, ophthalmologic, and otolaryngologic disorders are emphasized. Clinical presentation, diagnostic evaluation and treatment option are covered.

EMCP 503. Obstetric, Gynecologic, Pediatric, and Infectious Disease Emergency. 2 Hours.

PR: PA-C, NP, DO, MD degree, or by permission of the instructor. Emergency management of obstetric, gynecologic, pediatric, and infectious disease disorders is emphasized. Clinical presentation, diagnostic evaluation, and treatment options are covered.

EMCP 504. Trauma and Musculoskeletal Emergencies. 2 Hours.

PR: PA-C, NP, DO, MD degree, or by permission of instructor. Emergency management of the trauma patient is emphasized. Non-traumatic musculoskeletal disorders are also covered.

EMCP 505. Environmental Emergencies. 2 Hours.

PR: PA-C, NP, DO, MD degree, or by consent. Management of environmental emergencies is emphasized. Clinical presentation, diagnostic evaluation, and treatment options are covered for a variety of environmental-induced disorders.

EMCP 506. Toxicology/Dermatology Emergencies. 2 Hours.

PR: PA-C, NP, DO, MD degree, or by consent. Management of toxicologic and dermatologic emergencies is covered. pathophysiology, clinical presentation, diagnostic evaluation and treatment options are emphasized.

EMCP 507. Chest/Abdominal Emergencies. 2 Hours.

PR: PA-C, NP, DO, MD degree, or by consent. Emergency management of gastrointestinal, thoracic and respiratory emergencies is covered. Pathophysiology, clinical presentation, diagnostic evaluation, and treatment options are emphasized.

EMCP 508. Renal/Endocrine/Immune Emergencies. 2 Hours.

PR: PA-C, NP, DO, MD degree, or by consent. Emergency management of renal, urogenital, endocrine, metabolic, and immunologic disorders are covered. Pathophysiology, clinical presentation, diagnostic evaluation and treatment options are emphasized.

EMCP 509. Evidence-Based Emergency Medicine. 1 Hour.

PR: PA-C, NP, MD, or DO degree, or consent. Students will synthesize material learned in previous courses with the student's own clinical experiences. Evidence-based Medicine (EBM) will be utilized in this course to facilitate achievement of this objective.

EMCP 510. Emergency Medicine Procedures. 1 Hour.

PR: PA-C, NP, MD or DO degree, or consent. Students will focus on procedures that fall within the scope of practice of the Emergency Medicine practitioner.

EMCP 593A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

ENDODONTICS COURSES**ENDO 688. Clinical Endodontics. 1-5 Hours.**

(May be repeated for credit.) PR: Graduate of an accredited dental school and admission to the advanced education program in endodontics or consent. Clinical endodontic practice in the areas of: ordinary endodontic cases, complex endodontic cases, hemisection, root amputation, replantation, transplantation, endodontic implantation, vital pulp therapy, apexification, and bleaching.

ENDO 689. Endodontic Theory Yr-Sm. 1-6 Hours.

PR: Consent. (May be repeated for a maximum of 10 credit hours.) Provides seminar discussions in the topics of basic endodontic techniques, advanced endodontic techniques, endodontic literature review case presentation, and advanced endodontic theory.

ENDO 690. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of dentistry. Note: this course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It also provides a mechanism for students not on assistantships to gain teaching experience.

ENDO 691A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

ENDO 697. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis (697), problem report (697), research paper or equivalent scholarly project (697), or a dissertation (797). (Grading may be S/U).

ENGINEERING COURSES**ENGR 588. Graduate Cooperative Experience. 1 Hour.**

PR: Consent. Pre-arranged graduate co-op experience in student's major. Involves placement with a public or private employer. Includes employer supervision during employment and faculty evaluation after.

ENGR 590. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of engineering. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It also provides a mechanism for students not on assistantships to gain teaching experience. (Grading will be S/U).

ENGR 591A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

ENGR 693A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

ENGR 695. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

ENGR 697. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report,, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

ENGR 930. Professional Development. 1-6 Hours.

Professional development courses provide skill renewal or enhancement in a professional field or content area (e.g., education, community health, geology). These tuition waived continuing education courses are graded on a pass or fail grading scale and do not apply as graduate credit toward a degree program.

ENGLISH COURSES**ENGL 601. Studies in Composition and Rhetoric. 3 Hours.**

Historical developments in the field of composition and rhetoric as it relates to current issues and practices.

ENGL 602. Editing. 3 Hours.

Introduces students to the theory and practice of editing.

ENGL 605. Professional Writing Theory. 3 Hours.

Introduces students to the history of, development of, and current issues in professional writing theory and research.

ENGL 606. Topics in Humanities Computing. 3 Hours.

Topics rotate by semester; check with instructor. Topics may include: literary studies (electronic editions, hypertext, computer games, and virtual environments); critical theory (techno-theory, narrative theory); composition theory (rhetoric of online media, pedagogy); creative writing in digital media.

ENGL 607. Topics in Rhetoric. 3 Hours.

Topics vary by year; check with instructor. Course may include textual, historical, critical, and/or theoretical study. Not restricted to any one period or century.

ENGL 608. Writing Project Summer Institute. 3-6 Hours.

Experienced teachers examine issues in the teaching of writing and study current and past research in the field.

ENGL 609. College Composition Pedagogy. 3 Hours.

Introduces students to theories, practices, and current issues in teaching college composition. Restricted to GTAs in the English department.

ENGL 610. Professional Writing Internship. 3,6 Hours.

PR: ENGL 601 and ENGL 602 and ENGL 605. Student applies research and theory to writing tasks in a professional setting; (100 workplace hours for 3 credits; 200 hours for 6 credits.).

ENGL 611. Sturm Workshop. 1 Hour.

PR: Consent. Creative writing workshop conducted by Sturm visiting writer in residence.

ENGL 618. Graduate Writing Workshop: Poetry. 3 Hours.

PR: Consent. (With departmental consent, may be repeated for a maximum of 12 credit hours.) Advanced workshop in creative writing. Genre and focus vary from semester to semester.

ENGL 618A. Graduate Writing Workshop: Fiction. 3 Hours.

PR: Consent. (With departmental consent, may be repeated for a maximum of 12 credit hours.) Advanced workshop in creative writing. Genre and focus vary from semester to semester.

ENGL 618B. Graduate Writing Workshop: Non-Fiction. 3 Hours.

PR: Consent. (With departmental consent, may be repeated for a maximum of 12 credit hours.) Advanced workshop in creative writing. Genre and focus vary from semester to semester.

ENGL 623. Old English 1. 3 Hours.

Study of Anglo-Saxon with selected readings from the literature of the period.

ENGL 624. Old English 2. 3 Hours.

PR: ENGL 623. Beowulf and other texts in Old English.

ENGL 631. Studies in Nonfiction Prose. 3 Hours.

Advanced study in the genre of nonfiction, with emphasis varying from year to year. Course may include textual, historical, critical, formalist, and/or theoretical study. Not restricted to any one period or century.

ENGL 632. Studies in Poetry. 3 Hours.

Advanced study in the genre of poetry, with emphasis varying from year to year. Course may include textual, historical, critical, formalist, and/or theoretical study. Not restricted to any one period or century.

ENGL 634. Studies in Drama. 3 Hours.

Advanced study in the genre of drama, with emphasis varying from year to year. Course may include textual, historical, critical, formalist, and/or theoretical study. Not restricted to any one period or century.

ENGL 635. Studies in the Novel. 3 Hours.

Advanced study in the genre of the novel, with emphasis varying from year to year. Course may include textual, historical, critical, formalist, and/or theoretical study. Not restricted to any one period or century.

ENGL 636. Study of Selected Authors. 3 Hours.

Advanced study of one or more major authors.

ENGL 636A. Study of Selected Authors. 3 Hours.

Advanced study of one or more major authors.

ENGL 636B. Study of Selected Authors. 3 Hours.

Advanced study of one or more major authors.

ENGL 636C. Study of Selected Authors. 3 Hours.

Advanced study of one or more major authors.

ENGL 636D. Study of Selected Authors. 3 Hours.

Advanced study of one or more major authors.

ENGL 636E. Study of Selected Authors. 3 Hours.

Advanced study of one or more major authors.

ENGL 636F. Study of Selected Authors. 3 Hours.

Advanced study of one or more major authors.

ENGL 636G. Study of Selected Authors. 3 Hours.

Advanced study of one or more major authors.

ENGL 636H. Study of Selected Authors. 3 Hours.

Advanced study of one or more major authors.

ENGL 636I. Study of Selected Authors. 3 Hours.

Advanced study of one or more major authors.

ENGL 636J. Study of Selected Authors. 3 Hours.

Advanced study of one or more major authors.

ENGL 636K. Study of Selected Authors. 3 Hours.

Advanced study of one or more major authors.

ENGL 636L. Study of Selected Authors. 3 Hours.

Advanced study of one or more major authors.

ENGL 636M. Study of Selected Authors. 3 Hours.

Advanced study of one or more major authors.

ENGL 636N. Study of Selected Authors. 3 Hours.

Advanced study of one or more major authors.

ENGL 636O. Study of Selected Authors. 3 Hours.

Advanced study of one or more major authors.

ENGL 636P. Study of Selected Authors. 3 Hours.

Advanced study of one or more major authors.

ENGL 636Q. Study of Selected Authors. 3 Hours.

Advanced study of one or more major authors.

ENGL 636R. Study of Selected Authors. 3 Hours.

Advanced study of one or more major authors.

ENGL 636S. Study of Selected Authors. 3 Hours.

Advanced study of one or more major authors.

ENGL 636T. Study of Selected Authors. 3 Hours.

Advanced study of one or more major authors.

ENGL 636U. Study of Selected Authors. 3 Hours.

Advanced study of one or more major authors.

ENGL 636V. Study of Selected Authors. 3 Hours.

Advanced study of one or more major authors.

ENGL 636W. Study of Selected Authors. 3 Hours.

Advanced study of one or more major authors.

ENGL 636X. Study of Selected Authors. 3 Hours.

Advanced study of one or more major authors.

ENGL 636Y. Study of Selected Authors. 3 Hours.

Advanced study of one or more major authors.

ENGL 636Z. Study of Selected Authors. 3 Hours.

Advanced study of one or more major authors.

ENGL 646. American Literature to 1865. 3 Hours.

Readings in the literature of America from its beginnings to 1865; attention to major writers and genres; focus on literary history.

ENGL 647. American Literature, 1865-1915. 3 Hours.

Readings in the literature of America from 1865-1915; attention to major writers and genres; focus on literary history.

ENGL 648. American Literature, 1915-Present. 3 Hours.

Readings in the literature of America from 1915 to the present; attention to major writers and genres; focus on literary history.

ENGL 661. Medieval Literature. 3 Hours.

Readings in the literature of the medieval period; attention to major writers and genres; focus on literary theory.

ENGL 663. Shakespeare. 3 Hours.

Intensive study of selected plays. Special attention to textual problems and to language and poetic imagery, together with the history of Shakespearean criticism and scholarship.

ENGL 664. Renaissance Literature. 3 Hours.

Readings in the literature of the English renaissance; attention to major writers and genres; focus on literary history.

ENGL 666. Restoration and Eighteenth-Century Literature. 3 Hours.

Readings in the literature of England during the Restoration and the eighteenth century; attention to major writers and genres; focus on literary history.

ENGL 668. Romantic Literature. 3 Hours.

Readings in the literature of England during the Romantic period; attention to major writers and genres; focus on literary history.

ENGL 669. Victorian Literature. 3 Hours.

Readings in the literature of England during the Victorian period; attention to major writers and genres; focus on literary history.

ENGL 671. Twentieth-Century British Literature. 3 Hours.

Readings on the literature of England during the twentieth century; attention to major writers and genres; focus on literary history.

ENGL 680. Introduction to Literary Research. 1-6 Hours.

Bibliography; materials and tools of literary investigations; methods of research in various fields of literary history and interpretation; problem of editing. Practical guidance in the writing of theses.

ENGL 682. Recent Literary Criticism. 3 Hours.

Brief survey of theories of major schools of recent criticism and an application of these theories to selected literary works.

ENGL 688. Creative Writing Mentoring. 3 Hours.

Supervised practice in mentoring advanced undergraduate creative writers.

ENGL 689. Writing and Editing Practicum. 1-3 Hours.

Supervised practice in writing and editing. (Grading will be S/U.).

ENGL 691A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

ENGL 692A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

ENGL 693A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

ENGL 695. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

ENGL 698. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

ENGL 699. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use of the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is S/U; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement in the semester in which graduation occurs.

ENGL 701. Seminar in Rhetoric. 3 Hours.

PR: ENGL 601, or ENGL 605, or ENGL 609. Topics vary. Focus will be on a problem or issue in rhetorical studies that reflect the instructor's current research (check with instructor).

ENGL 741. Seminar in American Studies. 3 Hours.

Seminar in principal authors and movements in American literature.

ENGL 761. Seminar in Medieval Studies. 3 Hours.

Topics in English literature, 900-1500.

ENGL 764. Seminar in Renaissance Studies, 1550-1660. 3 Hours.

Studies in major authors and special topics in the Renaissance.

ENGL 766. Seminar in Restoration and Eighteenth-Century Studies. 3 Hours.

Studies in major authors and special topics in the period.

ENGL 768. Seminar in British Romanticism. 3 Hours.

Studies in major authors and special topics in the field of British Romanticism.

ENGL 769. Seminar in Victorian Studies. 3 Hours.

Research and discussion in selected topics in the literature and history of the period.

ENGL 771. Seminar in Twentieth-Century British Studies. 3 Hours.

Seminar in principal authors and movements in twentieth-century British literature.

ENGL 782. Current Directions in Literary Study. 3 Hours.

PR: Advanced graduate standing (prior completion of ENGL 682 is recommended). Intensive study of one or more current approaches to literature and theories of criticism, with some emphasis on the interrelations of literary study with other disciplines.

ENGL 789. Folger Seminar. 1-6 Hours.

PR: Graduate standing. (Enrollment is by special application only. Contact department chairperson for information.) Seminar conducted by distinguished scholars and held at the Folger Institute in Washington, D.C. Topics vary.

ENGL 790. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of English. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on assistantships to gain teaching experience. (Grading will be P/F.).

ENGL 793A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

ENGL 794A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

ENGL 795. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

ENGL 798. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

ENGL 799. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use of the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is P/F; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

ENGL 900. Professional Development. 1-6 Hours.

Professional development courses provide skill renewal or enhancement in a professional field or content area (e.g. education, community health, geology.) The continuing education courses are graded on a pass/fail grading scale and do not apply as graduate credit toward a degree program.

ENGL 930. Professional Development. 1-6 Hours.

Professional development courses provide skill renewal or enhancement in a professional field or content area (e.g., education, community health, geology.) These tuition-waived continuing education courses are graded on a pass/fail grading scale and do not apply as graduate credit toward a degree program.

ENGLISH AS A SECOND LANGUAGE COURSES**ESL 590. Teaching Practicum. 1-3 Hours.**

PR: Consent. Supervised practice in college teaching of English as a Second Language. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on Assistantships to gain teaching experience. (Grading will be S/U.)

ESL 591A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

ESL 630. American Culture. 3 Hours.

Advanced readings concerning the diversity of American culture with a focus on critical inquiry.

ESL 691A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

ESL 697. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.)

ENTOMOLOGY COURSES**ENTO 503. Medical Entomology. 3 Hours.**

Medically important arthropods affecting health of humans and domestic animals. Epidemiology of major arthropod-transmitted diseases of humans and animals. Identification, rearing, collecting, preparation and control of medically important arthropods.

ENTO 590. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of entomology. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on assistantships to gain teaching experience. (Grading will be S/U.)

ENTO 591A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

ENTO 693A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

ENTO 697. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.)

ENTO 790. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of Entomology. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on assistantships to gain teaching experience. (Grading will be S/U.)

ENTO 791A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

ENTO 792A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

ENTO 793A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

ENTO 794A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

ENTO 795. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

ENTO 796. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

ENTO 797. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.)

ENTO 798. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

ENTO 799. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use of the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is S/U; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

ENVIRONMENTAL PROTECTION COURSES**ENVP 515. Hazardous Waste Training. 3 Hours.**

PR: ENVP 155 or consent. A course covering important aspects of hazardous waste training. Includes health and safety plan development, protective equipment, air monitoring, incident command, site characterization, toxicology, full scale disaster exercises, risk assessment and safety plan writing.

ENVP 555. Environmental Sampling and Analysis. 3 Hours.

PR: ENVP 155 or consent. Introduction to environmental sampling and analysis. Lecture and hands-on experience will include sampling plan development, sampling point selection, sampling equipment use, containers, preservatives sample analysis, chain-of-custody, protective equipment and technical report development.

EPIDEMIOLOGY COURSES**EPID 601. Public Health Epidemiology. 3 Hours.**

PR or CONC: BIOS 601. Examines mortality and morbidity trends, disease and injury models, data sources classification, measures of frequency and association, research design, causal assessment, data interpretation, and screening from an epidemiological perspective.

EPID 611. Concepts and Methods of Epidemiology. 3 Hours.

PR: BIOS 610. An in-depth examination of the theory of epidemiology and its application to general epidemiologic research, including problem conceptualization, sound study design, research conduct, and interpretation of findings with depth of understanding expected of masters-level students.

EPID 612. Applied Epidemiology for Public Health. 3 Hours.

PR: BIOS 601 and EPID 610 and EPID 611. Applied quantitative methods essential to core training of epidemiology majors. Covering analysis of large public health datasets, methods of summarizing results, calculation of confidence intervals, standardization, calculation of measures of association.

EPID 625. Principles of Clinical Trials. 3 Hours.

Students will apply the core elements of clinical trials and learn to address their major challenges by critically evaluating clinical trial literature, designing original clinical trials and developing grant proposals in clinical trial research.

EPID 627. Epidemiology Proposal. 2 Hours.

Students develop a proposal for an epidemiology practicum project (applied or research-based) that integrates public health skills, theory and knowledge and is supported by a faculty-review process, (part one of the MPH culminating experience).

EPID 628. Epidemiology Practicum. 6 Hours.

PR: EPID 627. Students implement the substantive public health project (planned in proposal course) under the mentorship of faculty and preceptors. Results are reported through a formal paper and a poster presentation to faculty, students and guests.

EPID 629. Epidemiology Capstone. 3 Hours.

PR: EPID 610 and EPID 611 and EPID 612. The Epidemiology Capstone is the culminating experience for MPH students in epidemiology. It requires students to demonstrate their ability to synthesize and integrate the core public health and epidemiology knowledge and competencies via a paper and oral presentation. (Grading will be Pass/Fail.).

EPID 663. Public Health Surveillance. 3 Hours.

PR: EPID 601 or EPID 610 with a minimum grade of B. This course includes presentations and discussions of epidemiologic principles, basic statistical analysis, public health surveillance, field investigations, surveys and sampling, and epidemiologic aspects of current major public health problems in international health. The course will cover chronic and infectious diseases surveillance, and procedures and policies for data collection, compilation, and reporting. Metrics developed by the WHO will be used.

EPID 664. Chronic Disease Epidemiology. 3 Hours.

PR: EPID 610 or consent. A broad introduction to the epidemiology of chronic non-infectious diseases, including diabetes mellitus, hypertension, cardiovascular disease, cancer, osteoporosis, Alzheimer's disease, and the role of various lifestyle risk factors for these diseases.

EPID 665. Injury Control Seminar. 1 Hour.

A survey of current research practice in injury prevention and control (IPC). Local and regional researchers and practitioners provide students a unique perspective on IPC research, interventions, programs, and policies.

EPID 691A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation in advanced topics that are not covered in regularly scheduled courses.

EPID 695. Independent Study. 1-6 Hours.

Faculty-supervised study of topics not available through regular course offerings.

EPID 696. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

EPID 710. Advanced Principles of Epidemiology. 3 Hours.

PR or CONC: BIOS 610. An intensive introduction to epidemiological concepts and methods for PhD students intending to engage in, collaborate in, or interpret the results of epidemiologic studies. Familiarity with biomedical concepts may be needed.

EPID 711. Intermediate Epidemiology. 3 Hours.

PR: EPID 611 and BIOS 610. An in-depth examination of the theory of epidemiology and its application to general epidemiologic research, including problem conceptualization, sound study design, research conduct, and interpretation of findings with depth of understanding expected of doctoral students.

EPID 712. Quantitative Methods in Epidemiology. 3 Hours.

PR: EPID 610 or consent. Quantitative methods essential to core training of epidemiology majors, covering crude analysis of categorical and continuous variables, confounding, sensitivity analysis, effect measure modification, logistic regression, Poisson regression and negative binomial regression, and survival analysis.

EPID 714. Molecular and Genetic Epidemiology. 3 Hours.

PR: EPID 710. Students are introduced to molecular genetic epidemiology with a focused exposure to areas of emphasis, linkage and association-analysis with exposure to tools needed to critically review literature in genetic epidemiology and human genetics.

EPID 715. Advanced Epidemiology. 3 Hours.

PR: EPID 711. Causality and threats to validity in epidemiologic research are presented, focusing on assessment and control of bias, including selection bias, information bias and confounding. Assessment and control of effect modification (interaction) are included.

EPID 740. Gene X Environmental Interactions and Chronic Diseases. 3 Hours.

The goal of this course is to inform students about the role of environmental factors in gene expression related to complex diseases such as CVD and cancer.

EPID 745. Epigenetics and Systems Biology. 3 Hours.

Course provides overview of ways that non-genetic factors influence and interact with gene expression; comparing, contrasting systems biology approaches to more traditional reductionist methods for investigating complex phenotypes.

EPID 760. Demography and Transitions. 3 Hours.

PR: EPID 710 or consent. Life table and other population-based techniques and approaches to studying international and sociodemographic patterns and differentials in mortality morbidity, and disability.

EPID 761. Cardiovascular Epidemiology. 3 Hours.

PR: EPID 710. An in-depth introduction to epidemiological methods in studying cardiovascular disease and related conditions, including diabetes, hypertension, chronic kidney disease, sleep-disordered breathing. In addition, classical as well as novel cardiovascular risk factors will be covered.

EPID 762. Cancer Epidemiology. 3 Hours.

PR: EPID 710 or consent. This course is intended for students considering cancer epidemiology as a substantive focus. Providing students fundamental concepts and methodology in cancer epidemiology and reviewing current epidemiologic research in cancer from a variety of perspectives.

EPID 763. Injury Epidemiology. 3 Hours.

PR: EPID 711. In-depth application of epidemiology to injury. This course covers how to use select epidemiologic methods to study injury as a public health problem, focusing on issues specific to the prevention and control of injury.

EPID 764. Mind-body Medicine. 3 Hours.

PR: EPID 710 or consent. Using real world examples, this course covers the complex relationships between psychosocial factors and chronic illness; major mind-body practices and common clinical applications of these practices; the effects of these practices on specific health outcomes.

EPID 765. Epidemiology of Transportation Safety. 3 Hours.

PR: EPID 712. A broad introduction of epidemiological designs and methods in transportation safety in the context of specific road users, including inexperienced and mature drivers, passengers, large-truck drivers, pedestrians, bicyclists, motorcyclists, and all-terrain vehicle riders.

EPID 766. Physical Activity Epidemiology. 3 Hours.

PR: EPID 710. This course provides an in-depth examination of the epidemiology of physical activity. The course builds upon basic epidemiological methods and explores the relationship between physical activity and chronic diseases.

EPID 767. Maternal and Child Health Epidemiology. 3 Hours.

PR: EPID 710 and BIOS 610. A broad introduction of epidemiological designs and methods in maternal and child health topics including prenatal care, maternal complications, preterm birth, low birth weight, fetal, neonatal/infant mortality, congenital malformations, prenatal substance exposure and development disabilities.

EPID 768. Environmental Epidemiology. 3 Hours.

PR: EPID 710. A broad introduction of epidemiological methods to study environmental determinants of disease will be presented in the context of studies of specific health outcomes, including: cancer, non-malignant respiratory diseases, adverse reproductive outcomes, and neurologic diseases.

EPID 769. Occupational Epidemiology. 3 Hours.

PR: BIOS 610 for MPH students and EPID 710 for PhD students. Application of epidemiology to occupational disease and injury. Occupational hazards, including concepts of exposure and dose, as well as study design considerations unique to occupational studies, especially design challenges and analytic implications, will be covered.

EPID 770. Nutritional Epidemiology. 3 Hours.

This course addresses the role of nutrition and food components in primary, secondary, and tertiary disease prevention. Through cooperative learning, students will practice critical thinking skills in the study of nutrition in chronic disease prevention.

EPID 771. Infectious Diseases Epidemiology. 3 Hours.

PR: EPID 610 or EPID 710. This course is designed to cover the basic epidemiological, public health, economic, surveillance, prevention and other issues related to infectious diseases. The focus includes the major infectious diseases experienced globally as well as those specific to the United States.

EPID 790. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of (subject matter determined by department/division/college/school offering the course). NOTE: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It also provides a mechanism for students not on assistantships to gain teaching experience.

EPID 795. Independent Study. 1-9 Hours.

PR: Consent. Faculty-supervised study of topics not available through regular course offerings.

EPID 796. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

EPID 797. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading will be S/U).

EXERCISE PHYSIOLOGY COURSES**EXPH 567. Exercise Physiology 2. 4 Hours.**

PR: Consent. Comprehensive knowledge of the functioning of body systems during exercise, the acute and chronic adaptations that occur, and the practical application of this to health and disease.

EXPH 668. Diabetes and Exercise. 3 Hours.

PR: Graduate standing, consent. In-depth study of topics related to the comprehensive management of patients with diabetes mellitus, with special emphasis on the use of exercise in diabetes care.

EXPH 670. Lab Techniques and Methods 2. 3 Hours.

PR: Graduate standing, consent. This course teaches the techniques and methods used to monitor physiologic systems in humans during rest and exercise. It includes methods used to assess the health status of individuals desirous of exercise testing or prescription.

EXPH 671. Stress Testing. 3 Hours.

PR: EXPH 670, consent. In-depth study of graded exercise testing in laboratory or field situations. The course includes protocols for athletes, asymptomatic individuals, and special populations.

EXPH 672. Professional Field Placement. 1-18 Hours.

PR: EXPH 370, and EXPH 371, consent. Prearranged program to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development. (Internship.)

EXPH 673. Exercise Prescription. 3 Hours.

This course will provide graduate students an understanding of the exercise prescription process and the exercise management of patients with chronic diseases.

EXPH 680. Advanced Clinical Exercise Physiology. 3 Hours.

PR: Graduate Standing. Presentation of scientific techniques utilized by clinical exercise physiologists to assess fitness in healthy and disease populations. This course will refine clinical competencies needed to safely administering various fitness assessments in clinical populations in which the risk of untoward events increases.

EXPH 681. Clinical Exercise Prescription. 4 Hours.

PR: EXPH 670 and EXPH 680. This course will present current established exercise guidelines for the safe evaluation of functional capacities and the establishment of safe, effective exercise prescriptions for individuals with cardiovascular and/or metabolic diseases.

EXPH 682. Research Design and Methods. 4 Hours.

An advanced level of important concepts involved in the design of experimental studies in Exercise Physiology. The main focus will be on understanding the essential techniques for study design, data collection, its critical evaluation, and research reporting.

EXPH 691A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

EXPH 693A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

EXPH 695. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

EXPH 696. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

EXPH 697. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or dissertation. (Grading may be S/U.).

EXPH 698. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

EXPH 699. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is P/F; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

EXPH 786. Musculoskeletal Biology. 3 Hours.

Introduction to current research approaches in musculoskeletal biology of exercise physiology. This course will stress critical thinking, and refine skills related to research design and evaluation of research methods used in exercise physiology.

EXPH 787. Cardiopulmonary Physiology. 3 Hours.

An advanced survey of important concepts involved in cardiovascular/ cardiopulmonary physiology and pathophysiology. The main focus will be on understanding the changes to cardiovascular/pulmonary system brought about by physiological stimuli such as exercise, aging, and disease states.

EXPH 790. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in teaching exercise physiology. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It also provides a mechanism for students not on assistantships to gain teaching experience. (Grading will be S/U.).

EXPH 791A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation in advanced subjects which are not covered in regularly scheduled courses. Study may be independent or through specially scheduled lectures.

EXPH 792A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

EXPH 794A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

EXPH 795. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

EXPH 796. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

EXPH 797. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

EXPH 798. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

EXPH 799. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework but who wish to meet residency requirements, use the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 graduate colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights of duly enrolled students. Grading is P/F; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

FAMILY MEDICINE COURSES

FMED 731. Clerkship. 8 Hours.

PR: Successful completion of first two years of medical school. An eight week rotation in the office setting; rotations of four weeks to clinics within the university system and four weeks to private practitioner offices throughout the state. Lecture, laboratory, conference, and patient care.

FINANCE COURSES

FIN 500. Corporate Finance. 3 Hours.

PR: BADM 511, BADM 522, and BADM 524. A practical consideration of the operation of financial markets, considerations for the inter-temporal comparisons of opportunities, and the elements of the decision-making criteria for the financial manager.

FIN 510. Investments and Portfolio Management. 3 Hours.

PR: BADM 532. The course provides theoretical understanding of how financial decisions are made under uncertainty. The topics include the securities market environment, modern portfolio theory, risk analysis, bond and stock valuations, and derivative securities.

FIN 511. Financial Economics. 3 Hours.

A survey of Microeconomic Markets in the U.S. economy. Examines how the U.S. System interacts with larger global economy.

FIN 512. Ethical Standards in Finance. 3 Hours.

An overview of the impact of legal, societal, and ethical considerations on business decision-making and strategic planning in the finance industry.

FIN 513. Macroeconomics and Financial Markets. 3 Hours.

This course provides students with an understanding of how macroeconomic performance is measured, how monetary and fiscal policies influence macroeconomic performance, and how these relate to financial markets around the world.

FIN 520. Quantitative Finance. 3 Hours.

Examines statistical and probability concepts, statistical inference, regression analysis, time series analysis and financial modeling. Emphasizes financial applications, including portfolio optimization and analysis of financial time series.

FIN 521. Financial Reporting and Analysis. 3 Hours.

Fundamental security analysis requires that cash flows be evaluated primarily using external accounting data. This course provides students with the skills necessary to evaluate financial reports focusing on firm valuation.

FIN 522. Advanced Corporate Finance. 3 Hours.

Case study approach focusing on complex problems in the corporate forecasting, capital budgeting, cost of capital analysis, the financing of capital investments, and financial decisions on strategic investment.

FIN 523. Equity Investment. 3 Hours.

This course provides students with professional knowledge of investment tools in equity markets, industry and company analysis, valuation models, and equity portfolio management.

FIN 525. Derivative Securities. 3 Hours.

This course will extend the student's knowledge of derivatives markets for commodities and financial instruments. Particular attention will be given to the use of financial derivatives for risk management.

FIN 526. Portfolio Management. 3 Hours.

Examines the complete investment process from constructing investment objectives and policies to strategic asset allocation, security selection, trade execution, portfolio monitoring, and performance measurements.

FIN 527. Alternative Investments. 3 Hours.

Alternative investments are a growing presence in financial markets. These investments allow the investors to diversify their portfolios beyond rational debt and equity securities. This course provides students with the skills necessary to understand the risks and rewards in alternative investment markets.

FIN 528. Integrated Financial Analysis. 3 Hours.

This is a capstone course that brings together all elements of financial planning including ethical standards, quantitative methods, economics, financial reporting, corporate finance, equity and fixed income investments, derivatives, portfolio management, and wealth planning.

FIN 530. Energy Financial Economics. 3 Hours.

Introduction to the ways in which legal/regulatory systems affect the energy industry and to important economic and political concerns that underlie the regulation of the production and trading of energy and the connections to the derivative markets for the energy sector.

FIN 531. Energy Law/Regulation/Ethics. 3 Hours.

Provides an understanding of energy markets and the ancillary markets, the legal and regulatory environments, and the ethical questions surrounding this business sector. Additionally, the course will help prepare participants to address the ethical standards of the finance profession.

FIN 532. Energy Financial Accounting. 3 Hours.

Provides the tools to interpret and analyze external financial information from the viewpoint of investors and creditors. The energy sector has a unique perspective from other industries. The role of mark to market accounting techniques will be emphasized.

FIN 533. Energy Financial Risk Management. 3 Hours.

Investigates the evolving and expanding practice of financial risk management in the energy sector. Risk management is a complex process of identifying, quantifying, and managing risk exposures. The course analyzes and discusses the various sources of risk.

FIN 591A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

FIN 592A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

FIN 593A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

FIN 594A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

FIN 595. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

FIN 690. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of finance. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It also provides a mechanism for students not on assistantships to gain teaching experience. (Grading will be P/F.).

FIN 691A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

FIN 695. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

FIN 696. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

FIN 697. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

FIN 699. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use of the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is P/F; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

FIN 735. Portfolio Theory. 3 Hours.

PR: ECON 701 and ECON 702. Basics of decision making under risk. Portfolio choice under various utility and returns specifications. Asset allocation over time.

FIN 736. Asset Pricing. 3 Hours.

PR: FIN 735 or ECON 735. Theories of the determination of prices and returns in financial markets. Properties of general static and intertemporal asset pricing models and determinants of equilibrium returns in specific general equilibrium models.

FIN 737. Corporate Finance Theory. 3 Hours.

A comprehensive examination of the foundational theories in corporate finance. Topics will include: finance theory under certainty and uncertainty, utility theory, capital structure, issuance, dividend policy, corporate governance, M A theory, and financial distress.

FIN 741. Corporate Finance Seminar. 3 Hours.

PR: FIN 737. This course acquaints students with theoretical and empirical research in corporate finance. Topics include capital structure, dividend policy, stockholder-manager and bondholder-stockholder agency conflicts, governance mechanisms, market for corporate control, bankruptcy and corporate restructuring.

FIN 742. Investments Seminar. 3 Hours.

PR: ECON 736. A comprehensive examination of the theoretical and empirical literature covering the foundational topics in investments. Topics include portfolio theory, performance evaluation, derivatives, market anomalies, investor behavior and other pertinent developments in the investment area.

FIN 743. Advanced Topics Seminar. 3 Hours.

Examination of the theoretical and empirical research in important areas of finance. Examples include financial institutions, international finance, behavioral finance and market microstructure.

FIN 795. Independent Study. 1-9 Hours.

Faculty Supervised study of topics not available through regular course offerings.

FIN 797. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

FIN 798. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

FIN 930. Professional Development. 1-6 Hours.

Professional development course provide skill renewal or enhancement in a professional field or content area (e.g. education, community health, geology). These tuition-waived continuing education courses are graded on a pass/fail grading scale and do not apply as graduate credit toward a degree program.

FOOD SCIENCE TECHNOLOGY COURSES

FDST 545. Food Microbiology. 3 Hours.

PR: ENVM 341. The relationships of microorganisms to food-borne illness and intoxications, microbial food safety and food quality, food spoilage, food preservation and bio-processing. The emerging food preservation technologies and predictive microbiology will be introduced.

FDST 549. Food Microbiology Lab. 1 Hour.

PR: FDST 545. Laboratory training in methods used in microbiological examination of foods. This laboratory will provide hands-on experience for students who take or have taken FDST 545.

FDST 670. Advanced Muscle Foods. 3 Hours.

PR: FDST 365 and FDST 367. Theoretical and experimental aspects of muscle food science, muscle food production/process systems, and the quantitative biology of muscle systems used for food.

FOREIGN LIT IN TRANSLATION COURSES

FLIT 591A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

FLIT 594A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

FLIT 685. Comparative Literature: Theory and Practice. 3 Hours.

PR: Reading fluency in at least one foreign language. Conceptual bases of comparative literature and their application to literary interpretation.

FLIT 690. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of FLIT.

FLIT 691A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

FLIT 693A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

FLIT 694A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

FLIT 695. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

FLIT 697. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

FORENSIC AND INVSTGTV SCIENCE COURSES

FIS 501. Foundations of Criminalistics. 3 Hours.

This course reviews the core theories and fundamental principles of criminalistics. Particular attention will be dedicated to problems of interpreting physical evidence. Aspects on research, scientific method, and ethics will also be addressed.

FIS 502. Forensic Laboratory Management. 3 Hours.

This course provides an overview of management issues in forensic science laboratories, including personnel and human resources, project management, leadership, organization, communication, strategy and budgeting.

FIS 592A-Z. Directed Study. 1-6 Hours.

PR: Consent. Directed study, reading, and or research.

FIS 602. Forensic Informatics. 3 Hours.

This course will cover data management in forensic laboratories (procedural and scientific). Topics such as quality, legal environment, laboratory information systems, and forensic intelligence will be developed. This course includes a laboratory component.

FIS 604. Forensic Fingerprint Examination. 3 Hours.

This course presents the fundamental and advanced aspects of fingerprint comparisons using ACE-V methodology. Specific topics such as Daubert requirements, friction ridge identification; poroscopy, palm prints will be covered. This course includes a laboratory component.

FIS 610. Firearms Examination. 3 Hours.

This course presents the fundamentals and advanced aspects of firearms related to evidence. Topics include the design, mechanism, and manufacture of firearms as well as interior, exterior and terminal ballistics. This course includes laboratory component.

FIS 614. Trace Evidence Examination. 3 Hours.

PR: CHEM 314 or FIS 314. This course will develop the theories of transfer (such as hairs, fibers, paints, gunshot residues and glass). Topics such as microscopy, spectroscopy, and chromatography will be applied. This course includes a laboratory component.

FIS 615. Questioned Document Examination. 3 Hours.

This course will focus on handwriting comparisons, signatures, typewriting, and typescripts. Topics include erasures, additions and alterations, printed and photocopied documents and ink analysis. This course includes a laboratory component.

FIS 620. Forensic Casework Practicum. 3 Hours.

Students will manage mock cases involving multiple types of evidence. They will collect, analyze and interpret the evidence. Written reports on the case will be submitted to evaluation during a mock trial.

FIS 632. Advanced Forensic Biology. 3 Hours.

This course will provide students with the knowledge and skills to perform forensic DNA analyses. Topics include analytical methods and procedures, result interpretation and evidence assessment. This course includes a laboratory component.

FIS 660. Advanced Forensic Chemistry. 3 Hours.

This course covers the chemical analysis of a wide variety of forensic evidence types. Topics include statistics, sampling, data quality, calibration, sample preparation, instrumentation; drug analysis, toxicology and explosives. This course includes a laboratory component.

FIS 695. Independent Study. 1-6 Hours.

Faculty Supervised study of topics not available through regular class offerings.

FIS 696. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

FIS 697. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

FOREST HYDROLOGY COURSES**FHYD 593A-Z. Special Topics. 1-6 Hours.**

A study of contemporary topics selected from recent developments in the field.

FHYD 644. Watershed Hydrology. 3 Hours.

PR: FHYD 444. A qualitative and quantitative understanding of principles governing the occurrence, distribution, and circulation of water near the Earth's surface. Emphasis is on the physical understanding and parameterization of hydrologic processes and the water cycle.

FOREST MANAGEMENT COURSES**FMAN 512. Silvicultural Practices for Hardwood Forest Types. 3 Hours.**

PR: FMAN 311. Designing proper silvicultural systems for managing Appalachian hardwood stands; reconstructing stand histories, recognizing problems, and prescribing appropriate silvicultural treatment.

FMAN 540. Current Issues in Forest Management. 3 Hours.

PR: Consent. Analysis of environmental issues in forest management and current controversies surrounding the management of forested lands. Emphasis on traditional and ecosystem-based forest management policy, philosophy, and practices.

FMAN 591A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

FMAN 593A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

FMAN 611. Advanced Forest Ecology. 3 Hours.

PR: FMAN 212 or equivalent; FMAN 311. Ecological relationships in forests with emphasis on biogeochemical cycles.

FMAN 631. Forest Stand Dynamics. 3 Hours.

PR: Undergraduate courses in ecology or silviculture, and statistics. Examination of the processes causing temporal and spatial changes in communities of trees including: stand establishment, growth, competition, disturbance and mortality. Labs focus on the quantification of stand development patterns.

FMAN 640. Advanced Forest Biometrics. 3 Hours.

PR: FMAN 222 and STAT 511. Review and application of mathematical and statistical models used in forest volume, taper and height estimation procedures.

FMAN 641. Forest Growth a Yield Modeling. 3 Hours.

PR: FMAN 640 Review and application of mathematical and statistical models used in forest growth and yield modeling.

FMAN 644. Forest Growth and Yield Modeling. 3 Hours.

PR: FMAN 640. Review and application of mathematical and statistical models used in forest growth and yield modeling.

FMAN 650. Forest Valuation and Investment. 3 Hours.

Asset valuation concepts, with special emphasis on forests. Financial analyses of forest operations. Concepts and strategies in forestland investment and portfolio management.

FMAN 693A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

FMAN 695. Independent Study. 1-6 Hours.

Faculty-supervised study of topics not available through regular course offerings.

FMAN 697. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

FMAN 790. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of forest management. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on assistantships to gain teaching experience. (Grading will be S/U.).

FMAN 791A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

FMAN 792A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

FMAN 793A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

FMAN 794A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

FMAN 795. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

FMAN 796. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

FMAN 797. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

FMAN 798. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

FMAN 799. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use of the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is S/U; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

FORESTRY COURSES**FOR 525. Vegetation of West Virginia. 3 Hours.**

PR: FOR 205. Basics of plant taxonomy and community ecology, use of technical field keys, study of selected plant families, field trips to unusual and/or important plant communities and forest types in West Virginia.

FOR 575. Forest Soils: Ecology and Management. 3 Hours.

PR: AGRN 410 or AGRN 425 or consent. Properties, nutrient cycling processes, and sustainable management of forest soils, with examples from the most important wood fiber producing regions of the U.S.: the southeast, Pacific Northwest, and the central hardwood forest.

FOR 590. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of forestry. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on assistantships to gain teaching experience. (Grading will be S/U.).

FOR 591A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

FOR 592A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

FOR 593A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

FOR 594A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

FOR 595. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

FOR 650. Economics, Environment and Education in West Virginia. 3 Hours.

This course is designed for K-12 classroom teachers with little previous background in economics. We introduce the principles of economics using the WV forest products industry to provide examples.

FOR 670. Human Dimensions of Natural Resource Management. 3 Hours.

PR: Grad standing. This course applies social science theory and methods to solving natural resource management problems.

FOR 691A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

FOR 693A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

FOR 696. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

FOR 697. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

FOR 698. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

FOR 699. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use of the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is S/U; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

FOR 791A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

FOR 793A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

FOR 797. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

FRENCH COURSES**FRCH 501. French Stylistics. 3 Hours.**

Development of written communication in French through intense study of French grammar, stylistics, and translation.

FRCH 503. French Stylistics. 3 Hours.

Development of written communication in French through intense study of French grammar, stylistics, and translation.

FRCH 532. Early French Literature. 3 Hours.

PR: 18 hours of French or consent.

FRCH 533. Seventeenth Century Literature. 3 Hours.

PR: 12 hours of French or equivalent.

FRCH 534. Eighteenth Century Literature. 3 Hours.

PR: 18 hours of French or consent. Survey of major literary works of eighteenth century France.

FRCH 535. Nineteenth Century Literature. 3 Hours.

PR: 12 hours of French or equivalent.

FRCH 536. Twentieth Century Literature. 3 Hours.

Introduction to the major tendencies, authors, and works of twentieth century French literature. Analysis of the most representative works of this period and of the cultural and artistic movements to which they belong.

FRCH 538. Francophone Literature. 3 Hours.

PR: Consent. Readings in French literature from regions outside of metropolitan France, such as Africa, Quebec, and the Caribbean.

FRCH 590. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of French. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on assistantships to gain teaching experience. (Grading will be P/F.).

FRCH 591A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

FRCH 592A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

FRCH 593A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

FRCH 594A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

FRCH 595. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

FRCH 611. Literary Criticism. 3 Hours.

PR: B.A. in French or consent.

FRCH 635. The Romantic Movement. 3 Hours.

PR: 18 hours of French or consent.

FRCH 636. French Realism. 3 Hours.

PR: 18 hours of French or consent.

FRCH 639. French Women Writers. 3 Hours.

PR: B.A. in French or consent. Selected works of French women writers.

FRCH 647. The Modern Novel to 1930. 3 Hours.

PR: B.A. in French or consent.

FRCH 648. The Novel After 1930. 3 Hours.

PR: B.A. in French or consent.

FRCH 690. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of French. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It also provides a mechanism for students not on assistantships to gain teaching experience. (Grading will be P/F.).

FRCH 691A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

FRCH 692A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

FRCH 693A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

FRCH 694A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

FRCH 695. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

FRCH 696. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

FRCH 697. Research. 1-15 Hours.

PR: Consent. Research activities leading to a thesis, problem report, research paper, or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

FRCH 698. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

FRCH 699. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use of the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is P/F; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

FRCH 791A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

FRCH 930. Professional Development. 1-6 Hours.

Professional development courses provide skill renewal or enhancement in a professional field or content area (e.g. education, community health, geology). These tuition-waived continuing education courses are graded on a pass/fail scale and do not apply as graduate credit toward a degree program.

GENETICS COURSES**GEN 521. Basic Concepts of Modern Genetics. 3 Hours.**

PR: 8 hours of biological sciences and one year of chemistry courses. Independent inheritance. Chemical nature of genetic material. Control of phenotype by genetic material. Gene action and coding of genetic material.

GEN 525. Human Genetics. 3 Hours.

PR: GEN 371 or GEN 521 or Consent. Study of genetic system responsible for development of phenotype in man.

GEN 535. Population Genetics. 3 Hours.

PR: GEN 371 or GEN 521 or Consent. Relationship of gene and genotype frequencies in populations of diploid organisms, and the effects of mutation, selection, assortive mating, and inbreeding in relation to single gene pairs. Application of these concepts to multigenetic inheritance of quantitative traits.

GEN 591A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

GEN 595. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

GEN 692A-Z. Directed Study. 1-6 Hours.

Directed study, reading and/or research.

GEN 697. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

GEN 724. Cytogenetics. 4 Hours.

PR: GEN 171 or GEN 321. Emphasis on macromolecules that carry information of the chromosomes, cell division, and the cytological and molecular basis of genetics. Special attention given to visible manifestation of genes, human cytogenetics of genomes and chromosome morphology, and their evolution.

GEN 726. Advanced Biochemical Genetics. 3 Hours.

PR: GEN 371 or GEN 521 and organic chemistry. Physiological and biophysical concepts of genetic material. Structure and arrangement of genetic units. Nucleic acids as carriers of genetic information. Gene action and amino acid coding. Biochemical evolution of genetic material. Genetic control mechanisms of mutation.

GEN 727. Genetic Mechanisms of Evolution. 3 Hours.

PR: GEN 371 or equivalent. Molecular genetic mechanisms which result in evolutionary change. Origin of life, origin and organization of genetic variability, differentiation of populations, isolation and speciation, role of hybridization and polyploidy, and origin of man.

GEN 790. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of Genetics. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on assistantships to gain teaching experience. (Grading will be S/U.).

GEN 791A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

GEN 792A-Z. Directed Study. 1-6 Hours.

Directed study, reading and/or research.

GEN 793A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

GEN 794A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

GEN 795. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

GEN 796. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

GEN 797. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

GEN 798. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

GEN 799. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use of the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is P/F; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

GEOGRAPHY COURSES

GEOG 517. Climatological Analysis. 3 Hours.

PR: GEOG 207 or Consent. Statistical analysis and interpretation of climatological data and application to physical and human problems across the globe using user-friendly and programmable tools. (Also listed as GEOG 317.).

GEOG 525. Problems in Geomorphology. 0-4 Hours.

(Also listed as GEOL 525.).

GEOG 550. Geographic Information Science. 4 Hours.

PR: Instructor's permission. Principles and practice of geographical information science. Geospatial data handling for research, planning and decision-making. Spatial analysis, information production, and display.

GEOG 553. Environmental Impact Assessment. 3 Hours.

Study of the process and methods, including GIS, by which the environmental consequences of development actions are assessed and evaluated in advance of their occurrence.

GEOG 591A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

GEOG 594A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

GEOG 600. Geography Research Colloquium. 1 Hour.

PR: Consent. Lectures and presentation on recent and current research by resident and visiting scholars.

GEOG 601. Geographic Traditions. 3 Hours.

PR: Consent. Review of the major approaches in geographic scholarship.

GEOG 602. Geographic Research-Design. 3 Hours.

PR: GEOG 300 and GEOG 601. Choosing, preparing, and developing research problems of geographic interest. Emphasizes proposal writing and research design alternatives.

GEOG 603. Qualitative Research in Geography. 3 Hours.

PR: GEOG 602 or consent. Analysis of qualitative research in geography and related fields. Examine methodological approaches and techniques that explore and interpret issues in the development of geographical research projects.

GEOG 607. Geography of Fire. 3 Hours.

PR: Graduate standing. Course explores spatial science and human environment relations through a review of fire ecology literature. This is a seminar-style course with weekly readings, discussion, and a term project required by each student.

GEOG 612. Gender, Society and Space. 3 Hours.

PR: GEOG 601 or Consent. Examines how gender and feminist perspectives are an integral part of how space is used, distributed, and perceived in society. Overviews of major developments in the field including diversity and difference, representation, identity, and nature.

GEOG 615. Development Geography. 3 Hours.

PR: Consent. An analysis of the concept and practice of development. Alternative people-centered approaches to social change are investigated.

GEOG 621. Advanced Fluvial Geomorphology. 4 Hours.

PR: GEOL 321 or GEOG 321 or Consent. Analysis of stream processes, landforms, deposits, including paleohydrology and Appalachian surficial geology. Required weekend field trips at student's expense. (Also listed as GEOL 621.)

GEOG 622. Surficial and Glacial Geology. 4 Hours.

PR: GEOL 321 or GEOG 321 or Consent. Analysis of late Cenozoic landscapes, especially those caused by glaciers or otherwise influenced by global climate change. Required weekend field trips at student's expense. (Also listed as GEOL 622.)

GEOG 630. Seminar: Land Use and Cover Change. 3 Hours.

Review, discussion, and critique of major scientific approaches to the study of land use and cover change. All world regions and biomes covered. Includes theoretical and technical discussions of change, human dimensions, and policy issues.

GEOG 640. Geopolitical Perspectives. 3 Hours.

This course uses geopolitical perspectives to critically examine the linkages between power and places. Seminal literatures in the sub- field of geopolitics are read and critiqued, including critical geopolitics, feminist geopolitics and post-colonial theory.

GEOG 651. Geographic Information Science: Technical Issues. 3 Hours.

PR: GEOG 350. Current issues in GIS research. Technical aspects of GIS operations, algorithms, theory of geographical data structures, and error handlings. Labs focus on tools, data structures, database languages and macros. (2 hr. lec., 1 hr. lab.)

GEOG 654. Environmental Geographic Information Systems Modeling. 3 Hours.

Provides background and hands-on experience needed to answer scientific questions about the environment within a raster- based GIS Framework. Students should have introductory level GIS background.

GEOG 655. Remote Sensing Principles. 3 Hours.

Mapping of earth features using aerial and satellite-borne sensors, image enhancement, geo-referencing, and classification. (Also listed as GEOL 655.)

GEOG 689. Geography Graduate Student Internship. 1-6 Hours.

PR: Consent. Internship in the private or public sector designed for practical application of geographic training.

GEOG 691A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

GEOG 692A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

GEOG 693A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

GEOG 694A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

GEOG 695. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

GEOG 696. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his her program.

GEOG 697. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/ U.).

GEOG 698. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

GEOG 699. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use of the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is P/F; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

GEOG 701. Advanced Research Methods. 3 Hours.

PR: GEOG 601. Review of quantitative and qualitative methods used in geographic research.

GEOG 711. Regional Development. 3 Hours.

PR: Consent. Review of contemporary geographic theories of uneven spatial development of capitalism.

GEOG 752. Advanced Geographic and Information Science. 3 Hours.

PR: GEOG 452 or GEOG 651 or Consent. Functional strengths and weaknesses of GIS. Related geographical information, science technologies, GPS, remote sensing, multimedia, spatial statistics, and expert systems. Multi-dimensionality (4-D GIS), temporality, social implications of GIS.

GEOG 753. Exploratory Spatial Data Analysis. 3 Hours.

Develop expertise in spatial analytical techniques for use in geographical data analysis and GIS.

GEOG 755. Advanced Remote Sensing. 0-3 Hours.

PR: GEOG 655 or GEOL 655 or consent. Collection, processing, and classification of remotely sensed data, including optical, thermal, radar, and topographic information. (2 hour lecture, 1 hour laboratory.) (Also listed as GEOL 755.)

GEOG 780. Non-Thesis Project. 3 Hours.

Research activities leading to a non-thesis project report.

GEOG 791A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

GEOG 792A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

GEOG 793A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

GEOG 794A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

GEOG 795. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

GEOG 796. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

GEOG 797. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.)

GEOG 930. Professional Development. 1-6 Hours.

Professional Development courses provide skill renewal or enhancement in a professional field or content area (e.g., education, community health, geology). These tuition waived, continuing education courses are graded on a pass/fail grading scale and do not apply as graduate credit toward a degree program.

GEOLOGY COURSES

GEOL 510. Computer Aided Subsurface Interpretations. 3 Hours.

PR: GEOL 311 and GEOL 341. Develop subsurface interpretations from integrated geological, geophysical and engineering databases in a computer workstation environment. Construct maps and 3D visualizations of subsurface structure, seismic horizons, layer properties, etc., for prospect location and subsurface assessment.

GEOL 511. Sedimentary Geology in Ireland. 2 Hours.

PR: GEOL 311. Field course to study the sedimentary rock of Dingle, Ireland- their origin, classification, and economic importance. (Course is an extended field trip during spring break. Student is responsible for all expenses.)

GEOL 511A. Sedimentary Geology in Ireland - Travel. 1 Hour.

Travel portion of GEOL 511. See GEOL 511 for description.

GEOL 522. Surficial and Glacial Geology. 3 Hours.

PR: GEOL 321 or GEOG 321 or consent. Analysis of late Cenozoic landscapes, especially those caused by glaciers or otherwise influenced by global climate change. Required weekend field trips at student's expense. (Also listed as GEOG 522.)

GEOL 525. Problems in Geomorphology. 0-4 Hours.**GEOL 543. Tectonics. 3 Hours.**

PR: GEOL 341 and GEOL 311; undergraduates need Consent. Investigation of patterns and processes of large-scale deformation mechanisms that shape the earth. Focuses on the structural evolution and modeling process of various plate boundaries.

GEOL 554. Environmental and Exploration of Geophysics 2. 3 Hours.

PR: PHYS 102 and (MATH 156 or GEOL 351) or Consent. Basic and applied studies of reflection and refraction seismology and ground penetrating radar methods will be covered with an emphasis on the use of computers in the modeling and interpretation of seismic data.

GEOL 556. 3-D Seismic Visualization. 3 Hours.

This course focuses on the application of 3-D seismic data visualization and interpretation technologies to the characterization of subsurface structure, facies, and reservoirs, with particular reference to hydrocarbon exploration and CO₂ sequestration.

GEOL 558. Seismic Attribute. 3 Hours.

PR: GEOL 341 and GEOL 311 and MATH 155. The effective seismic attribute technologies and attribute interpretation workflows, their application to the characterization of subsurface structures, facies, and reservoir properties, with particular reference to hydrocarbon exploration and CO₂ sequestration.

GEOL 562. Quantitative Hydrogeology. 3 Hours.

PR: MATH 156 or GEOL 351 and GEOL 463 or Consent. Mathematical and computer analysis of groundwater flow, aquifer systems, radial-flow solutions; well/aquifer test methods; superposition, boundaries; dispersive/advective transport.

GEOL 564. Environmental Hydrogeology. 4 Hours.

PR: GEOL 101 and GEOL 102 and GEOL 463 and (PR or CONC: GEOL 562). Seminar reviewing groundwater occurrence, flow, quality, and exploration in various geologic terrains; groundwater pollution and dewatering; and groundwater technology. Includes topical literature review.

GEOL 575. Imperial Barrel Competition. 3 Hours.

The students will participate in the Imperial Barrel Award competition sponsored by the American Association of Petroleum Geologists (AAPG). They will evaluate a real-world petroleum basin using industry seismic and well data and will make a presentation to a panel of professional judges recommending an exploration strategy. Travel to the regional and national AAPG meeting may be required.

GEOL 579. Applied Petroleum Geoscience. 3 Hours.

Students work in teams to conduct integrated characterization of a petroleum reservoir, develop numerical simulation, consider technical options, perform economic analyses and make a final report to the company/organization.

GEOL 580. Organic Contaminant Geochemistry. 3 Hours.

This course focuses on fundamental chemical properties and structures of organic contaminants that control their functionality, fate, and transport in the environment. Natural organic matter and inorganic phases are discussed relative to contaminant mobility.

GEOL 585. Optical Mineralogy and Petrology. 3 Hours.

PR: GEOL 285. Introduction to the optical properties of minerals and the use of the petrographic microscope. Interpretation of sedimentary, igneous, and metamorphic rocks based on microscopic examination of thin sections. (Offered alternate years.).

GEOL 586. Advanced Isotope Geochemistry. 3 Hours.

PR: GEOL 486. Advance the understanding of isotopic systems by comprehensive discussion of selected research publications. Laboratory exercises will provide hands-on training in stable isotope measurement techniques. Study topics will focus on use of isotopes to address research questions in variety of fields, including geology, biology, forensics, environmental sciences and energy.

GEOL 588. Aqueous Geochemistry. 3 Hours.

PR: GEOL 101 and CHEM 112 or CHEM 116, or Consent. Review of basic chemical principles as they apply to aqueous geochemical environments. Properties of water and the types, sources, and controls of the common and environmentally significant chemical species dissolved in water.

GEOL 591A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

GEOL 593A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

GEOL 594A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

GEOL 610. Advanced Stratigraphy. 3 Hours.**GEOL 611. Carbonate Sedimentology. 4 Hours.**

PR: GEOL 331 and GEOL 311. Origin and distribution of modern marine carbonate sediments as models for interpretation of ancient limestone and dolomite facies.

GEOL 615. Stratigraphy of Porous Media. 3 Hours.

PR: GEOL 311. Advanced discussion of the deposition of clastic sediments, chemistry of carbonates, sequence stratigraphy, porosity development in sandstones and limestones, flow of oil through rock.

GEOL 616. Advanced Sedimentation. 4 Hours.

PR: GEOL 311 or Consent. (Required field trips at student's expense.) Origin of sedimentary rocks; principles involved in interpretation of ancient geography, climates, animals, and plants. Emphasis on detrital sediments and rocks.

GEOL 619. Advanced Petroleum Geology. 3 Hours.

Petroleum source rocks, thermal and biogenic maturity, primary and secondary migration of oil, porosity development in reservoirs, permeability. (Required weekend field trip.)

GEOL 621. Advanced Fluvial Geomorphology. 4 Hours.

PR: GEOL 321 or GEOG 321 or Consent. Analysis of stream processes, landforms, deposits, including paleohydrology and Appalachian surficial geology. (Required weekend field trips at student's expense; also listed as GEOG 521.)

GEOL 632. Paleocology. 3 Hours.

PR: GEOL 331 and GEOL 311 or Consent. Methods of paleoecologic analysis in sedimentary geology. Topics include trace fossil analysis, shell biogeochemistry, community paleoecology, biofacies analysis of basins, and Precambrian paleoecology.

GEOL 642. Advanced Structural Geology. 3 Hours.

PR: GEOL 341. Theoretical and observational aspects of the development of geological structures. Problems ranging from the microstructural to the orogenic scale will be addressed.

GEOL 645. Basin Analysis. 3 Hours.

PR: GEOL 341 and GEOL 311 or equivalent. The origin, development, and distribution of basins and the structure found within basins throughout the world are studied. The techniques used for investigating basin evolution are emphasized. The effects of basin processes on the occurrence of energy resources are addressed.

GEOL 655. Remote Sensing Principles. 3 Hours.

Mapping of earth features using aerial and satellite-borne sensors, image enhancement, geo-referencing, and classification. (Also listed as GEOG 655.)

GEOL 659. Quantitative Methods in Geoscience. 3 Hours.

PR: STAT 312 or STAT 511 or Consent. Brief review and introduction to multivariate quantitative techniques as applied to geology and geography.

GEOL 665. Groundwater Modeling. 4 Hours.

PR: GEOL 562 or Consent. Theory and application of groundwater flow modeling, focusing on MODFLOW; numerical methods; discretization and boundaries; parameterization and calibration; problems and case histories.

GEOL 666. Karst Geology. 3 Hours.

PR: Consent. Review of karst terrain hydrogeology and geomorphology, emphasizing origins and nature of caves, sinkholes and other karst landforms, environmental problems of karst, and its water and mineral/ petroleum resources.

GEOL 680. Masters Project Research. 1-5 Hours.

Planning and presentation of a professional project, including proposal, work plan execution, and project report. Status reports and timeline planning. Must be taken in two consecutive semesters, totaling to 6 credits.

GEOL 687. Physical Geochemistry. 3 Hours.

PR: GEOL 285 and CHEM 116. Introduction to thermodynamics and its application to geologic systems. Equilibrium calculations involving pure phases and solutions in gaseous, liquid, and solid states.

GEOL 690. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of geology. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It also provides a mechanism for students not on assistantships to gain teaching experience. (Grading will be P/F.)

GEOL 691A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

GEOL 692A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

GEOL 693A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

GEOL 694A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

GEOL 695. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

GEOL 697. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/ U.)

GEOL 698. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

GEOL 699. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking course work credit, but who wish to meet residence requirements, use the University facilities and participate in its academic and cultural programs. NOTE: Graduate students not actively involved in course work or research or enrolled, through enrollment in his/her departments Graduate Colloquium, to consult with graduate faculty, participate in both formal and informal academic activities sponsored by his/her program and retain all of the rights and privileges of duly enrolled students. Grading is P/F; colloquium credit may not be counted against credit requirements for master's programs.

GEOL 755. Advanced Remote Sensing. 3 Hours.

PR: GEOG 655 or GEOL 655 or consent. Collection, processing and classification of remotely sensed data, including optical, thermal, radar, and topographic information. (2 hour lecture, 1 hour laboratory.) (Also listed as GEOG 755.)

GEOL 790. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of geology. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on assistantships to gain teaching experience. (Grading will be P/F.).

GEOL 791A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

GEOL 794A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

GEOL 795. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

GEOL 796. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

GEOL 798. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

GEOL 799. Graduate Colloquium. 1-6 Hours.

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GEOL 930. Professional Development. 1-6 Hours.

Professional development courses provide skill renewal or enhancement in a professional field or content area (e.g., education, community health, geology). These tuition-waived continuing education courses are graded on a pass/fail grading scale and do not apply as graduate credit toward a degree program.

GERMAN COURSES

GER 590. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of German. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on assistantships to gain teaching experience. (Grading may be S/U.).

GER 591A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

GER 592A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

GER 593A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

GER 594A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

GER 595. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

GER 611. Literary Criticism. 3 Hours.

An introduction to the most important theories within modern literary criticism.

GER 690. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of German. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It also provides a mechanism for students not on assistantships to gain teaching experience. (Grading may be S/U.).

GER 691A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

GER 692A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

GER 693A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

GER 694A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

GER 695. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

GER 696. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

GER 697. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

GER 698. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

GER 699. Graduate Colloquium. 1-6 Hours.

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GER 791A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

GERONTOLOGY COURSES

GERO 512. Public Policy of Aging. 3 Hours.

Policy analysis of public programs for senior citizens - Older Americans Act, Medicare-Medicaid and Social Security. Discussion of future of these programs and societal response. Emphasis on senior programs in West Virginia. (Equivalent to GERO 412).

GERO 628. Aging Women & Cultural Issues. 3 Hours.

This course will use a multi-disciplinary approach to examine the impact of gender, race/ethnicity, and culture on aging, and the aging population.

GERO 629. Survey Methods. 3 Hours.

Students are provided the scientific knowledge and practical skills used in survey research. Focus is on question construction and development, questionnaire design, sampling and survey modes, interviewing techniques and survey data analysis.

GERO 645. Fundamentals of Gerontology. 3 Hours.

This course introduces students to a broad spectrum of topics and issues related to aging by drawing upon several core disciplines and their contributions to the corpus of gerontological knowledge and research.

GERO 681. Rural Gerontology. 3 Hours.

Overview of health, social, and policy issues that impact the quality of life of older adults living in rural environments, contrasted with those in urban areas.

GERO 691A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

GERO 693A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

GERO 695. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

GERO 697. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

GRADUATE ACADEMY COURSES

GRAD 550. Grants and Grantsmanship. 2 Hours.

This course aims at teaching basic concepts and techniques on how to write a competitive grant proposal to any funding agency and maximize chances of being a successful grant seeker.

GRAD 593A-Z. Special Topics. 1-6 Hours.

PR: Consent. A study of contemporary topics selected from recent developments in the field.

GRAD 594A-Z. Seminar. 1-6 Hours.

PR: Consent. Special seminars arranged for advanced graduate students.

GRAD 685. Teaching Capstone. 3 Hours.

Students will apply principles of effective course design to create a comprehensive teaching portfolio for the higher education job market. Fulfills the capstone requirement for the Certificate in University Teaching.

GRAD 690. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of graduate academy. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It also provides a mechanism for students not on assistantships to gain teaching experience. (Grading will be S/U.)

GRAD 693A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

GRAD 694A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

GRAD 695. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

GRAD 710. Scholarly Teaching. 3 Hours.

Graduate study of the theory and practice of teaching. Students will experience and create teaching materials employing strategies for active learning, assessment, and consider diversity of learning styles.

GRAD 794A-Z. Seminar. 1-6 Hours.

Special Seminars arranged for advanced graduate students.

HEALTH POLICY, MANAGEMENT AND LEADERSHIP COURSES

HPML 601. Foundations of Health and Policy. 3 Hours.

Students acquire a fundamental understanding of current health policy as well as the policy making system. Students will learn how health policy is made in the larger context of social structures and social choices.

HPML 610. Health Economics for Population Health. 3 Hours.

PR: BIOS 601 and HPML 601. Students acquire fundamental knowledge of health economics and economic approaches and methodologies to analyze critical issues in health care and health policy.

HPML 620. Public Health Leadership and Management 1. 3 Hours.

Students gain a foundation in the principles of leadership and management for public health and health care settings. Topics addressed include aspects of both strategic planning and human resources.

HPML 622. Analytic Methods for Health Policy, Management and Leadership. 3 Hours.

PR: BIOS 601 and HPML 601. Students acquire a foundation in essential evaluation approaches and methods needed as professionals in health policy, management, and leadership including policy analysis, health services research, program evaluation, and decision analysis.

HPML 624. Policy Tools for Population Health. 3 Hours.

Students advance their proficiency and ability to understand the policy system and work successfully within it to develop and advance evidence-based policy alternatives in order to improve population health.

HPML 626. Internship. 1-6 Hours.

(May be repeated for a maximum of 6 credit hours.) The internship provides students the opportunity to develop their practical skills and enhance professional competencies by applying the knowledge and techniques gained from their MPH coursework to public health practice.

HPML 629. Capstone. 3 Hours.

PR: PUBH 622. A required course for HPML students, this course is to be taken in the last semester of study. Students are required to demonstrate the ability to synthesize and integrate knowledge and competencies across the full breadth of the MPH-HPML curriculum.

HPML 660. Methods for Health Services Research 1. 3 Hours.

PR: BIOS 601 and HPML 622. Students acquire proficiency in health services research methodologies used to assess how health care services are organized, financed, assessed and delivered, and how these arrangements affect health care quality and outcomes, and population health.

HPML 661. Health Services Research Informatics. 3 Hours.

This course provides students with the applied practical understanding of and skills needed to access and use health care information systems used in performing health services research analysis.

HPML 670. Policy Analysis for Population Health 1. 3 Hours.

PR: BIOS 601 and HPML 601 and HPML 622. This course provides students an intermediate understanding of policy analysis approaches during the formation, implementation, and outcome stages of a policy's lifespan. A wide variety of healthcare and public health policies will be analyzed.

HPML 671. Population Health Policy Analysis Informatics 1. 3 Hours.

PR: BIOS 601 and HPML 601 and HPML 622. This course provides students with the applied practical understanding of and skills needed to access and use public health and policy information systems used in performing health policy analysis.

HPML 672. Global Health Policy. 3 Hours.

Using a health equity and social justice perspective, students will examine the major health issues facing the global health community, including health disparities, and the international institutions and policies developed to address these global health challenges.

HPML 675. Healthcare and Insurance Policy: Medicaid, Medicare, and the Affordable Care Act. 3 Hours.

Students will attain a thorough understanding of Medicaid, Medicare, and other healthcare delivery systems in the United States, with special attention paid to issues of Federalism, financing, and the political nature of health insurance delivery systems. The massive Patient Protection and Affordable Care Act legislation and its effect on the healthcare system in the United States will also be examined.

HPML 680. Performance and Economic Evaluation for Public Health. 3 Hours.

This course presents methods to demonstrate the business merit and worth of public health programs or policies. These commonly used techniques include measuring business performance, developing business case arguments, and performing economic evaluations.

HPML 681. Applied Health Care Leadership. 3 Hours.

An exploration of topics related to the theory and practice of leadership and activities designed to develop effective leadership skills that can be applied in both the healthcare management profession and society in general.

HPML 682. Managing Quality Improvement in Healthcare. 3 Hours.

Introduces students to the latest healthcare quality and patient safety improvement thinking through didactic sessions, interactive exercises and case studies with direct relevance for public health practitioners, healthcare administrators or clinicians. Examines healthcare quality and patient safety from a strategic viewpoint to make healthcare administrators effective decision makers. Provides students necessary theoretical knowledge to obtain a Six Sigma green belt.

HPML 683. Ethical Leadership in Public Health. 3 Hours.

Students will explore contemporary theory on both leadership and ethics and apply these to Public Health service.

HPML 691A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation in advanced topics that are not covered in regularly scheduled courses.

HPML 695. Independent Study. 1-6 Hours.

Faculty-supervised study of topics not available through regular course offerings.

HPML 696. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

HIGHER EDUCATION ADMINISTRATION COURSES**HIED 648. History of American Higher Education. 3 Hours.**

The administrative development of American higher education from 1636 to the present, including internal trends and external forces.

HIED 649. Contemporary Issues in Higher Education. 3 Hours.

The purpose of this course is to explore critical, contemporary challenges facing American higher education. The course explores issues of access, accountability, academic freedom, financial aid, state and federal government policy, changing legal structures, teaching and learning in a digital age, student issues, diversity, and the influence of business models and values on institutional strategy and practice.

HIED 650. Higher Education Administration. 3 Hours.

Key concepts of organization and administration within higher education institutions, concentrating primarily on the non-academic components of the institutions, from the president to first-level supervisor.

HIED 651. College Student Development. 3 Hours.

Review of research and literature on college student development from beginning freshmen through graduate school. Emphasis on different student subgroups.

HIED 652. Assessment in Higher Education. 3 Hours.

Critical analysis of contemporary assessment issues; develop sophisticated plans to evaluate the quality of student learning and growth in academic programs and student affairs.

HIED 653. College Students and Courts. 3 Hours.

PR: Consent. A study of the major areas of higher education law from the perspective of the college student. A case study approach.

HIED 654. College Student Affairs. 3 Hours.

PR: Consent. A study of the organization, administrative functioning components, issues, and models of college student services using a historical and topical approach.

HIED 655. Institutional Advancement. 3 Hours.

PR: Consent. Studies in fund raising, alumni relations, and foundation management.

HIED 656. Higher Education Budget and Planning. 3 Hours.

Covers knowledge of such areas as budgeting systems, budget preparation and administration, resource reduction and reallocation, and grants/contracts preparation and administration.

HIED 657. Community College Leadership. 3 Hours.

An analysis of the historical/philosophical development of community colleges in the US. A specific focus on developing a critical understanding of the administrative and leadership issues.

HIED 693A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

HIED 751. Academic Affairs Roles. 3 Hours.

PR: Consent. Management, leadership, and administrative roles of academic affairs offices in colleges and universities including academic personnel, program definition, research and teaching issues, and other functions of academic oversight.

HIED 752. Governance of Higher Education. 3 Hours.

PR: Consent. Formulation and implementation of state master plans and the roles of state governing bodies in public and private institutions.

HIED 753. Adult and Continuing Education. 3 Hours.

Principles, concepts, and processes involved in programming for adults in a community setting. Nature of adult learning, subject matter, and learning environment.

HIED 755. Higher Education Law. 3 Hours.

Critical legal issues of higher education, public and private, using a case study approach.

HIED 756. Higher Education Finance. 3 Hours.

Financial concerns in higher education with emphasis on taxation and legislative actions, sources of income, budgeting, and cost analysis.

HIED 759. Assessment Research in Higher Education. 3 Hours.

Students review an array of instruments designed to assess college students' perceptions, satisfaction, and learning. They will also critique these instruments to determine their quality.

HIED 760. Curriculum Development and Reform in Higher Education. 3 Hours.

Analyze curriculum development and implementation issues. Critique different curriculum designs in general education and major academic programs also.

HIED 762. College Student Research in Higher Education. 3 Hours.

Students will critique research articles pertaining to college student development and conduct research investigating a subpopulation's development.

HIED 790. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of HIED. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It also provides a mechanism for students not on assistantships to gain teaching experience.

HIED 797. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis(698), problem report (698), research paper or equivalent scholarly project (698), or dissertation (798).

HIED 798. Dissertation. 1-6 Hours.

PR: Consent. Note: this is an optional course for programs that believe that this level of control and supervision is needed during the writing of students' reports (698), theses(698), or dissertations (798).

HISTORY COURSES**HIST 517. German Central Europe: Empires, States and Nations, 1648-1900. 3 Hours.**

Explores the Habsburg Monarchy and Holy Roman Empire, following devastation of 30 years of War, Enlightenment and State-building, Industrialization and Nation-building until the eve of the Great War.

HIST 518. Twentieth Century German Central Europe. 3 Hours.

Explores the two World Wars, Holocaust, the Cold War, National Socialist, Communist, and Democratic regimes and Austria as well as the reunification of Germany following Revolutions of 1989.

HIST 525. History of Modern China. 3 Hours.

Provides an overview of Chinese history with an emphasis on major events since the mid-19th century, placed in a broad context of the important political, economic, social, and diplomatic events in China's historic past.

HIST 526. History of Modern Japan. 3 Hours.

Provides an overview of Japanese history with an emphasis on major events since the mid-19th century, placed in a broad context of the important political, economic, social, and diplomatic events in Japan's historic past.

HIST 550. West Virginia History. 3 Hours.

Elective course for public history graduate students and cultural resource management students.

HIST 558. United States Cultural History 1819-1893. 3 Hours.

Examines the cultural panics about identity and sensibility produced by capitalism, slavery, and war in the nineteenth-century United States.

HIST 575. Hollywood and History. 3 Hours.

Examines twentieth century American culture, politics and society through film. It explores the relationship between film and history, using films as primary sources for understanding the past and it examines how film is used in teaching history.

HIST 593A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

HIST 600. Cultural Resource Management. 3 Hours.

PR: Consent. Explores principles and practices of managing cultural and material historic resources, with an overview of best practices, federal requirements, and fundamental skills expected of the practitioner.

HIST 610. Historic Site Interpretation. 3 Hours.

Introduction to the craft of historic site interpretation. Readings, lectures, and field trips will explore current issues, approaches to developing meaningful experiences for visitors, and the transmission of culture through historic places.

HIST 611. Archival Management. 3 Hours.

PR: HIST 412. Principles and practices of archival work within a laboratory context. Includes lectures and selected readings illustrated by holdings and policies of West Virginia and Regional History Collection of the WVU Library.

HIST 613. Local History Research Methodology. 3 Hours.

Emphasis on research methods applicable to any locality; includes legal records, oral records, secondary sources, photographs, maps, and government documents.

HIST 614. Internship in Public History. 1-6 Hours.

PR: Consent. A professional internship at a historical agency. Supervision is exercised by history department faculty and the host agency. Written and oral research report required. (Grading may be P/F.).

HIST 615. Museum Studies. 3 Hours.

Introduction to museum management and curation of collections of historic or archaeological significance. Students will learn the basic skills necessary to work with and use museum collections.

HIST 616. History of American Architecture. 3 Hours.

Overview of American architecture and architectural styles to enable students to correctly identify building styles in the field.

HIST 619. Understanding Preservation Law. 3 Hours.

Overview of legal issues and federal regulations and guidelines in the practice of historic preservation.

HIST 620. Practicum in Cultural Resource Management. 3 Hours.

Professional placement or scholarly research project designed to be the capstone experience for students in the CRM graduate certificate program. Placement is tailored to the area of student interest.

HIST 691A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

HIST 693A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

HIST 697. Research. 1-15 Hours.

PR: Consent. Research activities leading to a thesis, PR, problem report, research paper, or equivalent scholarly project, or dissertation. (Grading may be S/U.).

HIST 700. Historiography. 3 Hours.

Core course for entering graduate students: critical survey of important contemporary approaches to history writing, methodological practices, and current issues in the field.

HIST 701. Readings in Medieval History. 3-6 Hours.

Examination of the literature, bibliography, sources, and research methods on selected problems in medieval history, using discussion and written reports on assigned readings. (May be repeated for a maximum of 6 hours.).

HIST 702. Seminar in Medieval History. 3 Hours.

PR: HIST 701; (Reading knowledge of Latin and a modern European language strongly recommended.) Directed examination of bibliographic sources and historiographical issues on selected aspects of the Middle Ages, leading to preparation of a research paper based on primary sources.

HIST 705. Readings in Early Modern History 3 Hr. 3 Hours.

Directed readings on selected major historiographical themes in European history relating to the period from the Renaissance to the French Revolution.

HIST 706. Seminar in Early Modern History. 3 Hours.

Research and writing of an article-length paper based on extensive and/or in-depth analysis of early modern primary sources. Class presentations and discussions of colleagues' work.

HIST 708. Readings In Central European History. 3-6 Hours.

All students will read and discuss selected works illustrating outstanding scholarship or interpretative problems related to modern Central European History. Opportunity will be also provided for individual reading projects. (May be repeated once).

HIST 709. Seminar in Central European History. 3 Hours.

An intensive survey of the bibliographical aids and printed source materials available in the field. A research paper and a bibliographical essay will be presented by each student. Reading knowledge of German and French strongly recommended. (May be repeated once.).

HIST 714. Readings in Eastern European History. 3-6 Hours.

Intensive readings on specific topics in Russian, Soviet or East European history. Students should normally have had History 217 and 218, or their equivalents. Primarily designed for graduate students and selected undergraduates.

HIST 715. Seminar In Eastern European History. 3 Hours.

PR: HIST 117, 118 or equivalent. Research seminar on selected topics in Russian, Soviet, or Eastern European history. One major paper and extensive reading based on available source materials is required. (May be repeated once.).

HIST 717. Readings In Western European History. 3 Hours.

This course, primarily for graduate students and selected undergraduates, is designed for an intensive reading program on special problems in western European history. (May be repeated once.).

HIST 718. Seminar in Western European History. 3 Hours.

A research seminar in selected topics in western European history. One major paper and extensive reading based on available source material is required. A reading knowledge of the appropriate language is required, if applicable.

HIST 721. Readings in Asian History. 3 Hours.

Intensive readings in the history of East Asia (especially China and Japan) since the nineteenth century; students should normally have had HIST 425 and 426, or their equivalents; reviews, as well as bibliographical and historiographical essays, required. (May be repeated once.).

HIST 722. Seminar in Asian History. 3 Hours.

Advanced readings in East Asian history; specific emphasis on research tools and techniques; research paper based on English-language sources required; students should normally have had HIST 425 and 426 or their equivalents. (May be repeated once.).

HIST 725. Readings in African History. 3 Hours.

This course will normally focus on readings and discussion on problems in the history of pre-colonial Africa, the major works in African history, and recent interpretations in the field. (May be repeated once.).

HIST 726. Seminar in African History. 3 Hours.

The seminar will normally focus on eastern Africa in the colonial period. Location and use of source materials will be emphasized as well as economic and political developments. Students will spend considerable time in research and writing on selected aspects of eastern African history. (May be repeated once.).

HIST 729. Readings in Latin American History. 3 Hours.

Critical examination of selected sources and topics for understanding and interpreting Latin American history. (May be repeated once.).

HIST 730. Seminar In Latin American History. 3 Hours.

PR: Consent. Survey of Latin American historiography, location and use of primary source materials, discussion of research techniques, and the writing of a research paper. Reading knowledge of Spanish, Portuguese, or French will be helpful. (May be repeated once.).

HIST 731. Readings In American History: 1585-1763. 3 Hours.

Supervised readings and reports designed to prepare students for intensive study in a seminar or for field examinations in colonial American history. (May be repeated once.).

HIST 732. Seminar in American History: 1585-1763. 3 Hours.

PR: HIST 331 or consent. Directed research on colonial American history, using original and secondary materials. (May be repeated once.).

HIST 750. Public History Methods. 3 Hours.

This course provides the foundations of public history as students examine approaches to historical interpretation for public audiences. Topics will include client-driven research, commemoration, and cultural heritage tourism.

HIST 755. Readings in American History: 1763-1800. 3 Hours.

Readings and reports designed to prepare students for an intensive study in a seminar or field examination. (May be repeated once.).

HIST 756. Seminar In American History: 1763-1830. 3 Hours.

PR: HIST 755 or consent. Advanced readings and research in revolutionary and early national American history. (May be repeated once.).

HIST 757. Readings in United States History: 1787-1850. 3 Hours.

Critical examination of major works and themes on the political, economic, social, and legal formation of the nation. (May be repeated once.) (Alternate years.).

HIST 758. Seminar in United States History: 1787-1850. 3 Hours.

Directed research in early United States history. Research will include primary and secondary sources. (May be repeated once.) (Alternate years.).

HIST 759. Readings in United States History: 1840-1898. 3 Hours.

Survey of interpretative literature on Sectionalism, Civil War, Reconstruction and Gilded Age. Assignments are both oral and written reports on assigned readings and a critical essay on some aspect of American historiography for this period.

HIST 760. Seminar in United States History: 1850-1898. 3 Hours.

Directed research in mid-and late 19th century American history, including guidance in methods of research and manuscript preparation. (May be repeated once.)

HIST 763. Readings in United States History: 1898-Present. 3 Hours.

Readings and class-led discussion of one paperback book per week, and preparation of a paper based on these books and the class discussion of them. (Course may be repeated for credit.)

HIST 764. Seminar in United States History: 1898-Present. 3 Hours.

Directed research in recent American history including guidance in methods of research and manuscript preparation. May be repeated once.

HIST 765. Readings in United States Diplomatic History. 3 Hours.

Readings in U.S. Diplomatic History with an emphasis on the 20th century.

HIST 766. Seminar in United States Diplomatic History. 3 Hours.

Directed research in the history of U.S. foreign policy with emphasis on 20th century including guidance in methods of research and manuscript preparation.

HIST 773. Readings in Appalachian Regional History. 3 Hours.

A course for graduate students and seniors in the history of West Virginia and neighboring states, which form what is known as the Trans-Allegheny or Upper Ohio region. (May be repeated once.)

HIST 774. Seminar in Appalachian Regional History. 3 Hours.

A seminar for graduate students in the history of West Virginia and neighboring states, which form what is known as the Trans-Allegheny or Upper Ohio region. (May be repeated once.)

HIST 775. Readings in Science and Technology. 3-6 Hours.

Examination of the literature, bibliography, and sources on selected topics in the history of science and technology. Class discussions and written reports on assigned topics. (Course may be repeated for credit.)

HIST 776. Seminar in Science and Technology. 3 Hours.

PR: HIST 775 or consent. Research seminar in the history of science and technology. Discussion of methods and sources; presentation and critique of research papers based on primary sources. (Course may be repeated for credit.)

HIST 782. Readings in United States Social History. 3 Hours.

The objective of the course is to establish for graduate students usable frames of reference for selected topics in social history by examining the ways in which historians have written about these topics. (Course may be repeated for credit.)

HIST 785. Readings in Environmental History. 3 Hours.

Examines broad themes including settlement patterns, attitudes toward nature, the rise of ecological science, and agricultural and industrial practices. Explores historiographical and methodological issues. (May be repeated once.) (Alternate years.)

HIST 786. Seminar in Environmental History. 3 Hours.

Directed research involving primary and secondary sources. Will focus on regional case studies and examination of broad intellectual and policy themes. (May be repeated once.) (Alternate years.)

HIST 787. Readings in World History. 3 Hours.

Core course for teaching concentration in world history; review of selected exemplary and recent readings in world history; evaluation of textbooks and teaching materials; composition of syllabi, lectures, and assignments.

HIST 790. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practices in college teaching of history. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibilities. It will also present a mechanism for students not on assistantships to gain teaching experience. (Grading will be P/F.)

HIST 791A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

HIST 792A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

HIST 793A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

HIST 794A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

HIST 795. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

HIST 796. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

HIST 797. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or dissertation. (Grading may be S/U.).

HIST 798. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

HIST 799. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use of the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is P/F; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

HIST 900. Professional Development. 1-6 Hours.

Professional development courses provide skill renewal or enhancement in a professional field or content area (e.g., education, community health, geology). The continuing education courses are graded on a pass/fail grading scale and do not apply as graduate credit toward a degree program.

HIST 930. Professional Development. 1-6 Hours.

Professional development courses provide skill renewal or enhancement in a professional field or content area (e.g., education, community health, geology). These tuition-waived continuing education courses are graded on pass/fail grading scale and do not apply as graduate credit toward a degree program.

HORTICULTURE COURSES

HORT 590. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of Horticulture. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on assistantships to gain teaching experience. (Grading will be S/U.).

HORT 791A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

HORT 793A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

HORT 796. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

HORT 797. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

HUMAN NUTRITION AND FOODS COURSES

HN&F 512. Maternal and Child Nutrition. 3 Hours.

PR: Consent. Physiological changes and nutritional requirements during pregnancy and lactation. Effects of growth and development on nutritional requirements during infancy, childhood and adolescence.

HN&F 592A-Z. Directed Study. 1-6 Hours.

Directed study, reading and/or research.

HN&F 593A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

HN&F 610. Nutrition and Fitness. 3 Hours.

PR: HN&F 171 or equivalent. Upon completion of this course the student will understand the physiological and metabolic changes that occur during physical activity and the ways in which those changes alter nutritional requirements.

HN&F 612. Maternal and Child Nutrition. 3 Hours.

PR: College level course in nutrition. Physiological changes and nutritional requirement during pregnancy and lactation. Effects of growth and development on nutritional requirements during infancy, childhood, and adolescence.

HN&F 614. Nutrition/Disease Prevention. 3 Hours.

This graduate level course covers the role of nutrition in the pathophysiology of chronic diseases, critical analysis, and translation of research into dietary recommendations for the prevention/treatment of chronic diseases.

HN&F 670. Human Nutrition Concepts and Application. 3 Hours.

PR: HN&F 460 or equivalent, and consent. Critical study of the nutrient evaluation methods and the nutrient requirements of the human in health and disease, and scope of its application.

HN&F 691A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

HN&F 692A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

HN&F 693A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

HN&F 695. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

HN&F 696. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

HN&F 697. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

HN&F 699. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use the University's facilities, and participate in its academic and cultural programs. NOTE Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium, to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is P/F; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

HN&F 900. Professional Development. 1-6 Hours.

Professional development courses provide skill renewal or enhancement in a professional field or content area (e.g. education, community health, geology). These continuing education courses are graded on a pass/fail grading scale and do not apply as graduate credit toward a degree program.

HN&F 930. Professional Development. 1-6 Hours.

Professional development courses provide skill renewal or enhancement in a professional field or content area (e.g. education, community health, geology). These tuition-waived continuing education courses are graded on a pass/fail grading scale and do not apply as graduate credit toward a degree program.

HUMANITIES COURSES

HUM 591A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

INDUSTRIAL ENGINEERING COURSES

IENG 502. Advanced Manufacturing Processes. 3 Hours.

PR: IENG 302 and IENG 303. Metal cutting economic models, solidification processes, bulk deformation, sheet metal and drawing, joining design, and economics. Overall view of manufacturing systems. Introduction to numerical control programming and projects on numerical control equipment.

IENG 505. Computer Integrated Manufacturing. 3 Hours.

PR: Graduate standing. Several aspects of computerized manufacturing systems will be covered. Emphasis will be placed on computer fundamentals, computer-aided design and manufacturing, numerically- controlled (NC) machine tools, part programming, system devices, and direct digital control. (2 hr. lec., 1 hr. lab.).

IENG 506. Computer Aided Process Planning. 3 Hours.

PR: Consent. Computer aided process planning for manufacturing applications; selection of processes and parameters; machining, casting, and forming; development of process plans from design data; and analysis of effect of changes in design on manufacturability in concurrent engineering.

IENG 507. Robotics and Flexible Automation. 3 Hours.

PR: Graduate standing. This course will provide an understanding of the principles, capabilities, and limitations of industrial robots and other flexible automation tools. Emphasis will be placed on kinematic analysis, trajectory planning, machine vision, and manufacturing automation. (2 hr. lec., 1 hr. lab.).

IENG 508. Advanced Problems in Manufacturing Engineering. 1-3 Hours.

PR: IENG 593 or IENG 502; Graduate standing. Special problems relating to one of the areas of manufacturing engineering, such as manufacturing processes, robotics, CAD/CAM, group technology, and manufacturing systems engineering.

IENG 514. Design of Industrial Experiments. 3 Hours.

PR: IENG 314 or Consent. Continuation of IENG 314. More complex experimental design especially useful to engineering and industrial researchers, including factorials and optimum-seeking design. Emphasis on use of existing digital computer routines and interpretation of results.

IENG 518. Technology Forecasting. 3 Hours.

PR: IENG 213 or Consent. Various procedures used in forecasting technical developments.

IENG 542. Advanced Production Control. 3 Hours.

PR: IENG 350. Different mathematical models useful in the design of effective production control systems. The various models include: static production control models under risk and uncertainty, dynamic models under certainty, and under risk.

IENG 551. Quality and Reliability Engineering. 3 Hours.

PR: Graduate standing. Introduction to quality and reliability engineering. Special emphasis on Taguchi Design and Markov Models for determining system reliability and availability.

IENG 553. Applied Linear Programming. 3 Hours.

PR: IENG 350 or Consent. Application of the assignment, transportation, and simplex algorithms to typical industrial problems. The methods and computational efficiencies of the revised simplex and other algorithms are also studied.

IENG 554. Applied Integer/Heuristic Programs. 3 Hours.

PR: IENG 350 or IENG 553 and knowledge of a computer programming language. Applications of integer and heuristic programming techniques for solving combinatorial optimization problems. Topics include computational complexity, relaxations, branch and bound, cutting planes, simulated annealing, tabu search, and genetic algorithms.

IENG 555. Scheduling and Sequencing Methods. 3 Hours.

PR: IENG 350. Theory and applications of analytical models used in the scheduling models; flow shop models; job shop models; and assembly line balancing methods.

IENG 556. Supply Chain Management. 3 Hours.

PR: IENG 350 or IENG 553. Principles and methods for designing and managing supply chain systems. Topics include: forecasting demand, strategies, aggregate planning, inventory control, outsourcing, transportation networks, and locating facilities within the supply chain network.

IENG 557. Geometric Programming. 3 Hours.

PR: IENG 350 or Consent. Introduction to the primal and dual solution techniques for geometric programming problems. Focus on the development of design relationships for cost optimization or profit maximization problems.

IENG 561. Industrial Hygiene Engineering. 3 Hours.

Introductory course in industrial hygiene with laboratory. Topics include: recognition, evaluation, and control of occupational and environmental contaminants and physical agents; basic IH quantitative analysis; PPE selection and evaluation.

IENG 564. Industrial Ergonomics. 3 Hours.

PR: IENG 360 or Consent. Practical experience in the application of ergonomic principles to industrial problems. Safety and production implications of work physiology, industrial biomechanics, and circadian rhythms, as well as current interest topics.

IENG 577. Advanced Engineering Economy. 3 Hours.

PR: IENG 377 or Consent. Special emphasis on depreciation, engineering and economic aspects of selection and replacement of equipment; relationship of technical economy to income taxation; and effect of borrowed capital and project cost control.

IENG 578. Costing and Estimating. 3 Hours.

PR: IENG 377 or Consent. Analysis of overhead, cost indexes, cost capacity factors; improvement curves; costing for materials with design considerations, conceptual cost estimating; costing for machining, joining, casting and forming; and facility cost estimation.

IENG 593A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

IENG 660. Human Factors System Design. 3 Hours.

PR: IENG 360 or Consent. Theoretical aspects and practical applications of man/machine relationships as they influence future system design. The student will examine human limitations with respect to acceptance of information, decision making, and ability to transmit the result of such decisions to controlled equipment systems to obtain design optimization. (2 hr. lec., 3 hr. lab.).

IENG 662. Systems Safety Engineering. 3 Hours.

PR: IENG 461 or Consent. Analysis of manufacturing methods, processes, and properties of materials from a system safety engineering viewpoint. Emphasis will be on hazard analysis techniques (fault tree, MORT, failure modes, and effects) and machine guarding methods.

IENG 668. Advanced Problems in Human Factors. 1-3 Hours.

PR: IENG 360 or IENG 660 and graduate standing. Special problems relating to one of the areas of human factors, such as ventilation, ergonomics, controls, vigilance, safety, and occupational health.

IENG 691A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

IENG 693A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

IENG 695. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

IENG 697. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

IENG 698. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

IENG 754. Inventory Theory. 3 Hours.

PR: IENG 213 and IENG 350 or Consent. Techniques used in optimization of inventory systems. Elements of static, deterministic inventory models, and static, stochastic inventory models. Selected inventory models. Selected topics related to inventory analysis.

IENG 756. Applied Stochastic Processes. 3 Hours.

PR: Consent. Stochastic systems with emphasis on application to inventory and queueing theory. Conditional probability, Poisson processes, renewal processes, Markov chains with discrete and continuous parameters.

IENG 790. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of industrial and management systems engineering. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on assistantships to gain teaching experience. (Grading will be S/U.).

IENG 791A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

IENG 792A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

IENG 793A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

IENG 794A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

IENG 795. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

IENG 796. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

IENG 797. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

IENG 798. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

IENG 799. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is S/U; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

INDUSTRIAL HYGIENE SAFETY COURSES**IH&S 527. Noise Measurement and Control. 3 Hours.**

PR: Senior or graduate standing. Includes noise physics, effects of noise on hearing and well-being, noise exposure regulations, and engineering of noise control. Practical experience with noise dosimeters and sound level meters is provided by a field trip.

IH&S 528. Industrial Ventilation Design. 3 Hours.

PR: Senior or graduate standing. Design of industrial exhaust ventilation for contaminant control. Includes dilution ventilation, hood design, duct system design, selection of fans and air-cleaning devices, and measurement of flows and pressures.

IH&S 627. Industrial Hygiene-Noise Assessment and Control. 3 Hours.

PR: Consent. Industrial hygiene aspects of assessing and controlling noise induced hearing loss. Practical experience with noise dosimeters, sound-level meters and instrumentation used to assess human noise exposure is provided by field trips and case studies.

IH&S 628. Ventilation Control Technology. 3 Hours.

PR: IMSE 561 or consent. The course will demonstrate techniques for the recognition, evaluation, and control of noise and ventilation problems. Students will use monitoring equipment to evaluate situations and perform several design projects.

IH&S 685. Internship. 3-6 Hours.

PR: Consent. (May be repeated) Professional internship providing on-the-job training under supervision of a previously approved environmentalist in settings appropriate to professional objectives.

IH&S 691A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

IH&S 692A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

IH&S 693A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

IH&S 694A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

IH&S 695. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

IH&S 696. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

IH&S 697. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

IH&S 698. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

IH&S 699. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is S/U; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

IH&S 725. Industrial Hygiene Sampling and Analysis. 4 Hours.

PR: IENG 561 and Consent. Calibration and use of sampling and analytical equipment used by industrial hygienists to evaluate the work environment. Advantages and disadvantages of different equipment under various conditions. Biological monitoring as an evaluation tool.

IH&S 797. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

INDUSTRIAL AND LABOR RELATIONS COURSES**ILR 505. Employment Law. 3 Hours.**

Survey of the legal principles guiding the employer-employee relationship. Examines laws regulating hiring, job opportunity, discrimination, affirmative action, sexual harassment, wages, benefits, privacy right, health, safety, employment at will, layoffs and termination.

ILR 506. Performance Management. 3 Hours.

Development of individual employees in an organization; performance evaluation, discipline of problem employees, identifying training needs, and design and delivery of training programs.

ILR 507. Conflict Management Processes. 3 Hours.

Sources of conflict in the workplace and processes utilized to deal with that conflict. Theories of conflict management, industry practices, and specific techniques for productive channeling of conflict. Significant experiential component.

ILR 508. Organizational Change and Renewal. 3 Hours.

Organizational evolution as a result of multiple change process, including employee involvement, empowerment, high performance organizations, process consulting, and goal setting. Emphasis on organizational and union relationships.

ILR 509. Talent Acquisition. 3 Hours.

Theoretical, practical, and legal issues involved in talent acquisitions in organizations: human resource planning, recruiting, staffing models, employment testing, statistical analysis, legal issues, and selection methods.

ILR 511. Human Capital Management. 3 Hours.

Overview of many issues related to managing human capital in organizations, examined from both a strategic and tactical level relevant to all practicing managers and future leaders.

ILR 520. Human Resource Information Systems. 3 Hours.

Use of computers for human resource management; HRIS planning, development and implementation, evaluating existing software; development of a database unique to human resource management.

ILR 522. International Industrial Relations. 3 Hours.

Analyzes the human resource and labor relations practices of firms and economies as they relate to the global market; basis of international business, legal/governmental environmental, labor movements, and industrial relations practices.

ILR 530. Compensation Issues. 3 Hours.

Seminar in compensation designed to develop further understanding of compensation theory and practice. Topic areas will include labor supply, wage theory, legal constraints, motivation, equity theory, organizational development as well as compensation structure and administration.

ILR 534. Work Group Dynamics and Leadership. 3 Hours.

Small group or individual research on topics related to leadership and group dynamics in the work environment including training and other human relations programs.

ILR 537. Practicum in Industrial Interviewing. 3 Hours.

Experiential learning of industrial interviewing techniques covering legal and technical aspects of employment interviewing and other types of interviewing.

ILR 540. Arbitration Theory and Practice. 3 Hours.

PR: Consent. Study of the purpose of arbitration, trends, principles of contract construction, hearing procedure evidence, remedies, training and education of arbitrators, training of advocates, and decision writing. Students will arbitrate mock cases.

ILR 543. Negotiation Strategy. 3 Hours.

Theory and practice of both principled negotiations and position bargaining; extensive role play and technique building exercises for individual and team negotiations; detailed preparation methods for all types of personal and professional negotiations.

ILR 544. Benefits Management. 3 Hours.

Considers employee benefits from the perspective of the industrial relations specialist who is responsible for articulating and administering a corporate program. Includes study of all benefits covered by major federal legislation.

ILR 545. Equal Employment Opportunity. 3 Hours.

A series of lectures by specialists in equal employment opportunity affairs. Lectures will include attorneys, directors of state and national EEO agencies, and representatives of business and industry and the labor movement.

ILR 546. Training and Development. 3 Hours.

Survey of the domain and issues of the field of training and development and practical approach to designing and conducting training and development programs. Topics include both scientific issues and applied issues.

ILR 548. Strategic Management for Human Resources. 3 Hours.

Stages and types of strategies; Formulation and implementation of strategies; human resource aspects of planning and strategic assessment; extensive case analysis and team projects.

ILR 549. Advanced Strategic Management. 3 Hours.

This is a case-based course. Case analyses and discussion will focus on the concepts of strategy creation, organization alignment strategy implementation and strategy leverage.

ILR 562. Labor Relations. 3 Hours.

Examination of the theory and practice of labor relations and collective bargaining. Topics include economic and historical environment, labor law, unionization, contract negotiation, patterns in contract content, conflict resolution, grievance handling, and an introduction to arbitration.

ILR 571. Human Resource/Industrial Relations Practicum 1. 1 Hour.

PR: Enrollment in the MS Industrial Relations program or consent. The first course in a series of four required one-credit hour courses that offers practicum experiences, delivers professional development opportunities, and provides exposure to contemporary topics in the field of HR/IR, (e.g., teambuilding, diversity issues).

ILR 572. Human Resource/Industrial Relations Practicum 2. 1 Hour.

PR: Enrollment in the MS Industrial Relations program or consent. The second course in a series of four required one credit hour courses that offers practicum experiences, delivers professional development opportunities, and provides exposure to contemporary topics in the field of HR/IR (e.g., HR investigations, performance management systems).

ILR 573. Human Resource/Industrial Relations Practicum 3. 1 Hour.

PR: Enrollment in the MS Industrial Relations program or consent. The third course in a series of four required one credit hour courses that offers practicum experiences, delivers professional development opportunities and provides exposure to contemporary topics in the field of HR/IR (e.g., outsourcing the HR function, HR impact on mergers and acquisitions).

ILR 574. Human Resource/Industrial Relations Practicum 4. 1 Hour.

PR: Enrollment in the MS Industrial Relations program or consent. The fourth course in a series of four required one credit hour courses that offers practicum experiences, delivers professional development opportunities, and provides exposure to contemporary topics in the field of HR/IR (e.g., anatomy of negotiation, personal finances).

ILR 580. Human Resources Practicum. 3 Hours.

This course offers professional development opportunities through a series of applied seminars taught by practicing professionals.

ILR 581. Collective Bargaining Practice. 3 Hours.

Examination of the development of the Collective Bargaining process from its legal and historical foundation through and including a simulated full contract negotiation similar to what students experience in Labor Relations when actually employed.

ILR 589. MS - Industrial and Labor Relations Internship. 3 Hours.

PR: Consent. Supervised professional experience in human resources and/or industrial relations. Internships are organized, administered, and evaluated jointly by faculty, student, and sponsoring organization. Minimum 12 contact hours per week.

ILR 590. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of industrial labor relations. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on assistantships to gain teaching experience. (Grading may be P/F.).

ILR 591A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

ILR 592A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

ILR 594A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

ILR 595. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

ILR 691A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

ILR 693A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

ILR 695. Independent Study. 1-6 Hours.

Faculty-supervised study of topics not available through regular course offerings.

ILR 696. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

ILR 697. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

ILR 698. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

ILR 699. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use of the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is P/F; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

INSTRUCTIONAL DESIGN TECHNOLOGY COURSES**IDT 600. Instructional Design and Technology Theories and Models. 3 Hours.**

Introduces students to the knowledge base of instructional design and technology.

IDT 610. Distance Education. 3 Hours.

This course addresses the nature of technical communication systems in distance education, their configuration and behavior, and the organizational factors associated with their development, acquisition, use, evaluation, and maintenance.

IDT 620. Social Network Media. 3 Hours.

This course will address the fundamental mechanics of using computers to access information networks for application in elementary, secondary, and higher education classroom instruction, as well as other education/business teaching/learning environment.

IDT 630. Instructional Delivery System. 3 Hours.

Emphasis on the four elements of content development: presenting, engagement, integration and assessment using open source systems.

IDT 640. Visual Literacy. 3 Hours.

Introduce students to knowledge of how humans use visual and nonverbal communication, and how visuals can be used in educational settings.

IDT 650. Multimedia Learning. 3 Hours.

Understand the use and design of multimedia materials in educational settings.

IDT 660. Instructional Design and Technology Authoring Systems. 3 Hours.

Design and development of online instruction through the use of current authoring systems.

IDT 670. Digital Tools and Web. 3 Hours.

Review, use and discussion of existing emerging web-based tools, and incorporate these tools in their instructional development.

IDT 685. Practicum. 1-12 Hours.

IDT 691A-Z. Advanced Topics. 1-6 Hours.

PR: Consent Investigation of advanced topics not covered in regularly scheduled courses.

IDT 693A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

IDT 698. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

IDT 715. School Networks. 3 Hours.

Hands-on exploratory course in the design, development and deployment of a school network. Explore the issues of design, policy, and security by building and deploying your internet server.

IDT 720. Instructional Systems Design. 3 Hours.

The systems approach is used to design instruction, applying the principles of instructional design.

IDT 735. Technology Integration. 3 Hours.

Apply the latest theories of learning and instructional design to a range of learning contexts, including public school, higher education and corporate/institutional needs, and develop technology-based instructional products.

IDT 740. Design Studio. 3 Hours.

Apply principles of instructional design, knowledge of learning theories, and experience with technological tools to the design of instructional products and curriculum for actual clients.

IDT 750. Prototype Studio. 3 Hours.

(May be repeated for a maximum of 6 hours.) Implement and revise design of online educational materials developed in IDT 740.

IDT 790. Teaching Practicum. 1-3 Hours.

Supervised practice in college teaching of technology education. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on assistantships to gain teaching experience. (Grading will be S/U.)

IDT 791A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

IDT 792A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

IDT 793A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

IDT 794A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

IDT 795. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

IDT 796. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

IDT 797. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project or a dissertation. (Grading may be S/U.)

IDT 798. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

IDT 799. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking course work credit but who wish to meet residency requirements, use the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is S/U; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

IDT 900. Professional Development. 1-6 Hours.

Professional development courses provide skill renewal or enhancement in a professional field or content area (e.g., education, community health, geology.) The continuing education courses are graded on a pass/fail grading scale and do not apply as graduate credit toward a degree program.

IDT 930. Professional Development. 1-6 Hours.

Professional development courses provide skill renewal or enhancement in a professional field or content area (e.g., education, community health, geology.) These tuition waived continuing education courses are graded on a pass/fail grading scale and do not apply as graduate credit toward a degree program.

IDT 931. Professional Development. 1-6 Hours.

Professional development courses provide skill renewal or enhancement in a professional field or content area (e.g., education, community health, geology.) These tuition waived continuing education courses are graded on a Pass/Fail grading scale and do not apply as graduate credit toward a degree program.

INTEGRATED MARKETING COMM COURSES**IMC 610. Introduction to Integrated Marketing Communications. 3 Hours.**

PR: Admission to the program. Introduces students to the fundamentals of Integrated Marketing Communications (IMC). Students learn and apply the IMC planning process and examine the role of integration to ensure consistency of creative strategy and complementary use of traditional and digital media. This course also provides a comprehensive orientation to the WVU IMC graduate program.

IMC 611. Marketing Research and Analysis. 3 Hours.

PR: IMC 610. Examines the role of marketing research within an IMC campaign. Students learn to identify research problems and select appropriate quantitative and qualitative designs to address them. They will examine sampling, questionnaire design, data processing and how to communicate research needs and results.

IMC 612. Audience Insight. 3 Hours.

PR: IMC 610. Provides an in-depth look at consumer behavior and its role in IMC. Examines consumer behavior in terms of internal influences, external influences, the consumer decision-making process, and consumers and culture. Students also learn ethnographic research.

IMC 613. Brand Equity Management. 3 Hours.

PR: IMC 610. Explores strategic and creative decisions to manage, build, and measure brands. Brand management issues investigated include consumer perceptions, competitive analysis, new product development, crafting communication messages, crisis management, and development of marketing programs.

IMC 614. Integrated Marketing Communication Media Analysis. 3 Hours.

PR: IMC 610. Addresses the role of media analysis and planning in IMC. Covers basic media terminology and media math, the distinctions between media objectives, strategies and tactics, and the different ways of allocating resources in media.

IMC 615. Creative Strategy and Execution. 3 Hours.

PR: IMC 610. Takes a comprehensive look at creative strategy and its role in IMC. Students master the fundamentals of conceiving and executing an eye-catching, effective and integrated campaign that uses traditional and digital media.

IMC 616. Direct Marketing. 3 Hours.

PR: IMC 610. Covers direct and interactive marketing from an IMC perspective. Includes database marketing, direct marketing message strategies across multiple media, direct and interactive marketing metrics, and the role of direct and interactive marketing in IMC campaigns.

IMC 617. Consumer Sales Promotion. 3 Hours.

PR: IMC 610. Overview of the role that sales promotion plays in IMC. Examines the functions of sales promotion in the marketing process as well as the legal regulations on sales promotion. The course focuses only on consumer promotion.

IMC 618. Public Relations Concepts and Strategy. 3 Hours.

PR: IMC 610. Examines the various functions of public relations in IMC, its impact on key publics, and its role in society. Covers the field's evolution, the responsibilities of PR practitioners, law and ethics, and emerging trends.

IMC 619. Emerging Media and the Market. 3 Hours.

PR: IMC 610. Examines how modern industry uses emerging media, such as blogs and virtual worlds to enhance the IMC process. Addresses the creative and ethical issues unique to digital media.

IMC 620. Research Methods. 3 Hours.

PR: IMC 610. Focuses on data analysis in marketing research. Emphasizes core statistical techniques, the application of statistical software, and the interpretation of statistical outputs. Ethical issues in marketing research are also discussed. SPSS software is required.

IMC 621. Current Topics in Integrated Marketing Communication. 3 Hours.

PR: IMC 610. A seminar that highlights significant issues and trends in Integrated Marketing Communication. Topics vary by term.

IMC 622. Multicultural Marketing. 3 Hours.

PR: IMC 610. Teaches cultural sensitivity and prepares students to promote products and services to a diverse marketplace within the U.S. The course focuses on racial/ethnic groups in the U.S., and it also covers mature and gay/lesbian markets.

IMC 623. Global Brand Communication. 3 Hours.

PR: IMC 610. This course examines key issues needed to develop strong global brands by considering past successes and failures in strategy, addressing the importance of knowing local culture in communication and positioning, and discussing emerging issues in brand globalization.

IMC 624. Cause Marketing. 3 Hours.

PR: IMC 610. Examines the marketing techniques used by businesses to make a difference in the world, focusing on partnerships between businesses and non-profit organizations. Through case studies, the history and uses of cause marketing are examined as well as predictions for the future of the marketing practice.

IMC 625. Advanced Creative Concepts. 3 Hours.

PR: IMC 610. Emphasizes the creative aspects of executing an IMC strategy including visual branding, verbal branding, creative direction, and art direction. Focuses on conceiving, developing, expressing, and executing a coherent visual identity using a comprehensive IMC strategy.

IMC 626. Business-to-Business Direct Marketing. 3 Hours.

PR: IMC 610. Course builds upon the basics of Direct Marketing developed in IMC 616. Students will learn to apply those concepts and techniques in the world of Business-to-Business IMC Direct Marketing. Some assignments allow the students to apply the strategies and tactics to their present employment.

IMC 627. Healthcare Marketing. 3 Hours.

PR: IMC 610. Explores various levels of the healthcare campaign and marketing process. Students learn the basic types of health campaigns, theories of health behavior change, issues in design and evaluating healthcare marketing, and the effects health outcomes.

IMC 628. Applied Public Relations. 3 Hours.

PR: IMC 610. Provides practical knowledge and hands-on experience in public relations from both the client and agency perspective. Students develop and produce PR tools and tactics including press releases, public service announcements, crisis communication plans, speeches, newsletters, and special events for a chosen client.

IMC 629. Mobile Marketing. 3 Hours.

PR: IMC 610. Examines exciting new business developments in mobility, explores fundamental forces that shape the wireless industry, discusses keys to establishing a competitive advantage, and examines emerging trends that may include where the industry is heading.

IMC 630. Sports Marketing. 3 Hours.

PR: Must be a student in the IMC program. Explores the history and present-day state of the sports marketing industry. Analyzes the field's major components, use of theory and research, consumers (aka fans), endorsements, sponsorships, branding, products, and particularly, its sport stars.

IMC 631. Crisis Communication. 3 Hours.

PR: IMC 610. Applying theory and case study analysis, students gain the expertise required to maneuver through myriad potential crisis situations that today's organizations and individuals encounter.

IMC 632. Political Marketing. 3 Hours.

PR: IMC 610. Covers political marketing from its roots to its current state and provides the necessary knowledge for strategizing and applying a political marketing plan within the context of today's elections and political climate.

IMC 633. Entrepreneurship in Integrated Marketing Communication. 3 Hours.

PR: IMC 610. Identifies what it takes to be a successful IMC entrepreneur by showing students how to assess risk, raise capital, position a new entity, organize, and keep and maintain sales.

IMC 634. Digital Storytelling. 3 Hours.

PR: IMC 610. Students will design a brand for a product or service and express that brand as a video for the Web. This course will provide guidelines for how to create a movie that reaches the desired audience and can be shared via social media.

IMC 635. Visual Information Design. 3 Hours.

PR: IMC 610. Students explore the power of imagery and how visual perception drives our memory. Students examine how to look at images, deconstruct layouts and apply color, design and typography to create effective verbo-visual messages for print and online and will gain valuable creative insight and skills that will serve them now and into the future.

IMC 636. Integrated Marketing Communication Campaigns. 3 Hours.

A rigorous and comprehensive capstone course that requires students to develop a thoughtful and professional quality IMC campaign for a real-world client. This course must be completed in a student's final academic session.

IMC 637. Internal Brand Communication. 3 Hours.

PR: IMC 610. Addresses the important roles that internal communications and branding play in a company's successful operation by examining internal communication strategies and implementation, the use of consistent messaging, and company -to-employee crisis communication.

IMC 638. Public Affairs. 3 Hours.

PR: IMC 610. This course explores ways to leverage public policy relationships and strategic partners to enhance an organization's brand and marketing strategy. Incorporates theory and real-world experience through examination of case studies.

IMC 640. Introduction to Digital Media Communication. 3 Hours.

Provides an overview of digital media and the latest methods for collecting, creating and disseminating persuasive messages. Focuses on the evolution of digital media and the ways they are used in entertainment, information-gathering and community-building.

IMC 641. Social Media and Marketing. 3 Hours.

PR: IMC 610 or IMC 640. Examines the latest strategies for monitoring and engaging consumers in social media from a marketing perspective. Explores popular platforms, such as Twitter and Facebook that are used to connect with and analyze target audiences.

IMC 642. Web Metrics and Search Engine Optimization. 3 Hours.

PR: IMC 610 or IMC 640. Examines how marketers strategically gather online information to measure traffic, engagement, and potential impact on ROI. Explores search engine optimization (SEO) and social media optimization (SMO) strategies used to build a presence for clients.

IMC 643. Digital Video Production. 3 Hours.

PR: IMC 610 or IMC 640. Introduces the technical and conceptual skills needed to create and add videos into integrated marketing campaigns. Covers the basics of selecting the best hardware and software for video projects. Students gain hands-on experience in shooting and producing engaging videos.

IMC 644. Digital Media Communication Campaigns. 3 Hours.

PR: IMC 610 or IMC 640. Apply the knowledge and skills acquired in previous DMC courses to develop a creative, innovative, and complete digital campaign for a selected organization in this capstone course.

IMC 693A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

IMC 695. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

JOURNALISM COURSES**JRL 500. Introduction to Graduate Studies. 1 Hour.**

(Open only to accelerated masters program students.) Designed to orient students to graduate study.

JRL 504. Mass Media and Society. 3 Hours.

(Open only to accelerated masters program students.) Study of mass media's role in society.

JRL 518. Advanced Reporting. 3 Hours.

Students write carefully researched stories using skills they acquired in previous classes while applying literary journalism techniques. Course emphasizes immersion reporting - spending extended time with one subject as well as peripheral theoretical readings. (Lab fees.).

JRL 520. Advanced Journalistic Writing and Research. 3 Hours.

(Open only to accelerated masters program students.) Study of advanced journalistic writing and research techniques.

JRL 527. American Journalism History. 3 Hours.

An intensive look at the development of media from seventeenth-century England and the American Colonies. Press freedom and its implications to the nation and world are considered on theoretical, economic, and cultural levels.

JRL 528. Media Ethics and Law. 3 Hours.

PR: Consent. How ethics and law work together to help create and maintain the media environment. Examines ethical paradigms within a legal framework, with special emphasis on morality.

JRL 530. Social Media and Journalism. 3 Hours.

PR: Consent. This lab course identifies and applies the principles behind social media applications such as blogs and networking sites.

JRL 531. Multimedia Reporting. 3 Hours.

PR: JRL 220 or consent. Reporting/production for online media. Ethics and role of visual journalist. Software basics and use of audio, video and still photography in online reporting.

JRL 540. Visual Storytelling. 3 Hours.

Development of advanced analytical skills in digital photojournalism, photo editing and cross-media design. Graduate students connect the theoretical and technical realms of the visual story to appreciate its broader scope.

JRL 545. International Media 1. 1-3 Hours.

PR: Consent. A combination of classroom theory and practical application of the function of media in an international setting.

JRL 546. International Media 2. 1-6 Hours.

PR: Consent. Centers around a trip that involves the study of media in the country students are visiting. Usually a continuation of International Media 1.

JRL 555. Women and Minorities in the Media. 3 Hours.

PR: Consent. Students explore the evolution of women and minorities in the media, from the 1960s to the present. Students critically examine how marginalized groups are depicted in mass media texts, such as television, movies, and magazines.

JRL 556. West Virginia Uncovered. 3 Hours.

PR: Consent. Student teams will work with the instructor and editors at a regional publication to report and produce multimedia news-feature packages.

JRL 559. Multimedia News Publication. 3 Hours.

PR: Admission to MSJ program and JRL 428 and JRL 489. In this lab/workshop style class, graduate students will produce stories and write a paper based on information from editors/producers.

JRL 586. Video Bureau Reporting. 3 Hours.

Students work with KDKA producers and news directors to develop, report and shoot stories to air on KDKA-TV. Graduate students will act as bureau chief or assume other leadership roles.

JRL 587. Advanced Video Reporting and Producing. 3 Hours.

Reporting, writing and producing television news stories using advanced production techniques; producing stories for cable or broadcast television. Additional theoretical research and writing into the organizational structures of broadcasting. (Lab fees).

JRL 591A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

JRL 593A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

JRL 594A-Z. Seminar. 1-6 Hours.

PR: Consent. Advanced study of methodological techniques. Research project chosen from area of student's major interest. A written report of the study undertaken is required.

JRL 595. Independent Study. 1-6 Hours.

Faculty-supervised study of topics not available through regular course offerings.

JRL 600. Introduction to Graduate Studies. 1 Hour.

(Required of all graduate journalism students; accelerated master's program students must take JRL 500.) Designed to orient students to graduate study.

JRL 601. Research Methods. 3 Hours.

(Required of all graduate journalism students.) Study of quantitative methods common to research in communications. An introduction to sampling, measurement, analytic procedures, and data.

JRL 604. Mass Media and Society. 3 Hours.

(Required of all graduate journalism students.) Study of mass media and their role in and influence on society; includes analysis of the social, political, and economic determinants of media content and character.

JRL 620. Advanced Journalistic Writing and Research. 3 Hours.

(Required of all graduate journalism students.) Study of advanced journalistic writing and research techniques. Students will practice the writing and research techniques on topics of their own choosing. Academic or popular topics may be selected.

JRL 689. Ethics of Mass Communication. 3 Hours.

PR: Open to graduate journalism students; Consent. Introduction to ethical principles and their application in the development of mass media systems and societal changes; professional codes; case studies; current problems.

JRL 690. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of Journalism. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It also provides a mechanism for students not on assistantships to gain teaching experience. (Grading may be S/U.).

JRL 691A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

JRL 692A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

JRL 693A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

JRL 694A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

JRL 695. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

JRL 696. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

JRL 697. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

JRL 698. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

JRL 699. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework but who wish to meet residency requirements, use the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is P/F; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

LANDSCAPE ARCHITECTURE COURSES**LARC 520. Introduction to Design. 4 Hours.**

Theory, principles, and elements of site planning and design. Lectures, readings, short problems, and site visits dealing with site analysis, ecological considerations, circulation and parking, management, and cost factors. Also includes basic computer graphics.

LARC 550. Design Studio. 4 Hours.

PR: LARC 520. Medium scale site design and development including planting, design and grading. Application of basic design principles, programming, and site analysis reinforcing design processes and visual thinking in the design of sites.

LARC 570. Meanings of Place. 3 Hours.

PR: Consent Study of place as a psychological and social phenomenon with implications for community development, historic preservation, interpretation, design, management, natural and cultural sustainability, and human well-being. (equivalent to RPTR 570).

LARC 595. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

LARC 651. Community Planning and Design. 5 Hours.

PR: LARC 650. Design studies focused on community planning, community development, and community growth. Integration with a community design team or other outreach project. (2 hr. lec; two 3 hr. studios.).

LARC 652. Land Development Princ. 5 Hours.

PR: LARC 650 and LARC 651. Brief history of land development. Design studio involving large scale design; projects with extensive time implementation sequence. (2 hr. lec., two 3 hr. studios.).

LARC 670. Research Methods in Design. 2 Hours.

A survey of the philosophies and methodologies of science and research as they apply to the field of landscape architecture. Development of research methods for terminal project.

LARC 693A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

LARC 694A-Z. Seminar. 1-6 Hours.

Seminars arranged for advanced graduate students.

LARC 695. Independent Study. 1-6 Hours.

Faculty-supervised study of topics not available through regular course offerings.

LARC 696. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

LARC 697. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis (697), problem report (697), research paper or equivalent scholarly project (697), or a dissertation (797). (Grading may be S/U).

LARC 698. Thesis. 1-6 Hours.

This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

LANGUAGE TEACHING METHODS COURSES**LANG 521. English as a Second Language Methods. 3 Hours.**

Theory and practice of teaching English as a second language; techniques and approaches for teaching speaking, listening, reading, and writing skills.

LANG 522. Computer Assisted Language Learning. 3 Hours.

Examines CALL (Computer Assisted Language Learning) methodologies, introduces principles of CALL evaluation, explores current CALL practices in language teaching, develops web-based CALL materials, and reviews CALL research.

LANG 590. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of languages. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on assistantships to gain teaching experience. (Grading may be P/F.).

LANG 591A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

LANG 592A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

LANG 593A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

LANG 594A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

LANG 595. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

LANG 621. Teaching Foreign Language in College. 3 Hours.

CONC: LANG 690. Methods and techniques of teaching a foreign language at the college level.

LANG 622. English as a Second Language Theory. 3 Hours.

PR: LING 101 or LING 311. Explores factors and processes involved in the acquisition of English as a second language and their implications for classroom instruction.

LANG 623. English as a Second Language Materials and Syllabus Design. 3 Hours.

PR: LANG 521. Theory and design of syllabi and materials applied to diverse ESL EFL teaching situations. Students produce and evaluate all aspects of integrated instructional units.

LANG 624. Second Language Writing. 3 Hours.

PR: LING 101 or equivalent. A study of how adults learn to write in a second language and how to help them improve their writing.

LANG 625. Language Assessment. 3 Hours.

Introduces fundamental principles of language testing and helps students develop skills in test development, item analysis, interpretation of test results.

LANG 626. Literacy in a Second Language. 3 Hours.

Reviews theoretical perspectives on reading and literacy development and explores research studies that cover different areas in second language reading and literacy (biliteracy).

LANG 690. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of languages. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It also provides a mechanism for students not on assistantships to gain teaching experience. (Grading may be P/F.).

LANG 690A. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of Languages. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on assistantships to gain teaching experience. (Grading may be P/F.).

LANG 690B. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of Languages. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on Assistantships to gain teaching experience. (Grading may be P/F.).

LANG 690C. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of Languages. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on assistantships to gain teaching experience. (Grading may be P/F.).

LANG 690D. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of Languages. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on assistantships to gain teaching experience. (Grading may be P/F.).

LANG 690E. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of Languages. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on assistantships to gain teaching experience. (Grading may be P/F.).

LANG 690F. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of Languages. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on assistantships to gain teaching experience. (Grading may be P/F.).

LANG 690G. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of Languages. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on assistantships to gain teaching experience. (Grading may be P/F.).

LANG 690H. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of Languages. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on assistantships to gain teaching experience. (Grading may be P/F.).

LANG 690I. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of Languages. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on assistantships to gain teaching experience. (Grading may be P/F.).

LANG 690J. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of Languages. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on assistantships to gain teaching experience. (Grading may be P/F.).

LANG 690K. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of Languages. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on assistantships to gain teaching experience. (Grading may be P/F.).

LANG 691A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

LANG 692A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

LANG 693A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

LANG 694A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

LANG 695. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

LANG 696. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

LANG 697. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

LANG 698. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

LANG 699. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use of the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is P/F; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

LANG 791A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

LANG 930. Professional Development. 1-6 Hours.

Professional Development courses provide skill renewal or enhancement in a professional field or content area (e.g., education, community health, geology). These tuition-waived continuing education courses are graded on a pass/fail grading scale and do not apply as graduate credit toward a degree program.

LAW COURSES**LAW 600. Advanced Criminal Law:Case Studies. 3 Hours.**

PR: LAW 705. The examination of pre-trial, trial and post-trial issues in an actual criminal case, identifying legal errors in all aspects; jury instruction, testimony, evidence to support the conviction and decision.

LAW 601. Lawyers, Poets and Poetry. 3 Hours.

The exploration of American historical and contemporary lawyers as poets and the relationship of legal language and poetry, with a theme of reflection and introspection.

LAW 602. Lawyers and Film. 3 Hours.

Through the viewing of films and open discussion, this course is designed to initiate reflection and introspection, while analyzing the struggles that arise in the pursuit of justice.

LAW 603. Comparative Brazilian Law. 1-3 Hours.

(May be repeated for a maximum of 3 credit hours.) A 2-component study abroad course with initial classroom preparation and subsequent travel to Brazil. An immersive learning experience in Brazilian law, culture, and politics. Brazilian laws are examined and compared to American laws and practice.

LAW 604. Natural Resources. 3 Hours.

A survey course that includes law, theory, and practical management challenges of natural resource policy, with a strong substantive foundation in a broad range of resources, including water, timber, minerals, and wildlife.

LAW 605. Post-Conviction Remedies. 3 Hours.

The examination of post-trial issues in an actual criminal case, identifying legal errors in all aspects; jury instructions, testimony, evidence to support the conviction, and decision.

LAW 606. Medical Malpractice. 2 Hours.

The exploration of the conflict between health care availability and the rights of medical malpractice victims with components of cases, as well as tort reform and related health care reform in general.

LAW 607. Psychology for Lawyers. 3 Hours.

A practical approach to the basic concepts of psychology, including analytical psychology, family counseling and therapy, gender differences, narrative and historical differences, psychology of juries, and psychological perspectives useful for both client and lawyer self-awareness.

LAW 608. Art Law. 3 Hours.

A thorough examination of various legal topics and issues through the prism of art. Topics include intellectual property concepts of copyright, fair use and parody, First Amendment issues, non-profit organizations, sales warranties, authenticity, and salvage.

LAW 609. Child Protection and the Law. 3 Hours.

A primary focus on child abuse and neglect civil protection proceedings as defined by West Virginia Code, Chapter 49; and an examination of both federal law and West Virginia's statutes, rules, and case law.

LAW 610. Comparative Law in Mexico. 1-3 Hours.

A 2-component, study abroad course with initial classroom preparation and subsequent travel to Mexico. An immersive learning experience in Mexican law, culture, and politics. Topics include: corporate governance, immigration and migration, and international human rights.

LAW 611. Consumer Protection Law. 3 Hours.

A practical survey of various state and federal laws designed to protect consumers, including WV Consumer and Credit Protection, Fair Debt Collection, Fair Credit Reporting, Truth in Lending, Fair Credit Billing and Gramm-Leach-Bliley.

LAW 612. Agriculture and Rural Land Use. 2-3 Hours.

A consideration of the impact of various aspects of law and policy (e.g., land use regulation, environmental law, property rights, subsidies) on agricultural and other rural lands and the resulting effect on the food system.

LAW 613. International Environmental Law. 2-3 Hours.

An issue-based approach to IEL, identifying pressing problems such as global climate change, ozone depletion, biodiversity, and studying some of the instruments and tools that have been created to deal with them.

LAW 614. Jewish/Islamic Comparative Law. 3 Hours.

A comparative law course that explores the foundations, structure, and general substance of both Jewish and Islamic legal systems with comparison to the American legal system.

LAW 615. Elder Law. 3 Hours.

A thorough examination of various legal topics and issues relating to the special needs of the elderly. Topics include legal capacity, surrogate decision-making, guardianship, Medicare, Medicaid, elder abuse, nursing homes and advance directives.

LAW 616. Cultural Property. 3 Hours.

This course will focus on issues concerning the restoration of artworks displaced during World War II, as well as the protection and preservation of cultural heritage and artifacts.

LAW 617. Geneva Study Abroad. 1-3 Hours.

(May be repeated for a maximum of 3 credit hours.) A 2-component, study abroad course with initial classroom preparation and subsequent travel to Geneva. This course addresses key subjects and themes in modern international trade regulation.

LAW 618. Criminal Procedure: Investigation. 3 Hours.

A course designed to cover all facets of the investigatory stage of criminal procedure: the right to representation by counsel, rules surrounding police practices and procedures of search and seizure, interrogation and identification.

LAW 619. Criminal Procedure: Adjudication. 3 Hours.

A comprehensive examination of criminal procedure adjudication covering regulation of prosecutors, defense counsel, pretrial legal issues, pretrial motions, plea bargains, and sentencing.

LAW 620. The Legislative Process. 3 Hours.

Exploration of the legislative process in America and its impact on judicial interpretation of statutory law. Numerous topics related to the role of legislators at all levels of the government's federalist system are surveyed.

LAW 621. Lawyers as Leaders. 3 Hours.

An exploration of topics related to the theory and practice of leadership by lawyers intended to develop effective leadership skills for application in both the legal profession and in society in general.

LAW 622. E-Discovery. 3 Hours.

PR: LAW 706 and LAW 722. An introduction to the basics of identification, preservation, collection, search and production of Electronically Stored Information and effective utilization of procedural and evidentiary rules, practice pointers, and admissible evidence.

LAW 623. Election Law and Policy. 3 Hours.

A survey of American political structure and legal process, exploring the constitutional, administrative, and policy-related aspects of the political framework, including the right to vote, redistricting, political parties, campaigns, and campaign finance.

LAW 624. Advanced Legal Research. 2 Hours.

The course focuses on advanced legal research methodologies and strategies within the context of federal, state, and local law. It is designed to prepare law students for research in practical settings.

LAW 625. Nonprofit Organizations. 3 Hours.

An examination of the law as related to nonprofit organizations. Various organizational structures and the creation, organization, and dissolution of nonprofit organizations will be considered, as well as tax laws relating to nonprofit organizations.

LAW 626. International Trade Law. 3 Hours.

A study of laws that affect businesses buying and selling products or services beyond U.S. borders. Includes the structure of the WTO system, economic theories underlying free trade, and remedies for unfair trade.

LAW 627. Land Use/Sustainable Development Clinic 1. 4-6 Hours.

A clinical course offered to selected, upper level law students, who with faculty supervision, will provide transactional pro bono representation to clients regarding land and water protection.

LAW 628. Land Use/Sustainable Development Clinic 2. 4-6 Hours.

PR: LAW 627. A continuation of LAW 627, presenting an opportunity for a higher level of responsibility, finalization of matters, and continued assistance for actual clients regarding land and water protection.

LAW 629. Advanced Family Law Advocacy. 2 Hours.

A focus on laws and issues of a domestic relations practice by using West Virginia domestic law as a framework, with emphasis on practical application.

LAW 630. Energy Law. 3 Hours.

An examination of law and regulatory policies that govern and impact the energy industry, including all energy sources and alternative fuel possibilities.

LAW 631. Cyberlaw. 3 Hours.

Cyberlaw explores the application of law to all aspects of internet activity and function. Topics such as privacy, consumer protection, trademarks, copyrights, on-line contracting and jurisdiction will be covered.

LAW 632. Advanced Labor Law. 3 Hours.

LAW 741 recommended. Advanced topics in labor-management relations under the general jurisdiction of the National Labor Relations Board (NLRB) and the courts.

LAW 633. International Business Transactions. 3 Hours.

LAW 729 recommended. A foundation for the pursuit of a career as a corporate attorney with an international focus.

LAW 634. Energy Reg, Markets and Environ. 3 Hours.

This course focuses on the legal basis for the economic regulation of energy, the environmental impact of energy production, and the development of policies promoting renewable energy and energy efficiency.

LAW 635. Land Use and Resilience Law. 3 Hours.

This course covers the multi-faceted nature of land use and resilience law, including common-law and private-law mechanisms and the regulatory state and planning. In addition, various topics in resilience law are introduced.

LAW 636. Copyright Law. 3 Hours.

PR: Student in College of Law. This course covers the basics of copyright, including copyrightable subject matter, formalities and copyright registration, and the substantive and procedural elements of infringement and defenses. Technological developments affecting copyright are also addressed (software/internet).

LAW 637. Transactional Skills. 3 Hours.

PR: LAW 779. A practical approach to transactional skills development with in-class simulation of all aspects including, planning, interviewing, negotiating, and drafting of business contracts.

LAW 638. Legislation and Regulation. 3 Hours.

An introduction to the modern administrative regulatory state, addressing main instruments of governance, including legislation and agency regulations, as well as statutory interpretation and application.

LAW 639. Food and Drug Law. 3 Hours.

This course focuses on the historical development of food and drug law and issues involving carcinogens and risk assessment in food safety; regulation of nutrition, and approval of new drugs, devices, and vaccines for diseases.

LAW 640. Parent, Child, and State. 3 Hours.

An exploration of the role and responsibility of the state to protect children and appropriate legal intervention as based upon West Virginia laws.

LAW 641. Introduction to Legal Research. 1 Hour.

PR: Student in the College of Law. This course focuses on basic legal research methodologies and strategies within the context of federal, state and local law. It is designed to prepare law students for basic research in practical settings.

LAW 642. Law Practice Management. 3 Hours.

PR: Student in the College of Law. This course introduces law office business operations and simulates office decision making dynamics. Subjects include human resources, financial planning/management, marketing, project management, office design, technology, quality control and similar subjects.

LAW 643. Taxation of Business Entities. 4 Hours.

PR: LAW 719. A comparative survey of the federal income taxation of C corporations, S corporations, and partnerships.

LAW 650. Entrepreneurship Clinic 1. 4 Hours.

In a clinical setting, apply Intellectual Property and Business Law concepts to assist actual clients in entrepreneur endeavors, covering the basics of business organizations, IP protection, financing, and contracting and the effect on entrepreneurs.

LAW 651. Entrepreneurship Clinic 2. 5 Hours.

PR: LAW 650. A continuation of Entrepreneur Clinic 1 to assist actual clients in entrepreneur endeavors, covering the basics of business organizations, IP protection, financing, and contracting and the effect on entrepreneurs.

LAW 652. Jessup International Moot Court. 1,2 Hour.

PR: LAW 768. A required course for students selected for the Jessup International Moot Court Competition Team that provides oral advocacy instruction and training for the current year's Jessup competition.

LAW 653. Law and Public Service. 1,2 Hour.

PR or CONC: LAW 654. A practical course in which selected student will serve as externs to public service and government agencies. Classroom instruction and reflective writing requirements are included.

LAW 654. Public Service Externship. 2-6 Hours.

PR or CONC: LAW 653. The fieldwork component of LAW 653.

LAW 655. Law and Public Service Full-Time. 2-6 Hours.

PR or CONC: LAW 656. A practical course in which selected students will serve as externs to public service and government agencies on a full-time basis. Classroom instruction and reflective writing requirements are included.

LAW 656. Law and Public Service Externship Full-Time. 6-11 Hours.

PR or CONC: LAW 655. The field work component of LAW 655.

LAW 670. LLM Seminar. 3 Hours.

A wide range study related to the degree program, exploring diverse advanced topics and perspectives. Rigorous preparation for discussion, a writing project, and in-class presentations are required.

LAW 677. United States Supreme Court Clinic 1. 4 Hours.

A clinical course that provides students with both instruction and practice in written and oral advocacy in appellate matters with emphasis on those before the United States Supreme Court.

LAW 678. United States Supreme Court Clinic 2. 4 Hours.

PR: LAW 677. A continuation of US Supreme Court Clinic 1 with additional emphasis on working with the government in Supreme Court matters and amicus curiae (friend of the court) briefs.

LAW 682. Practical Legal Writing 1. 1 Hour.

A bar review course focusing primarily on the Multistate Essay Exam (MEE) and Multistate Performance Test (MPT); includes strategies for taking the Multistate Bar Exam (MBE) and Multistate Professional Responsibility Exam (MPRE).

LAW 683. Practical Legal Writing 2. 1 Hour.

PR or CONC: LAW 682. Open by invitation only, a one-hour extension of Practical Legal Writing 1 for students who would benefit from additional review and who must register for Practical Legal Writing 1 concurrently.

LAW 688A. Seminar in American Constitutional History. 2 Hours.

A historical overview of American constitutional law from 1786 to present day, focusing on that part of history that still influences present-day constitutional law decision making.

LAW 688B. Seminar in International Trade Regulations. 2 Hours.

PR: Student in the College of Law. This course addresses various subjects in modern international trade regulation including foreign direct investment, trade in goods, and technology, and multilateral versus regional international trade regulation.

LAW 688C. Seminar in Corporate Governance. 2,3 Hours.

This seminar provides students an in-depth look at current laws and policies that affect corporate governance and corporate accountability systems.

LAW 689A. Seminar: Intellectual Property. 2 Hours.

Considers the economic and social role of intellectual property laws in American and world economics. Preparation of a research paper of publishable quality will be required.

LAW 689B. Seminar: Judicial Power and Restraint. 2 Hours.

This course critically explores the court's role in our constitutional democracy, including issues of federalism, separation of powers, recusal, interpretation, judicial philosophies, authority, judicial selection, abstention, remedial power, and judicial ethics.

LAW 689C. Seminar: Advanced Criminal Procedure. 2 Hours.

Explores criminal procedure, including bail application, motion, search and seizure, hearings, discovery of evidence, trial structure, appeal, and habeas corpus proceedings.

LAW 689D. Seminar: Environmental Law. 2 Hours.

This seminar provides a practical setting for environmental law in a litigation context that uses a case study method.

LAW 689E. Seminar: Land Transactions. 2 Hours.

This seminar provides the knowledge and practice of title examinations and the documents involved in conveyance. Students also submit a research paper on an issue involving real estate.

LAW 689F. Seminar: Lawyers and Legislation. 2 Hours.

Explores the role of lawyers in the legislative process with practical exercise in bill drafting and presentation to legislators.

LAW 689G. Seminar: Religion and Constitution. 2 Hours.

Explores the major doctrinal issues in the interpretation of the First Amendment's religion clauses. Related statutory schemes affecting religious liberty such as RFRA and RLUIPA will also be discussed.

LAW 689H. Seminar: Bioethics and the Law. 2 Hours.

An examination of the theological, philosophical and scientific foundations of bioethics; the operation of bioethical principles in the context of current bioethical controversies; and the relations between bioethics and the law.

LAW 689I. Seminar: Environmental Justice. 2 Hours.

A broad view of environmental justice issues and their impact on minorities and disempowered citizens and communities.

LAW 689J. Seminar: Civil Rights Litigation. 2 Hours.

Explores the history of the American Civil Rights Movement, the legal development of civil rights in the United States, and the development of legal precedents with emphasis on West Virginia Supreme Court of Appeals cases.

LAW 689K. Seminar: Civil Disobedience. 2 Hours.

An examination of the justification and operation of civil disobedience.

LAW 689L. Seminar Health Care Regulations. 2 Hours.

Medical innovation development from concept to clinical application. Primarily designed for law students or business majors, but also extended to medical students. Includes guest lecturers in intellectual property and credentialing areas.

LAW 689M. Seminar: Race/Racism and American Law. 2 Hours.

This seminar focuses on historical and current event issues regarding race, racism and American law. It offers students the opportunity to advance in research and writing on the subject.

LAW 689N. Seminar: Refugee and Asylum Law. 2 Hours.

A research and writing seminar examining U.S. and international refugee and asylum law through reading, discussion and individual research.

LAW 689O. Seminar: Family Mediation. 2 Hours.

A comprehensive exploration of the usage of mediation for the resolution of disputes in the area of family law.

LAW 689P. Seminar: Gender and Law. 2 Hours.

The examination of the multiplicities of identity regarding the categories of gender, sex, sexual orientation, race and class as used to confer benefits and determine constitutional rights.

LAW 689Q. Seminar: Constitutional Litigation. 2 Hours.

This course explores the development of U.S. constitutional law from a litigation and advocacy perspective, focusing on theoretical doctrinal, and policy arguments that have been employed to expand constitutional rights.

LAW 689R. Seminar in Commercial and Business Law. 2 Hours.

The examination of various topics relating to commercial, business, or construction (contracting, architecture, engineering) law. A substantial research paper is required.

LAW 689S. Seminar: Law and Socioeconomic. 2 Hours.

Advanced topics in the interrelationship between law and economic/social processes.

LAW 689T. Seminar: Comparative and International Workplace Law. 2 Hours.

Comparative analysis of workplace laws across global jurisdictions.

LAW 689U. Seminar: Animal Law. 2 Hours.

An interdisciplinary study of the dynamics of the relationships between humans and animals in American, comparative and international law. This is a writing-intensive seminar with an oral presentation and a substantial research paper.

LAW 689V. Seminar: Juvenile Justice. 2 Hours.

An examination of the legal, social, and historical underpinnings of the juvenile justice system in the U.S., in both theory and practice, with attention to court decisions as affecting juvenile court.

LAW 689W. Seminar: Issues in Energy Law. 2 Hours.

This seminar provides an understanding of a variety of issues regarding energy law and policy, both past and present, in the United States. A research paper on an energy law issue is required.

LAW 689X. Seminar: National Security Law. 2 Hours.

The history and framework of U.S. national security law and policies, with a focus on national security in the context of the use of military force, the intelligence community, civil liberties, and counterterrorism efforts.

LAW 689Y. Seminar in Sustainable Development. 2 Hours.

Consideration and further development of concepts and methods relating to sustainable development, including methods for incorporating consideration of economic development, environmental conservation, and social equity in decision-making at the regional, national and global level.

LAW 689Z. Seminar in Advanced Torts. 2 Hours.

An examination of significant contemporary torts topics. Newer torts compensation systems and statutory substitutes for the traditional common law torts system will be covered. A substantial research paper is required.

LAW 700. Legal Analysis, Research and Writing 1. 2 Hours.

Introduction to legal analysis, research, and writing. Stresses basic law school skills including case briefing, statutory analysis, and synthesis. Drafting of various legal documents including an office memorandum.

LAW 701. International Human Rights. 3 Hours.

An examination of historical, philosophical and legal issues in defining, understanding, and enforcing fundamental rights in a world of conflict and diversity.

LAW 702. Forensic Mental Health. 2 Hours.

This course will address the interface between the law and mental health issues. Topics covered will include the insanity defense, competencies, emotional injury, expert witness, and civil commitment.

LAW 703. Contracts 1. 4 Hours.

The study of operation of contracts in society, what it means to have a contract, how contracts are made, and the manner and extent to which contracts and non-contract promises will be enforced.

LAW 705. Criminal Law. 3 Hours.

Substantive law of crimes including: (1) the philosophical basis for penal systems, (2) the characteristics of particular crimes, and (3) conditions of exculpation.

LAW 706. Civil Procedure: Jurisdiction. 2 Hours.

This required, first-year course covers key civil procedure concepts including personal jurisdiction, notice and opportunity to be heard, subject matter jurisdiction, diversity jurisdiction, removal, venue, and the Erie doctrine.

LAW 707. Property. 4 Hours.

Law of real property in historical and theoretical context. Includes estates in land and future interest, concurrent ownership, methods of obtaining title, modern land transactions, recording, title examination, and the law of servitudes.

LAW 709. Torts 1. 4 Hours.

The basic civil common law response to injury. The fault-based liability system for intentional torts, privileges, and negligence. Consideration of fact and proximate cause, joint tortfeasors, and limited duty.

LAW 710. Torts 2. 3 Hours.

PR: LAW 709. A continuation of Torts 1. The tort law of land occupiers, damages, defenses, imputed negligence, strict liability, products liability, and modern statutory substitutes for tort law.

LAW 711. Legal Analysis, Research and Writing 2. 2 Hours.

PR: LAW 700. Continuation of LAW 700. Stresses research and writing. Drafting of various legal documents culminating in the preparation of a trial motion and memorandum and oral argument of the motion.

LAW 712. Analytical Methods for Lawyers. 3 Hours.

An introduction and overview of game theory, probability statistics, finance, accounting and economics, as they relate to the practice of law. Beneficial to students without undergraduate degrees in business or economics.

LAW 713. Toxic Torts. 3 Hours.

PR: LAW 709. An in-depth study of the law of toxic torts in the context of environmental harms.

LAW 714. Remedies. 3 Hours.

Equity, damages, and restitution. Survey of remedies available for harms.

LAW 715. Appellate Advocacy. 2 Hours.

PR: LAW 700 and LAW 711. Survey of appellate practice. Drafting of an appellate brief and an argumentation of the brief.

LAW 716. Wealth Transfers. 3 Hours.

An analysis of the laws estate administration, trusts, and future interests governing intestate succession, wills, trusts, and other testamentary substitutes focusing on West Virginia law. Rules of construction governing *inter vivos* and testamentary dispositions shall also be investigated.

LAW 717. Domestic Violence and The Law. 3 Hours.

(LAW 769 is recommended.) The examination of civil and criminal statutes and case law, as applied to domestic violence, focusing on national trends and West Virginia state law.

LAW 718. Advanced Bankruptcy. 3 Hours.

PR: LAW 767. The exploration of bankruptcy code complexities with emphasis on Chapter 11 reorganization.

LAW 719. Income Taxation 1. 3 Hours.

Gross income, deductions, exclusions, and gains and losses from dealing in property.

LAW 720. Entertainment Law. 3 Hours.

A foundation for the pursuit of a transactional or corporate law career in the entertainment industry. Includes the law contracts, copyright, trademark, and agent representation issues.

LAW 721. Sports Law. 3 Hours.

A foundation for the pursuit of a transactional or corporate law career in sports law. Includes the practical application of law of contracts and the process of negotiation.

LAW 722. Civil Procedure: Rules. 3 Hours.

This required, first-year course examines most provisions of the Federal Rules of Civil Procedure, including coverage of pleading, pre-trial motions, joinder, discovery, summary judgment, jury trial rights, and post-trial motions.

LAW 723. Immigration Law. 2,3 Hours.

Constitutional underpinnings for immigration power; categories of and requirements for employment-based, family-based, and diversity-based immigration; visas for temporary visitation; problems with illegal immigration; removal procedures; and special policy issues, such as terrorism.

LAW 725. Constitutional Law 1. 3,4 Hours.

Basic study of the principles of constitutional decision making. Areas of emphasis include the allocation of power within the federal system, procedural and substantive due process, and equal protection of the law.

LAW 726. Constitutional Law 2. 3 Hours.

PR: LAW 725. First Amendment freedoms of speech, press, assembly, association, and petition.

LAW 727. Evidence. 3 Hours.

Rules, principles, and practice of the law of evidence covering judicial notice; real, demonstrative, testimonial and circumstantial evidence; hearsay; and other exclusionary rules, privileges, confidential relationships, witnesses, and other related subjects.

LAW 728. West Virginia Constitutional Law. 2 Hours.

A study of the West Virginia Constitution, its history, and its judicial interpretation with special emphasis on the branches of state government.

LAW 729. Business Organizations. 4 Hours.

Basic introduction to business organizations, their formation, maintenance, and dissolution. Includes agency, partnership, and corporations.

LAW 732. Construction Law. 3 Hours.

The course explores specialized legal issues in the law governing building construction including legal relationships among the primary participants in such projects and an examination of current decisional and statutory law affecting those relationships.

LAW 733. Education Law. 3 Hours.

A survey of major topics in education law with a focus on public primary and secondary education. The course includes consideration of both constitutional and statutory law affecting schools.

LAW 734. Intellectual Property. 3 Hours.

Legal problems in the protection of ideas including copyright, trademark, patent, and law of unfair competition; and their interrelationship.

LAW 735. Patent Law. 3,4 Hours.

The application and interpretation of patent law, including the requirements for obtaining a patent, infringement action, and other patent related law and policy.

LAW 736. Legal Estate Planning. 3 Hours.

PR: LAW 716. The law in its relation to problems of intergenerational transfers, including federal transfer taxes (estate and gift tax), life insurance, revocable and irrevocable trusts, wills, and the probate process.

LAW 737. Land Use Planning. 3 Hours.

PR: LAW 707. An in-depth study of the law of land use planning and zoning, generally and specifically in West Virginia, examining constitutional and statutory basis of land-use controls.

LAW 738. Business Torts. 3 Hours.

The study of trademark, trade secrets, and unfair competition law, with a strong emphasis on the development of these doctrines in American law from both a statutory and common law perspective.

LAW 739. American Legal History. 3 Hours.

The study of American law from the colonial period to the present with emphasis on the jurisprudential, social, economic, political and cultural influences that have shaped the development of a distinctively American legal system.

LAW 740. Conflict of Laws. 3 Hours.

Legal problems arising when an occurrence cuts across state or national boundaries, emphasizing questions of characterization, jurisdiction, foreign judgments, recognition and application of foreign law in selected fields of law.

LAW 741. Employment Law. 3-4 Hours.

The course primarily focuses on federal and state regulations of the employee- employer relationships and may include: wrongful discharge, employee discrimination, wage/hour issues, and occupational safety and health.

LAW 742. Professional Responsibility. 3 Hours.

Professional responsibility in the administration of justice in society; Code of Professional Responsibility examined in light of traditional and changing demands of the legal system.

LAW 743. Patent Prosecution. 3 Hours.

PR: LAW 735. The study of all stages of patent prosecution, with an emphasis on claims drafting and amendment of claims. Prosecution study emphasizes drafting responses to official actions.

LAW 744. Law and Economics. 3 Hours.

Legal rules and institutions from perspective of economics; basic assumptions and principles with application to private law (contract, tort, nuisance, litigation) and public law (regulations, taxation, redistribution.).

LAW 746. Lawyers and Literature. 3 Hours.

A course of literary readings (emphasizing fiction and novels) that involve lawyers and focus on the theme of reflection and introspection.

LAW 747. Health Care Law. 3 Hours.

This introductory course in health care law includes state and federal regulation of the business of health care, system managed care, fraud and abuse, and health care transactions.

LAW 748. Presidential Powers. 2 Hours.

This course explores the role of the executive vis-a-vis Congress and the Judiciary through a study of the historical, textual, and functional bases of executive power, as well as the limitations on it.

LAW 750. Alternative Dispute Resolution. 3 Hours.

A theoretical and practical examination of negotiation, court-annexed and private mediation and arbitration, summary jury and minitrials, and other alternative dispute resolution processes; an assessment of the appropriateness of ADR for particular legal disputes.

LAW 752. Jurisprudence. 3 Hours.

Introduction to legal philosophy. Major jurisprudential issues; definition of law, concept of justice, relation of law and morality considered in light of specific legal theories and contemporary issues.

LAW 753. Estate and Gift Taxation. 3 Hours.

Application of federal transfer taxes (estate and gift tax) and West Virginia inheritance tax; inter vivos transfers; joint interests; life insurance; valuation; exemptions, exclusions and deductions; marital deduction.

LAW 754. State and Local Taxation. 2,3 Hours.

Constitutional limitations; examination of specific taxes such as ad valorem, sales and use, business and occupation, and income taxes; tax exemptions; and tax procedure.

LAW 755. Partnership Tax. 2 Hours.

PR: LAW 719. The study of Partnership Tax with an emphasis on reading the appropriate sections of the Internal Revenue Code and applying them to various problems to instill in the students the fundamentals of partnership tax.

LAW 756. Trial Advocacy. 4 Hours.

PR: LAW 727. Introduction to techniques of, and moral and ethical questions associated with trial practice, jury selection, opening statement, direct and cross examination, closing argument. Lecture, discussion, and simulation.

LAW 757. Law Review 1. 1 Hour.

PR: Student in college of law. (May be repeated for a maximum of 2 credit hours.) Legal research, writing, and editing involved in the production for publication of analytical and scholarly commentary on the law. Enrollment is limited to third-year students who are members of the West Virginia Law Review.

LAW 758. Law Review 2. 1 Hour.

PR: LAW 757. (May be repeated for a maximum of 2 credit hours.) Continuation of LAW 757.

LAW 759. Civil Rights. 3 Hours.

Survey of federal civil rights and statutes; causes of action to vindicate constitutional rights and remedy discrimination; primary emphases on substance, procedures, and defenses under 42 U.S.C. 1983.

LAW 760. Workers Compensation Law. 3 Hours.

A study of the compensation system for work related injuries.

LAW 762. Federal Courts. 3 Hours.

Jurisdiction and procedure in federal courts. Federal question and diversity jurisdiction; removal jurisdiction and procedure; the law applied in federal courts, and procedural rules unique to the federal system.

LAW 763. Employment Discrimination. 3 Hours.

Survey of federal and state statutes prohibiting discrimination in employment practices on grounds of race, gender, national origin, religion, age, or disability.

LAW 764. Administrative Law. 3 Hours.

Creation and operation of administrative agencies, common procedural practices and requirements of administrative procedure acts, judicial control of administrative agencies.

LAW 766. Coal/Oil and Gas. 3 Hours.

Nature of ownership of subsurface minerals; methods of transferring ownership thereof, partition among co-owners, analysis of leasehold estates, and rights and duties thereunder, coal mining rights and privileges.

LAW 767. Bankruptcy: Creditors and Debtors Rights. 3 Hours.

Federal bankruptcy law including consumer and business liquidation in Chapter 7 and rehabilitation in Chapter 11 and Chapter 13. Actual preparation of filings and plans. Introductory coverage of state debtors in collecting debts and enforcing judgments.

LAW 768. International Law. 3 Hours.

The law governing the behavior of nations; overview of customary law, treaties, dispute resolution, armed conflict, and recent specific problems for the United States in the world community.

LAW 769. Family Law. 3 Hours.

The law in its relation to creation, stability, and breakdown of domestic relations including engagement, marriage, annulment, separation, divorce, alimony and child support, custody, and adoption (Based on national and West Virginia law.).

LAW 770. Insurance. 2 Hours.

A survey of the basic principles, rules, and issues from the formation of the insurance relationship including indemnity, protections afforded, claims, and payment.

LAW 771. Labor Law. 3 Hours.

Labor-management relations under the general jurisdiction of the National Labor Relations Board and the courts. Collective bargaining, administration, and enforcement of labor agreements and enforcement and protection of rights of employees, unions, and the public.

LAW 773. Payment Systems. 2 Hours.

The law dealing with bills, notes and checks. The relationship of banks with depositors and other banks; commercial credit operations; creation and protection of claims, and UCC Articles 3, 4 and 4a.

LAW 774. Local Government. 2 Hours.

Distribution of governmental authority among local, state, and national governments; public office and employment, liability risks of local governmental action; taxing and budgeting.

LAW 775. Pre-trial Litigation. 3 Hours.

This course will immerse students in the daily work of civil litigators. Students will learn the procedural and substantive contours of litigating a hypothetical case from its inception through the eve of trial.

LAW 776. Sales and Secured Transactions. 4 Hours.

Functional approach designed to use the UCC for commercial and consumer problems. Focus on sale of goods, security interest in personal property, and Articles 1, 2, 6, and 9 of the UCC.

LAW 777. Health Care Torts. 3 Hours.

Introduction to legal issues that arise in the U.S. health care system relating mainly to patient care; emphasizing topics such as medical malpractice, informed consent, patient confidentiality, quality and accessibility of health care to patients.

LAW 778. Trade Regulation. 3 Hours.

Federal and state controls of vertical and horizontal integration and the legal limits upon the concentration of economic power in the United States.

LAW 779. Business Transactions Drafting. 4 Hours.

Focuses on the process and principles of drafting documents used in connection with various types of business arrangements. Such documents establish norms, or rules of expected behavior between the parties in the business context.

LAW 780. Federal Judicial Externship 1. 2-8 Hours.

PR: LAW 727 and PR or CONC: LAW 780A. Strongly recommended that students take LAW 618 and LAW 762 prior to enrolling in this course. A two-component, practical course in which selected students will serve as regular, full-time clerks to federal district court and appellate judges for one semester. Classroom instruction and writing requirements are included.

LAW 780A. Federal Judicial Externship 2. 6-11 Hours.

PR: LAW 727 and PR or CONC: LAW 780. Strongly recommended that students take LAW 618 and LAW 762 prior to enrolling in this course. The field work component of LAW 780.

LAW 781. Postmodern Jurisprudence. 3 Hours.

This course explores contemporary legal philosophy. It examines reactions of postmodern schools - law and literature, law and economics, critical race, gender law, queer crit, pragmatism, therapeutic jurisprudence - to classical jurisprudence including natural law, positivism and realism.

LAW 782. Legal Clinic 1. 7 Hours.

PR: LAW 706, LAW 722, and LAW 727. A clinical introduction to the arts and skills of lawyering. Students may represent clients and also engage in simulated practice exercises.

LAW 783. Legal Clinic 2. 7 Hours.

PR: LAW 782. A continuation of LAW 782. Students are given increased responsibilities for cases and will try a case in a simulated and/or actual trial setting.

LAW 784. Securities. 3 Hours.

Federal and state regulations of the distribution of and trading in securities, including the Blue-Sky Laws and federal acts.

LAW 785. Federal Corporate Taxation. 4 Hours.

PR: LAW 719. Application of federal income taxation to corporations and shareholders; distributions and redemptions; complete liquidations; corporate acquisitions and divisions; and Subchapter S.

LAW 786. Lugar Trial Advocacy. 1,2 Hour.

An extensive lecture series and trial simulation program designed to provide opportunities for students to develop advanced litigation skills. Students must participate in six full-scale mock trials and one outside trial competition.

LAW 787. Intercollegiate Moot Court. 1,2 Hour.

Appellate brief writing and argumentation for members of intercollegiate moot court teams.

LAW 788. Interviewing, Counseling, and Negotiation. 3 Hours.

This course provides instruction in the lawyering skills involved in interviewing and client counseling as well as negotiation on a client's behalf. Simulations are employed to develop and enhance these practical lawyering skills.

LAW 789. Law of Environmental Protection. 3 Hours.

Problems of identifying and evaluating scientific evidence of air and water pollution; weighting the benefits of economic and technological progress against resulting harm to the quality of life; choice among alternative forms of litigation and public regulation as methods of social control.

LAW 791A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

LAW 792A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

LAW 794A-Z. Seminar. 1-6 Hours.

Research seminar in various topics. Substantial writing is required under close supervision of the faculty member. (Enrollment limited).

LAW 795. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

LAW 797. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

LEGAL STUDIES COURSES

LEGS 610. Law and the Legal System. 3 Hours.

Introduction to the law and its functions, the structure of the U.S. legal system, and the actors in the legal system.

LEGS 620. Researching the Law. 3 Hours.

Provides experience in locating and interpreting primary and secondary legal authority; federal and state constitutions; agency rules and regulations.

LEGS 630. Law and Society. 3 Hours.

Explores the relationship between legal rules and social norms; the law's role in defining deviance and establishing social control; issues of equality; where people go to resolve disputes.

LEGS 640. Administrative Legal Process. 3 Hours.

Explores the role of administrative agencies in making law.

LEGS 650. The Legislative Process. 3 Hours.

Examines how legislation develops and implications of recent legislative reform enactments and proposals.

LEGS 660. Alternative Dispute Resolution. 3 Hours.

Theoretical and practical examination of alternative dispute processes and assessment of the appropriateness of alternative dispute resolution for particular legal disputes.

LEGS 691A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

LEGS 692A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

LEGS 695. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

LEGS 697. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

LEGS 699. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use of the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is P/F; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

LEGS 700. Research Capstone. 3 Hours.

Research activities leading to a scholarly project applying and extending knowledge gained across the master of legal studies program coursework.

LEGS 710. Family Law. 3 Hours.

Examines the distribution of power and responsibility among parent, child, and the state related to a variety of family issues and social service workers' reporting obligations.

LEGS 720. Media and the Law. 3 Hours.

Survey of mass media and the law, implications of existing law, and proposed changes.

LEGS 730. Employment Law. 3 Hours.

Explores law related to workers compensation, disability insurance, affirmative action/equal opportunity policies, workplace, workplace discrimination and related federal and state statutes.

LEGS 740. Commerce Law. 3 Hours.

Survey of the legal principles relating to the organization, operation, and management of business organizations and principles relating to commercial transactions.

LEGS 750. Criminal Law and Procedure. 3 Hours.

Covers investigative stages of search and seizure, interrogation, and identification. Familiarizes students with prosecutorial stages and evidentiary issues.

LEGS 760. Administrative Ethics. 3 Hours.

Analysis of ethical issues in the law and the administrative decision making process.

LEGS 770. Healthcare Law. 3 Hours.

Examines law and health care regulations related to provision of healthcare and issues related to liability.

LEGS 780. Constitutional Law. 3 Hours.

Examines the concept of constitutionalism, the relationships between the branches of government and between national and state governments, and the role of the Constitution in protecting individual liberties.

LIBRARY SCIENCE COURSES**LS 591A-Z. Advanced Topics. 1-6 Hours.**

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

LS 593A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

LS 690. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of library science. Note: This course is intended to insure that graduate assistants are adequately supervised when they are given college teaching responsibility. It also provides a mechanism for students not on assistantships to gain teaching experience. (Grading may be S/U.).

LS 691A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

LS 692A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

LS 693A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

LS 694A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

LS 695. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

LS 696. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

LS 697. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

LS 699. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use of the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is S/U; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

LINGUISTICS COURSES**LING 501. Structure of Spanish. 3 Hours.**

Description of phonological or grammatical systems of Spanish, with emphasis on contrastive analysis (Spanish/English) and applied linguistics.

LING 511. English as a Second Language Linguistics. 3 Hours.

PR: LING 101 or LING 301. Analysis of English structure for the purpose of teaching it to non-native speakers. Includes identification of problematic aspects and procedures for teaching them effectively.

LING 512. Applied Linguistics. 3 Hours.

PR: LING 311 and prior second language study. Study of the application of linguistic analysis in the areas of language acquisition, instruction, and use.

LING 513. History of Linguistics. 3 Hours.

PR: LING 311 or Consent. Development of linguistics from Greeks and Romans to contemporary researchers with concentration on major linguists and schools of the nineteenth and twentieth centuries.

LING 514. Sociolinguistics. 3 Hours.

PR: LING 101 or LING 311. Linguistic study of geographical and social variation in languages; effects of regional background, social class, ethnic group, sex, and setting; outcomes of conflict between dialect and between languages.

LING 516. Discourse Analysis. 3 Hours.

PR: LING 101 or equivalent. A study of the structural properties of spoken and written texts and how they are related to the contextual factors involved in text production.

LING 590. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of linguistics. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on assistantships to gain teaching experience. (Grading may be P/F.).

LING 591A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

LING 592A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

LING 593A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

LING 594A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

LING 595. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

LING 601. History of the Spanish Language. 3 Hours.

PR: LING 311 and 18 hours of Spanish or consent. Evolution of Castilian from Vulgar Latin to its modern standard form through a study of historical phonology, morphology, and syntax, together with the external factors which influenced the development of the language.

LING 603. History of the French Language. 3 Hours.

PR: LING 311 and 18 hours of French or consent. Evolution of French from Vulgar Latin into the Modern French standard through a study of historical phonology, morphology, and syntax, together with the external factors which influenced the development of the language.

LING 605. History of the German Language. 3 Hours.

PR: LING 311 and 18 hours of German or Consent. Historical development of standard German languages and dialects.

LING 611. Advanced Phonology. 3 Hours.

PR: LING 411. The form of phonological rules and their organization within a grammar, the structure of phonological representations, and the role of language universals in models of language acquisition.

LING 612. Advanced Syntax. 3 Hours.

PR: LING 412 or Consent. Examination and discussion of theoretical issues in generative-transformational syntax. Focus on specific proposals advanced within the framework of Government- Binding Theory.

LING 613. English as a Second Language Phonetics. 3 Hours.

PR: LING 311. Analysis of American English phonetics including sound segments, stress, rhythm, intonation, and positional variants. Techniques and practice offered for teaching pronunciation to non-native speakers.

LING 614. Psycholinguistics. 3 Hours.

PR: LING 311 or Consent. Provides an insight into the many areas of psycholinguistics study, including language acquisition, sentence processing, animal communication, dichotic listening, aphasia, and semantics.

LING 615. Language Change and Reconstruction. 3 Hours.

PR: LING 311 or equivalent. Exploration of the mechanisms of language change, theories of diachronic linguistics, and techniques for reconstructing unattested languages; concentration on the Indo-European family and its history.

LING 616. Language Typology. 3 Hours.

PR: LING 101 or LING 311 or equivalent. Study of the uniformity and diversity of the world's languages. Which characteristics of human languages are universal and which are subject to cross- linguistic variation. An overview of the main results and methodology of typological research.

LING 690. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of linguistics. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It also provides a mechanism for students not on assistantships to gain teaching experience. (Grading will be P/F.).

LING 691A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

LING 692A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

LING 693A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

LING 694A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

LING 695. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

LING 696. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

LING 697. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper, or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

LING 698. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

LING 699. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use of the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is P/F; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

LING 791A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

MANAGEMENT COURSES

MANG 590. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of management. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on assistantships to gain teaching experience. (Grading may be S/U.).

MANG 591A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

MANG 593A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

MANG 594A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

MANG 691A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

MANG 692A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

MANG 693A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

MANG 694A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

MANG 695. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

MANG 696. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

MANG 697. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

MANG 698. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

MANG 699. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use of the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is S/U; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

MANG 710. Philosophy of Research. 3 Hours.

This course provides an overview of the philosophical principles that guide research in organizations, ethical dilemmas and practical relevance of research, and factors that guide the selection of a research design and method of analysis.

MANG 711. Research Methods. 3 Hours.

PR: Consent. Graduate-level introduction to critical topics in research methodology relevant to the social sciences. Emphasis on theory-driven research design, data collection, measurement development and evaluation, and various quantitative data analytic issues with a particular focus on organizational research.

MANG 713. Multivariate Analysis and Structural Equation Modeling. 3 Hours.

This course discusses commonly used techniques (e.g., factor analysis, MANOVA, structural equation modeling) of analyzing multivariate data. The course will help students in choosing the appropriate methods for analyzing data in their own research.

MANG 720. Research Seminar in Human Resources Management. 3 Hours.

PR: MANG 710. This doctoral seminar will present the the issues facing global managers regarding strategic workforce management to facilitate organizational objectives as viewed through the perspectives of international theorists and researchers in the HRM literature.

MANG 730. Research Seminar in Leadership. 3 Hours.

PR: MANG 710. Traditional leadership theory is reviewed and contrasted with more recent models of effective leadership in a global context with a special emphasis on the leadership of organizational change.

MANG 740. Social Psychology and Group Process. 3 Hours.

PR: MANG 720. Graduate-level introduction to social and industrial-organizational psychology. Emphasis on major theories, issues, and literature regarding social psychology and organizational behavior in domestic and international contexts.

MANG 760. Organizational Theory. 3 Hours.

PR: MANG 710. A survey of modern developments in organizational theory and their connection to the field's roots. Modern organizational theory has several different sub-fields, and this course will connect these diverse theories with special emphasis on application.

MANG 770. Global Strategy and Theory. 3 Hours.

PR: MANG 710. Graduate-level introduction to international theory and strategy. Emphasis on major theories, issues, and literature regarding international theory and global strategy in regional and international contexts.

MANG 780. Current Topics in Organizational Behavior. 3 Hours.

PR: MANG 730. This course is designed to familiarize doctoral students with current research topics in global leadership with an emphasis on exploring emerging areas of leadership and making application in the context of leadership practice.

MANG 785. Current Topics in Strategy. 3 Hours.

PR: MANG 770. Evaluation and analysis of current literature regarding important managerial and strategic issues in the in the international environment from different theoretical perspectives, including strategic management, organizational theory, economic sociology, and economics.

MANG 795. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

MANG 797. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis (697), problem report (697), research paper or equivalent scholarly project (697), or a dissertation (797). Grading may be S/U.

MANG 798. Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that believe that this level of control and supervision is needed during the writing of students; reports, theses, or dissertation.

MARKETING COURSES**MKTG 500. Seminar in Marketing. 3 Hours.****MKTG 535. Management Distribution Systems. 3 Hours.****MKTG 590. Teaching Practicum. 1-3 Hours.**

PR: Consent. Supervised practice in college teaching of business and economics. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on assistantships to gain teaching experience. (Grading will be S/U.).

MKTG 591A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

MKTG 592A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

MKTG 593A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

MKTG 595. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

MKTG 691A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

MKTG 695. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

MKTG 697. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

MKTG 698. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

MKTG 699. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use of the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is P/F; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

MKTG 700. Seminar on Marketing Theory. 3 Hours.

Critical review of the literature with an emphasis on evaluating the structure of theories as well as the various schools of marketing thought. Additionally, students develop an understanding of social science and the scientific method.

MKTG 710. Philosophy of Research. 3 Hours.

This course provides an overview of the philosophical principles that guide research in organizations, ethical dilemmas and practical relevance of research, and factors that guide the selection of a research design and method of analysis.

MKTG 711. Advanced Topics in Marketing 1. 3 Hours.

this seminar involves the study of theory and empirical research as it relates to the following areas in Marketing: channels of distribution, sales and sales management, retail management, and services marketing.

MKTG 713. Multivariate Data Analysis. 3 Hours.

PR: MANG 712. This course discusses commonly used techniques (e.g., factor analysis, MANOVA, structural equation modeling) of analyzing multivariate data. The course will help students in choosing the appropriate methods for analyzing data in their own research.

MKTG 720. Seminar in Buyer Behavior. 3 Hours.

This course covers buyer behavior theories including information processing, attitude, behavior, decision making, social environment, and potential moderators from positivist and post-positivist perspectives.

MKTG 721. Advanced Topics in Marketing 2. 3 Hours.

This seminar further develops students' understanding of marketing theories and empirical research. Topics include pricing, international marketing, brand management, new product management and advertising and promotion.

MKTG 730. Advanced Marketing Research. 3 Hours.

PR: MKTG 700 and MKTG 720. This seminar covers common research methods employed in marketing research, including: experimental design, sampling and survey research, measurement, meta-analysis, and validity issues to facilitate students' ability to critique marketing papers and to develop their own research.

MKTG 740. Seminar in Marketing Strategy and Policy. 3 Hours.

This seminar is designed to deepen the students' understanding of marketing strategy, international marketing and public policy in marketing. Topics include: measuring marketing outcomes, competition, foreign market entry mode, country of origin, consumer welfare, and sustainability.

MKTG 795. Independent Study. 1-9 Hours.

Faculty-supervised study of topics not available through regular course offerings.

MKTG 797. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading will be S/U.).

MKTG 798. Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that believe that this level of control and supervision is needed during the writing of students' reports, theses, or dissertations.

MKTG 930. Professional Development. 1-6 Hours.

Professional development courses provide skill renewal or enhancement in a professional field or content area (e.g., education, community health, geology.) These tuition-waived continuing education courses are graded on a pass/fail grading scale and do not apply as graduate credit toward a degree program.

MATHEMATICS COURSES**MATH 520. Solution of Nonlinear Systems. 3 Hours.**

PR: MATH 420 or MATH 441. Solution of nonlinear systems of equations. Newton and Secant Methods. Unconstrained optimization. Nonlinear over relaxation techniques. Nonlinear least squares problems.

MATH 521. Numerical Analysis. 3 Hours.

PR: MATH 261 and computer language. Number systems and errors, interpolation by polynomials, linear systems, scalar algebraic equations and systems, optimization, approximation theory, integration initial, and boundary value problems.

MATH 522. Numerical Solution of PDE. 3 Hours.

PR: MATH 261 and computer language. Finite difference and finite element methods for elliptic, parabolic, and hyperbolic problems. Study of properties such as consistency, convergence, stability, conservation, and discrete maximum principles.

MATH 524. Middle School Number and Algebra 1. 2 Hours.

PR or CONC: C&I 524. Designed only for in service middle school and elementary mathematics teachers. Sets of numbers as examples of algebraic systems, properties of groups, rings, and fields.

MATH 525. Middle School Number and Algebra 2. 2 Hours.

PR or CONC: C&I 525. Continuation of MATH 524. Designed only for in service middle school and elementary mathematics teachers. Properties of polynomials and polynomial rings. Mathematics modeling with finite differences and least squares.

MATH 528. Middle School Functions and Change 1. 2 Hours.

PR or CONC: C&I 528. Designed only for in service middle school and elementary mathematics teachers. Function concept, operations on functions, limits, continuity, Intermediate Value Theorem, families of curves, optimization area. Classroom applications current research in learning. Applications in model curricula.

MATH 529. Middle School Functions and Change 2. 2 Hours.

PR or CONC: C&I 529. Continuation of MATH 528. Designed only for in service middle school and elementary mathematics teachers. Function concept, operations on functions, limits continuity, Intermediate Value Theorem, families of curves, optimization, area. Classroom applications, current research in learning. Applications in model curricula.

MATH 530. Introduction to Applied Mathematics. 1-6 Hours.

PR: MATH 251. (Designed especially for secondary-school mathematics teachers; others admitted with departmental approval obtained before registration.) Problem solving and construction of mathematical models in the social, life, and physical sciences. Examples illustrating the origins and use of secondary school mathematics in solving real world problems.

MATH 533. Modern Algebra for Teachers 1. 3 Hours.

PR: MATH 251. (Designed especially for secondary-school mathematics teachers. Others admitted with departmental approval obtained prior to registration.) Introduction to algebraic structures; groups, rings, integral domains, and fields. Development and properties of the rational and real number systems.

MATH 534. Modern Algebra For Teachers 2. 3 Hours.

PR: MATH 341 or MATH 533. Further investigation of algebraic structures begun in MATH 533. (Emphasis on topics helpful to secondary-school mathematics teachers.) Topics include Sylow theory, Jordan-Holder Theorem, rings and quotations, field extensions, Galois theory and solution by radicals.

MATH 535. Foundations of Geometry. 3 Hours.

PR: MATH 251 (Designed especially for secondary mathematics teachers; others admitted with departmental approval obtained before registration.) Incidence geometrics with models; order for lines and planes; separation by angles and by triangles; congruence; introduction to Euclidean geometry; geometry.

MATH 536. Transformation Geometry. 3 Hours.

PR: MATH 341 or MATH 533. (Designed especially for secondary-school mathematics teachers; others admitted with departmental approval obtained before registration.) A modern approach to geometry based on transformations in a vector space setting. The course unifies the development of geometry with the methods of modern algebra.

MATH 541. Modern Algebra. 3 Hours.

PR: MATH 341 Concepts from set theory and the equivalence of the Axiom of Choice. Zorn's Lemma and the Well-Ordering Theorem; a study of the structure of groups, rings, fields, and vector spaces; elementary factorization theory; extensions of ring and fields; modules and ideals; and lattices.

MATH 543. Linear Algebra. 3 Hours.

PR: MATH 441. Review of theory of groups and fields; linear vector spaces including the theory of duality; full linear group; bilinear and quadratic forms; and theory of isotropic and totally isotropic spaces.

MATH 545. Number Theory 1. 3 Hours.

PR: MATH 155 or MATH 156. Introduction to classical number theory covering such topics as divisibility, the Euclidean algorithm, Diophantine equations, congruencies, primitive roots, quadratic residues, number-theoretic functions, distribution of primes, irrationals, and combinatorial methods. Special numbers such as those of Bernoulli, Euler, and Stirling.

MATH 551. Real Variables 1. 3 Hours.

PR: MATH 451. A development of Lebesgue integral, function spaces and Banach spaces, differentiation, complex measures, the Lebesgue- Radon-Nikodym theorem.

MATH 555. Complex Variables 1. 3 Hours.

PR: MATH 451. Number systems, the complex plane and its geometry. Holomorphic functions, power series, elementary functions, complex integration, representation theorems, the calculus of residues, analytic continuation and analytic function, elliptic functions, Holomorphic functions of several complex variables.

MATH 557. Calculus of Variations. 3 Hours.

PR: (MATH 261 and MATH 452) or MATH 568. Necessary conditions and sufficient conditions for weak and strong relative minimums of an integral, Euler-Lagrange equation. Legendre condition, field construction, Weierstrass excess function, and the Jacobi equation.

MATH 561. Geometric Modeling-Curves/Surf. 3 Hours.

PR: MATH 261 and linear algebra. Mathematical techniques used in CAD/CAM environments, including conics, cubic splines, Bezier splines, B-splines rational Bezier and B-splines, interpolation, geometric continuity, and data exchange.

MATH 563. Mathematics Modeling. 3 Hours.

PR: MATH 261 and MATH 465. This course is concerned with construction, analysis, and interpretation of mathematical models that shed light on important problems in the sciences. Emphasis is on the simplification, dimensional analysis, and scaling of mathematical models.

MATH 564. Intermediate Differential Equations. 3 Hours.

PR: MATH 261. A rigorous study of ordinary differential equations including linear and nonlinear systems, self-adjoint eigenvalue problems, non-self-adjoint boundary-value problems, perturbation theory of autonomous systems, Poincare-theorem.

MATH 565. Wave Propagation. 3 Hours.

PR: MATH 465 or MATH 567 or Consent. Study of waves in applied mathematics. The wave equation and geometrical optics, water waves, exact solutions, and interacting solitary waves. Basic concepts of hyperbolic and dispersive waves, conservation laws and scalar PDE's shock waves, Bateman Burgers equation, and hyperbolic systems.

MATH 567. Advanced Calculus. 3 Hours.

per semester. PR: MATH 261. Primarily for engineers and scientists. Functions of several variables, partial differentiation, implicit functions, transformations; line surface and volume integrals; point set theory, continuity, integration, infinite series and convergence, power series, and improper integrals.

MATH 568. Advanced Calculus. 3 Hours.

per semester. PR: MATH 567. Primarily for engineers and scientists. Functions of several variables, partial differentiation, implicit functions, transformations; line surface and volume integrals; point set theory, continuity, integration, infinite series and convergence, power series, and improper integrals.

MATH 569. Seminar in Applied Mathematics. 1-12 Hours.

PR: Consent. Selected topics in applied mathematics. Topics previously offered include applied linear algebra, computational fluid dynamics, numerical partial differential equations, ordinary differential equations, perturbation methods, and stochastic processes.

MATH 571. Combinatorial Analysis 1. 3 Hours.

PR: One year of calculus. Permutations, combinations, generating functions, principle of inclusion and exclusion, distributions, partitions, compositions, trees and networks.

MATH 573. Graph Theory. 3 Hours.

PR: MATH 343 and MATH 283. Basic concepts of graphs and digraphs, trees, cycles and circuits, connectivity, traversibility, planarity, colorability, and chromatic polynomials. Further topics from among factorization, line graph, covering and independence, graph matrices and groups, Ramsey theory, and packing theory.

MATH 578. Applied Discrete Mathematics. 3 Hours.

PR: MATH 375 or MATH 378 or MATH 341 or MATH 343 or MATH 283. Topics may include combinatorial optimization, applied coding theory, integer programming, linear programming, matching, and network flows.

MATH 581. Topology 1. 3 Hours.

PR: MATH 452. A detailed treatment of topological spaces covering the topics of continuity, convergence, compactness, and connectivity; product and identification space, function spaces, and the topology in Euclidean spaces.

MATH 590. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of mathematics. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on assistantships to gain teaching experience. Grading will be P/F.

MATH 591A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

MATH 592A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

MATH 593A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

MATH 595. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

MATH 621. Computational Matrix Theory. 3 Hours.

Matrix norms singular value decomposition, QR factorization, least-square problems, conditioning and stability, eigenvalue problems, and iterative methods for solving large systems.

MATH 631. RUME 1: Introduction to Undergraduate Mathematics Education Research. 3 Hours.

PR: (MATH 451 and MATH 452) or MATH 551 or MATH 567. Research literature will provide background for investigating issues in knowing and learning undergraduate mathematics. Students will be introduced to research design, data collection, and qualitative analysis related to investigating aspects of learning undergraduate mathematics.

MATH 641. Modern Algebra 2. 3 Hours.

PR: MATH 545. Concepts from set theory and the equivalence of the axiom of choice. Zorn's Lemma and the Well-Ordering Theorem; a study of the structure of groups, rings, fields, and vector spaces; elementary factorization theory; extensions of ring and fields; modules and ideals; and lattices.

MATH 645. Number Theory 2. 3 Hours.

PR: MATH 305. Introduction to classical number theory covering such topics as divisibility, the Euclidean algorithm, Diophantine equations, congruencies, primitive roots, quadratic residues, number-theoretic functions distribution of primes, irrationals, and combinatorial methods. Special numbers such as those of Bernoulli, Euler, and Stirling.

MATH 651. Real Variables 2. 3 Hours.

PR: MATH 551. A development of the Lebesgue integral, function spaces and differentiation, complex measures, the Lebesgue-Radon- Nikodym theorem.

MATH 655. Complex Variables 2. 3 Hours.

PR: MATH 555. Number systems, the complex plane and its geometry. Holomorphic functions, power series, elementary functions, complex integration, representation theorems, the calculus of residues, analytic continuation and analytic function, elliptic functions, Holomorphic functions of several complex variables.

MATH 661. Geometric Modeling-Solids. 3 Hours.

PR: MATH 561. Mathematical techniques used in CAD/CAM environments, including basic primitives, manifold and non-manifold solids, Euler characteristic, half-space models, constructive solid geometry (CSG), boundary representation (B-rep), Euler operators, Boolean operations, and data exchange.

MATH 671. Combinatorial Analysis 2. 3 Hours.

PR: MATH 571. Permutations, combinations, generating functions, principle of inclusion and exclusion, distributions, partitions, compositions, trees, and networks.

MATH 677. Topics in Discrete Mathematics. 3 Hours.

PR: MATH 571 or MATH 543 or MATH 573. Topics may include algorithmic graph theory, combinatorial designs, matroid theory, $(0,1)$ - matrices, and permanents.

MATH 677A. Topics in Discrete Mathematics. 3 Hours.

PR: MATH 571 or MATH 543 or MATH 573. Topics include algorithmic graph theory, combinatorial designs, matroid theory, $(0,1)$ - matrices, and permanents.

MATH 677B. Topics in Discrete Mathematics. 3 Hours.

PR: MATH 571 or MATH 543 or MATH 573. Topics may include algorithmic graph theory, combinatorial designs, matroid theory, $(0,1)$ - matrices, and permanents.

MATH 677C. Topics in Discrete Mathematics. 3 Hours.

PR: MATH 571 or MATH 543 or MATH 573. Topics may include algorithmic graph theory, combinatorial designs, matroid theory, $(0,1)$ - matrices, and permanents.

MATH 677D. Topics in Discrete Mathematics. 3 Hours.

PR: MATH 571 or MATH 543 or MATH 573. Topics may include algorithmic graph theory, combinatorial designs, matroid theory, $(0,1)$ - matrices, and permanents.

MATH 677E. Topics in Discrete Mathematics. 3 Hours.

PR: MATH 571 or MATH 543 or MATH 573. Topics may include algorithmic graph theory, combinatorial designs, matroid theory, $(0,1)$ - matrices, and permanents.

MATH 677X. Topics in Discrete Mathematics. 3 Hours.

PR: MATH 571 or MATH 543 or MATH 573. Topics may include algorithmic graph theory, combinatorial designs, matroid theory, $(0,1)$ -matrices, and permanents.

MATH 677Y. Topics in Discrete Mathematics. 3 Hours.

PR: MATH 571 or MATH 543 or MATH 573. Topics may include algorithmic graph theory, combinatorial designs, matroid theory, $(0,1)$ -matrices, and permanents.

MATH 677Z. Topics in Discrete Mathematics. 3 Hours.

PR: MATH 571 or MATH 543 or MATH 573. Topics may include algorithmic graph theory, combinatorial designs, matroid theory, $(0,1)$ -matrices, and permanents.

MATH 681. Topology 2. 3 Hours.

PR: MATH 581. A detailed treatment of topological spaces covering the topics of continuity, convergence, compactness, and connectivity; product and identification space, function spaces, and the topology in Euclidean spaces.

MATH 683. Set Theory and Applications. 3 Hours.

PR: MATH 541 or MATH 551 or MATH 581. The course concentrates on the typical methods of set theory, transfinite induction, and Zorn's Lemma with emphasis on their applications outside set theory. The fundamentals of logic and basic set theory are included.

MATH 690. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of mathematics. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It also provides a mechanism for students not on assistantships to gain teaching experience. (Grading will be S/U.)

MATH 691A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

MATH 692A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

MATH 693A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

MATH 694A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

MATH 695. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

MATH 696. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

MATH 697. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project or a dissertation. (Grading may be S/U.)

MATH 698. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

MATH 699. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use of the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is P/F; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

MATH 741. Group Theory 1. 3 Hours.**MATH 742. Group Theory 2. 3 Hours.**

PR: MATH 741.

MATH 745. Analytic Number Theory 1. 3 Hours.

PR: MATH 555 and MATH 645. Selected topics in analytic number theory such as the prime number theorem, primes in an arithmetical progression, the Zeta function, the Goldbach conjecture.

MATH 746. Analytic Number Theory 2. 3 Hours.

PR: MATH 745. Selected topics in analytic number theory such as the prime number theorem, primes in an arithmetical progression, the Zeta function, the Goldbach conjecture.

MATH 747. Advanced Topics in Modern Algebra. 1-6 Hours.

This course will cover selected topics of modern algebra as an extension of the basic material covered in the 541-641 sequence. The topic will be selected from algebraic number theory, noncommutative rings and modules, representation theory, algebraic model theory, homological algebra. (May be repeated for credit with consent.)

MATH 750. Seminar in Analysis. 1-12 Hours.**MATH 751. Functional Analysis 1. 3 Hours.**

PR: MATH 551. A study of Banach and Hilbert spaces; the Hahn-Banach theorem, uniform boundedness principle, and the open mapping theorem; dual spaces and the Riesz representation theorem; Banach algebras; and spectral theory.

MATH 752. Functional Analysis 2. 3 Hours.

PR: MATH 751. A study of Banach and Hilbert spaces; the Hahn-Banach theorem, uniform boundedness principle, and the open mapping theorem; dual spaces and the Riesz representation theorem; Banach algebras; C^* algebras; spectral theory.

MATH 753. Special Functions. 3 Hours.

PR: MATH 261 and MATH 452. Operational techniques, generalized hypergeometric functions, classical polynomials of Bell, Hermite, Legendre, Noerlund, etc. Introduction to recent polynomial systems. Current research topics.

MATH 757. Theory of Partial Differential Equations 1. 3 Hours.

PR: MATH 452. Cauchy-Kowaleski theorem, Cauchy's problem, the Dirichlet and Neumann problems, Dirichlet's principle, potential theory, integral equations, eigenvalue problems, numerical methods.

MATH 758. Theory of Partial Differential Equations 2. 3 Hours.

PR: MATH 757. Cauchy-Kowaleski theorem, Cauchy's problem, the Dirichlet and Neumann problems, Dirichlet's principle, potential theory, integral equations, eigenvalue problems, numerical methods.

MATH 764. Asymptotic Methods. 3 Hours.

MATH 764. Asymptotic Methods. 3 hr. PR: MATH 564. Study of asymptotic methods for differential equations. Basic concepts - asymptotic expansions, asymptotic approximation; asymptotic evaluations of integrals - Laplace's methods, Kelvin's methods, the steepest descent; asymptotic solutions of equations; perturbation of eigenvectors; the difference between singular and regular perturbations; multiple scale analysis; the method of matched asymptotic expansions; perturbations of periodic systems.

MATH 771. Matroid Theory 1. 3 Hours.

PR: (MATH 541 or MATH 543) and (MATH 571 or MATH 573). Independent sets, circuits, bases, rank functions, closure operators and close sets, other axiom systems, geometric representations, duality and minors, linear and algebraic representability, connectivity, basics of partial ordered sets, flats and lattices, relationship between lattices and matroids.

MATH 772. Matroid Theory 2. 3 Hours.

PR: MATH 771. Matroid representability, representability over finite fields, algebraic matroids, matroid constructions, higher connectivity of matroids, binary and ternary matroids, the splitter theorem and its applications, submodular functions, matroid intersection theorem, matroids in combinatorial optimizations.

MATH 773. Advanced Topics in Graph Theory. 3 Hours.

PR: MATH 573. (May be repeated for credit toward graduation.) Topics may include: Algebraic graph theory, random graph theory, extremal graph theory, topological graph theory, and structural graph theory.

MATH 777. Advanced Topics in Combinatorics. 3 Hours.

PR: MATH 571 or MATH 677. Topics may include: Combinatorics on finite sets, probabilistic methods in combinatorics, enumerations, Polya Theory, combinatorial matroid theory, coding theory, combinatorial identities, infinite combinatorics, transversal theory, and matroid theory. (May be repeated for credit with consent.)

MATH 780. Seminar in Topology. 1-12 Hours.**MATH 781. Continuum Theory 1. 3 Hours.**

PR: MATH 581. The fundamental properties of continua (compact, connected, metric spaces), including boundary bumping, space filling curves, structure of special continua, and inverse limits.

MATH 782. Continuum Theory 2. 3 Hours.

PR: MATH 781. The fundamental properties of continua (compact, connected, metric spaces), including boundary bumping, space filling curves, structure of special continua, and inverse limits.

MATH 783. Set Theory and Applications. 3 Hours.

PR: MATH 683. The course elaborates on the applications of the transfinite induction, and combines recursion methods with other elements of modern set theory, including the use of additional axioms of set theory, introduction to the forcing method.

MATH 790. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of mathematics. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on assistantships to gain teaching experience. (Grading will be S/U.)

MATH 791A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

MATH 792A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

MATH 793A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

MATH 794A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

MATH 795. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

MATH 796. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least on seminar to the assembled faculty and graduate student body of his or her program.

MATH 797. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or dissertation. (Grading may be S/U.).

MATH 798. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

MATH 799. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use of the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is P/F; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

MATH 930. Professional Development. 1-6 Hours.

Professional development courses provide skill renewal or enhancement in a professional field or content area (e.g., education, community health, geology). These tuition-waived continuing education courses are graded on a pass/fail grading scale and do not apply as graduate credit toward a degree program.

MECHANICAL AND AEROSPACE ENGR COURSES**MAE 515. Analytical Methods in Engineering. 3 Hours.**

PR: Consent. Index notation for determinants, matrices, and quadratic forms; linear vector spaces, linear operators including differential operators; calculus of variations, eigenvalue problems, and boundary value problems.

MAE 521. Advanced Thermodynamics 1. 3 Hours.

PR: MAE 321 or MAE 426. First and second laws of thermodynamics with emphasis on entropy production and availability (exergy); Maxwell's relationships and criteria for stability; equations of state and general thermodynamic equations for systems of constant chemical composition.

MAE 525. Heavy Duty Vehicle Emissions. 3 Hours.

PR: Graduate student standing in engineering or instructor consent. Present research and development of advanced heavy-duty engines and their use in vehicle powertrains. Study emissions formation and control from existing and developing heavy-duty vehicle system designs using conventional and hybrid propulsion systems.

MAE 528. Introduction to Fuel Cell Technology. 3 Hours.

PR: Graduate student standing in engineering or consent. Fuel cells definition, types and application areas, thermodynamics of fuel cells, introduction of electrochemistry, Nernst Potential, Butler-Volmer and Tafel equations, experimental techniques, computational techniques, fuel cell materials, fuel processing and storage, stack, and system design.

MAE 531. Fluid Mechanics 1. 3 Hours.

PR: Consent. Advanced dynamics and thermodynamics of fluids. Basic laws of conservation of mass and momentum in differential, vector, and integral forms. Application to internal flows, fluid machinery, and structures.

MAE 532. Dynamics of Viscous Fluids. 3 Hours.

PR: Consent. Derivation of and exact solutions for the Navier-Stokes equations; laminar boundary-layer theory, similarity solutions, and integral methods.

MAE 534. Fluid Flow Measurements. 3 Hours.

PR: MAE 336 or Consent. Principles and measurements of static and dynamic pressures and temperatures, velocity, and Mach number and forces. Optical techniques and photography. Design of experiments. Review of selected papers from the literature. (2 hr. lec., 3 hr. lab.).

MAE 543. Advanced Mechanics of Materials. 3 Hours.

PR: Consent. Shear flow and shear center; curved beams; unsymmetrical bending, energy methods in structural analysis; theories of failure; instability of structures; beams on elastic foundation.

MAE 565. Artificial Intelligence Techniques in Mechanical and Aerospace Engineering. 3 Hours.

Introduction to solving complex problems in mechanical and aerospace engineering using genetic (evolutionary) algorithms, fuzzy logic-based modeling and control, and artificial neural networks.

MAE 580. Crystallography and Crystals. 3 Hours.

Introduction to the principles of structure of materials, and theory and applications of diffraction and imaging techniques for materials characterization using X-ray diffraction and transmission electron microscopy (TEM).

MAE 583. Thermodynamics and Kinetics of Materials. 3 Hours.

Fundamental concepts of thermodynamics and kinetics of materials. Classical thermodynamics. Examples of the application of thermodynamic concepts to the analysis of material systems.

MAE 593A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

MAE 621. Advanced Thermodynamics 2. 3 Hours.

PR: MAE 521 or Consent. Thermodynamics of multi-component inert and reacting systems; equilibrium analysis; introduction to irreversible processes involving diffusion and chemical kinetics; application of concepts to heterogeneous systems.

MAE 623. Conduction Heat Transfer. 3 Hours.

PR: MAE 423 or Consent. Analytical and numerical solutions of steady and non-steady heat conduction problems in one-, two-, and three dimensional bodies; solution of linearized equations; applications include extended surfaces, moving surfaces, moving heat sources, and instrumentation techniques.

MAE 624. Convection Heat Transfer. 3 Hours.

PR: MAE 423 or Consent. Laminar and turbulent flows in forced and free convection systems; external and internal flows with application to heat exchanger design; introduction to aerodynamic heating.

MAE 625. Radiation Heat Transfer. 3 Hours.

PR: MAE 423 or consent. Classical derivation of black body radiation laws; gray body and non-gray analysis; radiant properties of materials, radiant transport analysis, specular-diffuse networks, gas radiation, thermal radiation measurements; analytical, numerical solutions, and study of selected publications. (3 hr. lec.).

MAE 631. Gas Dynamics. 3 Hours.

PR: MAE 336 or equivalent. Nonsteady gas dynamics and shock interactions; compressible flow theory in subsonic, transonic, and supersonic regimes, and their numerical treatment.

MAE 633. Computational Fluid Dynamics. 3 Hours.

PR: MAE 532 or equivalent. Finite difference methods; convergence and stability; Navier-Stokes equations; discretization methods; grid distribution; solution of difference equations; pressure coupling; application to conduction/convection, boundary layers, and recirculating flows; introduction to general purpose CFD codes.

MAE 635. Turbomachinery. 3 Hours.

PR: MAE 320 or Consent. Flow problems encountered in design of water, gas, and steam turbines, centrifugal and axial flow pumps and compressors, design parameters.

MAE 636. Fundamentals of Turbulent Flow. 3 Hours.

PR: MAE 532 or consent. Statistical theories of turbulence and recent applications. Basic experimental data and length and time scale analysis. Application of semi-empirical theories to pipe, jet, and boundary-layer flow.

MAE 637. Multiphase Flows. 3 Hours.

PR: MAE 331. Particle dynamics including particle-particle and particle-surface interactions; fluidized bed concepts; mathematical models and numerical methods as applied to multiphase flows; design and instrumentation pertaining to multiphase units.

MAE 640. Continuum Mechanics. 3 Hours.

PR: MAE 242 and MAE 243. Mathematical preliminaries including index notation; analysis of stress; analysis of deformation; fundamental laws, field equations, and constitutive equations; application to fluids and solids.

MAE 641. Theory of Elasticity 1. 3 Hours.

PR: Consent. Cartesian tensors; plane stress and plane strain; 2-D problems in Cartesian and polar coordinates; stress and strain in 3-D; general theorems; torsion of noncircular sections.

MAE 642. Intermediate Dynamics. 3 Hours.

PR: MAE 242. Newtonian and Lagrangian mechanics. Dynamics of discrete systems and rigid bodies analyzed utilizing Newtonian and Lagrangian formulations.

MAE 643. Inelastic Behavior of Engineering Materials. 3 Hours.

PR: MAE 543 or Consent. Characterization and constitutive relations of engineering materials; nonlinear elasticity, plasticity, viscoelasticity and creep; numerical implementation.

MAE 644. Fracture Mechanics. 3 Hours.

PR: MAE 641. Linear-elastic and elastic-plastic fracture mechanics; fatigue, dynamic, and creep crack growth; fracture mechanics models for composite materials.

MAE 645. Energy Methods in Applied Mechanics. 3 Hours.

PR: Consent. Variational principles of mechanics and applications to engineering problems; principles of virtual displacements, minimum potential energy, and complementary energy, Castigliano's theorem, Hamilton's principle. Applications to theory of plates, shells, and stability.

MAE 646. Advanced Mechanics of Composite Materials. 3 Hours.

PR: MAE 446 or Consent. Manufacturing, testing, and diagnostics of composite materials. Anisotropic plates with cutouts. Inelastic behavior of polymer matrix composites. Analysis of advanced composites such as metal matrix, ceramic matrix, and textile.

MAE 648. Experimental Stress Analysis. 3 Hours.

PR: Consent. Strain gage techniques and instrumentation; stress analysis using optical methods such as photoelasticity and interferometric techniques; NDE and NDT or problems involving stress analysis. (2 hr. lec., 3 hr. lab.).

MAE 649. Microscopy of Materials. 3 Hours.

PR: CHE 366 or Consent. Optical and electron microscopic principles and techniques. Sample preparation methods. Microstructures of engineering materials. Laboratory demonstrations and experiments.

MAE 650. Mechanical Metallurgy. 3 Hours.

PR: MAE 244 or Consent. Elastic behavior and plastic theory. Dislocation theory. Strengthening mechanisms and fracture. Mechanical properties from materials testing including tension, torsion, fracture toughness, fatigue, and creep.

MAE 652. Advanced Kinematics of Mechanisms. 3 Hours.

PR: MAE 452 or Consent. Analytical synthesis of mechanisms with up to five accuracy points; Burmester curve theory and path curvature theory; force and moment balancing of mechanisms; computer-aided dynamic analysis of mechanisms and inverse dynamic analysis.

MAE 653. Advanced Vibrations. 3 Hours.

PR: Consent. Dynamic analysis of multiple degree-of-freedom discrete vibrating systems; Lagrangian formulation; matrix and numerical methods; impact; mechanical transients.

MAE 654. Advanced Machine Design. 3 Hours.

PR: Consent. Design for extreme environments, material selection, lubrication and wear, dynamic loads on cams, gears, and balancing of multiengines and rotors, electromechanical components.

MAE 656. Advanced Computer Aided Design. 3 Hours.

Geometric modeling; finite element meshing; design approaches, case studies using CAD principles; projects utilizing state-of-the-art CAD packages. (2 hr. lec., 3 hr. lab.).

MAE 660. Feedback Control in Mechanical Engineering. 3 Hours.

PR: Consent. Emphasis on design of control systems using classical, frequency domain, and time domain methods; advanced mathematical modeling of physical systems, compensation, stabilization, pole placement, state estimation; extensive use of computerized design tools, especially Matlab.

MAE 662. Robot Mechanics and Control. 3 Hours.

Kinematic and dynamic behavior of industrial robot manipulators; formulation of equations of motion for link joint space and end effector Cartesian space; path planning and trajectory motion control schemes.

MAE 663. Instrumentation in Engineering. 3 Hours.

PR: Consent. Theory of instrumentation suitable for measuring rapidly changing force, pressure, strain, temperature, vibration, etc.; computerized acquisition, analysis, and transmission of data; methods of noise reduction. (2 hr. lec., 3 hr. lab.).

MAE 680. Crystallography and Crystals. 3 Hours.

Introduction to the principles of structure of materials, and theory and applications of diffraction and imaging techniques for materials characterization using X-ray diffraction and transmission electron microscopy (TEM.).

MAE 687. Materials Engineering. 3 Hours.

A study of materials engineering fundamentals emphasizing semiconductor, polymer, metal, and ceramic/cementitious material systems. Mechanical and physical properties, theoretical aspects, testing, design criteria, manufacturing, and economics of material systems. Laboratory testing and evaluation. (Equivalent to CE 687, CHE 687, EE 687, MINE 687, and IMSE 687.).

MAE 691A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

MAE 693A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

MAE 694A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

MAE 695. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

MAE 697. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

MAE 721. Fundamentals of Combustion. 3 Hours.

PR: MAE 321 or MAE 426. Thermodynamics, chemical kinetics, and diffusion of reacting gases; laminar and turbulent flames; flame stability and ignition.

MAE 733. Perfect Fluid Theory. 3 Hours.

PR: Consent. Conformal mapping including Schwarz-Christoffel and Joukowski transformations. Inviscid flows over airfoils, spheres, cones, wedges, and bodies of revolution. (3 hr. lec.).

MAE 741. Theory of Elasticity 2. 3 Hours.

PR: MAE 641. Complex variable methods, stress couples, nonlinear elasticity, numerical methods, potential methods, boundary value problems, and various special topics.

MAE 743. Theory of Elastic Stability. 3 Hours.

PR: Consent. Stability of discrete mechanical systems, energy theorems, buckling of beams, beam columns and frames, torsional buckling, buckling of plates and shells, and special topics.

MAE 744. Theory of Plates and Shells. 3 Hours.

PR: MAE 543 or Consent. Classical and modern theories of plates; dynamic response, nonlinear effects, and exact and approximate solutions of plates; application to rectangular and circular plates; membrane shells; shells with bending stiffness.

MAE 760. Advanced Topics in Control Theory. 3 Hours.

PR: MAE 660 or MAE 465. State feedback through eigenstructure assignment; Observers and Kalman filters; multiple-model adaptive estimation and control; parameter estimation; direct and indirect model-reference adaptive-control algorithms; introduction to neural networks.

MAE 790. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of Benjamin M. Statler College of Engineering and Mineral Resources courses. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on assistantships to gain teaching experience. (Grading will be S/U.).

MAE 791A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

MAE 795. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

MAE 797. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

MAE 798. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

MAE 799. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is S/U; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

MEDICINE COURSES

MED 731. Clinical Clerkship in Medicine. 8 Hours.

(Third year.) CR. Required of third-year medical students. The individual student is assigned responsibility for specific patients from the inpatient and outpatient services at West Virginia University Health Sciences Center or Charleston Area Medical Center service. The student is an integral part of the team providing diagnostic and treatment services needed by the patient, under direct supervision of members of the faculty of the department. The student elicits the patient's history, performs physical examinations, and performs or secures indicated laboratory and clinical studies. The student records findings and presents case reports for discussion by members of the faculty during hospital rounds or outpatient clinics. The student attends such conferences, as directed. Clerkship in medicine occupies 8 weeks. (Grading will be S/U.).

MED 791A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

MED 797. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

MICROBIOLOGY AND IMMUNOLOGY COURSES

MICB 592A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

MICB 593A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

MICB 691A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

MICB 697. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/ U.).

MICB 698. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

MICB 699. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is P/F; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

MICB 702. Microbiology. 5 Hours.

(For dental students only.) PR: Organic chemistry. Detailed study of pathogenic microorganisms. Emphasis on oral flora.

MICB 781. Advanced Immunology. 3 Hours.

PR: BMS 710 and BMS 736 or MICB 701 or permission from the instructor. Students participate in a study of contemporary topics using primary literature selected from recent developments in the field of immunology.

MICB 784A. Special Problems in Microbiology. 1-6 Hours.

PR: Consent.

MICB 784B. Special Problems in Microbiology. 1-6 Hours.

PR: Consent.

MICB 784C. Special Problems in Microbiology. 1-6 Hours.

PR: Consent.

MICB 784D. Special Problems in Microbiology. 1-6 Hours.

PR: Consent.

MICB 784E. Special Problems in Microbiology. 1-6 Hours.

PR: Consent.

MICB 784F. Special Problems in Microbiology. 1-6 Hours.

PR: Consent.

MICB 784G. Special Problems in Microbiology. 1-6 Hours.

PR: Consent.

MICB 784H. Special Problems in Microbiology. 1-6 Hours.

PR: Consent.

MICB 784I. Special Problems in Microbiology. 1-6 Hours.

PR: Consent.

MICB 784J. Special Problems in Microbiology. 1-6 Hours.

PR: Consent.

MICB 784K. Special Problems in Microbiology. 1-6 Hours.

PR: Consent.

MICB 784L. Special Problems in Microbiology. 1-6 Hours.

PR: Consent.

MICB 784M. Special Problems in Microbiology. 1-6 Hours.

PR: Consent.

MICB 784N. Special Problems in Microbiology. 1-6 Hours.

PR: Consent.

MICB 784O. Special Problems in Microbiology. 1-6 Hours.

PR: Consent.

MICB 784P. Special Problems in Microbiology. 1-6 Hours.

PR: Consent.

MICB 784Q. Special Problems in Microbiology. 1-6 Hours.

PR: Consent.

MICB 784R. Special Problems in Microbiology. 1-6 Hours.

PR: Consent.

MICB 784S. Special Problems in Microbiology. 1-6 Hours.

PR: Consent.

MICB 784T. Special Problems in Microbiology. 1-6 Hours.

PR: Consent.

MICB 784U. Special Problems in Microbiology. 1-6 Hours.

PR: Consent.

MICB 784V. Special Problems in Microbiology. 1-6 Hours.

PR: Consent.

MICB 784W. Special Problems in Microbiology. 1-6 Hours.

PR: Consent.

MICB 784X. Special Problems in Microbiology. 1-6 Hours.

PR: Consent.

MICB 784Y. Special Problems in Microbiology. 1-6 Hours.

PR: Consent.

MICB 784Z. Special Problems in Microbiology. 1-6 Hours.

PR: Consent.

MICB 785. Immunology and Microbiology Journal Club. 1-2 Hours.

A review of contemporary topics selected from developments in the field during the current year.

MICB 790. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of microbiology. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on assistantships to gain teaching experience. (Grading will be P/F.).

MICB 791A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

MICB 792A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

MICB 793A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

MICB 794A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

MICB 795. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

MICB 796. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

MICB 797. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading will be S/U.).

MICB 798. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

MICB 799. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is P/F; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

MICB 801. Immunity, Infection and Disease. 9 Hours.

An integrated approach to the study of infectious disease in humans, with focus on innate and acquired immunity, mechanisms of pathogenesis of infectious microorganisms, transmission, and treatment.

MINING ENGINEERING COURSES**MINE 505. Integrated Mining Systems. 3 Hours.**

PR: Graduate standing or consent. Problem-based and integrative learning to solve problems on underground and surface mining systems based on engineering principles.

MINE 593A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

MINE 595. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

MINE 611. Advanced Ground Control-Coal Mines. 3 Hours.

PR: MINE 411 or consent. Ground and strata control for underground and surface coal mining, including slope stability and subsidence.

MINE 612. Surface Subsidence Engineering. 3 Hours.

PR: MINE 411. Elements of surface subsidence engineering due to underground mining: theories of surface subsidence, characteristics and prediction of surface movements, and effects of surface movements.

MINE 613. Ground Control Failures. 3 Hours.

PR: MINE 611 or consent. Case studies of ground control failures on coal pillar, roof bolting, roof fall, cutter, floor heave, multiple-seam mining, and longwall mining.

MINE 616. Advanced Rock Mechanics. 3 Hours.

PR: MINE 414 or consent. Testing techniques and interpretation, strength and fracture, classification, anisotropy, friction, jointed rock, fluid pressure, fragmentation, and excavation.

MINE 624. Numerical Analysis in Mineral Engineering. 3 Hours.

PR: Graduate standing or consent. Application of mathematical and numerical methods in metallurgy and mineral processing problems.

MINE 625. Advanced Mineral Processing. 3 Hours.

PR: MINE 327 or consent. Theory and technology of separation. Triboelectrostatic and magnetic dry ore and coal separation. Engineering and scientific aspects of column flotation of fines in coal and mineral industries.

MINE 627. Advanced Coal Preparation. 3 Hours.

PR: MINE 427 or consent. Coal preparation design and analysis. Fine coal column flotation, agglomeration, and dewatering. Biotechnology and others for HAPs removal. Coking and coal utilization. Instrumentation for process control.

MINE 628. Computation Fluid Flow in Mineral Engineering. 3 Hours.

PR: Graduate standing or consent. Applications of appropriate theories for solving fluid transportation problems in mineral engineering. Newtonian and non-Newtonian slurries and applications to mineral engineering are emphasized.

MINE 629. Mine Wastes Management/Closure. 3 Hours.

PR: Consent. Planning and design to control, detoxify and contain mine openings for mine and mill closure in mineral industry. Regulatory frameworks.

MINE 631. Mine Ventilation Network Analysis. 3 Hours.

PR: MINE 331 and MINE 381 or consent. Theory and computational techniques for mine ventilation network problems with emphasis on computer-aided analysis of complex mine ventilation systems.

MINE 632. Advanced Mine Ventilation. 3 Hours.

PR: MINE 331. Advanced topics in mine atmospheric control including control of methane, dust, humidity, and heat. Also covers leakage characteristics, fan selection, analysis of ventilation networks, and planning of mine ventilation system.

MINE 633. Coal Mine Methane Control. 3 Hours.

PR: Graduate standing or consent. Control of explosive gas emissions in coal mines. Procedures for measurement, mitigation, capture, and utilization of mine-generated gases. Techniques for gas emission forecasting.

MINE 661. Numerical Analysis for Mine Design. 3 Hours.

PR: Graduate standing or consent. An introduction to the formulation and application of boundary-element, finite-difference, and discrete element methods for geomechanical design of mines and geologic structures.

MINE 662. Displacement Discontinuity Modeling in Mining. 3 Hours.

PR: MINE 661 or consent. An in-depth look into the formulation and application of the displacement discontinuity method for modeling stresses and displacements in single and multiple-seam coal mines.

MINE 663. Geomechanical Modeling with Fast Lagrangian Analysis of Continuum. 3 Hours.

PR: MINE 611 or consent. An in-depth study of the application of the finite-difference program, FLAC, for modeling static and dynamic scenarios in mining, geologic and soil structures.

MINE 682. Advanced Mine Power Systems. 3 Hours.

PR: Graduate standing or consent. Advanced study of mine electrical power systems from theory to practice covering the vital aspects that go into planning and designing a mine power system.

MINE 685. Graduate Seminar in Coal Mining. 3-6 Hours.

MINE 686. Graduate Seminar Coal Mine. 3-6 Hours.

MINE 687. Materials Engineering. 3 Hours.

A study of materials engineering fundamentals emphasizing semiconductor, polymer, metal, and ceramic/cementitious material systems. Mechanical and physical properties, theoretical aspects, testing, design criteria, manufacturing, and economics of material systems. Laboratory testing and evaluation. (Equivalent to CE 687, CHE 687, EE 687, IMSE 687, and MAE 687.).

MINE 691A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

MINE 693A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

MINE 695. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

MINE 697. Research. 1-15 Hours.

PR: Consent. Research activities leading to a thesis, problem report, research paper, or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

MINE 711. Theories of Surface Subsidence. 3 Hours.

PR: MINE 612. Theories of surface subsidence due to underground coal mining including empirical, profile function, theoretical and physical modeling methods, and time factors. (3 hr. lec.).

MINE 712. Theory of Pillar Design. 3 Hours.

PR: MINE 411 and MINE 611. Examination of various theories of pillar design for room and pillar mining and longwall mining including chain pillars, barrier pillars, and bleeder pillars.

MINE 713. Theory of Roof Bolting. 3 Hours.

PR: MINE 611 or consent. Review and discuss various theories of roof bolting. Review select papers representative of recent developments of design of roof bolts and selection of materials.

MINE 716. Theory of Rock Failure. 3 Hours.

PR: MINE 414 or consent. Friction, elasticity, strength of rock, mechanism of brittle failure, factors affecting failure process, theories of failure, fracture propagation in rock, fracture toughness of rock and coal, fluid pressure, size, stress gradient, and time-dependent effects.

MINE 718. Rock Mechanics in Mine Design. 3 Hours.

PR: MINE 411 and MINE 414 or consent. Design process in mining engineering; design approaches for excavations in rock; input parameters for design; empirical, observational, and analytical methods of design; integrated designs. (1 hr. lec., 2 hr. lab.).

MINE 731. Mine Ventilation Network Optimization. 3 Hours.

PR: MINE 631 or consent. Application of mathematical optimization techniques to mine ventilation network problems, including linear and nonlinear optimization for controlled-flow and generalized networks.

MINE 769. Expert Systems in Mining. 3 Hours.

PR: Graduate standing. An overview of expert systems applications in mining, a detailed study of two mining applications, study of shells and their components, and study of a specific shell used to develop a project.

MINE 790. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of mining engineering. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on assistantships to gain teaching experience. (Grading may be S/U.).

MINE 791A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

MINE 792A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

MINE 793A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

MINE 794A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

MINE 795. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

MINE 796. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

MINE 797. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

MINE 798. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

MINE 799. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is S/U; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

MULTIDISCIPLINARY STUDIES COURSES**MDS 590. Teaching Practicum. 1-3 Hours.**

PR: Consent. Supervised practice in college teaching of multidisciplinary studies. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on assistantships to gain teaching experience. (Grading may be S/U.).

MDS 591A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

MDS 592A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

MDS 593A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

MDS 594A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

MDS 694A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

MDS 695. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

MDS 696. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

MDS 697. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

MDS 698. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

MDS 699. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use of the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is S/U; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

MDS 900. Professional Development. 1-6 Hours.

Professional development courses provide skill renewal or enhancement in a professional field or content area (e.g., education, community health, geology). The continuing education courses are graded on a pass/fail grading scale and do not apply as graduate credit toward a degree program.

MDS 930. Professional Development. 1-6 Hours.

Professional development courses provide skill renewal or enhancement in professional field or content area (e.g., education, community health, geology). These tuition waived continuing education courses are graded on a pass/fail grading scale and do not apply as graduate credit toward a degree program.

MUSIC COURSES**MUSC 500. Secondary Performance: Bassoon. 1,2 Hour.**

(May be repeated for credit.) Group or individual instruction in performance on bassoon, with emphasis on methods and materials for school music teachers.

MUSC 500A. Secondary Performance: Cello. 1,2 Hour.

(May be repeated for credit.) Group or individual instruction in performance on cello, with emphasis on methods and materials for school music teachers.

MUSC 500B. Secondary Performance: Clarinet. 1,2 Hour.

(May be repeated for credit.) Group or individual instruction in performance on clarinet, with emphasis on methods and materials for school music teachers.

MUSC 500C. Secondary Performance: Euphonium. 1,2 Hour.

(May be repeated for credit.) Group or individual instruction in performance on euphonium, with emphasis on methods and materials for school music teachers.

MUSC 500D. Secondary Performance: Flute. 1,2 Hour.

(May be repeated for credit.) Group or individual instruction in performance on flute, with emphasis on methods and materials for school music teachers.

MUSC 500E. Secondary Performance: Guitar. 1,2 Hour.

(May be repeated for credit.) Group or individual instruction in performance on guitar, with emphasis on methods and materials for school music teachers.

MUSC 500F. Secondary Performance: Horn. 1,2 Hour.

(May be repeated for credit.) Group or individual instruction in performance on horn, with emphasis on methods and materials for school music teachers.

MUSC 500G. Secondary Performance. 1,2 Hour.

(May be repeated for credit.) Group or individual instruction in performance on a minor instrument (or voice), with emphasis on methods and materials for school music teachers.

MUSC 500H. Secondary Performance: Oboe. 1,2 Hour.

(May be repeated for credit.) Group or individual instruction in performance on oboe, with emphasis on methods and materials for school music teachers.

MUSC 500I. Secondary Performance: Percussion. 1,2 Hour.

(May be repeated for credit.) Group or individual instruction in performance on percussion instruments, with emphasis on methods and materials for school music teachers.

MUSC 500J. Secondary Performance: Piano. 1,2 Hour.

(May be repeated for credit.) Group or individual instruction in performance on piano, with emphasis on methods and materials for school music teachers.

MUSC 500K. Secondary Performance: Pipe Organ. 1,2 Hour.

(May be repeated for credit.) Group or individual instruction in performance on pipe organ, with emphasis on methods and materials for school music teachers.

MUSC 500L. Secondary Performance: Saxophone. 1,2 Hour.

(May be repeated for credit.) Group or individual instruction in performance on saxophone, with emphasis on methods and materials for school music teachers.

MUSC 500M. Secondary Performance: String Bass. 1,2 Hour.

(May be repeated for credit.) Group or individual instruction in performance on string bass, with emphasis on methods and materials for school music teachers.

MUSC 500N. Secondary Performance: Trombone. 1,2 Hour.

(May be repeated for credit.) Group or individual instruction in performance on trombone, with emphasis on methods and materials for school music teachers.

MUSC 500O. Secondary Performance: Trumpet. 1,2 Hour.

(May be repeated for credit.) Group or individual instruction in performance on trumpet, with emphasis on methods and materials for school music teachers.

MUSC 500P. Secondary Performance: Tuba. 1,2 Hour.

(May be repeated for credit.) Group or individual instruction in performance on tuba, with emphasis on methods and materials for school music teachers.

MUSC 500Q. Secondary Performance: Viola. 1,2 Hour.

(May be repeated for credit.) Group or individual instruction in performance on viola, with emphasis on methods and materials for school music teachers.

MUSC 500R. Secondary Performance: Violin. 1,2 Hour.

(May be repeated for credit.) Group or individual instruction in performance on violin, with emphasis on methods and materials for school music teachers.

MUSC 500S. Secondary Performance: Voice. 1,2 Hour.

(May be repeated for credit.) Group or individual instruction in performance on voice, with emphasis on methods and materials for school music teachers.

MUSC 500T. Secondary Performance: Ethnic Percussion. 1,2 Hour.

(May be repeated for credit.) Group or individual instruction in performance on ethnic percussion, with emphasis on methods and materials for school music teachers.

MUSC 500U. Secondary Performance. 1,2 Hour.

(May be repeated for credit.) Group or individual instruction in performance on a minor instrument (or voice), with emphasis on methods and materials for school music teachers.

MUSC 500V. Secondary Performance. 1,2 Hour.

(May be repeated for credit.) Group or individual instruction in performance on a minor instrument (or voice), with emphasis on methods and materials for school music teachers.

MUSC 500W. Secondary Performance. 1,2 Hour.

(May be repeated for credit.) Group or individual instruction in performance on a minor instrument (or voice), with emphasis on methods and materials for school music teachers.

MUSC 500X. Secondary Performance. 1,2 Hour.

(May be repeated for credit.) Group or individual instruction in performance on a minor instrument (or voice), with emphasis on methods and materials for school music teachers.

MUSC 500Y. Secondary Performance. 1,2 Hour.

(May be repeated for credit.) Group or individual instruction in performance on a minor instrument (or voice), with emphasis on methods and materials for school music teachers.

MUSC 500Z. Secondary Performance. 1,2 Hour.

(May be repeated for credit.) Group or individual instruction in performance on a minor instrument (or voice), with emphasis on methods and materials for school music teachers.

MUSC 561. Graduate Theory Review. 3 Hours.

Review of undergraduate basic musicianship (writing, ear training, sight singing, and analysis) for incoming graduate students with deficiencies. Not open to undergraduates.

MUSC 590. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of music. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It also provides a mechanism for students not on assistantships to gain teaching experience. (Grading will be P/F.).

MUSC 591A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

MUSC 592A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

MUSC 593A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

MUSC 594A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

MUSC 595. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

MUSC 611. Music Industry Regulations. 3 Hours.

Advanced analysis of the current scope and content of music industry regulations and their impact on today's music industry commercial models and practices. Structure and methods of collective music rights administration and enforcement mechanisms. Regulatory responses to music digitalization and digital market place.

MUSC 615. Advanced Music Publishing. 3 Hours.

Main stream music publishing industry regulations, models, structures and organization. Current commercial practices, strategies, and procedures in music publishing. Catalog acquisition, administration and advancement methods and processes.

MUSC 630. Keyboard Performance and Pedagogy. 1-3 Hours.

(May be repeated for credit.) (Offered in one credit modules of which students may take one or more each semester.) Pedagogy, repertoire, interpretation, and other topics which will enhance preparation of private piano teachers.

MUSC 631. Survey of Orchestral Music. 3 Hours.

PR: 6 hours of upper-division music history or consent. Survey analysis of orchestral music from the late Baroque period to the present from the perspective of the conductor.

MUSC 632. Survey of Wind Music. 3 Hours.

PR: 6 hours of upper-division music history or consent. Survey and analysis of wind music from the late Baroque period to the present from the perspective of the conductor.

MUSC 633. Survey of Vocal Music. 3 Hours.

PR: 6 hours of upper-division music history. Survey of masses, oratorios, cantatas and opera from late Renaissance to the twentieth century. Sole repertoire will not be included.

MUSC 634. Jazz Performance and Pedagogy. 1-3 Hours.

(May be repeated for credit.) Methods and materials, observation. Offered in modules of which students may take one or more each semester: survey of jazz literature, survey of teaching technique, practical teaching/experience, or special topics.

MUSC 640. Chamber Music: Brass. 0-3 Hours.

(May be repeated for credit.) Performance in small brass ensembles.

MUSC 641. Chamber Music: Guitar. 0-3 Hours.

(May be repeated for credit.) Performance in small guitar ensembles.

MUSC 642. Chamber Music: Jazz. 0-3 Hours.

(May be repeated for credit.) Performance in jazz ensembles, instrumental or vocal.

MUSC 643. Chamber Music: Percussion. 0-3 Hours.

(May be repeated for credit.) Performance in percussion ensembles.

MUSC 644. Chamber Music: Percussion-Ethnic. 0-3 Hours.

(May be repeated for credit.) Performance in percussion ensembles emphasizing music from non-Western cultures.

MUSC 645. Chamber Music: Percussion-Gamelan. 0-3 Hours.

(May be repeated for credit.) Performance in Gamelan ensembles.

MUSC 646. Chamber Music: Percussion Steel Band. 0-3 Hours.

(May be repeated for credit.) Performance in steel band ensembles.

MUSC 647. Chamber Music: Piano. 0-3 Hours.

(May be repeated for credit.) Performance in piano four-hand chamber music or performance by pianists in other ensembles.

MUSC 648. Chamber Music: String. 0-3 Hours.

(May be repeated for credit.) Performance in small string ensembles.

MUSC 649. Chamber Music: Voice. 0-3 Hours.

(May be repeated for credit.) Performance in small vocal ensembles.

MUSC 650. Chamber Music: Woodwind. 0-3 Hours.

(May be repeated for credit.) Performance in wind quintet and small woodwind ensembles.

MUSC 651. Chamber Music: Other. 0-3 Hours.

(May be repeated for credit.) Performance in small mixed ensembles.

MUSC 660. Composition. 3 Hours.

(May be repeated for credit.) PR: Consent. Primarily for candidates for graduate degrees in theory or composition.

MUSC 670. Perspectives of Music History. 3 Hours.

A survey of western vernacular and art music from the Middle Ages to the present with particular attention to historiography, social context, and evolution of musical styles.

MUSC 678. Masters Field Study. 2-4 Hours.

A school-based field study that demonstrates application of knowledge and skills from graduate study as a culminating project in music education.

MUSC 680. Music in the Elementary School. 3 Hours.**MUSC 681. Teaching Music Appreciation. 3 Hours.****MUSC 682. Contemporary Techniques in Classroom Music. 3 Hours.**

PR: MUSC 382 or Consent. Principles and practice of contemporary techniques in elementary and junior high school classroom music, including those of Orff and Kodaly.

MUSC 683. Music Making in Middle School/Junior High. 3 Hours.

PR: MUSC 380, and MUSC 381, and MUSC 382 equivalent or Consent. Identification and sequencing of appropriate concepts and skills for general music class students. Selection and use of materials including popular music. Emphasis on student music-making activities. Evaluation procedures included.

MUSC 684. Music in Early Childhood. 3 Hours.

PR: MUSC 380, and MUSC 381, and MUSC 382, or equivalent, or Consent. Musical experiences for children three through ten years. Emphasis on intellectual, physical and social/emotional needs and characteristics of children. Materials and activities for developing music concepts, skills, and positive response.

MUSC 686. Instrumental Methods and Materials. 3 Hours.

PR: Consent. Methods, materials, and administration of K-12 instrumental music programs; sequential instruction; conceptual and skill development; aural and reading competencies in music. (Bi-weekly lab. 3 hr. lec.).

MUSC 687. Choral Music Methods and Materials. 3 Hours.

PR: Consent. Methods, materials, and administration of choral music programs; sequential instruction; conceptual and skill development; teaching aural and reading competencies. (Bi-weekly lab. 3 hr. lec.).

MUSC 688. General Music Methods and Materials. 3 Hours.

PR: Consent. Introduction to major pedagogical approaches used in K-12 general music classrooms; examination and development of materials and curricula; analysis of teaching and learning styles. (Bi-weekly lab. 3 hr. lec.).

MUSC 689. Master's Recital. 2-4 Hours.

PR: MUSC 499 Senior recital or consent. May be repeated for credit. Master's performance students shall be permitted to give a recital only after they pass a qualifying audition before a designated faculty committee at least six weeks before the recital is to be given.

MUSC 690. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of music. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It also provides a mechanism for students not on assistantships to gain teaching experience. (Grading will be P/F.).

MUSC 691A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

MUSC 692A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

MUSC 693A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

MUSC 695. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

MUSC 696. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

MUSC 697. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

MUSC 698. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

MUSC 699. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is P/F; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

MUSC 700N. Performance: Harpsichord. 1-4 Hours.

PR: Open to qualified students in any field in performance. (May be repeated for a maximum of 24 credit hours.) Normally offered for two credits (one 30-minute lesson per week) or four credits (one 60-minute lesson per week). A student must demonstrate ability of grade-level 10 to receive credit for this course.

MUSC 700O. Performance: Oboe. 1-4 Hours.

PR: Open to qualified students in any field in performance. (May be repeated for a maximum of 24 credit hours.) Normally offered for two credits (one 30-minute lesson per week) or four credits (one 60-minute lesson per week). A student must demonstrate ability of grade-level 10 to receive credit for this course.

MUSC 700P. Performance: String Bass. 1-4 Hours.

PR: Open to qualified students in any field in performance. (May be repeated for a maximum of 24 credit hours.) Normally offered for two credits (one 30-minute lesson per week) or four credits (one 60-minute lesson per week). A student must demonstrate ability of grade-level 10 to receive credit for this course.

MUSC 700Q. Performance: Trombone. 1-4 Hours.

PR: Open to qualified students in any field in performance. (May be repeated for a maximum of 24 credit hours.) Normally offered for two credits (one 30-minute lesson per week) or four credits (one 60-minute lesson per week). A student must demonstrate ability of grade-level 10 to receive credit for this course.

MUSC 700R. Performance: Tuba. 1-4 Hours.

PR: Open to qualified students in any field in performance. (May be repeated for a maximum of 24 credit hours.) Normally offered for two credits (one 30-minute lesson per week) or four credits (one 60-minute lesson per week). A student must demonstrate ability of grade-level 10 to receive credit for this course.

MUSC 700S. Performance: Viola. 1-4 Hours.

PR: Open to qualified students in any field in performance. (May be repeated for a maximum of 24 credit hours.) Normally offered for two credits (one 30-minute lesson per week) or four credits (one 60-minute lesson per week). A student must demonstrate ability of grade-level 10 to receive credit for this course.

MUSC 700T. Performance: Violin. 1-4 Hours.

PR: Open to qualified students in any field in performance. (May be repeated for a maximum of 24 credit hour.) Normally offered for two credits (one 30-minute lesson per week) or four credits (one 60-minute lesson per week). A student must demonstrate ability of grade-level 10 to receive credit for this course.

MUSC 700U. Performance: Applied Jazz. 1-4 Hours.

PR: Open to qualified students in any field in performance. (May be repeated for a maximum of 24 credit hours.) Normally offered for two credits (one 30-minute lesson per week) or four credits (one 60-minute lesson per week). A student must demonstrate ability of grade-level 10 to receive credit for this course.

MUSC 700V. Performance. 1-4 Hours.

PR: Open to qualified students in any field in performance. (May be repeated for a maximum if 24 credit hours.) Normally offered for two credits (one 30-minute lesson per week) or four credits (one 60-minute lesson per week). A student must demonstrate ability of grade-level 10 to receive credit for this course.

MUSC 700W. Performance. 1-4 Hours.

PR: Open to qualified students in any field in performance. (May be repeated for a maximum of 24 credit hours.) Normally offered for two credits (one 30-minute lesson per week) or four credits (one 60-minute lesson per week). A student must demonstrate ability of grade-level 10 to receive credit for this course.

MUSC 700X. Performance. 1-4 Hours.

PR: Open to qualified students in any field in performance. (May be repeated for a maximum of 24 credit hours.) Normally offered for two credits (one 30-minute lesson per week) or four credits (one 60-minute lesson per week). A student must demonstrate ability of grade-level 10 to receive credit for this course.

MUSC 700Y. Performance. 1-4 Hours.

PR: Open to qualified students in any field in performance. (May be repeated for a maximum of 24 credit hours.) Normally offered for two credits (one 30-minute lesson per week) or four credits (one 60-minute lesson per week). A student must demonstrate ability of grade-level 10 to receive credit for this course.

MUSC 700Z. Performance. 1-4 Hours.

PR: Open to qualified students in any field in performance. (May be repeated for a maximum of 24 credit hours.) Normally offered for two credits (one 30-minute lesson per week) or four credits (one 60-minute lesson per week). A student must demonstrate ability of grade-level 10 to receive credit for this course.

MUSC 704. Opera Theatre. 0-2 Hours.

Performance of major roles and advanced production techniques. Qualified students will undertake production-direction projects under supervision.

MUSC 710. Conducting. 3 Hours.

PR: MUSC 202 or equivalent. Instrumental and choral conducting. Major works are prepared and conducted through the use of recordings and music organizations.

MUSC 711. Conducting Seminar. 3 Hours.

PR: MUSC 710. Instrumental and choral conducting of major works under the supervision of the conductor of a major ensemble.

MUSC 720. Applied Voice Teaching Technique. 1 Hour.

PR: Consent. (May be repeated for a maximum of 6 credit hours.) Doctoral seminar intended to refine and further the skills acquired in MUSC 432 and MUSC 433.

MUSC 721. Voice Acoustics/Teaching Technology. 2 Hours.

This course is designed to prepare students to have knowledge of, and be comfortable using, technical equipment that has become available for use in the voice studio. Detailed attention will be given to Voce Vista.

MUSC 722. Vocal Repertoire-Teaching: English and American. 1 Hour.

This course is designed to compile a database of repertoire, by language or style, for ease of use in voice studio. Repertoire will be examined for pedagogic usefulness and appropriateness.

MUSC 723. Vocal Repertoire-Teaching: Italian and Spanish. 1 Hour.

This course is designed to compile a database of repertoire, by language or style, for ease of use in the voice studio. Repertoire will be examined from a standpoint of pedagogic usefulness and appropriateness.

MUSC 724. Vocal Repertoire-Teaching: German. 1 Hour.

This course is designed to compile a database of repertoire, by language or style, for ease of use in the voice studio. Repertoire will be examined from a standpoint of pedagogic usefulness and appropriateness.

MUSC 725. Voice Repertoire-Teaching: French. 1 Hour.

This course is designed to compile a database of repertoire, by language and style, for ease of use in the voice studio. Repertoire will be examined from a standpoint of pedagogic usefulness and appropriateness.

MUSC 726. Vocal Repertoire-Teaching: Opera/Oratorio. 1 Hour.

This course is designed to compile a database of repertoire, by language and style, for ease of use in the voice studio. Repertoire will be examined from a standpoint of pedagogic usefulness and appropriateness.

MUSC 727. Vocal Repertoire-Teaching: Musical Theatre. 1 Hour.

This course is designed to compile a database of repertoire, by language and style, for ease of use in the voice studio. Repertoire will be examined from a standpoint of pedagogic usefulness and appropriateness.

MUSC 730. Master Class in Applied Repertoire: Keyboard. 2 Hours.

(May be repeated for credit.) PR: Consent. Designed to give coverage through performance of the literature of the D.M.A. in keyboard.

MUSC 730A. Master Class in Applied Repertoire: Voice. 2 Hours.

(May be repeated for credit.) PR: Consent. Designed to give coverage through performance of the literature of the D.M.A. in voice.

MUSC 730B. Master Class in Applied Repertoire: Percussion. 2 Hours.

(May be repeated for credit.) PR: Consent. Designed to give coverage through performance of the literature of the D.M.A. in percussion.

MUSC 730C. Master Class in Applied Repertoire: Organ. 2 Hours.

(May be repeated for credit.) PR: Consent. Designed to give coverage through performance of the literature of the D.M.A. in organ.

MUSC 730D. Master Class in Applied Repertoire: Woodwind. 2 Hours.

(May be repeated for credit.) PR: Consent. Designed to give coverage through performance of the literature of the D.M.A. in a woodwind instrument.

MUSC 730E. Master Class in Applied Repertoire: String. 2 Hours.

(May be repeated for credit.) PR: Consent. Designed to give coverage through performance of the literature of the D.M.A. in a stringed instrument.

MUSC 730F. Master Class in Applied Repertoire: Brass. 2 Hours.

(May be repeated for credit.) PR: Consent. Designed to give coverage through performance of the literature of the D.M.A. in a brass instrument.

MUSC 730G. Master Class in Applied Repertoire: Piano. 2 Hours.

(May be repeated for credit.) PR: Consent. Designed to give coverage through performance of the literature of the D.M.A. in piano.

MUSC 730H. Master Class in Applied Repertoire. 2 Hours.

(May be repeated for credit.) PR: Consent. Designed to give coverage through performance of the literature of a specific D.M.A. Performance field.

MUSC 730I. Master Class in Applied Repertoire. 2 Hours.

(May be repeated for credit.) PR: Consent. Designed to give coverage through performance of the literature of a specific D.M.A. Performance field.

MUSC 730J. Master Class in Applied Repertoire. 2 Hours.

(May be repeated for credit.) PR: Consent. Designed to give coverage through performance of the literature of a specific D.M.A. Performance field.

MUSC 730K. Master Class in Applied Repertoire. 2 Hours.

(May be repeated for credit.) PR: Consent. Designed to give coverage through performance of the literature of a specific D.M.A. Performance field.

MUSC 730L. Master Class in Applied Repertoire. 2 Hours.

(May be repeated for credit.) PR: Consent. Designed to give coverage through performance of the literature of a specific D.M.A. Performance field.

MUSC 730M. Master Class in Applied Repertoire. 2 Hours.

(May be repeated for credit.) PR: Consent. Designed to give coverage through performance of the literature of a specific D.M.A. Performance field.

MUSC 730N. Master Class in Applied Repertoire. 2 Hours.

(May be repeated for credit.) PR: Consent. Designed to give coverage through performance of the literature of a specific D.M.A. Performance field.

MUSC 730O. Master Class in Applied Repertoire. 2 Hours.

(May be repeated for credit.) PR: Consent. Designed to give coverage through performance of the literature of a specific D.M.A. Performance field.

MUSC 730P. Master Class in Applied Repertoire. 2 Hours.

(May be repeated for credit.) PR: Consent. Designed to give coverage through performance of the literature of a specific D.M.A. Performance field.

MUSC 730Q. Master Class in Applied Repertoire. 2 Hours.

(May be repeated for credit.) PR: Consent. Designed to give coverage through performance of the literature of a specific D.M.A. Performance field.

MUSC 730R. Master Class in Applied Repertoire. 2 Hours.

(May be repeated for credit.) PR: Consent. Designed to give coverage through performance of the literature of a specific D.M.A. Performance field.

MUSC 730S. Master Class in Applied Repertoire. 2 Hours.

(May be repeated for credit.) PR: Consent. Designed to give coverage through performance of the literature of a specific D.M.A. Performance field.

MUSC 730T. Master Class in Applied Repertoire. 2 Hours.

(May be repeated for credit.) PR: Consent. Designed to give coverage through performance of the literature of a specific D.M.A. Performance field.

MUSC 730U. Master Class in Applied Repertoire. 2 Hours.

(May be repeated for credit.) PR: Consent. Designed to give coverage through performance of the literature of a specific D.M.A. Performance field.

MUSC 730V. Master Class in Applied Repertoire. 2 Hours.

(May be repeated for credit.) PR: Consent. Designed to give coverage through performance of the literature of a specific D.M.A. Performance field.

MUSC 730W. Master Class in Applied Repertoire. 2 Hours.

(May be repeated for credit.) PR: Consent. Designed to give coverage through performance of the literature of a specific D.M.A. Performance field.

MUSC 730X. Master Class in Applied Repertoire. 2 Hours.

(May be repeated for credit.) PR: Consent. Designed to give coverage through performance of the literature of a specific D.M.A. Performance field.

MUSC 730Y. Master Class in Applied Repertoire. 2 Hours.

(May be repeated for credit.) PR: Consent. Designed to give coverage through performance of the literature of a specific D.M.A. Performance field.

MUSC 730Z. Master Class in Applied Repertoire. 2 Hours.

(May be repeated for credit.) PR: Consent. Designed to give coverage through performance of the literature of a specific D.M.A. Performance field.

MUSC 731. Keyboard Literature. 3 Hours.

PR: MUSC 434 and MUSC 435A. Intensive study of the literature for keyboard instruments and the history of the literature.

MUSC 732. Song Literature. 1-3 Hours.

PR: MUSC 434 and MUSC 435. Intensive study of the Art Song and the Lied and the history of their development.

MUSC 733. Choral Literature. 3 Hours.**MUSC 737. Ethnic Percussion. 3 Hours.**

PR: MUSC 116 and MUSC 434 and MUSC 435; graduate percussion majors only. Examination of selected music from regions such as Africa, Asia, and Latin America; focus on music, instruments, and performance techniques and practices; functions of percussion music in society.

MUSC 738. Seminar in Ethnic Music. 3 Hours.

PR: Consent. Open to graduate music majors only. Examination of selected ethnic music from Africa, Asia, and Latin America. Focuses on the music, instruments, and performance techniques and practices of these regions, and how the music functions in society.

MUSC 761. Theory Topics. 3-5 Hours.

(May be repeated for max. 8 hr. credit.) Various types of analytical and theoretical problems and approaches to their solutions.

MUSC 762. Pedagogy of Theory. 3 Hours.

PR: MUSC 264 or Consent. Consideration of various approaches to the teaching of theory.

MUSC 763. Analytical Techniques. 3 Hours.

Analytical techniques and their application to scholarship and performance, with emphasis on pre-twentieth century styles.

MUSC 764. Compositional Techniques in Contemporary Music. 3 Hours.

Analysis of twentieth-century music.

MUSC 765. Transcription and Arranging. 3 Hours.

(May be repeated once for credit.) PR: MUSC 266 or equivalent. Major projects in scoring for orchestra, band, or wind ensemble.

MUSC 766. Composition Pedagogy. 3 Hours.

PR: graduate composition major status. Seminar in teaching techniques, curriculum design, and assessment of talent of undergraduate composers. Teaching practicum included.

MUSC 771. Music Research and Bibliography. 3 Hours.

Introduction to research strategies to discover and critically evaluate print and electronic music resources in the search for new understanding of the field and related disciplines. Students will defray costs of a required field trip.

MUSC 779. Psychology of Music. 3 Hours.

Introductory study of musical acoustics and psychology of perception of music.

MUSC 780. Choral Techniques. 2 Hours.

PR: (MUSC 380 and MUSC 381 and MUSC 382) or equivalent. Advanced techniques and procedures involved in development of choral ensembles.

MUSC 781. Instrumental Techniques. 2 Hours.

PR: (MUSC 380 and MUSC 381 and MUSC 382) or equivalent. Advanced techniques and procedures involved in individual performance and instruction through lecture demonstrations by performance faculty.

MUSC 782. Historical Foundations of Music Education. 3 Hours.

Examination of the history of music education from classical antiquity to the present, with particular emphasis on practices in the United States; examination and application of historical research methods.

MUSC 783. Foundations of Music Education. 3 Hours.

PR: (MUSC 380 and MUSC 381 and MUSC 382) or equivalent. Survey and critical study of historical, philosophical, psychological, and sociological aspects of music education. Includes current trends in music education.

MUSC 784. Introduction to Research in Music Education. 3 Hours.

PR: (MUSC 380 and MUSC 381 and MUSC 382) or equivalent. Methods and measures necessary for conduct and understanding of research in music education.

MUSC 787. Vocal Pedagogy Internship. 0-2 Hours.

This course provides the opportunity for advanced study with a specialist in the student's chosen area of dissertation research. This may take place at WVU or externally after passing the comprehensive exams.

MUSC 788. Doctoral Recital. 1-4 Hours.

PR: MUSC 689 Master's Recital or consent. Number of credits depends upon length and content of the program; it must be approved in advance by the student's doctoral committee. Acceptance of the recital will be at the discretion of the doctoral committee.

MUSC 789. Lecture Recital. 2 Hours.

PR: MUSC 771.

MUSC 791A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

MUSC 792A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

MUSC 793A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

MUSC 794A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

MUSC 795. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

MUSC 797. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

MUSC 900. Professional Development. 1-6 Hours.

Professional development courses provide skill renewal or enhancement in a professional field or content area (e.g. education, community health, geology.) The continuing education courses are graded on a pass/fail grading scale and do not apply as graduate credit toward a degree program.

MUSC 930. Professional Development. 1-6 Hours.

Professional development course provide skill renewal or enhancement in a professional field or content area (e.g., education, community health, geology). These tuition-waived continuing education courses are graded on a pass/fail grading scale and do not apply as graduate credit toward a degree program.

NEUROBIOLOGY AND ANATOMY COURSES**NBAN 701. Advanced Gross Anatomy. 2-6 Hours.**

PR: NBAN 703 or NBAN 724 and Consent. Morphological and functional analysis of a selected region, with dissection.

NBAN 703. Human Structure. 1-17 Hours.

PR: Admission to medical school or medical basic science graduate program or consent. Integrated approach combining human gross anatomy, microanatomy and embryology. Includes human cadaver dissection, microscopic anatomy of cells, tissues and organs with application to human health and disease.

NBAN 705. Microanatomy. 5 Hours.

PR: Admission to medical basic science graduate program or consent. Study of cells, tissues, and organs.

NBAN 706. Advanced Neuroanatomy. 2-4 Hours.

PR:CCMD 775 and Consent. (Course may be repeated.) Detailed study of selected areas of the nervous system.

NBAN 712. Special Topics in Anatomy. 2-4 Hours.

PR: Consent. Different topics of current interest in anatomy that are not included in the regular graduate courses.

NBAN 714. Applied Anatomy. 2-6 Hours.

PR: Consent. Detailed study of anatomy, adapted to the needs of the individual student.

NBAN 716. Craniofacial Growth and Maturation. 1 Hour.

PR: Consent. The current concepts of craniofacial growth and maturation are presented and integrated for application to clinical problems.

NBAN 718. Dental Histology. 6 Hours.

PR: Dental student standing or consent of instructor or chairperson. Cells, tissues, organs. Structure, function, and development of oral tissues.

NBAN 719. Advanced Head and Neck Anatomy. 1 Hour.

PR: Admission to medical, dental or basic science graduate programs, or consent. Head and neck craniofacial anatomy as it applies to specialties in dental or medical practice.

NBAN 724. Human Gross Anatomy. 7 Hours.

PR: Admission to dental school or medical basic science graduate program or consent. Human anatomy including cadaver dissection for dental students. (4 hr. lec., 3 hr. lab.).

NBAN 751. Advanced Microanatomy and Organology. 2-4 Hours.

PR: NBAN 705 or NBAN 709 and Consent. An extension of the major topics included in NBAN 705 or 709. Special emphasis on recent contributions.

NBAN 790. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of anatomy. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on assistantships to gain teaching experience. (Grading may be S/U.).

NBAN 791A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

NBAN 792A-Z. Directed Study. 1-6 Hours.

Directed study, readings, and/or research.

NBAN 793A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

NBAN 794A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

NBAN 795. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

NBAN 796. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

NBAN 797. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/ U.).

NBAN 798. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

NBAN 799. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is P/F; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

NBAN 801. Human Structure. 19 Hours.

Integrated approach combining human gross anatomy, microanatomy and embryology. Includes human cadaver dissection, microscopic anatomy of cells, tissues and organs with application to human health and disease.

NEUROLOGY COURSES

NEUR 741. Clinical Clerkship in Neurology. 2 Hours.

Required of third-year students. Basic fundamentals of the neurological evaluation and neurological diseases. Evaluation and treatment of hospitalized patients and patients seen at the physician office center. All evaluations are performed under supervision of attending and resident physicians. Conferences and correlative instruction in neuropathology and neuroradiology.

NEUR 791A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

NEUR 797. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

NEWS EDITORIAL COURSES

N-E 698. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

NURSING COURSES

NSG 522. Culture and Health. 3 Hours.

Healthcare is encountering increasing cultural diversity. By identifying cultural behaviors, beliefs, and meaning of health in diverse cultural contexts, students will become more culturally proficient in delivering care.

NSG 593A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

NSG 610. Leadership in Health Care. 3 Hours.

PR or CONC: NSG 622 and NSG 623. Critical analysis of leadership frameworks, values and beliefs, and application of skills in the practice setting.

NSG 611. System Based Decision Making. 2 Hours.

PR or CONC: NSG 622 and NSG 623. Decision making grounded in an understanding of the organization as an open living system.

NSG 612. Leading Health System Change. 4 Hours.

PR: NSG 610 and NSG 611. Developing system-based change management critical to advanced nursing in various settings, including selection training, and support of effective teams and workgroups.

NSG 613. Managing Health Care Resources. 3 Hours.

PR: NSG 622 and NSG 623. Management of financial and human resources to promote professional practice and organizational growth within organizational financial constraints.

NSG 614. Health Care Informatics. 3 Hours.

PR: NSG 627. Explore technologies to improve health care practices and learn to utilize technology for outcomes management.

NSG 615. Program Planning/Evaluation. 3 Hours.

PR: NSG 613. Health care program planning, strategies for program implementation, and program evaluation techniques.

NSG 617. Leadership Practicum 1. 2-5 Hours.

PR or CONC: NSG 615. Supervised practicum designed to apply healthcare leadership principles to practice. Students participate in nursing leadership and administrative activities in a selected healthcare setting.

NSG 618. Leadership Practicum 2. 2-5 Hours.

PR: NSG 617. Supervised practicum designed to build on initial application of healthcare leadership principles. Students participate in leadership and administrative activities in a selected health care setting.

NSG 622. Theory and Disciplined Reasoning. 3 Hours.

Introduction to the theoretical foundations of the discipline of nursing as a basis for applying critical thinking skills to the development of a conceptual framework for nursing.

NSG 623. Concepts of Advanced Nursing. 2 Hours.

PR or Conc: NSG 622. Exploration, analysis, and evaluation of concepts, theories, and research guiding the advanced practice of nursing. Learning activities emphasize advanced practice role.

NSG 624. Advanced Pathophysiology. 4 Hours.

Theoretical basis of pathophysiological changes in acute and chronic illness confronted in primary care across lifespan. This course lays the foundation for subsequent courses in diagnosis, management, and therapeutic interventions.

NSG 626. Lifespan Health Promotion. 2 Hours.

An in-depth study of theoretical foundations, epidemiological principles, and advance practice strategies for the promotion of health and prevention of disease across the life-span.

NSG 627. Research and Systematic Analysis. 5 Hours.

PR: NSG 622. An overview of research methods, evidence and epidemiological and statistical measures used in advanced practice nursing.

NSG 628. Health Policy, Finance, Ethics. 3 Hours.

PR: NSG 622. Study of how health policy, the organization and financing of health care, and ethical principles shape professional practice.

NSG 629. Advanced Practice/Families. 2 Hours.

PR: NSG 622 and NSG 623 and NSG 626 and NSG 627. Exploration and analysis of family theories, assessments, and interventions applicable to the advanced practice of nursing.

NSG 631. Advanced Pharmacotherapeutics. 3 Hours.

PR: NSG 624. Examination of the relationship between pharmacologic principles and the selection of pharmacologic agents in altered health states across the lifespan. This course lays the foundation of subsequent courses in diagnosis, management, and therapeutic interventions.

NSG 632. Advanced Assessment. 2 Hours.

PR: NSG 622 and NSG 623 and NSG 624. Preparation for the conduct of advance health assessment of patients. Diagnostic reasoning is emphasized as the student collects and analyzes data obtained from the patient history, physical examination, and diagnostic procedures.

NSG 633. Primary Care: Rural Families 1. 3 Hours.

PR: NSG 622 and NSG 623 and NSG 624 and NSG 626, and NSG 631 and NSG 632. Introduction to the domains and competencies of the advanced practice nursing role that are fundamental to primary health care of the rural family unit.

NSG 634. Primary Care: Rural Families 2. 4 Hours.

PR: NSG 633. Further development of the domains and competencies of the advanced practice nursing role introduced in NSG 633 that are fundamental to primary health care of the rural family unit.

NSG 635. Rural Family Health Practicum 1. 2-5 Hours.

PR or Conc: NSG 634. Supervised practicum designed to apply theory- and evidence-based advanced practice nursing. Students develop the advanced practice role as they manage health care and participate in service learning.

NSG 636. Rural Family Health Practicum 2. 4-5 Hours.

PR: NSG 635. Supervised practicum that builds upon NSG 635 and focuses on the application of theory- and evidence-based advanced nursing practice. With supervision, students manage health care and participate on interdisciplinary terms.

NSG 644. Pediatric Primary Care 2. 4 Hours.

PR: NSG 647. Further acquisition of knowledge and skills central to the assessment of health status, diagnosis, treatment and evaluation of children in the primary care setting.

NSG 645. Pediatric Practicum 1. 5 Hours.

PR or CONC: NSG 644. Supervised practicum designed to facilitate the student's competency in the delivery of primary health care to children.

NSG 646. Pediatric Practicum 2. 5 Hours.

PR: NSG 645. Supervised practicum designed to advance the student's competency in the delivery of primary health care to children.

NSG 647. Assessment and Pediatric Care 1. 5 Hours.

PR: NSG 622 and NSG 623 and NSG 624 and NSG 627. An Introduction to the knowledge and skills basic to the assessment of health status, diagnosis, and evaluation of children in the primary care setting.

NSG 654. Neonatal Pathophysiology. 4 Hours.

An introduction to the scientific foundations underlying processes contributing to health/illness states in neonates. Principles from genetics, embryology, and developmental physiology lay the foundation for subsequent courses in assessment, diagnosis and management.

NSG 655. Neonatal health Promotion. 2 Hours.

PR: NSG 622. Review of practices and services that contribute to healthy outcomes for sick and well neonates with focus on health promotion, disease prevention, and maintenance of function in the context of critical care and primary care.

NSG 656. Current Issues in Aging. 2 Hours.

An overview of contemporary gerontology that offers a multidisciplinary approach to providing services to older people in the United States.

NSG 657. Advanced Assessment of Older Adults. 2 Hours.

PR: NSG 624. Preparation for the conduct of advanced health assessment of older adults. Diagnostic reasoning is emphasized as the student collects and analyzes data obtained from the patient history, physical examination, and diagnostic procedures.

NSG 658. Geriatric Primary Care 1. 2,3 Hours.

PR: NSG 631 and NSG 657. Study of constellation of symptoms in the older adult that may be manifestations of other health problems.

NSG 659. Geriatric Primary Care 2. 4 Hours.

PR: NSG 657 and NSG 658. Study of common diseases and disorders seen in the older adult. An integration of advanced practice skills and role competencies in the care of older individuals and their families is emphasized.

NSG 660. Women's Reproductive Health. 2 Hours.

PR: Graduate status or permission. This course focuses on fertility control, reproductive health, menopause, and health promotion activities for women.

NSG 663. Neonatal Assessment/Care 1. 5 Hours.

PR: NSG 622 and NSG 623 and NSG 654 and PR or CONC: NSG 655. Preparation for conducting advanced assessment of neonates/young infants. Diagnostic reasoning is emphasized through collecting and analyzing data obtained from patient history, physical examination, and diagnostic procedures.

NSG 664. Neonatal Care 2. 4 Hours.

PR: NSG 663 and NSG 631. This course focuses on the management of common problems and conditions in neonates.

NSG 665. Neonatal Practicum 1. 5 Hours.

PR: NSG 631 and PR or CONC: NSG 664. This supervised practicum is designed to facilitate the student's competency in the delivery of care to infant populations.

NSG 666. Neonatal Practicum 2. 5 Hours.

PR: NSG 665. This supervised practicum is designed to facilitate the student's competency in the delivery of care to infant populations.

NSG 670. Curriculum in Nursing. 3 Hours.

A review of contemporary theory-based determinants of curriculum development in nursing, including analysis and evaluation of curricula for nursing education.

NSG 671. Clinical Practicum-Educators. 2 Hours.

PR: NSG 635. Implementation of theory-based advanced nursing practice in an area of student's clinical interest/expertise. Student develops the advanced practice role with a select population of clients and families.

NSG 672. Education Practicum. 3 Hours.

PR: NSG 674. Guided teaching experience under the supervision of an experienced faculty member that allows the student to function in the role of nurse educator in classroom and clinical settings.

NSG 674. Teaching in Nursing. 3 Hours.

PR: NSG 670. A general methods course involving the principles of instruction in didactic and clinical nursing education including analysis of course planning, teaching methods, and evaluation of student outcomes.

NSG 675. Geriatric Practicum 1. 2-5 Hours.

PR: NSG 657 and NSG 658 and Co-Req: NSG 659. Supervised practicum focusing on developing and implementing advanced practice knowledge and skills essential to the role of geriatric nurse practitioner. Students engage in delivering evidence-based care with older adults.

NSG 676. Geriatric Practicum 2. 4-5 Hours.

PR: NSG 675. Supervised practicum that focuses on evidence-based advanced practice in a variety of settings. The students, with supervision, will manage health care of geriatric clients and their families and participate on interdisciplinary teams.

NSG 683. Primary Care: Women and Girls 1. 3 Hours.

PR: NSG 622, NSG 623, NSG 624, NSG 626, NSG 631 and NSG 632. Introduction to the domains and competencies of the advanced practice nursing role that are fundamental to primary health care of women and girls.

NSG 684. Primary Care: Women and Girls 2. 4 Hours.

PR: NSG 683. Further development of the domains and competencies of the advanced practice nursing role introduced in NSG 683 that are fundamental to primary health care of the rural family unit.

NSG 685. Clinical Scholarship. 1 Hour.

Co-Req: NSG 635 (For FNP track) or NSG 645 (For PNP track). Knowledge dissemination within the advanced practice role using disciplined reasoning and systematic inquiry to examine and incorporate evidence-based strategies in the caring/healing process.

NSG 686. WHNP Practicum 1. 2-5 Hours.

PR or CONC: NSG 684. Supervised practicum designed to apply theory- and evidence- based advanced practice nursing. Students develop the advanced practice role as they manage health care and participate in service learning.

NSG 687. WHNP Practicum 2. 4-5 Hours.

PR: NSG 686. Supervised practicum that builds upon NSG 686 and focuses on the application of theory-and-evidence-based advanced nursing practice. With supervision, students manage health care and participate on interdisciplinary teams.

NSG 691A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

NSG 693A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

NSG 695. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

NSG 697. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper, or equivalent scholarly project, or a dissertation guided by a student-graduate faculty contact based on the course objectives and culminating in a written product. (Grading will be S/U.).

NSG 702. Population Health Promotion. 3 Hours.

PR: NSG 707. Provides a foundation for analysis of clinical prevention and population health programs or individuals, aggregates, and populations.

NSG 703. Theory of Practice. 3 Hours.

Provides an understanding of the scientific underpinnings of the application of theory to health care at the highest level of advanced nursing practice.

NSG 704. Health Care Leadership. 3 Hours.

Critical analysis of leadership in an organizational setting, with development of skills needed to enact the leadership role.

NSG 707. Evidence Based Practice. 3 Hours.

PR or CONC: NSG 703. Prepares the DNP student to translate research into practice, evaluate practice guidelines to improve health care practices and outcomes, and to participate in collaborative research.

NSG 708. Doctor of Nursing Practice Role Seminar. 2 Hours.

PR: Admission to the DNP program. Provides an understanding of the Doctor of Nursing Practice role at the highest level of nursing practice.

NSG 709. Health Care Informatics. 3 Hours.

PR: NSG 707. Explore information technologies used in acute and outpatient health settings and describe methods of utilization of technology for practice improvement and patient outcomes management.

NSG 710. Health Policy and Resource Management. 3 Hours.

PR: NSG 711. The foundation for leadership in health policy development, implementation, and evaluation, with a focus on advocacy for nursing, social justice, and equity. Financial resource management for nursing leadership and policy/ program implementation.

NSG 711. Health Care Focus. 3 Hours.

Provides for the development of knowledge and skills relative to the state of the science in a particular area of clinical practice.

NSG 713. Doctor of Nursing Practice Role Application. 1 Hour.

PR or CONC: NSG 742. Integration of Doctor of Nursing practice role competencies at the highest level of nursing practice.

NSG 717. Organization and Leadership. 3 Hours.

Provides a foundation for developing organizational and systems leadership skills critical to clinical care and health outcomes. Knowledge will help students to promote patient safety and excellence in health care organizations.

NSG 719. Health Care Policy. 3 Hours.

Provides a foundation for influencing, developing, implementing, and evaluating health care policies and legislation pertinent to issues in health care such as ethics, safety, costs, access, and quality.

NSG 724. Health Research Statistics 1. 3 Hours.

This course provides development of statistical knowledge and skills needed for quantitative health research using SPSS. Topics include descriptive statistics, probability, hypothesis testing, analysis of variance, chi-squared testing, linear regression, and logistic regression.

NSG 725. Health Research Statistics 2. 3 Hours.

This course continues the development of statistical knowledge and skills needed for quantitative health research using SPSS, including nonparametric testing, advanced regression topics and diagnostics, ANCOVA, SPSS syntax, classification, and factor, survival and power analyses.

NSG 727. Contemporary Nursing Science. 2 Hours.

PR: NSG 728 and PR or CONC: NSG 729. Focus is on an analysis of the state of the science for a phenomenon for study. Emphasis is placed on the application of the particular phenomenon to a population of interest.

NSG 728. Theoretical Basis of Nursing. 3 Hours.

PR: NSG 722. This course builds on philosophical basis of nursing. Discovery and verification of scientific knowledge are addressed by focusing on theory development. Methodologies include concept analysis and evaluation of middle-range theories of nursing and related sciences.

NSG 729. Quantitative Research Methods. 4 Hours.

PR: NSG 724 and NSG 725. Quantitative methods and measurement relevant to conducting research in nursing are studied.

NSG 730. Principles of Measurement. 3 Hours.

PR: NSG 727 and NSG 728. The role of measurement in nursing research is studied. Measurement in the areas of attitudes, personality, competence, development, and group qualities is emphasized. Instrument development and reliability/ validity issues are also discussed.

NSG 731. Qualitative Research Methods. 3 Hours.

PR: NSG 727 and NSG 728. An exploration of the philosophical foundation and methods of qualitative inquiry. Research designs, ethical issues, rigor, integrity, data collection, interpretation, and representation are studied in depth.

NSG 732. Seminar in Nursing Scholarship. 2 Hours.

PR: Admission to the PhD program. This course socializes students to clinical scholarship in preparation for the conduct of independent research and for future roles as nurse scholars and nurse scientists.

NSG 733. Research Grant Development. 2 Hours.

PR: NSG 781. Analysis of the grant-writing process, including current federal application formats, provides students with the background to complete a submittable grant proposal in their own area of research.

NSG 734. Use of Data. 3 Hours.

PR: NSG 726 and NSG 729. This course focuses on use of the following data bases: clinical, financial, health services, nursing, local, state, and national. The uses of existing data in clinical and policy decisions and in research will be explored.

NSG 735. Principles: Nursing Education. 3 Hours.

PR: EDP 700. This course examines the research base of educational strategies in nursing education in classroom and clinical settings. The course also examines external determinants on nursing curriculum, accreditation issues, and evaluation of nursing programs.

NSG 736. Advanced Health Policy and Ethics. 3 Hours.

PR: NSG 728, NSG 724, NSG 732, NSG 724, NSG 735, NSG 725, and NSG 704. Examination of ethical issues of research and current health policy.

NSG 737. Leadership. 3 Hours.

PR: NSG 734. Through exploration of contemporary leadership theory and application to self, an authentic personal leadership style will be developed to enable the student to enact a leadership role in health care and/or education.

NSG 738. Issues in Nursing Scholarship. 3 Hours.

PR: NSG 729, NSG 731, and NSG 737. Seminar focused on broad issues of ethics in the conduct of research and role acquisition of nurse scientist in academic, clinical, and health policy settings.

NSG 745. Clinical Immersion. 1-8 Hours.

PR: NSG 711. Provides for the mastery of clinical skills relative to the state of the science in a particular area of clinical practice.

NSG 760. Doctor of Nursing Practice Clinical Project. 3 Hours.

PR: NSG 711. Develop a scholarly initiative to improve practice system, or patient outcomes.

NSG 761. Clinical Project 1. 1 Hour.

PR: NSG 715 and NSG 716. Identifies a practice problem and connects the problem to existing knowledge and science.

NSG 762. Clinical Project 2. 1 Hour.

PR: NSG 761 and NSG 717 and NSG 718. Students design an initiative to address the practice problem identified in NSG 761 using the appropriate research methods and a variety of scientific principles.

NSG 763. Doctor of Nursing Practice Capstone. 1-6 Hours.

PR: NSG 762. Project implementation using leadership skills to create and evaluate change relative to a practice problem. Analyze relationship of project to practice and policy.

NSG 768. Prospectus Development. 1-6 Hours.

Supervised experiences in planning the dissertation research project, developing the chapters for the prospectus, and preparing the proposal document for review by committee members.

NSG 769. Faculty Career Development. 1 Hour.

Supervised experiences in searching for available positions, preparing and submitting application materials, participating in campus interviews, and planning a successful future career.

NSG 781. Research Mentorship. 1-3 Hours.

PR: NSG 729. In this guided practicum, the student's research skills are developed and cultivated through participation in the mentorship process with an experienced researcher (the chairperson or his/her designee).

NSG 783. Dissertation Seminar. 1 Hour.

PR: NSG 729. This seminar provides an opportunity for continued knowledge synthesis related to the selected topic of research. Students will participate in proposal presentation and critique. The expectation is a National Research Service Award Predoctoral Fellowship Application.

NSG 791A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

NSG 792A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

NSG 793A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

NSG 794A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

NSG 795. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

NSG 796. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

NSG 797. Research. 1-9 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper, or equivalent scholarly project, or a dissertation. (Grading will be S/U.).

NSG 798. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (6978), or dissertations (798). Grading is normal.

NSG 799. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is P/F; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

OBSTETRICS AND GYNECOLOGY COURSES**OBST 741. Clinical Clerkship in Obstetrics and Gynecology. 8 Hours.**

(Required of third-year medical students) Presents core knowledge of obstetrics and gynecology with small group instructional seminars, ward rounds, didactic teaching sessions and grand rounds conducted by faculty, house officers, visiting faculty, and students. Students participate in the care of all inpatients and attend all departmental clinics.

OBST 791A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

OBST 797. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

OCCUPATIONAL THERAPY COURSES**OTH 500. Health Care Issues in Occupational Therapy. 3 Hours.**

PR: OTH student status. Occupational therapy practice models in diverse health care delivery systems are discussed, including hospital based, home health, outpatient/private practice, long term care settings, and public schools. (2 hr. lec., 2 hr. other.).

OTH 501. Management for Occupational Therapy Practice. 4 Hours.

PR: OTH student status. This course reviews the structure and recent changes in the United States health care system with attention to those aspects of managed care of importance to the entry-level occupational therapist. (3 hr. lec., 2 hr. lab.).

OTH 503. Occupational Therapy in Pediatrics. 3 Hours.

PR: OTH student status. This course reviews the medical and developmental conditions of pediatric populations commonly encountered by occupational therapists. Emphasis is placed on OT assessment and interventions. (2 hr. lec., 2 hr. lab.).

OTH 505. Prosthetics and Orthotics. 3 Hours.

PR: OTH student status. Principles of practice applications of upper and lower limb prosthetics and orthotics commonly encountered and/or manufactured by the occupational therapist. (1 hr. lec., 4 hr. lab.).

OTH 520. Occupational Therapy in the Work Environment. 3 Hours.

PR: OTH student status. A holistic approach to evaluation and intervention commonly practiced by occupational therapists in work settings. This course will focus on task analysis in various work settings using an occupational performance frame of reference. (1 hr. lec., 4 hr. lab.).

OTH 540. Level 2 Fieldwork 1. 1-6 Hours.

PR: OTH student status. Students are placed in one 12-week, or 2 6-week placement(s) depending on the facility and the needs of the student. Students will be placed in facilities where individualized instruction can occur. (Course will be graded S/U.).

OTH 550. Education in Occupational Therapy. 3 Hours.

PR: OTH student status. Principles of community and adult education are provided. Students are taught to prepare instructional materials, workshops/seminars, and how to assess instructional outcomes. Use of various media are used and reviewed.

OTH 551. Occupational Therapy in Prevention & Wellness. 3 Hours.

PR: OTH student status. Students are taught occupational therapy principles and strategies to develop community health promotion and wellness programs in a variety of settings.

OTH 570. Advanced Theory in Occupational Therapy. 3 Hours.

PR: OTH grad student standing. This course will provide a holistic approach to theory in occupational therapy including theory development and application of theory to occupational therapy practice.

OTH 593A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

OTH 594A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

OTH 640. Level 2 Fieldwork 2. 1-6 Hours.

PR: OTH student status. Students are placed in one 12-week, or two 6-week placement(s), depending on the facility and the needs of the student. Students will be placed in facilities where individualized instruction can occur. (Grading will be S/U.).

OTH 697. Research. 1-15 Hours.

PR: OTH student status. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

OCCUPATIONAL AND ENVIRONMENTAL HEALTH SCIENCE COURSES

OEHS 601. Environmental Health. 3 Hours.

A review of issues illustrating responsibilities and roles of public health work force in identifying, managing and preventing casualties from environmental causes in air, water, soil, food, pesticides, and related subjects. WV policy dilemmas.

OEHS 610. Environmental Practice. 3 Hours.

The course involves application of Public Health principles to the planning and operation of drinking water, sewage disposal, solid and hazardous waste management, air pollution and general community sanitation.

OEHS 620. Occupational and Environmental Hazard Assessment. 4 Hours.

Lecture and laboratory experience to understand occupational and environmental hazards related to the workplace. Principles from chemistry, physics and biology are used quantify exposures. This course provides an overview of various industrial hygiene concepts.

OEHS 622. Public Health Toxicology. 3 Hours.

This interdisciplinary course will survey the principles of toxicology that pertain to human health and the environment, and the integration of these principles into public health practice.

OEHS 623. Occupational Injury Prevention. 3 Hours.

This course introduces students to the problem of occupational injury. It covers the epidemiology of occupational injury and provides a critical perspective on injury causation and the strategies used to prevent occupational injury. This course is also listed as OEHS 732 - students may not count both toward degree requirements.

OEHS 626. Internship. 1-6 Hours.

PR: Consent. (May be repeated for a maximum of 6 credit hours.) The internship provides students the opportunity to develop their practical skills and enhance professional competencies by applying the knowledge and techniques gained from their MPH coursework to public health practice.

OEHS 629. Capstone. 1 Hour.

PR: PUBH 622. This course is the culminating experience for OEHS Master's students through which they will demonstrate their ability to integrate and synthesize the MPH and OEHS competencies in relation to the occupational/environmental public health problem on which their Practice-based Experience (PBE) was focused.

OEHS 630. Public Health Biology. 3 Hours.

This course will provide students with a fundamental understanding of Public Health Biology, which comprises a wide range of concepts including: human physiology, infectious and non-infectious disease, mechanisms of disease pathology, toxicology, and population health disparities. The students will learn underlying and advanced knowledge of human physiology and its role in public health.

OEHS 665. Worksite Evaluation. 2 Hours.

Students are introduced to health and safety hazards associated with industrial operations through in-plant inspections, interaction with plant medical and safety staff, and in-class discussions.

OEHS 691A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation in advanced topics that are not covered in regularly scheduled courses.

OEHS 695. Independent Study. 1-6 Hours.

Faculty-supervised study of topics not available through regular course offerings.

OEHS 696. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

OEHS 723. Emergency and Disaster Response. 3 Hours.

This course addresses the basics of how public health practitioners respond to disasters, develop response protocols, and perform as skillful public health leaders.

OEHS 732. Occupational Injury Prevention. 3 Hours.

This course introduces students to the problem of occupational injury. It covers the epidemiology of occupational injury and provides a critical perspective on injury causation and the strategies used to prevent occupational injury.

OEHS 733. Advanced Work Injury Analysis. 3 Hours.

This course will discuss how formal and informal aspects of work organization contribute to workplace injuries and other work-related health outcomes. A variety of social and organizational theories and perspectives will be used to illustrate how organizational factors can affect rates of work-related injury.

OEHS 734. Aerosols and Health. 3 Hours.

This course will give an understanding of the basic principles behind aerosol generation, measurement, mechanics and toxicity for aerosols found in the environment and their application to health effects caused by exposure to these aerosols.

OEHS 742. Outbreak Assessment. 3 Hours.

This course covers environmental and epidemiologic principles and concepts within the context of case studies associated with disease outbreaks.

OEHS 770. Molecular Diagnosis Public Health. 3 Hours.

This course gives an overview of the interdisciplinary approaches in molecular diagnosis and prognosis for personalized patient care. Knowledge of genome-wide association studies will guide hypotheses-driven experimentation and aid clinical decision-making.

OEHS 790. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of OEHS. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It also provides a mechanism for students not on assistantships to gain teaching experience.

OEHS 795. Independent Study. 1-9 Hours.

PR: Consent. Faculty-supervised study of topics not available through regular course offerings.

OEHS 796. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

OEHS 797. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading will be S/U.).

ORTHODONTICS COURSES**ORTH 616. Biomechanics. 2 Hours.**

PR: Consent. Design and function of the teeth and their surrounding structures, and response of these tissues to orthodontic procedures.

ORTH 617. Orthodontic Technique. 2 Hours.

PR: Consent. Laboratory course in techniques related to fabrication and manipulation of orthodontic appliances.

ORTH 618. Orthodontic Materials. 1 Hour.

PR: Consent. Physical properties of materials used in orthodontic appliances.

ORTH 619. Orthodontic Diagnosis. 1-3 Hours.

PR: Consent. Seminar-type class on technique of patient examination, acquiring diagnostic records, and analyzing and correlating this information to the treatment of clinical problems.

ORTH 620. Cephalometrics. 1-3 Hours.

PR: Consent. Use of radiographic cephalometry in studying growth of the human face, analysis of dentofacial malformations, and evaluation of orthodontic treatment.

ORTH 621. Orthodontic Mechanics. 1-4 Hours.

Seminar and laboratory course on basic orthodontic mechanical properties.

ORTH 623. Growth and Development. 1-5 Hours.

PR: Consent. Seminar-type course on normal and abnormal growth of the human head and its application to orthodontics.

ORTH 625. Orthodontic Seminar. 1-8 Hours.

PR: Consent. Discussions including all branches of dental science, with special emphasis on the orthodontic interest. Assigned topics and articles in the literature discussed.

ORTH 625A. Orthodontic Seminar. 1-8 Hours.

PR: Consent. Discussions including all branches of dental science, with special emphasis on the orthodontic interest. Assigned topics and articles in the literature discussed.

ORTH 625B. Orthodontic Seminar. 1-8 Hours.

PR: Consent. Discussions including all branches of dental science, with special emphasis on the orthodontic interest. Assigned topics and articles in the literature discussed.

ORTH 625C. Orthodontic Seminar. 1-6 Hours.

PR: Consent. Discussions including all branches of dental science, with special emphasis on the orthodontic interest. Assigned topics and articles in the literature discussed.

ORTH 625D. Orthodontic Seminar. 1-8 Hours.

PR: Consent. Discussions including all branches of dental science, with special emphasis on the orthodontic interest. Assigned topics and articles in the literature discussed.

ORTH 625W. Orthodontic Seminar. 1-8 Hours.

PR: Consent. Discussions including all branches of dental science, with special emphasis on the orthodontic interest. Assigned topics and articles in the literature discussed.

ORTH 625X. Orthodontic Seminar. 1-8 Hours.

PR: Consent. Discussions including all branches of dental science, with special emphasis on the orthodontic interest. Assigned topics and articles in the literature discussed.

ORTH 625Y. Orthodontic Seminar. 1-8 Hours.

PR: Consent. Discussions including all branches of dental science, with special emphasis on the orthodontic interest. Assigned topics and articles in the literature discussed.

ORTH 625Z. Orthodontic Seminar. 1-8 Hours.

PR: Consent. Discussions including all branches of dental science, with special emphasis on the orthodontic interest. Assigned topics and articles in the literature discussed.

ORTH 626. Orthodontic Clinic. 1-12 Hours.

PR: ORTH 616 and ORTH 617. Clinical treatment of selected patients.

ORTH 627. Surgical Orthodontics. 1 Hour.

PR: Consent. Diagnosis and treatment of patients that require surgical orthodontic treatment.

ORTH 628. Early Orthodontic Treatment. 1 Hour.

PR: Consent. Diagnosis and treatment of young patients that require early orthodontic and orthopedic treatment.

ORTH 629. Orthodontic Patient Management. 1 Hour.

PR: Consent. Addresses the skills needed to effectively manage an orthodontic practice.

ORTH 630. Craniofacial Anomalies. 1 Hour.

PR: Consent. Diagnosis and treatment of patients presented with craniofacial anomalies.

ORTH 631. Journal Club. 1 Hour.

PR: Consent. Review of literature in the orthodontic journals.

ORTH 632. Dentofacial Orthopedics. 1 Hour.

PR: Consent. Detailed study of the variety of appliances and their respective modalities in orthodontic treatment.

ORTH 633. Orthodontics-Periodontics Seminar. 1 Hour.

PR: Consent. A series of seminars on the diagnosis and treatment of oral conditions requiring interdisciplinary care by the specialties of periodontics and orthodontics.

ORTH 690. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of dentistry. Note: This course is intended to insure that graduate teaching assistants are adequately prepared and supervised when they are given college teaching responsibility. It also provides a mechanism for students not on assistantships to gain teaching experience.

ORTH 691A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

ORTH 692A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

ORTH 693A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

ORTH 694A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

ORTH 695. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

ORTH 696. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

ORTH 697. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/ U.).

ORTH 716. Craniofacial Growth and Maturation. 1 Hour.

PR: Consent. The current concepts of craniofacial growth and maturation are presented and integrated for application to clinical problems.

PATHOLOGY COURSES

PATH 601. Special Studies in Oral Pathology. 1-3 Hours.

PR: PATH 738 and PATH 753. Advanced study of local or systemic disease processes affecting oral structures through seminars, assignment of specific topics, or research activities.

PATH 603. Pathology and Anatomy. 6 Hours.

This course will cover gross and microscopic human anatomy including embryology, histology and microanatomy lab.

PATH 605. Advanced Microanatomy. 2 Hours.

Microanatomy of disease states including clinical correlations for students in the pathologists assistant program.

PATH 610. Pathology Assistant Education Methods. 1 Hour.

Techniques in educational methodology for pathologist's assistants.

PATH 620. Clinical Pathology Seminar. 2 Hours.

This course presents a review of clinical pathology, including pertinent forensic molecular, toxicologic and radiologic diagnostics.

PATH 625. Anatomical Pathology Techniques. 4 Hours.

This course will cover standard techniques in surgical and autopsy dissection, preparation of reports, basic forensic, investigation techniques, and basic histological and immunological staining techniques.

PATH 627. Pathology Assistant Practicum 1. 9 Hours.

Rotations in surgical and autopsy pathology to include forensics and pediatrics.

PATH 628. Pathology Assistant Practicum 2. 9 Hours.

Rotations in surgical and autopsy pathology to include forensics and pediatrics.

PATH 629. Pathologists' Assistant Practicum 3. 7 Hours.

PR: PATH 628. This course is a continuation of PATH 628 and advanced procedures and application of advanced techniques in surgical and autopsy pathology.

PATH 630. Pathology Review 1. 2 Hours.

This course includes an intense review of clinical and anatomical pathology theory and techniques, and presentation of scientific journal articles and clinical cases.

PATH 631. Pathology Review 2. 2 Hours.

PR: PATH 630. This course is a continuation of PATH 630 and includes an intense review of clinical and anatomical pathology theory and techniques, and presentation of journal articles and clinical cases.

PATH 648. Surgical and Autopsy Pathology Procedures. 3 Hours.

PR: PATH 625 and PATH 752. This course is specifically designed for Pathologists' Assistant students as a comprehensive review course covering both surgical and autopsy pathology techniques to correlate with clinical rotations.

PATH 693A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

PATH 728. General Pathology. 5 Hours.

PR: Consent. A study of the pathophysiological changes associated with human disease and a study of disease of major organ systems.

PATH 738. Oral Pathology 1. 3 Hours.

PATH 753. Oral Pathology 2. 2 Hours.

PR: PATH 738 or consent. Continuation of PATH 738.

PATH 782. Advanced Oral Histopathology. 1,2 Hour.

PR: PATH 738 and PATH 753 or consent. An elective seminar stressing the significant microscopic features and diagnosis of various oral lesions.

PATH 790. Teaching Practicum. 1-3 Hours.

PR: (PATH 301 and PATH 302) or (PATH 728 and PATH 738 and PATH 753.) Supervised practice in college teaching of pathology. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on assistantships to gain teaching experience. (Grading will be P/F.).

PATH 791A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

PATH 792A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

PATH 793A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

PATH 794A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

PATH 795. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

PATH 796. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

PATH 797. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

PATH 798. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

PATH 799. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is P/F; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

PATH 801. Mechanisms of Human Disease. 11 Hours.

Integrated study of disease using structure-function relationships. This course includes the structural, biochemical, and functional changes in cells, tissues, and organs that underlie disease.

PEDIATRICS COURSES**PEDI 731. Clinical Clerkship in Pediatrics. 8 Hours.**

CR. Required of third-year medical students. See description of clinical clerkship under MED 731. Clerkship in pediatrics occupies six weeks.

PEDI 791A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

PEDI 797. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

PETROLEUM AND NATURAL GAS ENGR COURSES**PNGE 501. Petroleum Engineering Problems. 1-3 Hours.**

PR: Senior standing. Investigation of a special problem in petroleum engineering.

PNGE 532. Introduction to Reservoir Simulation. 3 Hours.

PR or CONC: PNGE 434 or Consent. Partial differential equations for fluid flow in porous media and the use of finite difference equations in solving reservoir flow problems for various boundary conditions. Study of individual well pressures and fundamentals of history matching.

PNGE 533. Secondary Recovery of Oil by Water Flooding. 3 Hours.

PR: PNGE 333. Theory of immiscible fluid displacement mechanism, evaluation and economics of water flood projects, and oil field flooding techniques. (3 hr. lec.).

PNGE 591A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

PNGE 601. Fluid Flow in Porous Media. 3 Hours.

PR: PNGE 434 and MATH 261 or consent. Theoretical and practical aspects of the physical principles of hydrodynamics in porous media. (3 hr. lec.).

PNGE 632. Reservoir Simulation and Modeling. 3 Hours.

PR: PNGE 532 or consent. Application of finite-difference equations to multi-phase fluid flow in porous media in two or three dimensions with gravity and capillary pressure effects. Simulation of waterflood performance and enhanced recovery techniques.

PNGE 633. Advanced Secondary Recovery. 3 Hours.

PR: PNGE 533. Secondary recovery of oil by gas flooding, miscible fluid injection, in-situ combustion, and heat injection. (3 hr. lec.).

PNGE 634. Pressure Transient Analysis. 3 Hours.

PR: PNGE 434 or consent. Methods of analysis of pressure transient data obtained from well testing for the purpose of determining in-situ reservoir conditions including porosity, lateral extent, average reservoir pressure, and formation permeability.

PNGE 691A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

PNGE 693A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

PNGE 695. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

PNGE 697. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

PNGE 701. Environmental Issues in Petroleum Engineering. 3 Hours.

PR: Graduate standing. Environmental impacts of petroleum exploration and production, methods to minimize or eliminate potential environmental impacts, treatment and disposal of the drilling and production wastes, and remediation methods for petroleum contaminated sites.

PNGE 710. Advanced Drilling Engineering. 3 Hours.

PR: PNGE 310. Drilling optimization, methods for estimating formation pore and fracture pressures, air drilling, application of directional drilling and deviation control, horizontal drilling, and coiled tubing applications.

PNGE 711. Advanced Productions Engineering. 3 Hours.

PR: PNGE 420. Advanced well completion methods, problem well analysis, well remediation and workover planning, multi-phase flow in pipes, system approach for oil and gas wells, application of NODAL analysis, and surface and subsurface production equipment.

PNGE 734. Advanced Reservoir Engineering. 3 Hours.

PR: PNGE 434. Modeling and simulation of heterogeneous reservoirs, predicting the performance of the heterogeneous reservoirs during primary, secondary, and enhanced recovery production.

PNGE 735. Advanced Formation Evaluation. 3 Hours.

PR: PNGE 450. Advanced methods for interpreting well logs, shaly sand analysis, and production logging methods.

PNGE 770. Advanced Natural Gas Engineering. 3 Hours.

PR: PNGE 470. Application of reservoir modeling, history matching, and type curves techniques to analyze and predict the performance of conventional and unconventional gas reservoirs.

PNGE 790. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of petroleum and natural gas engineering. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on assistantships to gain teaching experience. (Grading may be S/U.).

PNGE 791A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

PNGE 792A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

PNGE 793A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

PNGE 794A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

PNGE 795. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

PNGE 796. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

PNGE 797. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

PNGE 798. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

PHARMACOLOGY AND TOXICOLOGY COURSES

PCOL 549. Applied Pharmacology. 4 Hours.

PR: For exercise physiology and other graduate students or selected undergraduate seniors with consent. Effect of drugs in humans with emphasis on application of drugs relevant to health professionals.

PCOL 701. Bioinformatics Tools. 2 Hours.

Introduction to biomedical databases and ontologies, sequence comparison and alignment, gene finding and protein function prediction, analysis of gene expression and high throughput proteomics, and pathways analysis.

PCOL 743. Pharmacology 1. 3 Hours.

PR: Second year professional standing or Consent. Cellular and biochemical effects that explain the therapeutic or adverse effects of drugs. These will be integrated into considerations of drug effects, toxicities and interactions between drugs.

PCOL 744. Pharmacology 2. 3 Hours.

PR: Second year professional standing or Consent. Continuation of Pharmacology 1. Cellular and biochemical effects that explain the therapeutic or adverse effects of drugs. These will be integrated into considerations of drug effects, toxicities and interactions between drugs.

PCOL 745. Advanced Pharmacology 1. 1-3 Hours.

This course contains three modules and addresses general pharmacological principles and contemporary topics in integrative, cellular, and molecular aspects of cardiovascular, inflammatory, endocrine, and pulmonary pharmacology, and toxicology.

PCOL 746. Advanced Pharmacology 2. 1-3 Hours.

This course contains three modules and addresses contemporary topics in integrative, cellular, and molecular aspects of neuropharmacology (first two modules) and cancer pharmacology (third module).

PCOL 760. Pharmacology and Therapeutics. 5 Hours.

PR: Second year dental students or graduate students with Consent. Lecture and demonstrations relevant to explaining how drugs function in the human body. Team teaching by basic science faculty and clinical dental faculty.

PCOL 761. Medical Pharmacology. 7 Hours.

(For medical and selected graduate students in the medical sciences with instructor's consent) PR: Basic principles of drug action, mechanisms of therapeutic effects and undesirable effects. Emphasis on the classes of drugs currently used in medical practice.

PCOL 762. Literature Survey. 1 Hour.

per semester. PR: Graduate status in pharmacology and toxicology or Consent. Current literature pertinent to pharmacology and toxicology including journals of allied biological sciences.

PCOL 764. Advanced Pharmacology. 1-6 Hours.

PR: PCOL 761 or Consent. Advanced lectures and discussion of general principles of pharmacology and toxicology and advanced lectures in biochemical, endocrine, pulmonary, and cardiovascular pharmacology. (1-6 hr. lec.) (Alternate years.).

PCOL 770. Summer Medical Pharmacology. 7 Hours.

Online course covering basic principles of drug action, mechanisms of therapeutic effects, and undesirable effects. Emphasis on the classes of drugs currently used in medical practice.

PCOL 790. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of pharmacology. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on assistantships to gain teaching experience.

PCOL 791A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

PCOL 792A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

PCOL 793A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

PCOL 795. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

PCOL 796. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

PCOL 797. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. Grading may be S/U.

PCOL 798. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

PCOL 799. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking course work credit but who wish to meet residency requirements, use of the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is S/U; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

PCOL 801. Medical Pharmacology. 9 Hours.

Basic principles of drug action, mechanisms of therapeutic effects and undesirable effects. Emphasis on the classes of drugs currently used in medical practice.

PHARMACY COURSES**PHAR 691A-Z. Advanced Topics. 1-6 Hours.**

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

PHAR 693A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

PHAR 694A-Z. Seminar. 1-6 Hours.

Seminars arranged for advanced graduate students. Grading may be S/U.

PHAR 696. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

PHAR 697. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

PHAR 700. Pharmacy as a Profession. 1 Hour.

PR: First professional year standing or consent. Introduces students to the concept of professionalism, the scope of pharmacy practice opportunities, the health care system as it relates to pharmacy, and other contemporary issues in pharmacy practice. (Grading will be S/U.).

PHAR 701. Pharmaceutical Care Lab 1. 2 Hours.

PR: First professional year standing or consent. Students will develop skills in medical terminology, communications, information retrieval, dispensing, compounding, calculations, pharmaceutical care, and problem-solving skills.

PHAR 702. Pharmaceutics 1. 3 Hours.

PR: First professional year standing or consent. Introduces drug physical-chemical characteristics relevant to the design and performance of delivery systems. Pharmaceutical dosage forms taught include disperse and polydisperse systems (suspensions, emulsions, creams, ointments, aerosols and transdermals).

PHAR 703. Pharmacy Practice Experience 1. 1 Hour.

PR: First professional year standing or consent. Provides an overview of the roles and responsibilities of community pharmacists and provides experiential learning in a community pharmacy setting. First course in a six-semester sequence that introduces students to various pharmacy practice settings.

PHAR 704. Introduction to Research. 1 Hour.

Provides pharmacy students with a forum for the discussion of a wide variety of research activities and careers. Also provides an appreciation for the science on which the pharmacy profession is based and continually evolves.

PHAR 708. Pharmaceutics 2. 3 Hours.

PR: PHAR 702. Continuation of PHAR 702. Solids dosage forms (tablets, capsules, sustained-release), regulatory pathways for marketing drugs, and biopharmaceutical principles (dosage form behavior in body).

PHAR 709. Immunology and Biotechnology. 2 Hours.

PR: First year professional standing or consent. Students will learn basic functions of the immune system, elements of the pharmaceutical applications of biotechnology, and be introduced to the chemotherapy of infections.

PHAR 710. Pharmacy Practice Experience 2. 1 Hour.

PR: PHAR 703 or consent. Provides an overview of the roles and responsibilities of community pharmacists and provides experiential learning in a community pharmacy setting. Second course in a six-semester sequence that introduces students to various pharmacy practice settings.

PHAR 711. Chemical Properties of Drugs. 2 Hours.

PR: First year professional standing or consent. Principles of chemical stability and chemical properties as they relate to drug molecules. Topics to be covered include functional group analysis, solubility, oil/water partitioning, organic acids and bases, and drug decomposition and metabolism.

PHAR 712. Pharmaceutical Care Lab 2. 2 Hours.

PR: First professional year standing or consent. Continuation of PHAR 701.

PHAR 714. Introduction to Community Rotation. 4 Hours.

PR or CONC: PHAR 710. Students will gain experience preparing prescriptions, providing basic drug information to patients, and participating in disease prevention activities in a community pharmacy setting.

PHAR 715. Pharmacotherapeutics 1. 4 Hours.

PR: Second professional year standing or consent. Principles and concepts of pathophysiology and pharmacotherapeutics. An organ system approach to disease states and their therapeutic management is followed.

PHAR 716. Chemistry of Drug Action 1. 3 Hours.

PR: PHAR 711 or consent. Provides a basic understanding of relationships between the chemical structure of a drug and its biological effect. Physicochemical properties, enzymatic transformations and structure-activity relationships (SAR) of important pharmaceutical agents are discussed.

PHAR 717. Pharmacy Practice Experience 3. 1 Hour.

PR: Second professional year standing or consent. Introduces students to the principles of service learning through development of an on-site healthcare-related service project. Third course of a six-semester sequence that introduces students to various pharmacy practice settings.

PHAR 718. Pediatric Pharmacotherapy. 2 Hours.

PR: Second professional year standing or consent. Overview of common pathophysiology and pharmacotherapy principles in the pediatric population and selection of drug therapy to treat the pediatric patient.

PHAR 719. Pharmacy Practice Experience 4. 1 Hour.

PR: PHAR 717 or consent. Introduces students to the principles of service learning through implementation of an on-site healthcare related service project. Fourth course of a six-semester sequence that introduces students to various pharmacy practice settings.

PHAR 720. Patient Health Education. 2 Hours.

PR: Second professional year standing or consent. Interpersonal communication skills will be enhanced in the areas of patient-centered and colleague-centered communications. Students will learn processes for providing pharmaceutical care (e.g., interviewing and counseling patients; formulating a plan; monitoring; and documenting information).

PHAR 721. Advocacy and Leadership. 2 Hours.

PR: Second and third professional year standing or consent. The course will focus on developing the student's leadership skills as an advocate for the profession of pharmacy.

PHAR 722. Weapons of Mass Destruction and Disaster Planning. 1 Hour.

Through didactic, hands on instruction, and participation in real world disaster planning sessions and/or drills, students learn about weapons of mass destruct (WMD) surveillance and mitigation in addition to disaster planning principles.

PHAR 723. Pharmaceutical Care Lab 3. 1 Hour.

PR: Second professional year standing or consent. Continuation of PHAR 712.

PHAR 724. Pharmaceutical Care Lab 4. 2 Hours.

PR: Second professional year standing or consent. Continuation of PHAR 723.

PHAR 725. Pharmacotherapeutics 2. 4 Hours.

PR: PHAR 715 or consent. A continuation of PHAR 715.

PHAR 726. Chemistry of Drug Action 2. 2 Hours.

PR: PHAR 716 or consent. A continuation of PHAR 716.

PHAR 727. Medical Literature Evaluation. 2 Hours.

PR: Second professional year standing or consent. Emphasis is placed on the critical analysis and evaluation of the primary literature. Secondary and computerized information resources are also discussed, including other selected aspects of drug information.

PHAR 728. Pharmacy Management. 2 Hours.

PR: Second professional year standing or consent. This course provides an introductory survey of the basic principles of personnel and fiscal management as they apply to organizational planning and decision-making, organizational design and structure, leadership and control in organizations, and the issues facing pharmacy managers.

PHAR 729. Intro Institutional Rotation. 2 Hours.

PR or Conc: (PHAR 719 and PHAR 724) or consent. Gain experience in an institutional pharmacy setting.

PHAR 730. Pharmacotherapeutics 3. 4 Hours.

PR: PHAR 725 or consent. A continuation of PHAR 725.

PHAR 731. Pharmacogenomics and Pharmacokinetics. 3 Hours.

PR: Third year professional standing or consent. Fundamental principles of pharmacogenomics (how genetic influences affect drug dosing and efficacy) and pharmacokinetics (pharmacokinetic and biological processes a drug undergoes upon entering the body).

PHAR 732. Non-Prescription Drugs. 3 Hours.

PR: Third year professional standing or consent. An advanced level course on the appropriate selection, and use of non-prescription drug products in the contemporary practice setting, the basis for self-medication, assessment of patient condition, and approach to patient counseling.

PHAR 733. Pharmacy Systems. 2 Hours.

PR: Third year professional standing or consent. Basic principles of financial management as they apply to the day-to-day operations in pharmacy systems present in institutional, community, long-term care facilities and other pharmacy venues.

PHAR 734. Pharmacy Law and Ethics. 3 Hours.

PR: First professional year standing or consent. The legal and ethical basis of pharmacy practice. Students learn about federal and state statutes, rules, and regulations that affect pharmacy practice. Ethics related situations that can arise during pharmacy practice will also be discussed.

PHAR 735. Pharmaceutical Care Lab 5. 1 Hour.

PR: PHAR 724. Continuation of PHAR 724.

PHAR 736. Pharmaceutical Care Lab 6. 1 Hour.

PR: Third Year Professional standing or consent. Experience in pharmaceutical compounding, patient assessment and monitoring, professional/ethical decision making, pharmacokinetic dosing of medications, and prevention of adverse drug-related events and medication errors.

PHAR 737. Disease Prevention Health Promotion. 2 Hours.

PR: Third year professional standing or consent. This course exposes pharmacy students to pharmacoepidemiology and public health. Instruction focuses on pharmacists as integral to preventing and detecting disease and promoting community health. Emphasis is given to rural health care and Appalachian culture.

PHAR 738. Outcomes Assessment and Quality Improvement. 2 Hours.

PR: Third professional year standing or consent. Outcomes assessment and quality improvement will expose students to the development and implementation of formularies, drug use evaluations, outcomes assessment, and quality improvement. Emphasis will be placed on how these issues relate to pharmaceutical services.

PHAR 739. Therapeutic Patient Monitoring. 2 Hours.

PR: Third professional year standing or consent. Employs both didactic and experiential instruction to provide students with the knowledge and skills required to care for patients with diabetes, perform immunizations, and care for complex patients with multiple disease states.

PHAR 740. Pharmacotherapeutics 4. 4 Hours.

PR: PHAR 730 or consent. A continuation of PHAR 730.

PHAR 741. Clinical Pharmacokinetics. 3 Hours.

PR: PHAR 731 or consent. This course will review advanced concepts in pharmacokinetics and cover the basic pharmacokinetic properties of commonly used drugs and apply these principles to drug dosing, patient management, and rational therapeutic drug monitoring.

PHAR 742. Pharmacy Practice Experience 5. 1 Hour.

PR: Third professional year standing or consent. Provides experiential learning in an acute or ambulatory care pharmacy practice setting. Fifth course in a six-semester sequence that introduces students to various pharmacy practice settings.

PHAR 743. Teach to Learn: Learn to Teach. 3 Hours.

Provides pharmacy students the opportunity to learn how to teach in higher education/pharmacy and develop their teaching skills by participating in select teaching and learning activities.

PHAR 744. Education Journal Club. 1 Hour.

PR: PHAR 743 or Consent. Evaluate educational research articles from pharmacy education and other healthcare disciplines. Students will present and critically analyze educational literature and develop presentation skills.

PHAR 745. Critical Care Pharmacotherapy. 2 Hours.

PR: Third professional year standing or consent. Gain knowledge in multiple facets of critical care pharmacotherapy, particularly for students interested in pharmacy residency training in a clinical setting.

PHAR 746. Pharmacy Practice Experience 6. 1 Hour.

PR: PHAR 742 or consent. Provides experiential learning in an acute or ambulatory care pharmacy practice setting. Sixth course in a six-semester sequence that introduces students to various pharmacy practice settings.

PHAR 747. History of Pharmacy. 2 Hours.

Gives the student a deeper appreciation of the background of pharmacy and its development from ancient times to present.

PHAR 748. Acute Care Case Studies. 2 Hours.

PR: Third professional year standing or consent. Gain experience developing pharmaceutical care plans in an acute care setting. Further prepares students interested in pursuing pharmacy residency training.

PHAR 749. Pharmaceutical Investigations. 2-3 Hours.

PR: Consent. Original investigation in pharmaceutics, medicinal chemistry, pharmacology, pharmaceutical systems and policy, or clinical pharmacy. (Grading may be P/F.).

PHAR 749A. Pharmaceutical Investigation. 2-3 Hours.

PR: Consent. Original investigation in pharmaceutics, medicinal chemistry, pharmacology, pharmaceutical systems and policy, or clinical pharmacy. (Grading may be P/F.).

PHAR 749B. Pharmaceutical Investigation. 2-3 Hours.

PR: Consent. Original investigation in pharmaceutics, medicinal chemistry, pharmacology, pharmaceutical systems and policy or clinical pharmacy. (Grading may be P/F.).

PHAR 749C. Pharmaceutical Investigation. 2-3 Hours.

PR: Consent. Original investigation in pharmaceutics, medicinal chemistry, pharmacology, pharmaceutical systems and policy or clinical pharmacy. (Grading may be P/F.).

PHAR 749V. Pharmaceutical Investigation. 2-3 Hours.

PR: Consent. Original investigation in pharmaceuticals, medicinal chemistry, pharmacology, pharmaceutical systems and policy, or clinical pharmacy. (Grading may be P/F.).

PHAR 749W. Pharmaceutical Investigation. 2-3 Hours.

PR: Consent. Original investigation in pharmaceuticals, medicinal chemistry, pharmacology, pharmaceutical systems and policy, or clinical pharmacy. (Grading may be P/F.).

PHAR 749X. Pharmaceutical Investigation. 2-3 Hours.

PR: Consent. Original investigation in pharmaceuticals, medicinal chemistry, pharmacology, pharmaceutical systems and policy, or clinical pharmacy. (Grading may be P/F.).

PHAR 749Y. Pharmaceutical Investigation. 2-3 Hours.

PR: Consent. Original investigation in pharmaceuticals, medicinal chemistry, pharmacology, pharmaceutical systems and policy, or clinical pharmacy. (Grading may be P/F.).

PHAR 749Z. Pharmaceutical Investigation. 2-3 Hours.

PR: Consent. Original investigation in pharmaceuticals, medicinal chemistry, pharmacology, pharmaceutical systems and policy, or clinical pharmacy. (Grading may be P/F.).

PHAR 750. Automation and Technology. 2 Hours.

PR: Second year professional standing or consent. Provides an understanding of the newest technology that is available to a pharmacist in a retail or institutional setting. Students will learn to use PowerPoint, and gain experience making presentations and public speaking.

PHAR 751. Geriatrics. 2 Hours.

PR: Second or third year pharmacy students. A review of common pharmacotherapeutic and social issues of importance to older adult patients.

PHAR 752. History of Drug Discovery. 2 Hours.

This course is concerned with the way in which advances in chemistry and biochemistry have influenced advances in drug discovery and therapeutics beginning with the late 18th century through today.

PHAR 753. Social and Behavioral Theory and Health Outcomes Research. 3 Hours.

Basic social and behavioral theories related to the health behavior change and health outcomes. Open to graduate students in pharmacy, public health, or other health care fields.

PHAR 754. Decision Analysis in Healthcare. 3 Hours.

Core skills in clinical decision analysis which builds on concepts derived from epidemiology, biostatistics, computing, economics and operations research and applies them to medical and pharmacological decisions.

PHAR 755. Pharmacoeconomics. 3 Hours.

This graduate-level course is intended to train graduate students in evaluating and conducting pharmacoeconomic research.

PHAR 756. Health Survey Research Methods. 3 Hours.

This course seeks to increase students' understanding of survey research methods and to develop basic skills in survey development and administration.

PHAR 757. Patient Reported Outcomes. 3 Hours.

Provides a foundation in health outcomes research with an emphasis on patient reported outcomes in health service research.

PHAR 758. Ethical and Regulatory Aspects of Clinical Research. 1 Hour.

Provides overview of ethical and regulatory aspects of clinical research. Grading will be Pass/Fail.

PHAR 759. Clinical and Population Practicum. 1 Hour.

Expose students to a population of interest in preparation for a research project. This course will help students to understand the lived experience of the population of interest and expose students to aspects of the healthcare system. Students will either work with a clinical population or community-based population to address one or more disease states. Grading will be Pass/Fail.

PHAR 760. Acute Care Rotation 1. 5 Hours.

PR: Fourth year professional standing or consent. Five-week experience in the delivery of pharmaceutical care in an acute care setting.

PHAR 761. Acute Care Rotation 2. 5 Hours.

PR: Fourth year professional standing or consent. Experience in the delivery of pharmaceutical care in an acute care setting.

PHAR 762. Ambulatory Care Rotation 1. 5 Hours.

PR: Fourth year professional standing or consent. Experience in the delivery of pharmaceutical care in an ambulatory care setting.

PHAR 763. Ambulatory Care Rotation 2. 5 Hours.

PR: Fourth year professional standing or consent. Five-week experience in the delivery of pharmaceutical care in an ambulatory care setting.

PHAR 764. Elective Rotation 1. 5 Hours.

PR: Fourth year professional standing or consent. Five-week experience in a pharmacy practice setting, such as acute care, ambulatory, community, hospital, poison center, drug information, home health, long term care, or research.

PHAR 765. Elective Rotation 2. 5 Hours.

PR: Fourth year professional standing or consent. Five-week experience in a pharmacy practice setting, such as acute care, ambulatory, community, hospital, poison center, drug information, home health, long term care, or research.

PHAR 766. Selective Rotations. 5 Hours.

PR: Fourth year professional standing or consent. Five-week experience in a pharmacy practice setting, selected from a list and includes: pharmacy administration, discharge counseling, drug information, informatics, long term care, managed care, medication reconciliation, medication safety, nuclear pharmacy, clinical toxicology, and quality outcomes.

PHAR 769. Advanced Health Service Research Methods. 3 Hours.

Provides a working knowledge of health services research methods and how to apply these methods to answer typical research questions in health services research. The course will examine concepts but will have an applied focus with hands-on research using publicly available datasets or those that students have access for their dissertations/manuscripts.

PHAR 770. Community Rotation. 5 Hours.

PR: Fourth year professional standing or consent. Five-week experience in the delivery of pharmaceutical care in a community pharmacy setting.

PHAR 772. Institutional Rotation. 5 Hours.

PR: Fourth year professional standing or consent. Five-week experience in the delivery of pharmaceutical care in a health system setting.

PHAR 774. Current Topics in Pharmacy. 1 Hour.

Discussion of current topics in pharmacy practice. Core components of giving a seminar and journal club will be practiced.

PHAR 775. Advanced Biopharmaceutics. 3 Hours.

Concepts of biopharmaceutics and pharmacokinetics in relation to the design and evaluation of dosage forms and determination of rational dosage regimens in health and disease.

PHAR 776. Preparing Residency Applicants. 2 Hours.

Increase knowledge and skills needed to pursue postgraduate residency training in pharmacy, and implement measures to increase pharmacy residency competitiveness.

PHAR 779. Drugs: Bench to Market. 3 Hours.

PR: Graduate standing PR: Graduate Standing or permission of instructor. This is an introductory course that describes the process of drug discovery to the development of new forms for therapeutic use. Topics covered include drug design/discovery, pharmacokinetics and dynamics, pharmaceuticals and industry pharmacy.

PHAR 780. Introduction to Molecular Modeling. 4 Hours.

PR: Graduate standing or permission of instructor. Introduction to molecular modeling describes computational methods for chemical and biological problems and is designed to enable the student to use molecular modeling methods as a research tool in their current or future research activities.

PHAR 781. Drug Metabolism. 3 Hours.

PR: Graduate standing or permission of instructor. This course presents a comprehensive review of the field of drug metabolism with an emphasis on the chemistry and enzymology of drug biotransformation, and current methods in drug metabolism research.

PHAR 782. Tumors of the Central Nervous System Journal Club. 1 Hour.

(May be repeated for a maximum of 15 credit hours.) Fundamental and advanced topics focused on drug distribution into normal brain, brain pathology and brain cancers. Other areas of focus include, advanced drug delivery methods, pharmacokinetics, experimental design and statistical analysis. Students will present and critically analyze scientific literature and develop presentation skills.

PHAR 783. Pharmacy Cell Biology Seminar. 1 Hour.

A literature review course in which each student will present and critically analyze primary literature in cell and molecular biology as pertinent to pharmaceutical and biomedical sciences.

PHAR 784. Pharmacology Journal Club. 1 Hour.

A primary literature based course that critically evaluates the latest findings and methods used in pharmacological research.

PHAR 785. Pharmacoepidemiology. 3 Hours.

This course covers basic principles and research study designs used in pharmacoepidemiology, as well as a review of the primary literature that details case examples of drugs withdrawn from the US drug market.

PHAR 786. Health Services Research and Secondary Database. 3 Hours.

PR: PHAR 785. This course presents various topics related to large databases including common study designs, advantages and limitations, and basic steps to extracting and analyzing large databases.

PHAR 787. Drug Discovery and Development. 1 Hour.

This seminar will teach students in the Pharmaceutical Sciences and related disciplines the current state-of-the-art of drug discovery, design, and development, develop student presentation skills, and convey the importance of staying current with key developments.

PHAR 788. Graduate Seminar in Health Outcomes Research. 1 Hour.

(May be repeated for credit toward graduation.) Forum for graduate students to present research, discuss research issues and contemporary topics of interest, develop an understanding of research methods through discussion, while focusing on scientific presentation skills. Topics vary from semester to semester.

PHAR 789. Seminar in Nanoscience. 2 Hours.

(May be repeated for a maximum of 4 hours.) Facilitates interdisciplinary research at the nanoscale by providing a forum for discussion and exploration of nanoscale science and engineering from a variety of perspectives including research and development of nanoscale devices and systems. Grading will be Pass/Fail.

PHAR 790. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of pharmacy. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on assistantships to gain teaching experience. (Grading will be P/F.).

PHAR 791A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

PHAR 792A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

PHAR 793A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

PHAR 794A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

PHAR 795. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

PHAR 796. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

PHAR 797. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

PHAR 798. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

PHAR 799. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is P/F; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

PHAR 800. Pharmacy Practice and Management 1. 4 Hours.

Introduces student to the practice of pharmacy, with a focus on community pharmacy. PPM 1 is the first course in a five-course sequence (PPM 1-5) that introduces and reinforces the distributive, clinical, and administrative roles of pharmacists in various practice settings.

PHAR 801. Drug Delivery. 5 Hours.

An introduction to the concepts and techniques involved in the design and evaluation of pharmaceutical dosage forms, principles of physical pharmacy and drug delivery, and their applications in patient care.

PHAR 802. Preparation of Pharmaceutical Products. 2 Hours.

Gain experience in pharmaceutical calculations and preparing sterile and non-sterile dosage forms. Students will apply the principles of pharmaceutics to the preparation of pharmaceutical products.

PHILOSOPHY COURSES**PHIL 501. Metaphysics. 3 Hours.**

Traditional problems associated with universals and particulars, reality and experiences, causality, space and time, matter and mind, the nature of the self, etc.

PHIL 502. Theory of Knowledge. 3 Hours.

Definitions of knowledge, truth, and belief. Problems associated with skepticism, induction, perception, introspection, memory, and a priori knowledge.

PHIL 510. Philosophy of Science. 3 Hours.

Philosophical problems associated with the concepts and methodology of science.

PHIL 531. Health Care Ethics. 3 Hours.

Topics: Clinician- patient relationship, life-sustaining treatment, physician- assisted death, physician/nurse conflicts, confidentiality, research, reproductive technology, abortion, maternal/fetal conflicts, genetics, rationing, and access.

PHIL 590. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of philosophy. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on assistantships to gain college teaching experience. (Grading may be S/U.).

PHIL 591A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

PHIL 593A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

PHIL 594A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

PHIL 691A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

PHIL 692A-Z. Directed Study. 1-6 Hours.

PR: Consent. Directed study, reading, and/or research.

PHIL 693A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

PHIL 694A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

PHIL 695. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

PHIL 696. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

PHIL 697. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

PHIL 698. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

PHIL 699. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking course work credit but who wish to meet residency requirements, use of the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is S/U; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

PHYSICAL EDUCATION/TEACHING COURSES**PET 600. Workshop in Physical Education. 1-15 Hours.**

Professional development experience for the physical education teacher.

PET 605. Professional Issues in Physical Education. 3 Hours.

Designed to examine current professional issues in physical education and the impact of these issues on the professional's life.

PET 615. Research Methodology in Physical Education. 3 Hours.

Application of historical, descriptive, and experimental research strategies and designs to physical education.

PET 645. Standards-Based Assessment in Physical Education. 3 Hours.

Students completing this course will acquire the dispositions, knowledge, and performance competencies related to standards-based measurement and evaluation of school-aged children in K-12 physical education.

PET 665. Curriculum in Physical Education. 3 Hours.

Designed to examine the factors affecting curriculum development. Emphasis on research in the changing curriculum, and the selection and sequencing of developmentally appropriate activities for early, middle, and adolescent childhood.

PET 668. Issues in Motor Development. 3 Hours.

Examines the contributions made to the body of knowledge of motor development by various theories of child development, psychology, learning, and ecology. A variety of theoretical perspectives, assessment techniques, and issues will be reviewed.

PET 671. Childhood Motor Development. 3 Hours.

PR: PET 668. This course will study changes during childhood in motor behavior which reflect the interaction of the mover with contextual features of the environment and the demands of the movement task. Laboratory experiences with children included.

PET 672. Advanced Laboratory in Physical Education. 1-6 Hours.

Provides graduate students with teaching experiences in physical activity programs for children. Students can choose between pre-school or elementary school age children and land-based or water-based learning environments. Open to all majors.

PET 673. Instructional Technology in Sport and Physical Education. 3 Hours.

The purpose of this course is to investigate emerging educational and instructional technologies in sport and physical education. Students will critically examine the implications of technology integration in teacher and coach education.

PET 680. Theory of Fitness Education. 3 Hours.

This course explores the theoretical foundations and related literature underlying the provision of fitness education and the role of this content in physical education programs.

PET 681. Motor Development in Special Populations. 3 Hours.

Designed to examine the motor developmental patterns of various special population groups focusing on physical education's interactive role with the developmental process. Current developmental research related to the area will be emphasized. (Offered every third summer.)

PET 683. Principles of Effective Teaching. 3 Hours.

Research based principles of effective teaching as they relate to physical education. Students will examine and evaluate their own teaching practices through a series of reflective assignments.

PET 685. Physical Education Supervision Techniques. 3 Hours.

Effective supervision practices for the perspective physical education directing teacher.

PET 686. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of physical education teaching. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on assistantships to gain teaching experience. (Grading may be S/U.)

PET 688. Applied Motor Learning. 3 Hours.

Examines the theoretical foundations and related literature that underlie the learning, performance, and retention of motor skills with applications to teaching and coaching.

PET 690. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of physical education teaching. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It also provides a mechanism for students not on assistantships to gain teaching experience. (Grading may be P/F.)

PET 691A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

PET 692A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

PET 693A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

PET 694A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

PET 695. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

PET 696. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

PET 697. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper, or equivalent scholarly project, or a dissertation. (Grading may be S/U.)

PET 698. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

PET 699. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is P/F; colloquium credit may not be counted against requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

PET 730. Diversity Issues in Physical Education/Teaching. 3 Hours.

A synthesis of research and literature covering a wide range of social/ political issues related to diversity and inclusion in physical education such as gender equity, developmental disabilities, and multiculturalism.

PET 735. Reading Research 1. 3 Hours.

This course provides the doctoral student with an introduction to the literature that underlies the knowledge base in physical education teaching and teacher education.

PET 736. Reading Research 2. 3 Hours.

This course provides the doctoral student with an introduction to the literature that underlies the knowledge base in physical education teaching and teacher education.

PET 741. Research in Kinesiology. 3 Hours.

PR: PET 735. The purpose of this seminar is to provide doctoral students with the knowledge and skills needed to initiate a well-focused line of scholarly investigation leading to dissertation completion and continued research productivity following program completion.

PET 745. Physical Education/Teaching Curriculum Development and Evaluation. 3 Hours.

A historical and philosophical analysis of curriculum theory related to the preparation of physical education teachers with an emphasis on current models, content standards, curricular design and evaluation, as well as the curriculum accreditation.

PET 750. Research on Teaching. 3 Hours.

An introduction to research on teaching in physical education with an emphasis on the cognitive process that underlie learning and instruction.

PET 755. Physical Activity in Schools. 3 Hours.

This course provides student in-depth knowledge of the key guidelines, intervention strategies, and program evaluation methods associated with children's physical activity in schools.

PET 761. Instructional Technology in Sport and Physical Education. 3 Hours.

The purpose of this course is to investigate emerging educational and instructional technologies in sport and physical education. Students will critically examine the implications of technology integration in teacher and coach education.

PET 770. Motor Behavior Issues Seminar. 3 Hours.

This course is a readings, discussion, research, and application seminar in human movement production. Emphasis will be placed on bridging theory to practice. Applications focus on teaching/ learning, fundamental motor skills, and rehabilitation of motor skills.

PET 775. Physical Education Supervision. 3 Hours.

Examination of the supervision process in physical education and related supervision issues.

PET 780. Research on Teaching. 3 Hours.

The history, methods, findings, and educational implications of research on behavioral and cognitive processes that underlie teaching.

PET 781. Research on Teaching in Physical Education. 3 Hours.

This course is designed to examine issues related to the provision of quality physical education in P-12 programs, and to the integration of many elements contributing to the student's professional preparation.

PET 785. Behavior Analysis. 3 Hours.

Examination of basic and advanced concepts of applied behavior analysis as they relate to research in physical education and related fields as well as course design and implementation at the college level.

PET 790. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of physical education. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on assistantships to gain teaching experience. (Grading may be S/U.).

PET 791A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

PET 792A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

PET 793A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

PET 794A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

PET 795. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

PET 796. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

PET 797. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading will be S/U.).

PET 798. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

PET 799. Graduate Colloquium. 1-6 Hours.

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PET 930. Professional Development. 1-6 Hours.

Professional development courses provide skill renewal or enhancement in a professional field or content area (e.g., education, community health, geology). The tuition-waived continuing education courses are graded on a pass/fail grading scale and do not apply as graduate credit toward a degree program.

PET 931. Professional Development. 1-6 Hours.

Professional development courses provide skill renewal or enhancement in a professional field or content area (e.g., education, community health, geology). These tuition-waived continuing education courses are graded on a pass/fail grading scale and do not apply as graduate credit toward a degree program.

PHYSICAL SCIENCE COURSES

PHSC 590. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of physical science. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on assistantships to gain teaching experience. (Grading will be S/U.).

PHSC 591A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

PHSC 592A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

PHSC 593A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

PHSC 594A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

PHSC 595. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through course offerings.

PHSC 696. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

PHSC 697. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

PHSC 698. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

PHSC 699. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use of the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is S/U; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

PHYSICAL THERAPY COURSES**PT 503. Pediatric Physical Therapy. 2 Hours.**

Survey of developmental conditions commonly seen in pediatric physical therapy. Includes laboratory practice of evaluation, treatment planning and clinical problem solving.

PT 591A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

PT 593A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

PT 595. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

PT 690. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of physical therapy. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It also provides a mechanism for students not on assistantships to gain teaching experience. (Grading will be S/U.).

PT 691A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

PT 693A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

PT 697. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

PT 705. Intro to Evidence Based Physical Therapy. 2 Hours.

An introduction to evidence based practice. Students learn strategies for obtaining and building evidence databases. Introduction to analysis and application of evidence.

PT 706. Advanced Clinical Anatomy. 5 Hours.

This course presents advanced study of clinical applications of gross anatomy to physical therapy practice through lecture and lab. Laboratory includes dissection, computer-based instruction and clinical palpation.

PT 711. Professional Roles 1. 3 Hours.

PR: PT 705. Introduction to fundamentals of professional behavior for the physical therapist. Includes units on professionalism, culture, health care ethics, and clinical documentation.

PT 713. Lifespan Functional Movement. 2 Hours.

An overview of motor learning including acquisition of developmental patterns, motor control, and motor skill acquisition. This course also provides an overview of the effects of normative processes of aging on neuromotor patterns in occupational performance.

PT 714. Clinical Sciences 1. 4 Hours.

An Introduction to basic sciences fundamentals to physical therapy diagnosis and treatment. Areas of study include embryology, histology, pathology, and immunology.

PT 715. Evidence Based Physical Therapy 1. 2 Hours.

PR: PT 705. The purpose of this course is to give the student the information needed to begin to apply research findings to individual patients. Research design and methods, ethics, appraisal and evidence-based practice will be emphasized.

PT 716. Kinesiologic Foundations. 4 Hours.

PR: Admission to professional program in PT. Functional anatomical correlations and human movement. Statics, biomechanics, dynamics and functional movement analysis. (2 Hr. lec; 4 hr. lab.).

PT 718. Evaluation Procedures. 3 Hours.

Theory and practice in evaluation procedures used by therapists. Includes manual muscle test, isokinetic muscle testing, and assessment of components of movement, posture, balance and hand function.

PT 720. Clinical Education 1. 1 Hour.

This course is designed to introduce the first year doctorate of physical therapy student to the roles of the physical therapist and other members of the health care team through a combination of varied classroom and clinical opportunities. This will occur under the supervision of a licensed physical therapist as well as through interprofessional opportunities with peers and mentors.

PT 723. Developmental Life Tasks. 3 Hours.

Life-span human development across cognitive, psychosocial and neuromotor domains with particular emphasis on applications to physical or occupational therapy interventions. Cultural influences in health and illness.

PT 724. Exercise Foundations. 3 Hours.

Principles of aerobic and resistance training for rehabilitation populations. Includes laboratory experience in exercise testing and development of exercise programs for therapeutic purposes.

PT 725. Evidence-Based Physical Therapy 2. 3 Hours.

PR: PT 705 and PT 715. Continuation of critical thinking and scientific inquiry. Emphasis is on understanding quantitative and qualitative research designs and data analysis.

PT 727. Neurobiologic Foundations. 4 Hours.

PR: Enrolled in professional sequence. Basic and clinical applications of neurophysiological basis of physical and occupational therapy practice.

PT 728. Physical Therapy Procedures 1. 4 Hours.

Introduction, theoretical basis, and laboratory practice of procedures basic to physical therapy practice.

PT 730. Clinical Education Symposium 1. 1 Hour.

PR: PT 720. Coreq: PT 733. Students attend and evaluate case presentations applicable to physical therapy practice, and practice documentation skills. Case topics will coincide with didactic material presented in PT 733.

PT 732. Physical Therapeutic Agents 1. 2 Hours.

Theory and practical application of modalities used in physical therapy practice. Therapeutic agents of this course include but are not limited to, hydrotherapy, therapeutic heat and cold, and ultrasound.

PT 733. Cardiopulmonary PT. 3 Hours.

Medical lectures on cardiovascular and pulmonary conditions, including surgical and pharmacologic treatments. Course includes topics on stress testing, usage of monitoring equipment and evaluation and planning of rehabilitation protocols.

PT 734. Clinical Sciences 2. 2 Hours.

PR: PT 714. Introduction to radiology for the physical therapy student. Study includes plain film radiology of the musculoskeletal and cardiopulmonary systems, an overview of advanced imaging techniques, and exposure to tests and intervention treatments performed by radiologists.

PT 738. Physical Therapy Procedures 2. 3 Hours.

Theory and clinical application of therapeutic exercise techniques. (1 hr. lec, 4 hr. lab.).

PT 740. Clinical Education 2. 1 Hour.

This course is designed to give the second year doctorate of physical therapy student hands-on experience and practice with communication, examination, documentation and treatment techniques through a combination of varied classroom and clinical opportunities. This will occur under the supervision of a licensed physical therapist as well as through interprofessional opportunities with peers and mentors.

PT 741. Professional Roles 2. 4 Hours.

PR: PT 711. Provides information on educational theories and methods for use when working with patients, peers, students, and community members. Students use educational principles to design prevention, screening, and wellness programs for various community agencies.

PT 742. Physical Therapy Agents 2. 2 Hours.

PR: Physical therapy majors only; must have successfully completed the required previous coursework in the professional sequence. Continuation of therapeutic physical agents 1. Includes, but is not limited to, practical application and theory in electrotherapeutic modalities used in physical therapy practice. (1 hr. lec, 2 hr. lab.).

PT 743. Geriatric Physical Therapy 1. 2 Hours.

Students are provided information about medical and psychosocial factors associated with aging. Study of the role of physical therapy in geriatrics, including laboratory practice of common evaluation and treatment procedures. (1hr. lec, 2 hr. lab.).

PT 744. Clinical Sciences 3. 2 Hours.

PR: PT 714 and PT 734. Introduction to pharmacology for the physical therapy student. Includes study of pharmacotherapeutics, and an overview of selected medications. The emphasis is on clinical application and the therapist's role as a health care team member.

PT 745. Evidence Based Physical Therapy 3. 2 Hours.

PR: PT 705 and PT 715 and PT 725. Continuation of preparation for critical thinking and clinical decision-making. Emphasis is on generating a clinical research proposal and small group learning aimed at utilizing evidence to support clinical judgment in simulated patient cases.

PT 746. Orthopedic Physical Therapy 1. 5 Hours.

PR: PT 706 and PT 716 and PT 718. The first of two courses in physical examination of the musculoskeletal system, including mechanisms of injury, differential diagnosis and medical, surgical, and physical therapy interventions for musculoskeletal problems. (2 hr. lec., 3 hr. lab.).

PT 754. Clinical Sciences 4. 3 Hours.

Introduction to selected topics in clinical medicine, which are basic to physical therapy practice. Topics include genetics, metabolic and endocrine disorders, oncology, rheumatology, wound care and somatic disorders.

PT 755. Evidence Based Physical Therapy 4. 2 Hours.

PR: PT 705 and PT 715 and PT 725 and PT 745. Continuation of preparation for clinical -thinking and decision-making in the clinic. Emphasis is on autonomous practice. Students will work in small groups in a case-based learning format, utilizing evidence to make clinical decisions.

PT 756. Orthopedic Physical Therapy 2. 3 Hours.

PR: PT 746. The second of two courses in physical examination of the musculoskeletal system, including mechanism of injury, differential diagnosis and medical/surgical, and physical therapy interventions for musculoskeletal problems. (1 hr. lec, 2 hr. lab).

PT 757. Neurologic Physical Therapy 1. 3 Hours.

PR: PT 727. Issues related to physical therapy management of patients with neurologic disorders are presented. Through lecture and lab, students learn assessment and intervention for several common problems based on theories of motor control, learning and function.

PT 760. Clinical Education 3. 2,6 Hours.

(May be repeated for a maximum of 8 hours.) Students practice full-time for sixteen weeks under the direction of licensed physical therapists and participate in rural health projects.

PT 761. Professional Roles 3. 3 Hours.

PR: PT 741. Principles of business and management as they apply to contemporary physical therapy practice. Fiscal management risk management, marketing, and program improvement are addressed.

PT 762. Health Care Issues in Physical Therapy. 2 Hours.

PR: PT 741. The role of physical therapists as advocates for people with disabilities is discussed. Investigation of community and home barriers is included. Students discuss the roles of and demands on physical therapists in various practice settings.

PT 763. Pediatric Physical Therapy. 3 Hours.

Students learn assessment and interventions for a variety of conditions that uniquely affect children. Students will explore current topics that influence pediatric practice. Practical experience sessions include observations in pediatric settings.

PT 765. Evidence-Based Physical Therapy 5. 1 Hour.

PR: PT 755. Continuation and culmination of the evidence-based physical therapy track. Emphasis is on review and integration of physical therapy principles in preparation for successful completion of the National Board Examination. (Grading will be Pass/Fail).

PT 767. Neurologic Physical Therapy 2. 2 Hours.

PR: PT 727 and PT 757. Physical therapy management of patients with disorders of neurologic origin is presented. Through lecture and lab, students learn assessment and intervention planning for complex problems based on theories of motor control, learning and function.

PT 768. Prosthetics and Orthotics 1. 3 Hours.

Presents biomechanical principles applies to prosthetic and orthotic prescription and fabrication. Student learns how to plan and implement rehabilitation programs for patients that must use orthotic or prosthetic devices. (2 hr. lec, 1 hr. lab.).

PT 770. Clinical Education Symposium 3. 2 Hours.

PR: PT 730 and PT 740. Students prepare oral and written case reports based on their patient care experiences.

PT 771. Survey of Niche Physical Therapy Practice. 2 Hours.

This course is designed to expose students to unique areas in physical therapy that are considered elective and advanced practice. Experiential learning and critical analysis are emphasized more than specific skill acquisition.

PT 780. Clinical Education 4. 8 Hours.

PR: PT 760. Students practice full-time for sixteen weeks under the direction and supervision of licensed physical therapists.

PT 781. Advanced Cardiopulmonary Physical Therapy. 1 Hour.

This course emphasizes content necessary for physical therapists to act as autonomous practitioners. Previous coursework and concepts of differential diagnosis are applied to simulated patient cases representative of cardiovascular and pulmonary physical therapy.

PT 782. Advanced Integumentary Physical Therapy. 1 Hour.

This course emphasizes content necessary for physical therapists to act as autonomous practitioners. Previous coursework and concepts of differential diagnosis are applied to simulated patient cases representative of integumentary physical therapy.

PT 783. Advanced Orthopedic Physical Therapy. 2 Hours.

This course emphasizes knowledge and skills necessary for physical therapists to act as autonomous practitioners. Previous coursework and concepts of differential diagnosis are applied to simulated patient cases representative of orthopedic physical therapy.

PT 784. Advanced Neurologic Physical Therapy. 1 Hour.

This course emphasizes content necessary for physical therapists to act as autonomous practitioners. Previous coursework and contemporary literature are applied to analysis of patient cases.

PT 791A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

PT 792A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

PT 793A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

PT 795. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

PT 797. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or dissertation. (Grading may be S/U.).

PHYSICS COURSES

PHYS 554. Outline of Modern Physics. 3 Hours.

PR: One year introductory college physics. (Primarily for education majors; not open to physics majors.) Elementary study of atomic and molecular structures and spectra, solid state and nuclear physics, relativity and elementary particles.

PHYS 593A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

PHYS 611. Introduction to Mathematical Physics. 3 Hours.

PR: Calculus, differential equations, PHYS 111 and PHYS 112 or equivalent. Complex variables: series, contour integration and conformal mapping; ordinary differential equations; Fourier series, Laplace transforms; Fourier transforms; special functions; Bessel functions and Legendre, Hermite differential equations; poisson's equation, wave equation, and Laquerre polynomials; introduction to partial differential equations.

PHYS 621. Optics. 3 Hours.

PR: PHYS 112 or equivalent and MATH 251. A basic course in physical optics covering radiation theory, diffraction, interference, polychromatic waves, scattering, polarization, double refraction, and selected topics in quantum optics.

PHYS 631. Advanced Classical Mechanics 1. 3 Hours.

PR: PHYS 331 and PHYS 332 and differential equations. Lagrange and Hamilton form of equations of motion, rigid bodies, small and nonlinear oscillations. Transformation theory, relativistic dynamics, and systems with an infinite number of degrees of freedom.

PHYS 633. Electromagnetism 1. 3 Hours.

PR: PHYS 333 and PHYS 334 and differential equations. Boundary value problems in electrostatics and magnetostatics. Greens functions. Multipole expansions. Dispersion and absorption of electromagnetic waves propagating in matter.

PHYS 634. Electromagnetism 2. 3 Hours.

PR: PHYS 333 and PHYS 334 and differential equations. Propagation of guided waves. Radiation from antennas, small sources, and relativistic particles. Fraunhofer and Fresnel diffraction. Special relativity and the covariant formulation of electromagnetism.

PHYS 651. Quantum Mechanics 1. 3 Hours.

PR: PHYS 451. The Schrodinger equations. One-dimensional problems. Operators and Hilbert space. Three-dimensional problems. Orbital and spin angular momentum. One-electron atoms.

PHYS 652. Quantum Mechanics 2. 3 Hours.

PR: PHYS 651. Time-independent perturbation theory. Angular momentum coupling and Clebsch-Gordon coefficients. Time-dependent perturbation theory. Emission and absorption of radiation by atoms. Scattering theory.

PHYS 691A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

PHYS 693A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

PHYS 697. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

PHYS 710. Nonlinear Dynamics. 3 Hours.

PR: PHYS 631. Flows, fixed-point analysis, and bifurcations in 1D, 2D, and 3D using analytical, numerical, and geometrical approaches. Limit cycles, chaos, fractals, strange attractors, iterated maps, and Hamiltonian systems.

PHYS 725. Advanced Atomic and Molecular Physics 1. 3 Hours.

PR: PHYS 651. Review of one-electron atoms leading to approximation schemes for many-electron atoms. Thomas-Fermi theory, Hartree-Fock theory, and central field approximation. LS, JJ, and intermediate coupling of angular momentum. Relativistic effects.

PHYS 761. Statistical Mechanics. 3 Hours.

PR: PHYS 461 and PHYS 651. Ensemble theory, applications to noninteracting systems, as well as perturbative and approximate treatment of interactions. Typical applications include equilibrium constants, polymers, white dwarfs, metals, superfluids, magnetic transitions.

PHYS 771. Introduction to Solid State Physics. 3 Hours.

PR: PHYS 471 and PHYS 651 or equivalent. Crystal structure and reciprocal lattices. Waves in crystals. Band structure and metals.

PHYS 772. Semiconductor Physics. 3 Hours.

PR: PHYS 771. Semiconductor band structure. Intrinsic and extrinsic semiconductors. Hall effect and magneto-transport effects. Fundamentals of nanostructures and quantum structures. Semiconductor device physics.

PHYS 773. Collective Phenomena in Solids. 3 Hours.

PR: PHYS 771. Paramagnetism. Magnetic phenomena in thin films and multilayers. Phase transitions: mean field theories and fluctuations. Superconductivity and BCS theory.

PHYS 774. Optical Properties of Solids. 3 Hours.

PR: PHYS 771. Absorption and dispersion in light propagation. Quantum wells and quantum dots. Solid state laser materials. Nonlinear optics and parametric amplification.

PHYS 781. Principles of Plasma Physics. 3 Hours.

Plasmas occur naturally in electrical discharges and in space and are produced artificially in laboratory devices. This course is a survey of plasma phenomena using fluid and kinetic models.

PHYS 782. Computer Simulation of Plasma. 3 Hours.

PR: (PHYS 481 or PHYS 781) and PHYS 633; programming proficiency in C, FORTRAN, or BASIC. Projects teach mathematical and physical foundations of computer simulation algorithms and develop and refine physical understanding and intuition of phenomena encountered in plasma research.

PHYS 783. Advanced Kinetic Theory of Plasmas. 3 Hours.

PR: PHYS 481 and PHYS 631 and PHYS 634. The Vlasov equation, quasilinear theory, nonlinear phenomena. Plasma waves and instabilities. Landau damping and finite-Larmor-radius effects.

PHYS 784. Advanced Magnetohydrodynamic Theory of Plasmas. 3 Hours.

PR: PHYS 481 and PHYS 631 and PHYS 634. The fluid approximation. Magnetohydrodynamic description of plasma equilibrium and stability. Confinement schemes and plasma waves. Emphasis on analytic theory.

PHYS 790. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of physics. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on assistantships to gain teaching experience. (Grading will be P/F.).

PHYS 791A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

PHYS 792A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

PHYS 793A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field. field.

PHYS 794A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

PHYS 795. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

PHYS 796. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

PHYS 797. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

PHYS 798. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

PHYS 799. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use of the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is P/F; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

PHYS 930. Professional Development. 1-6 Hours.

Professional development courses provide skill renewal or enhancement in a professional field or content area (e.g., education, community health, geology.) These tuition-waived continuing education courses are graded on a pass/fail grading scale and do not apply as graduate credit toward a degree program.

PHYSIOLOGY COURSES**PSIO 741. Physiological Methods 1. 1-5 Hours.**

PR: Consent. Research techniques and strategies for physiology.

PSIO 742. Physiological Methods 2. 1-4 Hours.

PR: Consent. Research techniques and strategies for physiology.

PSIO 743. Fundamentals of Physiology. 5 Hours.

PR: College physics, algebra, chemistry, and consent. (For dental students and a limited number of full-time graduate students.) Analysis of basic facts and concepts relating to cellular processes, organ systems, and their control.

PSIO 744. Graduate Seminar. 1-3 Hours.

PR: Graduate standing and consent. (Grading may be S/U.).

PSIO 746. Neurophysiology. 1-4 Hours.

PR: (MATH 126 or MATH 341) and (PHYS 101 and PHYS 102) or consent. (For graduate students in the Health Sciences Center's basic sciences departments and a limited number of regular full-time graduate students.) Properties of excitable tissues (nerve and muscle), synaptic transmission, reflexes and central nervous system function, and behavior. (1-3 hr. lec. 1 hr. conference.).

PSIO 750. Graduate Physiology. 7 Hours.

(For graduate students in HSC graduate programs and a limited number of other full-time graduate students.) PR: Consent. Survey of quantitative level of basic concepts and experimental approaches to cellular, endocrine, and neural mechanisms controlling physiological processes.

PSIO 760. Human Physiology. 6 Hours.

A blended online medical physiology course with weekly face-to-face class meetings for first-year medical students who took a leave of absence and will repeat their first year.

PSIO 790. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of physiology. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on assistantships to gain teaching experience. (Grading may be P/F.).

PSIO 791A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of topics not covered in regularly scheduled courses.

PSIO 792A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

PSIO 793A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

PSIO 794A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

PSIO 795. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

PSIO 796. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

PSIO 797. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

PSIO 798. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

PSIO 799. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking course work credit but who wish to meet residency requirements, use the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is P/F; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

PSIO 801. Summer Medical Physiology. 7 Hours.

An online course designed for medical students who need to remediate the physiology portion of WVU SOM: CCMD 730 (or equivalent), prior to entering their second year. Course will be taught on a Pass/Fail basis.

PLANT PATHOLOGY COURSES**PPTH 501. Diseases of Economic Plants. 0-3 Hours.**

; 2 Hr. in summer. PR: PPT 401 or 503 or consent. Recognition, cause, and control of diseases of economic plants. (Sem. 1--Diseases of vegetable crops and of tree and small fruits; Sem. 2--Diseases of ornamental plants and field and forage crops; S--Diseases of forest trees. Students may register for 1-3 Hrs. in fall and spring and 2 Hr. in summer until 8 hours of credit are accumulated).

PPTH 503. Mycology. 4 Hours.

Lectures and field and laboratory studies of parasitic and saprophytic fungi.

PPTH 509. Nematology. 3 Hours.

(Primarily for graduate students majoring in the agricultural sciences or biology.) Nematode taxonomy, binomics, and control, with particular emphasis on plant parasitic forms.

PPTH 591A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

PPTH 697. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

PPTH 730. Physiology of the Fungi. 4 Hours.

PR: Organic chemistry, mycology, and bacteriology, or Consent. Physiological aspects of growth, reproduction, and parasitism of fungi, with emphasis on nutrition, environmental, and other biotic factors.

PPTH 790. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in the college teaching of plant pathology. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on assistantships to gain teaching experience. (Grading will be S/U.).

PPTH 791A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

PPTH 792A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

PPTH 793A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

PPTH 794A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

PPTH 795. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

PPTH 796. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

PPTH 797. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

PPTH 798. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of students reports (698), or dissertations (798). Grading is normal.

PPTH 799. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use of the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is S/U; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirements of registration in the semester in which graduation occurs.

PLANT SCIENCE COURSES**PLSC 547. Applied Wetlands Ecology and Management. 3 Hours.**

The management and ecology of wetland vegetation, soils, hydrology, and wildlife. (Cross listed as WMAN 547 and CE 547.).

PLSC 550. Grants and Grantsmanship. 2 Hours.

A course covering all steps of grant preparation, application, submission and review process.

PLSC 553. Organic Crop Production. 3 Hours.

PR: PLSC 206 and AGRN 202 and AGRN 203 or consent. Principles, practices, history, philosophy and economics of organic farming and gardening. Crop/livestock systems, national and international research on organic production. (Students may not receive credit for both PLSC 453 and PLSC 553).

PLSC 591A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

PLSC 592A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

PLSC 593A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

PLSC 595. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

PLSC 692A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

PLSC 693A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

PLSC 697. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading will be S/U.).

PLSC 790. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of plant science. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on assistantships to gain teaching experience. (Grading will be S/U.).

PLSC 791A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

PLSC 792A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

PLSC 793A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

PLSC 794A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

PLSC 795. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

PLSC 796. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

PLSC 796A. Graduate Seminar. 1 Hour.

PR: Consent. It is anticipated that each graduate student will present at least one seminar to the assembled faculty and graduate student body of his/her program.

PLSC 796B. Graduate Seminar. 1 Hour.

PR: Consent. It is anticipated that each graduate student will present at least one seminar to the assembled faculty and graduate student body of his/her program.

PLSC 797. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

PLSC 798. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

PLSC 799. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use of the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is P/F; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

POLITICAL SCIENCE COURSES**POLS 523. Religion and Politics. 3 Hours.**

This course examines contemporary research on how religion and religious institutions affect politics and vice versa. The focus is on American politics, but the effects of religion on politics in other nations will also be discussed.

POLS 530. Policy Analysis. 3 Hours.

Overview of the field of political science and the sub-field of public policy studies. Focuses on the issues and problems involved in studying policymaking, and an assessment of policy analysis as a mode of thinking and inquiry. (3 hr. seminar.).

POLS 531. Economic Analysis of Politics. 3 Hours.

Application of economic analysis to questions of politics and public policy. Consideration of problems of public goods, voting behavior, and legislative behavior. (3 hr. seminar.).

POLS 536. Politics of Agenda Setting. 3 Hours.

Examines the social, economic, institutional and political influences on the development of public problems and their placement on the policy agenda. (3 hr. seminar.).

POLS 550. Comparative Politics. 3 Hours.

Survey of the subfield of Comparative Politics within Political Science. Course includes an introduction to the major methods and theoretical perspectives employed in the field including an overview of rational, structural and cultural perspectives.

POLS 555. Comparative Public Policy. 3 Hours.

Comparison of public policy stages in several advanced industrial democracies with emphasis on various explanations of public policy in these countries in different policy areas. (3 hr. seminar.).

POLS 559. Contentious Politics. 3 Hours.

This is a course sub- field of political science, encompassing International Relations, Comparative and American Politics. This course presents a survey of the main concepts, theoretical debates, and methodological approaches in the field.

POLS 560. International Theory and Policy. 3 Hours.

Survey of theoretical approaches in the study of international relations, covering major works in the realist, neo-liberal, and foreign policy literature. Emphasis on the place of foreign policy explanations within the wider, systemic international relations literature. (3 hr. seminar.).

POLS 591A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

POLS 593A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

POLS 600. Introduction to Political Research. 3 Hours.

Introduction to the research methods and techniques used in political and policy analysis. Topics include logic of inquiry, research design, measurement, and survey and unobtrusive research.

POLS 601. Quantitative Political Analysis. 3 Hours.

PR: POLS 600 and STAT 511, or equivalent. Application of a range of statistical techniques in political and public policy research. Includes use of selected computer software commonly used in political science and policy analysis.

POLS 602. Advanced Quantitative Methods. 3 Hours.

PR: POLS 601 or equivalent advanced topics in quantitative methods for political science and policy research. Methods surveyed include multiple linear regression, time-series analysis, causal modeling, and linear programming.

POLS 603. Advanced Quantitative Analysis. 3 Hours.

POLS 603. Advanced Quantitative Analysis. 3 hr. A survey of advanced statistical applications in political science, covering time series analysis, maximum likelihood estimation, and structural equation modeling.

POLS 611. Intergovernmental Relations. 3 Hours.

Examination of the politics and policy consequences of intergovernmental relations among the national, state, and local governments in the United States. Topics include the development of intergovernmental relations, regulatory federalism, and intergovernmental fiscal relations. (3 hr. seminar.).

POLS 630. Seminar: American Politics and Policy. 3 Hours.

A survey of classic and contemporary literature on U.S. politics and policy. Emphasis on how various institutions and linkage mechanisms affect the policy process. (3 hr. seminar.).

POLS 635. Seminar: Policy Evaluation. 3 Hours.

Methods and techniques in evaluating public policies. Topics include the relation of policy analysis to policymaking; types of evaluation; planning, evaluations; alternative evaluation designs; measuring program consequences; problems of utilization, and the setting of evaluation research. (3 hr. seminar.).

POLS 638. Seminar: Policy Implementation. 3 Hours.

Research seminar focusing on how the intentions of policy-makers are transformed into programs and policies which have both intended and unintended consequences. Topics include traditional implementation studies, rational choice approaches, neo-institutionalism, and principal-agent theory. (3 hr. seminar.).

POLS 639. Research in Policy Analysis. 3 Hours.

Supervised, independent research on a policy problem utilizing the techniques and methods of quantitative policy research. Designed for advanced students, the research is conducted following the completion of the department's research methods sequence.

POLS 650. Professional Seminar in Comparative Politics. 3 Hours.

POLS 660. International Political Economy. 3 Hours.

Advanced theoretical courses in IPE. Topics include capital financial and trade liberalization, economic development, regionalism, and the intricacies between domestic governments and international economic relations.

POLS 665. Comparative Foreign Policy. 3 Hours.

Application of the comparative method of theoretically assessing the mainly domestic sources of conflict and change in foreign policy beyond the U.S. case and in cross-national and historical perspective.

POLS 666. National Security Policy. 3 Hours.

Overview of security policy issues as both foreign and domestic policy. Traces the development of defense and security, arms transfers, spending tradeoffs, deterrence, game theoretic decision models, intelligence analysis, and terrorism.

POLS 667. Foreign Policy Decision Making. 3 Hours.

This course examines the roots of foreign policy decision making. It examines how ideational, cultural, institutional and political variables constrain decision makers, and how the core psychological characteristics of decision makers shape their behavior.

POLS 670. Professional Seminar in Political Theory. 3 Hours.

POLS 691A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

POLS 703. Internship. 6-9 Hours.

per semester; students may enroll more than once. PR: Consent.

POLS 710. Judicial Politics, Policy and Law. 3 Hours.

Judicial influence on American public policy with emphasis on the political theory of American law, the agenda of disputes, the formulation of public policy by courts, and the effects of judicial policy on politics. (3 hr. seminar.).

POLS 712. American Construction and Political Development. 3 Hours.

The development of American political institutions, with emphasis on theoretical underpinnings of American politics and the role of courts and the Constitution in defining the scope of political change in America.

POLS 715. The American Presidency. 1-6 Hours.

This course examines how the president interfaces with other power centers in the political system, and assesses the extent to which this institution is capable of meeting what we have come to expect of it.

POLS 729. Seminar: State and Local Government. 3 Hours.

Examination of selected topics in state government and politics. (3 hr. seminar.).

POLS 771. Read Research Political Theory. 2-4 Hours.

POLS 779. Seminar in Political Theory. 3 Hours.

POLS 790. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of political science Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on assistantships to gain teaching experience. (Grading will be P/F.).

POLS 791A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

POLS 792A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

POLS 793A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

POLS 794A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

POLS 795. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

POLS 796. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

POLS 797. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

POLS 798. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of students reports (698), or dissertations (798). Grading is normal.

POLS 799. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use of the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is P/F; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

POLS 900. Professional Development. 1-6 Hours.

Professional development courses provide skill renewal or enhancement in a professional field or content area (e.g., education, community health, geology.) The continuing education courses are graded on a pass/fail grading scale and do not apply as graduate credit toward a degree program.

POLS 930. Professional Development. 1-6 Hours.

Professional development courses provide skill renewal or enhancement in a professional field or content area (e.g., education, community health, geology.) These tuition-waived continuing education courses are graded on a pass/fail grading scale and do not apply as graduate credit toward a degree program.

PROSTHODONTICS COURSES

PROS 688. Advanced Clinical Prosthodontics. 1-6 Hours.

Advanced prosthodontics practice in the areas of fixed and removable partial dentures, complete dentures, temporomandibular dysfunction, maxillofacial prosthetics and implant prosthodontics.

PROS 689. Advanced Prosthodontics Theory. 1-6 Hours.

Advanced theories and techniques in fixed and removable partial dentures, complete dentures, maxillofacial prosthetics, implantology and geriatric prosthodontics to include case presentations, literature surveys and articulator analysis seminars.

PSYCHOLOGY COURSES

PSYC 511. Research Design and Data Analysis 1. 3 Hours.

Principles of experimental design in psychology including group and single subject methodologies. Topics include: (1) internal and external validity; (2) simple and complex analysis of variance; and (3) reversal and multiple baseline designs.

PSYC 512. Research Design and Data Analysis 2. 3 Hours.

PR: PSYC 511. Inferential statistics, simple correlation and regression, multiple correlation and regression, partial correlation, analysis of power, and analysis of covariance, analysis of variance of designs with unequal cell sizes.

PSYC 524. Fundamentals of Gerontology. 3 Hours.

An advanced multidisciplinary examination of current research in biological, psychological, and sociological issues of human aging and the ways in which these impinge on the individual to create both problems and new opportunities. (Also listed as BIOL 738.).

PSYC 531. Experimental Analysis of Behavior. 3 Hours.

Research and theory in the psychology of learning. Assessment of traditional and behavior-analytic approaches to the study of positive reinforcement, aversive control, and stimulus control. Includes laboratory work with animals.

PSYC 532. Human Behavior. 3 Hours.

PR: PSYC 531. Review of the role of basic human operant research in testing the generality of animal-based behavior principles, analyzing phenomena that are specific to humans, and extending behavior analysis to traditional psychological problems.

PSYC 533. Applied Behavior Analysis. 3 Hours.

PR: PSYC 531. Methodological, empirical, and conceptual issues in the application of basic research in behavior analysis to problems of social significance.

PSYC 541. Infant Development. 3 Hours.

Examination of psychological literature on prenatal and infant development. Topics include physical, cognitive, perceptual, language, and socioemotional development.

PSYC 542. Child Development. 3 Hours.

Examination of psychological literature on child development. Topics include perception, learning, language, problem solving, social cognition, peer and family relationships, gender, moral development, friendship, aggression, and altruism.

PSYC 543. Adolescent and Young Adult Development. 3 Hours.

Examination of the psychological literature in adolescence and young adulthood. Topics include learning, problem solving, social cognition, peer and family relationships, gender, moral development, friendship, aggression, and altruism.

PSYC 544. Adult Development and Aging. 3 Hours.

Examination of psychological literature on adulthood and aging. Topics include health, cognition, family relationships, personality, psychopathology, work, and retirement.

PSYC 545. Conceptual Issues in Developmental Psychology. 3 Hours.

History, philosophies, and theories of psychological development in the major age periods and the life span; conceptual issues such as nature-nurture, sex differences, cultural differences, life events, rigidity-plasticity, continuity-discontinuity, and competence-performance.

PSYC 546. Methodological Issues in Developmental Psychology. 3 Hours.

Methodological issues in psychological research on the major age periods and the life span. Topics include: validity; reliability; age, cohort, and time of measurement; cross-sectional, longitudinal, and mixed designs; data analytic methods; ethical issues.

PSYC 593A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

PSYC 601. Professional Issues in Behavior Analysis. 1-3 Hours.

(May be repeated for credit.) Survey of professional issues in behavior analysis.

PSYC 602. Professional Issues in Developmental Psychology. 1-3 Hours.

(May be repeated for credit.) Survey of professional issues in developmental psychology. (Grading may be S/U.).

PSYC 603. Professional Issues in Clinical Psychology. 1-3 Hours.

(May be repeated for credit.) Survey of professional issues in clinical psychology. (Grading may be S/U.).

PSYC 604. Ethical Issues in Psychology. 1-3 Hours.

(May be repeated for credit with consent.) The ethical standards for psychologists as applied to research and clinical problems.

PSYC 605. Legal Issues in Clinical Psychology. 1-3 Hours.

(May be repeated for credit with consent.) Review of the major areas in which psychologists interact with the civil and criminal legal systems.

PSYC 606. Seminar on Teaching Psychology. 1-3 Hours.

(May be repeated for credit.) Review and discussion of methods and issues in college teaching of psychology.

PSYC 607. Ethical and Legal Issues in Psychology. 3 Hours.

Surveys the ethical guidelines and major legal issues confronted by psychologists.

PSYC 608. Professional Issues - Behavioral Neuroscience. 1 Hour.

Survey of professional issues in behavioral neuroscience.

PSYC 609. Ethics in Behavior Analysis. 3 Hours.

PSYC 609. Ethics in Behavior Analysis. 3-Hr. Surveys the ethical guidelines and standards for behavior analysts.

PSYC 611. Single-Subject Research Methods. 3 Hours.

PR:PSYC 511 and PSYC 531. Critical evaluation of single-subject designs in basic and applied research. Major topics include single-subject methodology's historical and conceptual bases, its relation to group-statistical methods, and its role in behavioral psychology.

PSYC 612. Multivariate Analysis. 3 Hours.

PR:PSYC 511. Data analysis techniques in psychology with application to typical research problems. Includes simple matrix algebra, discriminant analysis, multivariate analysis of variance, and an introduction to factor analysis. (Equiv. to STAT 541.).

PSYC 613. Quasi-Experimental Design. 3 Hours.

PR: PSYC 511 and PSYC 512. Consideration of the statistical procedures used with quasi-experimental group and single-subject designs.

PSYC 614. Program Evaluation and Intervention. 3 Hours.

Examines the nature, method, and process of evaluative research, especially as it applies to social and behavioral treatment and service delivery programs.

PSYC 615. Software Design in Psychology. 3 Hours.

PR: Consent. Practical introduction to software development for behavioral research applications including real-time experimental control and data collection, graphical user interfaces, and data analysis; general algorithmic methods; event-driven models. No programming background required.

PSYC 630. Behavior Analysis Practicum. 3 Hours.

PR: PSYC 533 and consent. Supervised applied behavior analysis experience integrated with a seminar emphasizing group solutions to problems that individuals encounter in students' applied projects. Progress and final project reports are presented and evaluated. (1 hr. sem., 2 hr. practicum.).

PSYC 650. Behavioral Neuroscience Methods. 3 Hours.

An overview of the most common research methods and techniques used in the behavioral neuroscience field.

PSYC 651. Behavior Pathology. 3 Hours.

Advanced study of diagnostic classification, functional analysis, and experimental research in psychopathology of child, adult, and geriatric adjustment problems.

PSYC 652. Clinical Interviewing. 3 Hours.

Clinical interviewing assessment, and interviewing skills acquisition.

PSYC 653. Behavioral and Psychological Assessment 1. 3 Hours.

Conceptual and methodological bases for behavioral assessment; comparison of trait-oriented versus behavioral assessment; design and evaluation of measurement systems, particularly self-report, ratings by others, and direct observation, within the basic framework of generalizability theory.

PSYC 654. Behavioral and Psychological Assessment 2. 4 Hours.

PR: PSYC 653. Evaluation of clinically relevant behavior and environments by means of testing and other methods. Includes test selection, administration, and report writing.

PSYC 655. Research Methods in Clinical Psychology. 3 Hours.

Fundamental knowledge of research methodology in the science of clinical psychology. Acquisition of skills in research design, evidence-based practice of psychology, scholarly review, and scientific writing.

PSYC 656. Grant Writing in Psychology. 3 Hours.

Essential writing skills for securing extramural funding for research programs in the behavioral sciences.

PSYC 660. Clinical Psychology Practicum. 1-15 Hours.

(May be repeated for credit.) PR: Consent. Supervised practice of psychological techniques in clinics or institutional settings; experience in psychological testing, interviewing, report writing, case presentation, interpretation of tests and supportive counseling.

PSYC 661. Behavior Therapy. 3 Hours.

Reviews the roots and development of behavioral interventions. Applied clinical intervention is stressed in concert with evaluation and research application.

PSYC 670. Clinical Child Psychology Practicum. 1-15 Hours.

(May be repeated for credit.) PR: Consent. Supervised field experience in various aspects of delivering psychological services directly or indirectly to children. Experience in assessment, treatment, program design, administration, and evaluation.

PSYC 671. Child Behavior Therapy. 3 Hours.

Assessment, intervention, and evaluation strategies appropriate for childhood disorders and based on behavior principles.

PSYC 693A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

PSYC 694A-Z. Seminar. 0-6 Hours.

Special seminars arranged for advanced graduate students.

PSYC 698. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

PSYC 701. Advanced Professional Issues in Psychology. 1-3 Hours.

(May be repeated for credit.) Discussion of professional issues in psychology relevant to advanced doctoral students. (Grading May be S/U.).

PSYC 711. Seminar in Methodology. 1-3 Hours.

(May be repeated for credit with consent.) Current problems and techniques in research design, data analysis, and research methods.

PSYC 721. History and Systems. 3 Hours.

Study of the history of psychology from its roots in physics, biology, and philosophy. The development of American psychology is emphasized.

PSYC 722. Biological Aspects of Behavior. 3 Hours.

PR: Consent. Overviews of the areas of psychological investigation that pertain to the relation between biology and psychology, including neuroscience, psychobiological theories of personality and development, neurological and neuropsychological assessment, psychophysiology, and biologically-based treatment strategies, including basic psychopharmacology.

PSYC 723. Psychophysiology. 3 Hours.

PR: 3 hours of physiological psychology or consent. The current state of theory, methods, and findings concerning the association of physiological response systems and psychological states and processes, including biofeedback intervention.

PSYC 725. Social Psychology. 3 Hours.

Survey of current concepts, research, and findings in social psychology. Includes such topics as self and identity, attribution theory, interpersonal perception, social cognition, attitude change, social influence, interpersonal processes, prosocial behavior, aggression, and prejudice.

PSYC 730. Advanced Behavior Analysis Practicum. 1-6 Hours.

PR: PSYC 533 or consent. Supervised applied behavior analysis experience in an approved setting.

PSYC 731. Research Issues in Behavior Analysis. 3 Hours.

(May be repeated for credit with consent.) PR: Consent. Examination of research issues in general psychology from a behavior analytic perspective. Topics vary from year to year.

PSYC 732. Behavior Theory and Philosophy. 3 Hours.

PR: PSYC 531 or equivalent. Critical consideration of contemporary concepts, theories, and methods of psychology.

PSYC 733. Stimulus Control and Memory. 3 Hours.

PR: PSYC 531 or consent. Critical review of basic research and theory in discrimination learning, stimulus generalization, and memory.

PSYC 734. Reinforcement and Punishment. 3 Hours.

PR: PSYC 531. Examination of theories of response acquisition, maintenance, and suppression in the context of recent experimental work with animals and humans.

PSYC 736. Advanced Experimental Analysis of Behavior. 3 Hours.

(May be repeated for credit with consent.) PR: PSYC 531. Selected topics and research issues in the experimental analysis of behavior.

PSYC 737. Advanced Applied Behavior Analysis. 3 Hours.

(May be repeated for credit with consent.) PR: PSYC 533. Application of research and theory of behavior analysis to social problems; other selected topics.

PSYC 740. Practicum in Developmental Psychology. 1-6 Hours.

PR: Consent. Provides experience in a wide range of applied settings. Sites are chosen to accommodate exposure to the entire life-span from infancy through old age. Supervising responsibilities are determined by the instructor-in-charge in the agency.

PSYC 745. Seminar in Life-Span Development. 3 Hours.

(May be repeated for credit with consent.) Current issues in life-span development or selected periods of the life span.

PSYC 750. Clinical Internship. 1-15 Hours.

Intensive training in clinical assessment, diagnosis, consultation, and/or treatment skills that occur during an internship placement, typically at an off-campus training site.

PSYC 751. Integrative Behavioral Psychotherapy. 3 Hours.

Conceptual and practical introduction to basic tenets, concepts, and techniques of major schools of psychotherapy. Reviews psychotherapy integration efforts by analyzing therapy process variables and therapist activities presumably common to many effective forms of therapy.

PSYC 752. Family and Marital Therapy. 3 Hours.

Examines both theoretical and practical aspects of the assessment and treatment of family and marital difficulties.

PSYC 754. Clinical Psychopharmacology. 3 Hours.

Survey of the ways in which psychotropic drugs are used to treat behavioral and psychological disorders.

PSYC 755. Seminar in Clinical Supervision. 1 Hour.

(May be repeated for credit with consent.) Theoretical foundations and empirical research pertaining to clinical supervision, coupled with experiential training in conducting clinical supervision in applied settings.

PSYC 762. Seminar in Clinical Psychology. 1-3 Hours.

(May be repeated for credit with consent.) Research and problems in clinical psychology.

PSYC 762A. Seminar in Clinical Psychology. 1-3 Hours.

(May be repeated for credit with consent) Research and problems in clinical psychology.

PSYC 762B. Seminar in Clinical Psychology. 1-3 Hours.

(May be repeated for credit with consent.) Research and problems in clinical psychology.

PSYC 762C. Seminar in Clinical Psychology. 1-3 Hours.

(May be repeated for credit with consent) Research and problems in clinical psychology.

PSYC 762D. Seminar in Clinical Psychology. 1-3 Hours.

(May be repeated for credit with consent.) Research and problems in clinical psychology.

PSYC 762E. Seminar in Clinical Psychology. 1-3 Hours.

(May be repeated for credit with consent.) Research and problems in clinical psychology.

PSYC 762F. Seminar in Clinical Psychology. 1-3 Hours.

(May be repeated for credit with consent.) Research and problems in clinical psychology.

PSYC 762G. Seminar in Clinical Psychology. 1-3 Hours.

(May be repeated for credit with consent.) Research and problems in clinical psychology.

PSYC 762H. Seminar in Clinical Psychology. 1-3 Hours.

(May be repeated for credit with consent.) Research and problems in clinical psychology.

PSYC 762I. Seminar in Clinical Psychology. 1-3 Hours.

(May be repeated for credit with consent) Research and problems in clinical psychology.

PSYC 762J. Seminar in Clinical Psychology. 1-3 Hours.

(May be repeated for credit with consent) Research and problems in clinical psychology.

PSYC 762K. Seminar in Clinical Psychology. 1-3 Hours.

(May be repeated for credit with consent) Research and problems in clinical psychology.

PSYC 762L. Seminar in Clinical Psychology. 1-3 Hours.

(May be repeated for credit with consent) Research and problems in clinical psychology.

PSYC 762M. Seminar in Clinical Psychology. 1-3 Hours.

(May be repeated for credit with consent) Research and problems in clinical psychology.

PSYC 762N. Seminar in Clinical Psychology. 1-3 Hours.

(May be repeated for credit with consent) Research and problems in clinical psychology.

PSYC 762O. Seminar in Clinical Psychology. 1-3 Hours.

(May be repeated for credit with consent) Research and problems in clinical psychology.

PSYC 762P. Seminar in Clinical Psychology. 1-3 Hours.

(May be repeated for credit with consent) Research and problems in clinical psychology.

PSYC 762Q. Seminar in Clinical Psychology. 1-3 Hours.

(May be repeated for credit with consent) Research and problems in clinical psychology.

PSYC 762R. Seminar in Clinical Psychology. 1-3 Hours.

(May be repeated for credit with consent) Research and problems in clinical psychology.

PSYC 762S. Seminar in Clinical Psychology. 1-3 Hours.

(May be repeated for credit with consent) Research and problems in clinical psychology.

PSYC 762T. Seminar in Clinical Psychology. 1-3 Hours.

(May be repeated for credit with consent) Research and problems in clinical psychology.

PSYC 762U. Seminar in Clinical Psychology. 1-3 Hours.

(May be repeated for credit with consent) Research and problems in clinical psychology.

PSYC 762V. Seminar in Clinical Psychology. 1-3 Hours.

(May be repeated for credit with consent) Research and problems in clinical psychology.

PSYC 762W. Seminar in Clinical Psychology. 1-3 Hours.

(May be repeated for credit with consent) Research and problems in clinical psychology.

PSYC 762X. Seminar in Clinical Psychology. 1-3 Hours.

(May be repeated for credit with consent) Research and problems in clinical psychology.

PSYC 762Y. Seminar in Clinical Psychology. 1-3 Hours.

(May be repeated for credit with consent) Research and problems in clinical psychology.

PSYC 762Z. Seminar in Clinical Psychology. 1-3 Hours.

(May be repeated for credit with consent) Research and problems in clinical psychology.

PSYC 772. Seminar in Clinical Child Psychology. 1-3 Hours.

(May be repeated for credit with consent.) Current issues and research related to a particular area of clinical psychology involving children.

PSYC 790. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of psychology. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on assistantships to gain teaching experience. (Grading may be P/F.).

PSYC 792A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

PSYC 793A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

PSYC 794A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

PSYC 795. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

PSYC 798. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

PUBLIC ADMINISTRATION COURSES

PUBA 595. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

PUBA 600. Scope and Practice. 3 Hours.

Orientation to the field of public administration, ethics and professional standards and professional skills. Review of foundations, theories, scope and methods. Study of public management heritage and exploration of current trends and issues.

PUBA 610. Public Management Theory and Practice. 3 Hours.

Graduate-level introduction to management theory and practice in the public sector, including contextual influences, administrative behavior and motivation, decision-making, leadership, organizational design, communication, and evaluation.

PUBA 620. Public Financial Management. 3 Hours.

PR: Consent. Principles and practices of public sector financial management including management control concepts, governmental financial accounting and reporting, analytical and managerial techniques, and microcomputer applications to public financial management.

PUBA 630. Research Methods. 3 Hours.

Introduction to the foundations and processes of applied research applicable to public administration, with emphasis upon data collection and analysis, statistical modeling and research design.

PUBA 640. Legal and Political Foundations. 3 Hours.

PR: Consent. Constitutional-legal basis of American public administration; the policy making process; administrative agency relationships with executive, legislative, and judicial branches; bureaucratic power and legitimacy; and administrative legal process.

PUBA 645. Public Administration and Policy Development. 3 Hours.

Policy development examined in terms of values, process, specific policy cases, alternative futures analyses, and policy science.

PUBA 650. Local Governance. 3 Hours.

Introduction to the institutions and processes of local governance. Institutions include: government structures (county, municipal, special districts), volunteer boards and commissions, and various types of community-based organizations.

PUBA 655. Public Engagement. 3 Hours.

Explores theories of community engagement. Develops skills in techniques for engaging citizens and other stakeholders in collaborative local governance and community building efforts.

PUBA 670. Health Systems. 3 Hours.

Graduate-level introduction to the development, structure, and current issues in the healthcare in the United States including health promotion, disease prevention, epidemiology, delivery and utilization of health services, financing, policy, regulation, and ethical concerns.

PUBA 671. Healthcare Organization and Operation. 3 Hours.

PR: PUBA 670 or PR or CONC:CHPR 635. Examines the organization and management of health-care settings including system influences, leadership, communication, organization behavior, team development, organization design, evaluation, productivity, performance improvement.

PUBA 672. Healthcare Finance. 3 Hours.

PR or CONC: PUBA 670 or CHPR 635. Examines financing of health-care, financial management concepts, insurance mechanisms, reimbursement, cost accounting, budgeting, and staffing for healthcare organizations, including integrated networks and managed care. The course focuses on concepts needed by first line and mid-level managers.

PUBA 673. Alternative Healthcare Delivery Systems. 1 Hour.

PR or CONC:PUBA 670. Examines the key management issues in a variety of nontraditional settings, such as but not limited to, birthing centers, physician practice management, PATCH. Settings chosen will be determined from current developing areas in health-care.

PUBA 674. Rural Healthcare. 1 Hour.

PR or CONC: PUBA 670 or CHPR 635. Provides an overview of the issues affecting healthcare in rural settings, the health status of rural populations, and initiatives to provide improved access and address issues in service delivery and administration of rural health-care settings.

PUBA 675. Organization Performance Improvement. 1 Hour.

Introduces tools used to measure and improve organizational performance. The focus is on health-care organizations, with general application to public management. Techniques of total quality management and continuous quality improvement are covered.

PUBA 678. Population Health Management. 1 Hour.

PR: PUBA 670. Examines concepts of populations' health, managerial uses of epidemiological data, and population management approaches to health maintenance.

PUBA 691A-Z. Advanced Topics. 1-6 Hours.

Investigation of advanced topics not covered in regularly scheduled courses.

PUBA 693A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

PUBA 697. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

PUBA 700. Capstone Seminar. 3 Hours.

PR: All PUBA 600 level and PUBA 751 or concurrent. Links MPA academic preparation to professional career through analysis of practice settings, professional literature, and internship/professional experience of student; integrates coursework, practice themes, competencies, and ethics.

PUBA 710. Administrative Behavior in Public Organizations. 3 Hours.

Introduces and familiarizes the student with the nature of individual and group behavior in public organizations and bureaucratic settings.

PUBA 712. Administrative Ethics and Justice. 3 Hours.

PR: PUBA 610 or consent. Analysis of ethical issues in public administration. Study of the concepts of distributive and procedural justice and their applications to administrative decision-making.

PUBA 715. Organizational Development and Change Management. 3 Hours.

Examines organization development and change management applied to public agencies. Explores basic organization development skills, and techniques for effective change management.

PUBA 716. Creativity and Innovation. 1 Hour.

Examines knowledge about creativity and innovation in public organizations. Explores approaches to increasing creativity for individuals and groups. Reviews organization structure and processes as they relate to creativity.

PUBA 717. Performance Management. 2 Hours.

Examines the principles of performance management in public organizations. Explores a variety of performance management models and practices with emphasis on service delivery to improve organizations.

PUBA 720. Public Budgeting. 3 Hours.

PR: PUBA 620. Advanced study of public budgeting at the federal, state, and local levels of government. Emphasis is placed on principles of public finance, budgeting processes and approaches; revenue sources and tax structures; and budget preparation and analysis.

PUBA 730. Applied Research in Public Administration. 3 Hours.

PR: PUBA 630. Completion of an original, quantitative, applied research project dealing with issues and/or problems in the public sector.

PUBA 741. Human Resources Systems. 3 Hours.

PR: Consent. Examines competing values, systems, processes, and methods for managing human resources in government and non-profit organizations; including merit, patronage, professional, collective bargaining, and entrepreneurial models.

PUBA 743. Conflict Management. 3 Hours.

PR: Consent. Explores the nature and causes of organizational, personal, and policy conflict in the public and non-profit sectors; develops approaches and tools for managing, negotiating, and resolving conflicts.

PUBA 750. Public Planning. 3 Hours.

Examine the substantive range of public planning arenas. Principles and practices of organizational, program, project, or physical planning with consideration of the political and economic context.

PUBA 751. Public Service Internship. 1-6 Hours.

PR: Consent. A working internship in a government or public service related agency, designed to provide students with an opportunity to gain field experience, and to relate knowledge gained through course work situation. (Grading will be S/U.).

PUBA 755. Sustainable Community Development. 3 Hours.

PR: PUBA 645 or PUBA 750. Explores the theory, principles, and ethics of economic, environmental, and social sustainability as applied to community and economic development activities, with a focus on project and program implementation.

PUBA 770. Managed Care. 1 Hour.

PR or CONC: PUBA 670. Examines the key management issues in the managed care environment. General organization of managed care entities, key management control issues, financing, and reimbursement mechanisms and trends in managed care will be covered.

PUBA 772. Integrated Delivery System. 1 Hour.

PR: PUBA 670. Examines organization and management of integrated delivery systems in healthcare including models of integration.

PUBA 773. Policy Issues in Women's Health. 1 Hour.

PR: PUBA 670 or consent. Provides an overview of women's healthcare issues involving the interaction of medical and social systems. How to facilitate quality care will be examined from policy, administrative and advocacy standpoints.

PUBA 774. Healthcare Law and Ethics. 1 Hour.

PR or CONC: PUBA 670. Explores legal and ethical issues in the healthcare setting for administrative and medical managers.

PUBA 775. Healthcare Policy. 1 Hour.

PR or CONC: PUBA 670. Provides an introduction to policy issues in healthcare including state and federal roles in healthcare, the policy process and various healthcare policy. Explores values and American political processes as they influence health policy.

PUBA 776. Healthcare Planning/Marketing. 1 Hour.

PR: PUBA 670. Examines planning and marketing for healthcare settings. Includes strategic planning. Serves to introduce key issues for administrators.

PUBA 777. Healthcare Information Systems. 1 Hour.

PR: PUBA 670. Provides an overview of major factors influencing health care information systems, categories of healthcare information technology; and legal, ethical, human resource issues within management systems.

PUBA 779. Special Topics in Health Care. 1-6 Hours.

PR: PUBA 670. Focuses on those subjects of most topical concern in health care administration.

PUBA 779A. Special Topics in Health Care. 1-6 Hours.

PR: PUBA 670. Focuses on those subjects of most topical concern in health care administration.

PUBA 779B. Special Topics in Health Care. 1-6 Hours.

PR: PUBA 670. Focuses on those subjects of most topical concern in health care administration.

PUBA 779C. Special Topics in Health Care. 1-6 Hours.

PR: PUBA 670. Focuses on those subjects of most topical concern in health care administration.

PUBA 779D. Special Topics in Health Care. 1-6 Hours.

PR: PUBA 670. Focuses on those subjects of most topical concern in health care administration.

PUBA 779E. Special Topics in Health Care. 1-6 Hours.

PR: PUBA 670. Focuses on those subjects of most topical concern in health care administration.

PUBA 779F. Special Topics in Health Care. 1-6 Hours.

PR: PUBA 670. Focuses on those subjects of most topical concern in health care administration.

PUBA 779G. Special Topics in Health Care. 1-6 Hours.

PR: PUBA 670. Focuses on those subjects of most topical concern in health care administration.

PUBA 779H. Special Topics in Health Care. 1-6 Hours.

PR: PUBA 670. Focuses on those subjects of most topical concern in health care administration.

PUBA 779I. Special Topics in Health Care. 1-6 Hours.

PR: PUBA 670. Focuses on those subjects of most topical concern in health care administration.

PUBA 779J. Special Topics in Health Care. 1-6 Hours.

PR: PUBA 670. Focuses on those subjects of most topical concern in health care administration.

PUBA 779K. Special Topics in Health Care. 1-6 Hours.

PR: PUBA 670. Focuses on those subjects of most topical concern in health care administration.

PUBA 779L. Special Topics in Health Care. 1-6 Hours.

PR: PUBA 670. Focuses on those subjects of most topical concern in health care administration.

PUBA 779M. Special Topics in Health Care. 1-6 Hours.

PR: PUBA 670. Focuses on those subjects of most topical concern in health care administration.

PUBA 779N. Special Topics in Health Care. 1-6 Hours.

PR: PUBA 670. Focuses on those subjects of most topical concern in health care administration.

PUBA 779O. Special Topics in Health Care. 1-6 Hours.

PR: PUBA 670. Focuses on those subjects of most topical concern in health care administration.

PUBA 779P. Special Topics in Health Care. 1-6 Hours.

PR: PUBA 670. Focuses on those subject of most topical concern in health care administration.

PUBA 779Q. Special Topics in Health Care. 1-6 Hours.

PR: PUBA 670. Focuses on those subjects of most topical concern in health care administration.

PUBA 779R. Special Topics in Health Care. 1-6 Hours.

PR: PUBA 670. Focuses on those subjects of most topical concern in health care administration.

PUBA 779S. Special Topics in Health Care. 1-6 Hours.

PR: PUBA 670. Focuses on those subjects of most topical concern in health care administration.

PUBA 779T. Special Topics in Health Care. 1-6 Hours.

PR: PUBA 670. Focuses on those subjects of most topical concern in health care administration.

PUBA 779U. Special Topics in Health Care. 1-6 Hours.

PR: PUBA 670. Focuses on those subjects of most topical concern in health care administration.

PUBA 779V. Special Topics in Health Care. 1-6 Hours.

PR: PUBA 670. Focuses on those subjects of most topical concern in health care administration.

PUBA 779W. Special Topics in Health Care. 1-6 Hours.

PR: PUBA 670. Focuses on those subjects of most topical concern in health care administration.

PUBA 779X. Special Topics in Health Care. 1-6 Hours.

PR: PUBA 670. Focuses on those subjects of most topical concern in health care administration.

PUBA 779Y. Special Topics in Health Care. 1-6 Hours.

PR: PUBA 670. Focuses on those subjects of most topical concern in health care administration.

PUBA 779Z. Special Topics in Health Care. 1-6 Hours.

PR: PUBA 670. Focuses on those subjects of most topical concern in health care administration.

PUBA 780. Healthcare Administration Practicum. 3 Hours.

Students will develop and execute a field experience or scholarly research project that applies and integrates knowledge gained during healthcare administration course work into a functional capstone experience.

PUBA 790. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of public administration. NOTE: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It also provides a mechanism for student not on assistantships to gain teaching experience.

PUBA 791A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

PUBA 792A-Z. Directed Study. 1-6 Hours.

Directed study, reading and/or research.

PUBA 793A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

PUBA 794A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

PUBA 795. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

PUBA 796. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

PUBA 797. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

PUBA 798. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of students reports (698), or dissertations (798). Grading is normal.

PUBA 799. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking course work credit but who wish to meet residency requirements, use of the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is P/F; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

PUBLIC HEALTH COURSES

PUBH 501. Advanced Professional Writing. 3 Hours.

A review of English syntax and usage in professional writing; constructing and developing ideas; research and writing based on careful reading of author's instructions, using the APA style manual, using library resources, and academic honesty.

PUBH 536. Worksite Wellness. 3 Hours.

Overviews the field of health promotion in a worksite setting, offering a comprehensive introduction. Persons with interest in exploring the possibility of employment in health promotion in a worksite setting will find this course helpful.

PUBH 580. Prevention through Resilience. 3 Hours.

The principles of resilience, resiliency theories and current research, resilience and stress and the mind-body implications, recognizing and eliciting resilience and resilient outlooks and behaviors in ourselves and clients, professional and public health implication.

PUBH 581. Rural Gerontology. 3 Hours.

This course is designed to provide students with a broad understanding of current research information regarding health and social aspects of rural elderly in the United States. The course consists of lecture and class discussions.

PUBH 586. Public Mental Health. 3 Hours.

This course will teach the students the principles, concepts, and methods of general epidemiology, and how to apply them to the study of the distribution and causes of mental disorders in populations.

PUBH 595. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

PUBH 601. Introduction to Community/Public Health. 3 Hours.

An introduction to the field of community/public health with an emphasis on the relationship and role of public health to other disciplines in resolving public health problems.

PUBH 605. Introduction to Global Public Health. 4 Hours.

This course identifies and explores major global issues in public health including epidemiology of infectious diseases, malnutrition, famine and water sanitation. Course may be graded Satisfactory/Unsatisfactory.

PUBH 617. Ethical/Legal Issues in Public Health. 3 Hours.

This course provides an opportunity for sustained reflection on the many ethical and legal issues involved in public health. Ethical and legal frameworks will be identified and applied to the analysis of critical issues.

PUBH 618. Health Services/Outcomes Research Methods. 3 Hours.

This course covers the key issues facing the health care system today and teaches the basic skills needed to evaluate health care programs addressing these issues.

PUBH 622. MPH Practice-Based Experience. 1-6 Hours.

PR: Consent. (May be repeated for a maximum of 6 credit hours.) The practice-based experience provides students with the opportunity to develop their practical skills and enhance professional competencies by applying the knowledge and techniques gained from their MPH coursework to public health practice. Grading will be on a pass/fail basis.

PUBH 628. Aging Women & Culture Issues. 3 Hours.

This course will use a multi-disciplinary approach to examine the impact of gender, race/ethnicity, and culture on aging and the aging population.

PUBH 645. Fundamentals of Gerontology. 3 Hours.

This course introduces students to a broad spectrum of topics and issues related to aging by drawing upon several core disciplines and their contributions to the corpus of gerontological knowledge and research.

PUBH 646. Public Policy of Aging. 3 Hours.

Analysis of major policy and public programs for older adults, including Medicaid, Medicare, Social Security and the Older Americans Act. A major emphasis is placed on programs in West Virginia.

PUBH 659. Public Health Foundations. 3 Hours.

Examines the history of public health, from its roots in sanitation to current efforts to broadly improve population health. Each of the five core disciplines, epidemiology, biostatistics, environmental health, social and behavioral sciences, and health policy and management receives attention. Quantitative and qualitative research designs are covered as well as infectious diseases, tuberculosis, and risk management.

PUBH 662. Clinical Research Methods and Practices. 3 Hours.

Students learn research techniques for application to a wide variety of cardiovascular, neurological, trauma and social services emergency care, conduct real-time clinical research, and interact with patients/potential study subjects in the Emergency Department. (Also listed as CHPR 440; students may not count both PUBH 662 and CHPR 440 toward degree requirements.)

PUBH 680. Health-Based Leadership. 3 Hours.

PR:CHPR 635 or equivalent. Gain personal understanding, knowledge, and growth in the human dimensions of leadership: developing rapport, trust, teamwork, and mentoring; managing tone and facilitating problem situations; evaluating systems and leading system change; articulating vision, mission and strategy.

PUBH 685. Internship-Public Health Practicum. 1-5 Hours.

The internship provides the students with the opportunity to develop their practical skills and enhance professional competencies by applying the knowledge and techniques gained from their MPH coursework to public health practice.

PUBH 686. Occupational Medicine Practicum. 5 Hours.

This course provides occupation medicine residents with the opportunity to develop practical skills and professional competencies by applying the knowledge and techniques gained from their MPH and occupational medicine coursework to public health practice.

PUBH 687. Practicum Proposal. 2 Hours.

PR: PUBH 611 and PUBH 630 and PUBH 650 and PUBH 660 and (PUBH 691E or CHPR 634). A structured, faculty-supported process for developing a proposal for the 300-hour practice and theory- based practicum.

PUBH 688. MPH Practicum Report. 3 Hours.

PR: PUBH 611 and PUBH 630 and PUBH 650 and PUBH 660 and PUBH 687 and PUBH 689 and (PUBH 691E or CHPR 634). Provides students with the opportunity to report the results of their practicum projects to others via a professional paper and presentation.

PUBH 689. Practicum. 3 Hours.

PR: PUBH 611 and PUBH 630 and PUBH 650 and PUBH 660 and PUBH 687 and CHPR 612 and (PUBH 691E or CHPR 634). Implementation of the practicum proposal; a planned, supervised, and evaluated public health-oriented experience encompassing 300 hours of activity reflecting public health practice and theory. Students are required to take 3 credit hours of the practicum but may spread credits among semesters.

PUBH 691A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

PUBH 693A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

PUBH 695. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

PUBH 696. Graduate Seminar. 1 Hour.

PR: Consent. It is anticipated that each graduate student will present at least one seminar to the assembled faculty and graduate student body of his/her program.

PUBH 697. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project or a dissertation. (Grading is S/U).

PUBH 698. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that believe that this level of control and supervision is needed during the writing of students' reports, theses, or dissertations.

PUBH 703. Social and Behavioral Measurement. 3 Hours.

Theory and development of effective tools for measuring social and behavioral public health phenomena. Students will learn how to find, construct and analyze effective social and behavioral measurement instruments.

PUBH 705. Injury Control Research Methods. 3 Hours.

PR: PUBH 660 or equivalent and PUBH 611 or equivalent. Evidence-based approach to increasing the knowledge and methodological skills necessary for basic injury (unintentional and intentional) control research.

PUBH 706. Current Research Issues. 2 Hours.

The purpose of this course is to utilize research-based discussions to stimulate a unique information gathering environment of current research and investigation.

PUBH 707. Applied Multivariable Statistics. 3 Hours.

Basic theory and application of survival analysis, multivariate analysis of variance (MANOVA) and exploratory factor analysis.

PUBH 766. Medical Toxicology. 2 Hours.

This course introduces healthcare providers to the clinical aspects of toxicology, including the evaluation and treatment of individuals and populations with potential toxic exposures.

PUBH 790. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of public health. Note: this course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on assistantships to gain teaching experience. (Grading will be P/F.).

PUBH 791A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

PUBH 794A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

PUBH 796. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

PUBH 797. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

PUBH 798. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

PUBLIC RELATIONS COURSES**PR 512. Fund Raising and Foundation Management. 3 Hours.**

PR: Journalism graduate student or senior standing. Seminar. Studies in fund raising, alumni relations, and foundation management.

PR 522. Public Relations Case Studies. 3 Hours.

Graduate seminar based on in-depth studies of public relations programs developed and applied in support of our institutions. Primary emphasis on successful campaigns, but unsuccessful efforts also will be examined for causes of failure.

PR 559. Public Relations Campaigns. 3 Hours.

Intensive seminar based on in-depth analysis of public relations plans/ programs. Primary emphasis on developing successful campaigns for actual clients. Students research the abstract/theoretical sides of public relations to appreciate how it fuels the economy.

PR 591A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

PR 593A-Z. Special Topics. 1-6 Hours.

PR: Consent. A study of contemporary topics selected from recent developments in the field.

PR 697. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

PR 698. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of students reports (698), or dissertations (798). Grading is normal.

PR 699. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use of the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is S/U; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

READING COURSES

RDNG 573. Professional Development. 1-6 Hours.**RDNG 583. Special Workshop in Reading. 1-6 Hours.**

For elementary and secondary students in pre-service education programs, as well as elementary and secondary teachers in in-service education.

RDNG 603. Literature in Elementary School. 3 Hours.

A web-based course that provides information about different aspects of children's literature and discusses classroom implementation.

RDNG 621. Reading and Writing Instruction in Elementary Schools. 3 Hours.

Examines processes of reading and writing at the elementary school level. Explores instructional practices associated with those processes.

RDNG 622. Content Area Literacy Instruction. 3 Hours.

Presents essential content area literacy skills and examines ways in which they may be developed in various subject matter areas.

RDNG 623. Literacy and the Young Child. 3 Hours.

Focus is on perspectives of young children's reading and writing development and approaches for fostering this development in school and home settings.

RDNG 624. Foundations of Literacy. 3 Hours.

Inquiry into the historical, psychological, and linguistic foundations underpinning literacy instruction. Students will also consider the interdisciplinary nature of the study of literacy.

RDNG 627. Developing Reading Interests. 3 Hours.

Emphasis on methods and techniques for developing reading habits, interests, and tastes and on motivating individuals to read. Special attention is given to instructional practices which support the pursuit of independent reading.

RDNG 630. Teaching the Language Arts. 3 Hours.

Explores the interrelationship of the language arts - writing, reading, speaking, and listening. Special attention is given to understanding instructional practices, organizing language arts programs, and selecting materials.

RDNG 631. Selection and Evaluation of Reading Materials. 3 Hours.

PR: RDNG 621. Survey of critical reading skills, techniques, and procedures with emphasis on the selection of supplementary materials needed for effective developmental and remedial reading programs.

RDNG 640. Instructing Students Who Have Reading Difficulties. 3 Hours.

PR: RDNG 621 and (RDNG 624 or RDNG 622). A methods course that emphasizes ways to intervene when students face reading difficulties. Course focuses on methods that can be used by classroom teachers, reading specialists, and other special teachers of reading and language arts.

RDNG 641. Problems in Reading. 3 Hours.

PR: RDNG 640. A laboratory course in the university reading clinic. Major emphasis on tutoring children who have reading problems.

RDNG 642. Teaching Reading to Children who have Profound Reading Problems. 3 Hours.

Basic course on reading intervention methods. Intended for learning disabilities majors. Emphasis on practicum experience.

RDNG 680. Seminar. 1-6 Hours.

PR: Consent. Seminar for master's degree students stressing special topics concerned with the education and sociological and psychological aspects of language arts instruction.

RDNG 681. Special Topics. 1-6 Hours.

PR: Consent. Special topics or research in reading and language arts for master's degree students in reading.

RDNG 681A. Independent Research in Literacy. 3 Hours.

A program elective, this course offers possibilities for graduate students to pursue independent study and research in literacy. Students study a specific literacy area, theme, or question under the approval and advising of a faculty member.

RDNG 682. Assessment of Reading Ability. 3 Hours.

Focuses on methods and issues related to the assessment of reading ability. Students acquire reading specialist level knowledge and implementation skill of format and informal reading assessment and consider related issues of classroom and clinic application.

RDNG 685. Practicum. 1-12 Hours.

PR: Consent. Practicum type course for master's degree student teaching, and reading administration and supervision practicum experience can be pursued.

RDNG 691A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

RDNG 692A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

RDNG 693A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

RDNG 694A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

RDNG 695. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

RDNG 697. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

RDNG 725. Survey of Reading Research. 3 Hours.

A research course in which each student will complete an individual problem in an area of special interest.

RDNG 726. Literacy Leadership. 3 Hours.

PR: 18 hours of M.A. requirements. Roles, responsibilities, and practices of reading specialists, administrators, and classroom teachers in organizing literacy programs from early childhood through college.

RDNG 732. Survey of Major Problems in the Language Arts. 3 Hours.

PR: RDNG 630 or consent. An advanced course covering major problems of the teacher or supervisor of language arts instruction. A research course in which the student completes an individual problem.

RDNG 743. Instructional Intervention for Reading Difficulties. 3 Hours.

PR: Consent. Advanced course focusing on ways to assess and instruct students who have reading difficulties. Explores theories, issues, and methodology.

RDNG 744. Advanced Clinical Reading. 3 Hours.

PR: RDNG 641. Laboratory course in remedial reading. Emphasis on diagnosis and treatment of reading difficulties.

RDNG 780. Seminar. 1-6 Hours.

PR: Consent. The interrelationships among the language arts: mental, physical, and psychological deterrents to language arts; and similar topics.

RDNG 781. Special Topics. 1-6 Hours.

PR: Admission to doctoral program in reading and consent. Advanced seminar. Weaknesses and strengths in current reading programs, needed research in reading, and suggestions for improving reading instruction at elementary, secondary, and college levels.

RDNG 785. Practicum. 1-12 Hours.

PR: Consent. Practical application of reading theory to organizing and conducting developmental and remedial reading programs.

RDNG 790. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of reading. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on assistantships to gain teaching experience. (Grading will be S/U.).

RDNG 791A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

RDNG 792A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

RDNG 793A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

RDNG 794A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

RDNG 795. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

RDNG 796. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

RDNG 797. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

RDNG 798. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

RDNG 799. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking course work credit but who wish to meet residency requirements, use the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is S/U; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

RDNG 900. Professional Development. 1-6 Hours.

Professional development courses provide skill renewal or enhancement in a professional field or content area (e.g., education, community health, geology.) The continuing education courses are graded on a pass/fail grading scale and do not apply as graduate credit toward a degree program.

RDNG 930. Professional Development. 1-6 Hours.

Professional development courses provide skill renewal or enhancement in a professional field or content area (e.g., education, community health, geology.) These tuition waived continuing education courses are graded on a pass/fail grading scale and do not apply as graduate credit toward a degree program.

RECREATION PARKS TOURISM RES COURSES

RPTR 570. Meanings of Place. 3 Hours.

Study of place as a psychological and social phenomenon with implications for community development, historic preservation, interpretation design, management, natural and cultural sustainability, and human well-being. (Equivalent to LARC 570.).

RPTR 608. Recreation and Park Management Practicum. 2-4 Hours.

PR: Consent. Field experience and conference in the study, analysis, and solution of management problems in private, commercial and governmental recreation and park organizations.

RPTR 680. Non-Personal Interpretation. 3 Hours.

This course focuses on the theoretical underpinnings and application of non-personal communication methods. This is a project-based course about interpreting historical, cultural, and natural resources.

RPTR 685. Personal Interpretation. 3 Hours.

This course focuses on the theoretical underpinnings and applications of personal communication methods. This is a project-based course about interpreting historical, cultural, and natural resources.

RPTR 691A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

RPTR 693A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

RPTR 697. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading will be S/U.).

RPTR 714. Outdoor Recreation Behavior. 3 Hours.

This course explores the biophysical, psychological, social psychological, and sociological constructs that contribute to a contemporary, interdisciplinary understanding of outdoor recreation behavior. These concepts will be related to recreation resource management.

RPTR 715. Leisure and Recreation. 3 Hours.

PR: Consent. Study of leisure as a social phenomenon and its implications for recreation.

RPTR 718. Participatory Approaches Natural Resource Management. 3 Hours.

This seminar style class focuses on the adoption of more participatory approaches to managing natural resources. Specific topics will include the use of advisory committees, mediating conflicts, facilitation skills, management partnerships and public participation plans.

RPTR 738. Tourism Planning. 3 Hours.

Use of natural settings; integration of tourism development with respect to environmental protection concerns. (Field trip required; some transportation and food costs.)

RPTR 752. Tourism and Natural Resources Marketing. 3 Hours.

Apply the principles of marketing to tourism and natural resources emphasizing the convergence of increasing tourism demand and destination/resource competitiveness and sustainability.

RPTR 790. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of recreation, parks, and tourism resources. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on assistantships to gain teaching experience. (Grading may be S/U.)

RPTR 791A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

RPTR 792A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

RPTR 793A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

RPTR 794A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

RPTR 795. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

RPTR 796. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

RPTR 797. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.)

RPTR 798. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of students reports (698), or dissertations (798). Grading is normal.

RPTR 799. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use of the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is S/U; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

REHABILITATION COUNSELING COURSES**REHB 600. Introduction to Rehabilitation Services. 3 Hours.**

PR: Consent. Introduction to comprehensive rehabilitation, its history and development as a philosophy process, and professional area. Professional and ethical issues in rehabilitation counseling. Other services involved in various rehabilitation settings.

REHB 610. Medical Aspects of Rehabilitation. 3 Hours.

PR: Consent. An overview of medical aspects and implications of disability for the handicapped person in the rehabilitation process. Studies of the more common severe disabilities and their remediation also will be included.

REHB 612. Disability Across the Lifespan. 3 Hours.

A study of the psychological adjustment of disability across the lifespan, using a model of understanding stages of human development including cultural, interpersonal, and interpersonal factors. Includes information on appropriate interventions.

REHB 620. Career Development and Job Placement. 3 Hours.

PR: Consent and graduate standing in social sciences or education. Principles and methods involved in the vocational counseling and placement of disabled persons. The use of occupational and educational information. Theories of career development, occupational analysis, and job placement in rehabilitation.

REHB 621. Vocational Evaluation Systems and Techniques. 3 Hours.

PR: REHB 600. An introduction to vocational evaluation. Formal and informal vocational evaluation systems and procedures will be explored with the goal of preliminary development of individualized evaluation plans.

REHB 622. Advanced Vocational Evaluation Techniques. 3 Hours.

PR: REHB 621. Advanced vocational evaluation systems including empirically based and informal systems will be studied. Emphasis will be on administration, scoring and interpretation, particularly as it relates to handicapped populations with specific evaluation problems.

REHB 623. Seminar in Vocational Evaluation Services. 3 Hours.

PR: REHB 621 and consent. Supervisory and professional issues in vocational evaluation services with an emphasis on standards, methods, procedures and resources for developing and maintaining vocational evaluation services.

REHB 624. Rehabilitation Client Services. 3 Hours.

PR: REHB 620. The planning and management of client services focusing on serving the public and private sectors. The Human Service and Rehabilitation Service Systems will be explored considering both career and independent living issues.

REHB 672. Counseling Practicum. 1-4 Hours.

PR: Graduate standing, liability insurance, and consent. Supervised experience in the application of counseling techniques in the rehabilitation process. Demonstration of high professional standards, counseling skills, and personal characteristics appropriate to the counseling relationship are essential.

REHB 675. Clinical Practice. 1-15 Hours.

PR: Consent. Clinical practice (internship) in selected agencies, rehabilitation centers, clinics, or hospitals conducting an organized program of services for the physically, mentally, emotionally, or socially handicapped. Practice will be under direct supervision of faculty and agency personnel.

REHB 680. Seminar. 1-6 Hours.

Seminars arranged for advanced graduate students.

REHB 690. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of human resources and education. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It also provides a mechanism for students not on assistantships to gain teaching experience. (Grading will be S/U.).

REHB 691A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

REHB 692A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

REHB 693A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

REHB 695. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

REHB 696. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

REHB 697. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

REHB 698. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

REHB 699. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking course work credit but who wish to meet residency requirements, use the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is S/U; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

RELIGIOUS STUDIES COURSES

RELG 590. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of religion. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on assistantships to gain teaching experience. (Grading will be S/U.).

RELG 591A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

RELG 592A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

RELG 593A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

RELG 594A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

RELG 595. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

RELG 697. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

RELG 698. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

RELG 699. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but wish to meet residency requirements, use of the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is S/U; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

RESOURCE MANAGEMENT COURSES

RESM 540. Geospatial Modeling. 3 Hours.

There are two goals for this course: to present the fundamental methods for analyzing spatial data statistically, and to demonstrate spatial model building implementation and analysis. A prior statistics or econometric course is recommended.

RESM 575. Spatial Analysis for Resource Management. 3 Hours.

This interdisciplinary course develops and applies advanced Geography Information System (GIS) and spatial analysis skills for natural resource and environmental management. (Previous GIS experience helpful.).

RESM 591A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

RESM 593A-Z. Special Topics. 0-6 Hours.

A study of contemporary topics selected from recent developments in the field.

RESM 640. Geographic Information Systems for Aquatic Resource Management. 3 Hours.

Using Geographical Information Systems (GIS) to analyze the special components of a stream, river, or large water body for aquatic resource management and habitat assessment.

RESM 690. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in the college teaching of resource management. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It also provides a mechanism for students not on assistantships to gain teaching experience. (Grading will be S/U.).

RESM 691A-Z. Advanced Topics. 1-6 Hours.

RESM 691. Advanced Topics. 1-6 hr. PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

RESM 692A-Z. Directed Study. 1-6 Hours.

Directed study, reading and/or research.

RESM 693A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

RESM 694A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

RESM 695. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

RESM 696. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

RESM 697. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

RESM 698. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

RESM 699. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking course work credit but who wish to meet residency requirements, use of the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is S/U; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

RESM 793A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

RESM 794A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

RESM 795. Independent Study. 1-9 Hours.

Faculty Supervised study of topics not available through regular course offerings.

RESM 796. Graduate Seminar. 1 Hour.

PR: Consent. Each Graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

RESM 797. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis (697), problem report (697), research paper or equivalent scholarly project (697), or a dissertation (797). Grading may be S/U.

RUSSIAN COURSES

RUSS 591A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

RUSS 691A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

RUSS 697. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

SAFETY MANAGEMENT COURSES

SAFM 501. Safety Management Integration. 3 Hours.

Consideration of integrated arrangements, staff roles, management theory, staff liaison, project improvement, effectiveness, audits, and collaboration needed to assure success of the safety function.

SAFM 502. Controlling Environmental and Personnel Hazards. 3 Hours.

Investigation of hazard control principles relating to environmental facilities and equipment including control procedures recommended by authorities from the fields of engineering, medicine, and public health as well as from the field of safety.

SAFM 505. Safety Legislation and Compliance. 3 Hours.

Comprehensive study and analysis of federal and state legislation which mandates compliance with certain safety conditions and practices related to work performed in occupational and comparable settings.

SAFM 528. Economic Aspects of Safety. 3 Hours.

PR: Graduate standing. An overview of economic factors that must be considered when justifying the development and implementation of safety initiatives, including examining published research, cost estimating, ROI, risk assessment, benefit-cost analysis, and project planning.

SAFM 533. Disaster Preparedness. 3 Hours.

Major elements involved in disasters and emergencies, preparedness planning, systems utilization, and attention to essential human services, with emphasis on community action.

SAFM 534. Fire Safety Management. 3 Hours.

Analysis of fire services usually provided under safety manager jurisdiction, with special attention to legal bases, organizational structure, services rendered, training needs, and management techniques.

SAFM 539. Security Management. 3 Hours.

Safety manager responsibilities for security of persons and property including organizational patterns, personnel competencies expected, surveillance and monitoring methods, and occupational problems among security personnel.

SAFM 550. Loss Control and Recovery. 3 Hours.

Identifying and elimination areas of loss or recovering from losses of people, property, and efficacy via management practices, insurance and worker's compensation, and other management techniques and resources effective in controlling those losses.

SAFM 552. Safety and Health Training. 3 Hours.

Analysis of safety and health performance discrepancies, developing and conducting training programs to eliminate those discrepancies and the evaluation of program effectiveness in terms of cost effectiveness and organizational impact.

SAFM 578. Substance Abuse in the Workplace. 3 Hours.

The problem, nature, and effects of alcohol and drug use in the workplace; approaches for treatment and avoidance such as EAP's, community programs, and testing; development of management approaches and programs.

SAFM 580. Fundamentals of Environmental Management. 3 Hours.

An introductory but comprehensive overview of topics related to environmental technology as it applies to safety management. Focuses on regulation and technology relative to environmental management. Includes field trip.

SAFM 640. Instrumentation for Safety Managers. 3 Hours.

Anticipation, recognition, and evaluation of industrial hygiene topics encountered by safety managers. Fundamental instrumentation techniques are presented in laboratory and lecture formats. Management-oriented control and remediation programs are developed.

SAFM 642. Biomechanics of Safety Management. 3 Hours.

Applying the laws of physics to describe the abilities and limitations of the human body biomechanically and physiologically in order to maintain safety, quality, and productivity objectives; based on safety management principles.

SAFM 689. Professional Field Experience. 1-18 Hours.

PR: Must have completed 12 hours in SAFM and consent. Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

SAFM 691A-Z. Advanced Topics. 1-6 Hours.

Investigation of advanced topics not covered in regularly scheduled courses.

SAFM 692A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

SAFM 693A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

SAFM 695. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

SAFM 697. Research. 1-6 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading will be S/U.).

SAFM 699. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is S/U; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

SAFM 790. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of safety and environmental management. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on assistantships to gain teaching experience. (Grading will be S/U.).

SAFM 791A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

SAFM 792A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

SAFM 793A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

SAFM 794A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

SAFM 795. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

SAFM 796. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

SAFM 797. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper, equivalent scholarly project, or dissertation. (Grading may be S/U.).

SAFM 798. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of students reports (698), or dissertations (798). Grading is normal.

SERVICE LEARNING COURSES

SRVL 695. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

SOCIAL CULTURAL FOUNDATIONS COURSES

SCFD 600. Sociology of Education. 3 Hours.

Education as a social institution; cultural and class influences on education; social roles and career patterns in the school system; the school and problems of the community. (Also listed as SOCA 332.).

SCFD 615. Qualitative Research Methods. 3 Hours.

An introduction to the nature of qualitative research and to techniques of interviewing, observation, and the analysis of documents and other cultural artifacts. Includes guided experience in designing and implementing a qualitative research study.

SCFD 620. Philosophy of Education. 3 Hours.

Examines different systems of educational philosophies focusing on aims, values, and criteria of education. Stresses the application of philosophic thinking to educational language, issues, methods, and subject matter.

SCFD 640. History of American Education. 3 Hours.

Major forces affecting U.S. educational developments at all school levels are examined in political, social, economic, and cultural context. Major historical periods include colonial, early national, pre/post civil war, and late nineteenth to mid-twentieth century.

SCFD 650. Comparative Education. 3 Hours.

PR: Graduate standing. Compares educational systems in selected foreign countries with the United States. Examines formal and informal educational influences in historical and contemporary contexts and in socioeconomic, political, and philosophical perspectives.

SCFD 685. Practicum. 1-12 Hours.

PR: Consent.

SCFD 693A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

SCFD 694A-Z. Seminar. 1-6 Hours.

Selected topics in historical, sociological, and philosophical foundations of education. (Titles to be announced each semester.).

SCFD 697. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

SCFD 700. John Dewey Studies. 3 Hours.

This seminar focuses on the work of John Dewey. Students examine secondary and primary works. The course traces the influence of Dewey's life and thought from 1859 to present.

SCFD 715. Advanced Qualitative Research. 3 Hours.

PR: SCFD 615. Advanced exploration of methodological issues related to qualitative research, including basic interpretive, case study, grounded theory, phenomenological, and mixed-methods dissertations and research projects. The course also provides a service course for doctoral students in other colleges.

SCFD 781. Nature of Inquiry 1. 1 Hour.

PR: HRE Interdisciplinary PhD students or consent. First course in a sequence focusing on epistemological, ontological, cultural, and political contexts of educational inquiry. (Grading S/U.).

SCFD 782. Nature of Inquiry 2. 1 Hour.

PR: SCFD 781 or consent. Second course in a sequence focusing on epistemological, ontological, cultural, and political contexts of educational inquiry. (Grading S/U.).

SCFD 783. Nature of Inquiry 3. 1 Hour.

PR: SCFD 782 or consent. Third course in a sequence focusing on epistemological, ontological, cultural, and political contexts of educational inquiry. (Grading S/U.).

SCFD 790. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of SCFD. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on assistantships to gain teaching experience. (Grading will be S/U.).

SCFD 791A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

SCFD 792A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

SCFD 793A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

SCFD 794A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

SCFD 795. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

SCFD 796. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

SCFD 797. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

SCFD 798. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of students reports (698), or dissertations (798). Grading is normal.

SCFD 799. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking course work credit but who wish to meet residency requirements, use the university's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is S/U; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

SOCIAL WORK COURSES**SOWK 513. Social Work Research Methods. 3 Hours.**

(Research course.) Basic concepts in social research methods. Emphasis on conceptualization of social work problems for research, role of social science theories in research, measurement options in research design, and analysis of data.

SOWK 520. Human Behavior in the Social Environment. 3 Hours.

PR: Admission to the MSW program. Study of theoretical concepts underlying human behavior using a systems model and including the major systems in society with a primary focus on the impact of human diversity on human behavior and social interactions.

SOWK 531. Social Welfare Policy and Services. 3 Hours.

(Policy course.) Introduction to the history, development, and implementation of social policy in the United States. Special emphasis is given to those policies which have the greatest impact on non-metropolitan areas and the Appalachian region.

SOWK 540. Generalist Social Work Practice. 3 Hours.

PR: Admission to the MSW program. Focuses on developing the basic framework of social work practice theory and professional values for working with individuals, groups, families, and communities.

SOWK 547. Multicultural Social Work Practice. 3 Hours.

Understanding and appreciating human differences as encountered in professional practice. Practicing with sensitivity to influences such differences may present to the social worker.

SOWK 572. Contemporary Issues in Aging. 3 Hours.

Intended for students who have an interest in health and aging. The opportunity to attend a broad array of workshops on current issues and skills related to practice with older adults and their families.

SOWK 581. Generalist Field Experience. 1-14 Hours.

PR or CONC: SOWK 513 and SOWK 520 and SOWK 531, and SOWK 540 and Consent. Graduate foundation field instruction in selected settings under the general direction of the faculty.

SOWK 593A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

SOWK 616. Evaluation Research in Social Work. 3 Hours.

(Research course.) PR: SOWK 513 or consent. Methods of collecting, analyzing, and interpreting data on the need for implementation and effects of social interventions. Examination of the effects of political, ethical, and resource variables on the research process.

SOWK 618. Personal Practice Assessment. 3 Hours.

PR: SOWK 513 or consent. the use of single-system evaluation methods to assess the effectiveness of social work interventions, with an emphasis on using these tools to guide practice decision making.

SOWK 619. Social Work in Vietnam and Cambodia. 3 Hours.

PR: SOWK 520 and SOWK 540 and SOWK 513 and SOWK 531 and SOWK 621 and SOWK 633. Travel course which examines issues related to assessment and intervention in community health/mental health in Vietnam and Cambodia.

SOWK 621. Human Behavior/Diversity and Social Justice. 3 Hours.

PR: SOWK 540 and SOWK 540 or advanced standing. Advanced content on human behavior in the social environment with special emphasis on vulnerable populations and social justice issues of concern to social workers.

SOWK 625. Social Work in Northern Ireland. 3 Hours.

PR: SOWK 520 and SOWK 513 and SOWK 540 and SOWK 531 and SOWK 621 and SOWK 633. Travel course which examines issues related to peace and reconciliation in Northern Ireland.

SOWK 626. Child Mental Health. 3 Hours.

PR: SOWK 513 and SOWK 520 and SOWK 531 and SOWK 540. Elective course which examines the structure of the United States' public mental health system for children, related policy issues and intervention options.

SOWK 627. Advanced Clinical Practice in Integrated Healthcare. 3 Hours.

PR: SOWK 581 and SOWK 621 and SOWK 633 and SOWK 649. The course will introduce students to the essential practice skills needed to effectively address the challenges of integrating services, care and support for persons with health, mental health and substance use problems.

SOWK 633. Social Policy Analysis. 3 Hours.

(Policy course.) PR: SOWK 531 or consent. Skill development in techniques of social policy analysis. Selection of analytical methods and issues offered in different sections.

SOWK 641. Social Work with Groups. 3 Hours.

PR: SOWK 621 or consent. Theory and skills for working with a variety of groups and settings. Focus on dynamics and roles of social workers and group members.

SOWK 643. Psychopathology and Social Work Practice. 3 Hours.

(Practice course.) PR: SOWK 540 or consent. Nature, presenting characteristics, and intervention with the major forms of mental and emotional maladjustment that impact social functioning, adaptation, and life satisfaction from the perspective of the social work profession.

SOWK 644. Brief Therapy. 3 Hours.

Solution Focus Therapy and how it is applied to working with individuals, couples and families. Content: Assessment, stages, goal setting, conducting sessions, interventions, tailoring therapy to address problems, family preservation, abuse, neglect, substance abuse and divorce.

SOWK 645. Supervision in Social Work. 3 Hours.

Practice course. PR: SOWK 621 or consent. Functions, conflicts, and dynamics of supervision of professionals, and the relationship of ethical and value principles.

SOWK 649. Advanced Practice with Individuals and Families. 3 Hours.

(Practice course.) PR: SOWK 540 or consent. Theories, concepts, and value issues associated with providing direct clinical social work services to individuals. Students will also be involved with skill building exercises through classroom activities.

SOWK 650. Families and Groups. 3 Hours.

PR: SOWK 649. This course is designed to advance the student's knowledge in the direct practice procedures used in group and family therapy. Required course for DP students.

SOWK 651. Community Organization Theory and Practice. 3 Hours.

PR: SOWK 513 and SOWK 520 and SOWK 531 and SOWK 540. Practice issues in skill development and community organization and development with special emphasis on rural communities.

SOWK 653. End of Life Care. 3 Hours.

Online course focused on social work with those who are dying and bereaved by death. Elective course to prepare the student for social work practice with clients coping with terminal illness, loss and grief.

SOWK 654. Social Agency and Program Administration. 3 Hours.

(Practice course.) PR: SOWK 540 or consent. Practice issues and skill development in programming, budgeting, staffing, organization, and control of social agencies and programs.

SOWK 655. Non-Profit Management and the Third Sector. 3 Hours.

Understanding the role and place of the third sector in post-industrial society.

SOWK 656. Non-profit Financial Management. 3 Hours.

PR: SOWK 531 or consent. Intensive examination of the current state-of-the-art of non-profit financial management, with attention to accountability, budgeting, cost measurement, and related topics.

SOWK 657. Grant Development. 3 Hours.

Course offers broad overview of external funding for social service agencies, emphasis on nonprofit sector. Students will have opportunity to find funding sources, develop grant proposals write, edit, and prepare to submit a request for funding.

SOWK 658. Social Work with Veterans. 3 Hours.

This course is designed to advance the student's knowledge concerning the needs of veterans and their families.

SOWK 673. Legal Issues in Social Work. 3 Hours.

This course will explore in detail the legal and ethical obligations of social workers in practice. Review of common legal issues in social work practice and legal issues clients may face.

SOWK 674. Community Mental Health. 3 Hours.

(Field of practice course.) PR: SOWK 621 and ((SOWK 643 and SOWK 649) OR (SOWK 651 and SOWK 654)). An overview of the field of mental health which addresses major policy, program, practice, theory, and research issues. Current federal and state issues are examined.

SOWK 675. Substance Abuse. 3 Hours.

SOWK 675. Substance Abuse. The course explores issues pertaining to substance abuse and treatment by the social work professional. Introduction to terminology, pharmacological, cultural and social issues in substance abuse with socio-political and historical aspects of substance abuse.

SOWK 677. Social Work Practice Children/Families. 3 Hours.

CoReq: SOWK 682. Analyzes the population at risk, examines family theory, major programs, services and policies. Examines family theory, major programs, services and policies. Examines gaps in services and major styles of family intervention in social work roles.

SOWK 678. Family Victimology. 3 Hours.

(Practice course.) PR: SOWK 621 or consent. The interface of social work practice in family victimology, with emphasis on victim welfare policy and service, victim compensation programs, and victim prevention. Social concern for physical and sexual abuse, domestic violence, and related topics.

SOWK 679. Social Work with Couples/Families. 3 Hours.

(Practice course.) PR: SOWK 621 or consent. This course explores social work practice focused on couples or families as a unit. Emphasis on intervention models oriented to couple and family relationship counseling and on clinical social work techniques.

SOWK 680. Child Welfare Continuum. 3 Hours.

PR: SOWK 621 or consent. Exploration of policy and service issues in child welfare practice includes family preservation and home-based services, adoption, foster and residential care, community based practice and intervention in rural and cross-cultural contexts.

SOWK 681. Social Work in Health Settings. 3 Hours.

PR: SOWK 621 and ((SOWK 643 and SOWK 649) OR (SOWK 651 and SOWK 654)). Comprehensive strategies for serving clients, including the aged, with physical and/or emotional problems and their families with an emphasis on direct practice approaches. Practice in traditional and nontraditional settings is examined.

SOWK 682. Advanced Field Experience. 1-14 Hours.

PR: (SOWK 621 and SOWK 633 and SOWK 643) or (SOWK 651 and SOWK 649) or SOWK 654 and consent. Graduate advanced field instruction in selected settings under the general direction of the faculty.

SOWK 692A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

SOWK 693A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

SOWK 694A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

SOWK 695. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

SOWK 696. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

SOWK 697. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

SOWK 698. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

SOWK 699. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use of the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is P/F; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

SOWK 930. Professional Development. 1-6 Hours.

Professional development courses provide skill renewal or enhancement in a professional field or content area (e.g., education, community health, geology). These tuition-waived continuing education courses are graded on a pass/fail grading scale and do not apply as graduate credit toward a degree program.

SOCIAL AND BEHAVIORAL SCIENCES COURSES

SBHS 601. Social and Behavioral Theory. 3 Hours.

The focus of this course is on the role of individual behavior in attaining health. Integration of the concepts of health education and behavioral science to facilitate changes in health behavior is addressed.

SBHS 610. Public Health Research Methods. 3 Hours.

This course is designed to introduce students to the basic elements of conducting effective evaluation of health promotion programs.

SBHS 611. Community Assessment. 3 Hours.

This course is designed to provide students with the knowledge and skills needed to conduct meaningful community health assessments using direct observations, secondary data sources, key informants and public documents, integrating community perceptions and published evidence.

SBHS 613. Public Health Program Evaluation. 3 Hours.

Examination of research design, methods, and practices in the assessment and evaluation of public health programs; emphasis on practical applications of program evaluation to change behavior, allocate funds, build and strengthen programs.

SBHS 614. Community-Based Participatory Research. 3 Hours.

This course focuses on initiating and conducting research projects in meaningful partnership with communities, including human research ethics and community-based participatory research elements, principles, and theories via a combination of readings, lectures, videos, and exercises.

SBHS 615. Intervention Design. 3 Hours.

PR: SBHS 601 and SBHS 610 or consent. This course will provide students with the conceptual and practical tools used in planning, designing, implementing, and evaluating health promotion programs. Through reading, cooperative learning, and discussing, students will gain experience in these four areas. Students will also apply information learned in foundation courses.

SBHS 626. Internship. 1-5 Hours.

(May be repeated for a maximum of 5 credit hours.) The internship provides students the opportunity to develop their practical skills and enhance professional competencies by applying the knowledge and techniques gained from their MPH coursework to public health practice.

SBHS 627. Practicum Proposal. 2 Hours.

Students develop a proposal for a discipline-specific practicum project (applied/research-based) integrating public health skills, theory and knowledge as the first part of the culminating experience supported by a faculty-review/mentoring process.

SBHS 628. Practicum. 3 Hours.

PR: SBHS 627 or consent. Culminating Experience: Students implement the substantive public health project (planned in proposal course) under the mentorship of faculty/preceptors. Results are reported through a formal paper and a poster presentation to faculty, students and guests.

SBHS 629. Capstone Course. 2 Hours.

This is the culminating experience for social and behavioral sciences majors in the MPH program and requires students to demonstrate their capacity to synthesize and integrate the core and SBHS departmental competencies via a paper and poster.

SBHS 630. Foundations of Wellness. 3 Hours.

Wellness is examined as a component of health promotion. A wellness lifestyle is fundamental to promoting a holistic wellness concept. Quality-of-life issues and programs are explored for a variety of audiences.

SBHS 633. Women and Violence. 3 Hours.

This course examines the issue of violence in the lives of women across the lifespan and from a sociocultural perspective. Implications for health concerns and educational interventions will be addressed.

SBHS 634. Issues in Women's Health. 3 Hours.

This course examines a broad array of health issues and causes of illness that shape and define women's access and understanding of health concerns across the lifespan, which includes examination of cultural diversity.

SBHS 660. Survey Research Methods. 3 Hours.

This course presents scientific knowledge and practical skills used in survey research. Focus is on question construction and development, questionnaire design, sampling and surveying modes, interviewing techniques, and survey data analysis.

SBHS 661. Qualitative Research Methods. 3 Hours.

Introduces students to qualitative research methods and study designs. Includes critiques of qualitative study literature, student-driven studies using various types of study designs and how to analyze and report the results of qualitative studies. (Also listed as SBHS 761 - students may not count both this course and 761 toward degree requirements.)

SBHS 662. Issues in Men's Health. 3 Hours.

Men are markedly at risk for specific health problems and complications. This course will provide skills for student to research and develop educational programs to improve health and well-being of men.

SBHS 663. Advanced Evaluation in Public Health. 3 Hours.

PR: (BIOS 601 and SBHS 613 and EPID 617) or consent. Advanced topics will include the use of logic models, innovative approaches in evaluation, analyzing and interpreting evaluation data, the role of evaluation in shaping policy, and developmental evaluation. Didactic instruction and experiential learning will be emphasized.

SBHS 664. Public Health Advocacy. 3 Hours.

The course will introduce students to advocacy as an important tool to mobilize social and organizational change through education and community support. The course will train students to develop effective advocacy strategies, present those strategies through written and oral communication, and refine their professional skills. This course requires some amount of travel for course related activities.

SBHS 665. Grant Writing for Public Health Practice. 3 Hours.

PR: SBHS 601 and (SBHS 613 or SBHS 612). This course addresses skills and techniques necessary for writing successful grant proposals for professionals in public health agencies. This is a writing intensive course focused on grant writing and evaluation of social and behavioral based health promotion and disease prevention programs and interventions and is specifically tailored for the public health practice workforce.

SBHS 691A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation in advanced topics that are not covered in regularly scheduled courses.

SBHS 695. Independent Study. 1-6 Hours.

Faculty-supervised study of topics not available through regular course offerings.

SBHS 696. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

SBHS 697. Research. 1-15 Hours.

PR: Consent, Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. Grading will be S/ U.).

SBHS 698. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that believe that this level of control and supervision is needed during the writing of the students' reports, theses, or dissertations.

SBHS 701. Public Health Grant Writing. 3 Hours.

PR: SBHS 601. This course addresses various components of the grant writing process, including collaboration, funding sources, proposal preparation, and grants management for health professionals. Students will benefit from having a research methods course.

SBHS 711. Research Translation for Health. 3 Hours.

PR: SBHS 610. Principles, theories, and evidence-based methods of knowledge and research translation for health are discussed to facilitate student competence for translating research discoveries into policies and practices that promote health and prevent disease.

SBHS 715. Intervention Design. 3 Hours.

PR: SBHS 601 and SBHS 610. This course will provide students with the conceptual and practical tools used in planning, designing, implementing, and evaluating health promotion programs. Through reading, cooperative learning, and discussing, students will gain experience in these four areas. Students will also apply information learned in foundation courses.

SBHS 760. Survey Research Methods. 3 Hours.

This course presents scientific knowledge and practical skills used in survey research. Focus is on question construction and development, questionnaire design, sampling and survey modes, interviewing techniques, and survey data analysis. (Also listed as SBHS 660. Students may not count both SBHS 760 and SBHS 660 toward degree requirements.)

SBHS 761. Qualitative Research Methods. 3 Hours.

This course will introduce students to qualitative research methods, including the various types of study design. The course will include critiques of qualitative studies in the relevant research literature as well as student-driven studies using various types of study designs. Students will also learn about analyzing and reporting the results of qualitative studies.

SBHS 763. Advanced Evaluation Public Health. 3 Hours.

PR: BIOS 601 and SBHS 613 or consent. Application of scientific public health program evaluation methods. Students will learn about theory and methods of program evaluation, identification of stakeholders, data collection, preparation, analysis, reporting and conclusion.

SBHS 790. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of SBHS. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It also provides a mechanism for students not on assistantships to gain teaching experience.

SBHS 795. Independent Study. 1-9 Hours.

PR: Consent. Faculty-supervised study of topics not available through regular course offerings.

SBHS 796. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

SBHS 797. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Will be graded S/U).

SOCIOLOGY AND ANTHROPOLOGY COURSES

SOCA 511. Survey Research Methods. 3 Hours.

PR: Intended for majors only. Provides students with an overview of survey research including problem definition, research design, sampling, measurement, instrument construction, project management, ethical considerations, and report writing.

SOCA 515. Comparative Research Methods. 3 Hours.**SOCA 517. Data Analysis. 3 Hours.**

PR: STAT 211 or equivalent. Using social science survey data, this course integrates statistics, computer usage, and social science theory to examine alternative methods of analyzing social science data. Makes extensive use of SPSS software package.

SOCA 518. Data Analysis. 3 Hours.

PR: SOCA 517. Continuation of SOCA 517.

SOCA 522. Contemporary Sociological Theory. 3 Hours.

Review of recent trends and orientations in sociology. Theory construction, topologies, models, and the relationship between theory and research. Review of current literature.

SOCA 591A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

SOCA 593A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

SOCA 610. Advanced General Sociology. 3 Hours.

This course orients students to the field of sociology, providing them with an understanding of the breadth of the field. With a solid foundation in the field, students will be better prepared to conduct their own research and teach their own introduction to sociology class. Students are required to take this course in their first semester of the program.

SOCA 620. Sociological Research Methods. 3 Hours.

Focuses on the logic of framing and designing social research: Philosophical foundations, connections between theory and methods, narrowing research options, and making design and data collection decisions. Emphasis on reading and critiquing published studies.

SOCA 630. Classical Social Thought. 3 Hours.

This course introduces students to the general concepts, principles, and perspectives used in the study of social reality, with an emphasis on the highly influential works that were important in founding the field of sociology.

SOCA 689. Field Work. 1-6 Hours.

PR: Departmental consent. Supervised field work.

SOCA 690. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of sociology and anthropology. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It also provides a mechanism for students not on assistantships to gain teaching experience. (Grading will be P/F.).

SOCA 691A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

SOCA 692A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

SOCA 693A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

SOCA 694A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

SOCA 695. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

SOCA 696. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

SOCA 697. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

SOCA 698. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

SOCA 699. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use of the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all the rights and privileges of duly enrolled students. Grading is P/F; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

SOCA 710. Teaching Sociology. 3 Hours.

Students will engage in the literature on teaching and learning, exploring the major issues involved in teaching at the university level. Each student will work with an instructor in the activities that constitute the teaching enterprise in an apprenticeship role for the semester. Students are expected to develop a course plan by the end of the semester.

SOCA 711. Writing in Quantitative Methods. 3 Hours.

PR: SOCA 615 SOCA 616. This course provides students with the resources to write a polished quantitative paper that is suitable for submission to a peer-reviewed journal. The students will revise the paper they have completed as part of the requirements for SOCA 615/616, a research paper from a substantive course, or a paper that is part of a research or grant project.

SOCA 721. Qualitative Methods. 3 Hours.

PR: SOCA 620. Provides students with tools to critically evaluate and design qualitative research projects. Focuses on philosophical foundations and researcher/subject roles, considerations associated with data collection, and data analysis methods.

SOCA 725. Introduction to Evaluation Research Methods. 3 Hours.

PR: SOCA 620. This course serves as an introduction to evaluation methodology and to the evaluation tools commonly used to assess effectiveness of a wide variety of programs and policies.

SOCA 726. Ethnographic Investigation. 3 Hours.

PR: SOCA 620. This seminar offers training in theories and practical application of ethnographic methods. The focus is on understanding the types of questions best answered by ethnographic investigations, why such methods are appropriate, and hands-on training in various styles of ethnography. Students will be expected to perform original ethnographic research using the concepts and tools gained in this course.

SOCA 728. Content Analysis. 3 Hours.

PR: SOCA 620. Advanced introduction to the analysis of textual content for social insight; surveys classic approaches and recent advances in quantitative and qualitative content analysis; students design and execute projects that analyze textual data for social inference.

SOCA 730. Sociological Explanation. 3 Hours.

PR: SOCA 630. Addresses the development and application of sociological theory to empirical research questions. Includes the logic of theory, strategies and steps in constructing theories, and strengths and limitations of theories.

SOCA 760. Space, Place, and Community. 3 Hours.

PR: SOCA 610. This course presents sociological based ideas about space, place and community, discussing the theoretical contributions in these areas, assessing the methodological contributions to the discipline and linking them all to sub-areas within community, including urban, rural, medical and environmental sociology.

SOCA 780. Individual and Society. 3 Hours.

PR: SOCA 610. This course provides the foundation for understanding culture, as defined according to three main areas of inquiry: the study of how systems of ideas interact with, reproduce, and transform other social structures and social identities; the study of cultural products, including media; and analysis of the patterns of social interaction of groups of people.

SOFTWARE ENGINEERING COURSES**SENG 510. Software Project Management. 3 Hours.**

Techniques and tools for managing the software development process for large development projects.

SENG 520. Software Analysis and Design. 3 Hours.

Defining software requirements and an introduction to the principles and concepts relevant to the design of large programs and software systems.

SENG 530. Validation and Verification. 3 Hours.

Tools and techniques for applied verification and validation of computer software including requirements, design, and code relevant to several development lifecycle models.

SENG 540. Software Evolution. 3 Hours.

Software process and the Capability Maturity Model (CMM), software maintenance and evolution, program understanding, reengineering, software configuration management, and software tools related to these issues.

SENG 550. Object Oriented Design. 3 Hours.

Highlights contemporary design and analysis techniques with a strong emphasis on the Unified Modeling Language(UML). The class focuses on problem space analysis utilizing object oriented techniques to produce real world design solutions in UML.

SENG 581. Quality Software Process Management. 3 Hours.

PR: SENG 510 or consent. Evaluate quality theories and practices; research quality history, principles and techniques; and apply software engineering quality management methods and standards to develop software quality model artifacts in an enterprise environment.

SENG 582. Enterprise Architecture Framework. 3 Hours.

PR: SENG 520 or Consent. Study of architecture frameworks used in government and business to design holistic advanced computer systems. Application of frameworks to the enterprise processes, technologies, and people to achieve the enterprise mission and objectives.

SENG 591A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

SENG 610. Advanced Software Project Management. 3 Hours.

PR: SENG 510. Presents best practices for managing software development projects. Addresses leadership, teamwork, issues in modern system development, complexity and its influence on projects, estimating project effort and duration, development of software-intensive systems and systems-of-systems.

SENG 611. Strategies for Software Development. 3 Hours.

PR: SENG 510 or Consent. This course investigates the forces which drive a software organization's business strategy; alignment of a project to the business needs (product line or platform); and the importance of various project management, development and business models.

SENG 630. Requirements Engineering. 3 Hours.

PR: SENG 520 or consent. Study of the requirements engineering phase of the software development process. Techniques for building strong requirements, including management, analysis, risk mitigation, validation, customer signoff, and change control.

SENG 691A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

SENG 695. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

SENG 697. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

SPANISH COURSES**SPAN 590. Teaching Practicum. 1-3 Hours.**

PR: Consent. Supervised practice in college teaching of Spanish. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on assistantships to gain teaching experience. (Grading will be P/F.).

SPAN 591A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

SPAN 592A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

SPAN 593A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

SPAN 594A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

SPAN 595. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

SPAN 611. Literary Criticism. 3 Hours.

Introduction to the main tendencies of contemporary literary theory as applied to Spanish literature; literary theory and practice. Review and evaluation of the main critical approaches from a practical standpoint.

SPAN 630. Latin American Culture. 3 Hours.

A study of history, culture, politics, economics, and development of the Latin American continent.

SPAN 631. Latin American Short Story. 3 Hours.**SPAN 632. Latin American Novel to 1960. 3 Hours.****SPAN 633. Latin American Novel Since 1960. 3 Hours.****SPAN 634. Latin American Poetry. 3 Hours.****SPAN 635. Latin American Theatre. 3 Hours.****SPAN 636. Latin American Nobel Prize Winners. 3 Hours.****SPAN 637. Early Spanish-American Literature. 3 Hours.**

In depth readings in Spanish-American literature of the colonial period in their historical context.

SPAN 638. Mexican Literature. 3 Hours.

In-depth readings of literary works from Mexico.

SPAN 643. Contemporary Spanish Narrative. 3 Hours.**SPAN 650. Spanish Civilization. 3 Hours.**

Diachronic study of Spanish civilization with particular attention to literary and artistic movements and their relation to the socio-political sphere. (Course taught in Spanish.).

SPAN 651. Medieval and Golden Age. 3 Hours.

In-depth reading in Spanish literature of the Middle Ages Renaissance, and Baroque periods, in narrative, drama, and poetry, within its historical context. Non-canonical works will also be included and studied.

SPAN 652. Cervantes. 3 Hours.

PR: 24 hours of Spanish or consent.

SPAN 653. Eighteenth and Nineteenth Century Literature. 3 Hours.

Introduction to the major tendencies, authors, and works of the 18th and 19th Centuries Spanish Peninsular Literature; presentation and analysis of the main literary movements of the period, from the Enlightenment to Naturalism.

SPAN 654. Spanish Literature 1898-1936. 3 Hours.

Survey of the major trends and representative authors and works of the Modernist period in Spain.

SPAN 655. Spanish Literature 1936-1975. 3 Hours.

In-depth study of Spanish literature published between 1936, the outbreak of the Spanish Civil War, and 1975, the end of the Franco dictatorship. Focus on all genres and their historical context.

SPAN 656. Spanish Literature after 1975. 3 Hours.

Survey of the major trends and representative authors and works of Spanish literature since the end of the Franco dictatorship.

SPAN 671. Latin American Women Writers. 3 Hours.**SPAN 672. Spanish Women Writers. 3 Hours.****SPAN 673. Hispanic Literature and Film. 3 Hours.****SPAN 674. Afrohispanic Literature. 3 Hours.**

The reading, discussion, and analysis of literature written by Hispanic authors of African descent.

SPAN 690. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of Spanish. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It also provides a mechanism for students not on assistantships to gain teaching experience. (Grading will be P/F.).

SPAN 691A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

SPAN 692A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

SPAN 693A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

SPAN 694A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

SPAN 695. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

SPAN 696. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

SPAN 697. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper, or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

SPAN 698. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

SPAN 699. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use of the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is P/F; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

SPAN 791A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

SPAN 930. Professional Development. 1-6 Hours.

Professional development courses provide skill renewal or enhancement in a professional field or content area (e.g. education, community health, geology). These tuition waived continuing education courses are graded on a pass/fail grading scale and do not apply as graduate credit toward a degree program.

SPECIAL EDUCATION COURSES**SPED 500. Legal/Educational Foundations: Special Education. 3 Hours.**

Comprehensive overview of legal requirements and educational practices related to exceptionalities which require special education.

SPED 513. Internship: Multicategorical Special Education K-6. 3 Hours.

PR: Consent. Internship or advanced student teaching for certification or additional endorsement to work with students with mild/moderate disabilities in grades K-6.

SPED 514. Internship: Multicategorical Special Education 5-Adult. 3 Hours.

PR: Consent. Internship or advanced student teaching for certification or additional endorsement to work with students with mild/moderate disabilities in grades 5-12.

SPED 561. Individualizing Academic Instruction for Special Needs. 3 Hours.

Planning, implementing and evaluating modifications to core academic curriculum in reading/literacy, mathematics, science and social studies; developing unit plans and lesson plans using Differentiated Instruction and Universal Design for Learning; designing individualized learning activities and instructional materials to teach academic content.

SPED 562. Designing Supportive Learning Environments for Special Needs. 3 Hours.

Designing and arranging learning environments that support diverse learners and promote inclusion of students with disabilities; using classroom settings, schedules, activities, and expectations to create a positive classroom climate and promote engagement in learning by students with and without special needs; using positive behavior supports to manage individual and group behaviors in the classroom.

SPED 563. Co-Planning/Co-Teaching for Inclusion for Special Needs. 3 Hours.

Developing successful working relationships with teacher colleagues, implementing models of professional collaboration and consultation in school settings; implementing models of co-teaching in classroom environments; coordinating planning and teaching activities for co-taught lessons; applying conflict management and problem resolution strategies to facilitate collaboration in inclusive schools.

SPED 564. Initial Professional Practice for Special Needs. 1 Hour.

Mentored initial classroom practice in applying evidence-based practices for students with disabilities related to individualized instruction, classroom and behavior management, and collaboration and consultation; guided self-assessment of and reflection on entry-level performance related to state teaching standards to inform professional development.

SPED 565. Promoting Academic Learning and Achievement for Special Needs. 3 Hours.

Designing, planning and implementing evidence-based practices and specialized instructional strategies for students with disabilities; conducting curriculum-based assessments to monitor student progress and evaluate achievement of learning outcomes in the core academic curriculum in reading/literacy, mathematics, science and social studies.

SPED 566. Individualizing Behavior Interventions for Special Needs. 3 Hours.

Developing and conducting functional behavior assessments to target inappropriate behaviors exhibited by students with disabilities; designing and implementing individualized Behavior Intervention Plans to promote student engagement and manage inappropriate behaviors in the classroom; collecting and interpreting data to assess effectiveness of Behavior Intervention Plans.

SPED 567. Collaborating for Effective Educational Programs for Special Needs. 3 Hours.

Legal and education foundations of special education services, including eligibility, placement, individual education programs, and collaborative programs; strategies for developing partnerships with families and collaborating with professionals from education and related services disciplines; team-based strategies for developing individualized education programs planning for transition into adulthood.

SPED 568. Advanced Professional Practice for Special Needs. 2 Hours.

Mentored advanced classroom practice in applying evidence-based practices for students with disabilities related to individualized instruction, classroom and behavior management, and collaboration and consultation; formal professional assessment of end-of-year performance related to state teaching standards to inform planning for future professional development.

SPED 591A-Z. Advanced Topics. 1-6 Hours.

PR:Consent. Investigation in advanced topics that are not covered in regularly scheduled courses.

SPED 593A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

SPED 600. Instructional/Assistive Technology. 3 Hours.

Characteristics and functions of instructional and assistive technologies; selection, design and implementation of devices for mobility, manipulation, environmental control communication, and learning; and legal mandates, ethical issues and policy initiatives in technology adoption and utilization.

SPED 601. Academic Interventions for Special Needs. 3 Hours.

Curriculum development and instructional programming across academic content areas for students with mild/moderate disabilities.

SPED 602. School-Based Assessment for Special Needs. 3 Hours.

Development of expertise in various forms of cognitive and effective assessment techniques, understanding psychoeducational needs of exceptional learners, and designing appropriate educational prescriptions from assessment protocols.

SPED 603. Classroom/Behavior Management for Special Needs. 3 Hours.

Theory and classroom application of procedures to implement behavior changes in children with mild/moderate disabilities and/or problems; effective group and individual behavior management.

SPED 604. Characteristics/Educational Adaptations: Developmental Disabilities. 3 Hours.

Characteristics and educational implications of physical, neurological, and sensory impairments; management strategies, adaptive equipment and assistive technology; and functional skills training programs for infants, toddlers and preschoolers with special needs and persons with severe disabilities.

SPED 605. Family/Professional Collaboration: Developmental Disabilities. 3 Hours.

Strategies and interpersonal skills for needs assessment, conferencing and training; parental involvement; interdisciplinary teaming interagency collaboration in educational programs for infants, toddlers, and preschoolers with special needs and persons with severe disabilities.

SPED 606. Communication and Literacy Intervention: Developmental Disabilities. 3 Hours.

Design and implementation of assessment, instruction and augmentative communication devices to promote learning of communication, oral language and early literacy skills by infants, toddlers and preschoolers with special needs and persons with severe disabilities.

SPED 607. Formal and Informal Assessment: Developmental Disabilities. 3 Hours.

Principles and practices of assessment, legal and ethical issues in assessment, and using assessment results to plan individualized educational programs for infants, toddlers, and preschoolers with special needs and persons with severe disabilities.

SPED 609. Technology Applications for Special Needs. 3 Hours.

Implementing computer-assisted and online instruction in the special education programs; technology tools for student learning and collaboration as well as teacher design and management of instruction.

SPED 610. Typical/Atypical Development: Early Intervention. 3 Hours.

Characteristics of atypically developing children from birth through age six; causes and correlates of developmental delays and disabilities and at risk conditions during the prenatal, perinatal and postnatal periods; and strategies for promoting child development in early intervention programs.

SPED 611. Early Learning Curriculum: Early Intervention. 3 Hours.

Design and evaluation of developmental and pre-academic curricula based on early learning standards and individualized family service or education plans for infants, toddlers, and preschoolers with special needs.

SPED 612. Responsive Intervention: Early Intervention. 3 Hours.

Design, delivery and evaluation of individualized instruction for infants, toddlers, and preschoolers with special needs using relationships and routines-based interventions to promote early development, parent-child interactions, and acquisition of pre-academic skills.

SPED 613. Inclusive Practices in Early Childhood Education Settings. 3 Hours.

Inclusive practices in early childhood education programs for children with developmental disabilities, delays and at risk conditions from three to eight years of age; pre-academic and social skills development with attention to designing curricula, individualized education programs, and evidence-based practices to foster pre-academic and social skills of individual learners with special needs in inclusive settings.

SPED 616. Behavior Guidance/Support: Early Intervention. 3 Hours.

Development guidance and positive behavior support for infants, toddlers and preschoolers with special needs in home-and center-based programs to foster emotion development social skills and appropriate behavior.

SPED 617. Birth to Three Services for Children and Families. 3 Hours.

Overview of services for infants and toddlers with disabilities or at risk and families, including assessment; natural environment; role and importance of family; routines-based intervention model; importance of quality interactions among caregivers and children; collaboration among family members, caregivers, and early intervention providers; and transition process.

SPED 619. Culminating Practicum: Early Childhood Special Education. 6 Hours.

PR: Consent. Internship or advanced student teaching in this area of specialization. Early intervention/early childhood special education.

SPED 620. Standards-Based Curriculum: Severe Disabilities. 3 Hours.

Design and evaluation of academic and functional curricula based on state content standards and individualized education and habilitation plans for children and adults with severe disabilities.

SPED 622. Instructional Programming: Severe Disabilities. 3 Hours.

Design, delivery and evaluation of individualized instruction for children and adults with severe disabilities to promote access to the general education curriculum and develop academic, social and functional skills in inclusive school and community environments.

SPED 625. Secondary/Adult Programs: Severe Disabilities. 3 Hours.

Education and habilitation in secondary and post-secondary programs for children and adults with severe disabilities in functional academics, vocational training, independent living, productive employment, community participation, recreation/leisure skills, and sexuality and aging.

SPED 626. Positive Behavior Support:Severe Disabilities. 3 Hours.

Strategies for functional analysis, prevention, intervention, and crisis management of self-injury, stereotypes, self-stimulation, noncompliance, and aggression; legal and ethical issues in management of problem behavior.

SPED 629. Culminating Practicum: Severe/Multiple Disabilities. 6 Hours.

PR: Consent. Internship or advanced student teaching in this area of specialization. Severe/Multiple Disabilities.

SPED 630. Intro Low Vision/Blindness. 3 Hours.

Vision impairments and their impact on development and learning; psychosocial aspects of vision loss for individual and family; functional vision assessment; legal and educational foundations of programs for individuals with low vision/blindness.

SPED 631. Introduction to Braille. 3 Hours.

Fundamentals of Braille code, employing Braille code for reading and writing, implements for production of Braille code, and uses of Braille code by individuals with low vision/blindness.

SPED 632. Braille Reading and Literacy Development. 3 Hours.

PR: SPED 631. Assessment of literacy skills; teaching of reading and writing, using print enhancements, assistive technologies and Braille; teaching Braille readiness and Braille reading and writing skills; development of literacy in individuals with low vision/blindness.

SPED 633. Nemeth Code and Mathematics Development. 3 Hours.

PR: SPED 631. Assessment of mathematics skills; teaching of computation and problem solving using print enhancements, assistive technologies and Nemeth code; teaching Nemeth code for mathematics and other areas; development of numeracy in individuals with low vision/blindness.

SPED 635. Teaching Students With Low Vision/Blindness. 3 Hours.

Classroom and itinerant teaching models; design and delivery of instruction in academic and functional skills and selection of methods, materials and environments to promote learning by individuals with low vision/blindness.

SPED 636. Teaching Students With Vision/Multiple Impairments. 3 Hours.

Service delivery models; design and delivery of instruction in academic and functional skills and selection of methods, materials and environments to promote learning by individuals with multiple impairments (vision impairments plus other impairments).

SPED 637. Basic Orientation and Mobility Skills. 3 Hours.

Environmental cues, environmental arrangement, travel skills and mobility aids as well as strategies for teaching individuals with low vision/blindness orientation and mobility skills for safety and independence.

SPED 639. Culminating Practicum: Low Vision/Blindness. 6 Hours.

PR: Consent. Internship or advanced student teaching in this area of specialization: low vision/blindness.

SPED 650. Learning Characteristics:Autism. 3 Hours.

Characteristics and educational implications of autism spectrum disorders, assessment of individual learning and behavior, and planning, implementing and collaborating in the design of programs and services for children and adults.

SPED 652. Educational Interventions: Autism. 3 Hours.

Design, delivery and evaluation of instruction for individuals with autism spectrum disorders, use of assistive technology and augmentative communication and implementation of functional behavior assessment and positive behavior support for children and adults.

SPED 653. Professional Ethics for Behavior Analysts. 3 Hours.

This course will provide for prospective behavior analysts a range of ethical principles and practices appropriate to governing self-guided professional activities, as well as those conducted for and with external agencies, service recipients, and their caregivers and families.

SPED 654. Foundations and Philosophies of Applied Behavior Analysis. 3 Hours.

The purpose of this course is to provide a philosophical and procedural foundation in the science and technology of behavior analysis. Course concepts will connect basic findings from behavioral research to fundamental treatment concepts and applications for professionals.

SPED 655. Naturalistic and Functional Analyses of Behavior. 3 Hours.

The purpose of this course will be instruction in the use of functional behavior assessment and functional analysis procedures, as well as the proper use of these procedures within the steps of creating and implementing effective, evidence-based programs of behavior change. Emphasis will be placed on connecting assessment results to the interventions most likely to produce desired, sustainable change.

SPED 656. Methods in Behavioral Intervention and Treatment. 3 Hours.

The purpose of this course will be to instruct students in the use of specific techniques for (a) applying the principles of operant conditioning, (b) adapting techniques for individual needs and preferences, (c) modifying behavior in applied settings, and (d) evaluating and adjusting intervention components for maximal effectiveness.

SPED 657. Systems for Behavior Change/Team Building/Case Management. 3 Hours.

This course will integrate the thoughtful use of behavior change systems (e.g., those that plan for sustainability and generalization) with procedures for training agency staff, families, and education professionals in the implementation of behavior support plans. Special emphasis will be placed on effectively and efficiently assessing procedural integrity, social validity, and the level of intrusiveness of behavioral treatments.

SPED 659. Culminating Practicum: Autism Spectrum Disorders. 6 Hours.

PR: Consent. Internship or advanced student teaching in this area of specialization: Autism spectrum disorders.

SPED 661. Transition Planning and Programs for Students with Disabilities. 3 Hours.

Laws, policies, and evidence-based practices related to transition for students with disabilities, including assessment, transition planning, and instructional methods to facilitate successful postsecondary enrollment, employment, daily living, social relationships, and community involvement.

SPED 662. Differentiating Instruction for English Language Learners with Disabilities. 3 Hours.

Overview of second language learning; characteristics and needs of individuals with disabilities when English is a second language; and evidence-based strategies for using universal design and differentiated instruction to plan, implement and evaluate instruction for K-12 students who have disabilities and are English Language Learners.

SPED 663. Collaborative-Consultative Inclusion Strategies. 3 Hours.

Strategies for building and maintaining effective collaborative teams for the inclusive environment. Communication, decision making, group dynamics, and conflict resolution will be discussed.

SPED 665. Mathematics for Special Needs. 3 Hours.

Comprehensive approach to mathematics instruction for students with mild/moderate disabilities, curriculum design and modifications, curriculum-based assessment of individual needs and learning outcomes, and research-based strategies to address special needs in mathematics.

SPED 666. Reading for Special Needs. 3 Hours.

Comprehensive approach to reading instruction for students with mild/moderate disabilities, curriculum design and modifications, curriculum-based assessment of individual needs and learning outcomes, and research-based strategies to address special needs in reading.

SPED 667. Elementary Content Methods. 3 Hours.

Elementary programs for students with mild/moderate disabilities, planning and delivering research-based intervention in reading, mathematics and written expression to address content standards and learning needs, and academic study survival skills.

SPED 668. Secondary Content Methods. 3 Hours.

Secondary and post-secondary programs for students with mild/moderate disabilities, planning and delivering research-based intervention in core content areas to address content standards and learning needs and development and implementation of transition plans.

SPED 669. Culminating Practicum: Multicategorical Special Education. 6 Hours.

PR: Consent. Internship or advanced student teaching in this area of specialization: multicategorical special education.

SPED 670. Introduction to Gifted Education. 3 Hours.

Introductory course concerning characteristics of gifted and talented children and implications these factors have for education. Definition, characteristics, history and philosophy of special programs, identification procedures, and development of program prototypes.

SPED 671. Gifted and High Ability Learners in Inclusive Classrooms. 3 Hours.

Characteristics of gifted and high academic ability students that create opportunities and challenges for learning in general education classrooms; differentiated instructional strategies to tailor academic curriculum content to individual needs; design of project-based learning for individual and group instruction; collaboration strategies to coordinate work of gifted education specialists and general education teachers at the elementary and secondary levels.

SPED 672. Teaching Strategies: Gifted Education. 3 Hours.

Development of qualitatively different educational experiences for gifted students. Models of differentiation in contents, process, and product in academic areas.

SPED 674. Support for Special Populations in Gifted Education. 3 Hours.

Emotional and social needs of students who are gifted and talented, strategies for designing instructional programs to foster emotional maturity and social relationships, and considerations for working with special populations of gifted and talented individuals.

SPED 675. Research to Practice. 3 Hours.

Identification of special education issues and action research strategies for investigating issues in educational practice.

SPED 676. Critical Thinking/Creativity in Gifted Education. 3 Hours.

Definition and rationale for promoting critical thinking and creativity skills in students who are gifted and talented; design of instructional activities to teach reasoning, problem solving, decision making, brainstorming, and creative problem solving.

SPED 679. Culminating Practicum: Gifted Education. 6 Hours.

PR: Consent. Internship or advanced student teaching in this area of specialization: gifted education.

SPED 680. Culminating Project. 6 Hours.

PR: Consent and completion of all required courses. Planning for and completion of an individualized project in applied research or curriculum development or program design to document integration of knowledge and skills across courses as the final requirement for completion of the Master's degree in special education. (6 hr. lec.).

SPED 685. Problem in Special Education. 3 Hours.

Research for master's degree in special education.

SPED 690. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in the college teaching of special education. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It also provides a mechanism for students not on assistantships to gain teaching experience. (Grading will be S/U.).

SPED 691A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

SPED 693A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

SPED 695. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

SPED 697. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

SPED 713. Designing Single Case Research. 3 Hours.

Measurement and design tactics for research with one or a small number of participants allowing the researcher to identify effective practices for individual students or clients.

SPED 767. Professional Product Preparation. 1 Hour.

Supervised experiences in planning and developing responses, preparing documentation, and responding to faculty feedback in the preparation of professional products for committee review.

SPED 768. Prospectus Development. 1-6 Hours.

Supervised experiences in planning the dissertation research project, developing the chapters for the prospectus, and preparing the proposal document for review by committee members.

SPED 769. Faculty Career Development. 1 Hour.

Supervised experiences in searching for available positions, preparing and submitting application materials, participating in campus interviews, and planning a successful future career.

SPED 770. Policy Analysis and Development. 3 Hours.

Advanced foundations of special education and disability services; historical trends and philosophical perspectives; policy review, analysis, research, and formulation; and advocacy roles and activities related to policy development.

SPED 771. Personnel Preparation Strategies. 3 Hours.

Design, delivery and evaluation of preparation programs in special education and disability services; observation, supervision and evaluation of student teaching and practicum experiences; issues and trends in special education personnel preparation.

SPED 772. Professional Writing and Grant Writing. 3 Hours.

Writing for professional publication in special education and disability services; review and editing of the written works of others; grant writing and review for private foundations or state and federal agencies.

SPED 773. Professional Development Models. 3 Hours.

Design, implement, and evaluate professional development for practitioners in special education and disability services, including induction and mentoring programs, peer and consultant coaching, in-service training for individuals and groups, and communities practice.

SPED 774. Analysis and Design of Research. 3 Hours.

Research literature in special education and disability services; integrative reviews and research critiques; formulation of research questions; translation of questions into appropriate research designs for participants with exceptionalities; preparation of research proposals.

SPED 775. Program Administration and Supervision. 3 Hours.

Planning/implementing service delivery for eligibility, placement, program planning, and assessment; developing/ managing budgets with multiple funding sources; staffing practices for hiring and monitoring personnel; communication and interaction skills for collaborative activities.

SPED 776. Leadership for System Change. 3 Hours.

Theories of leadership; current and evolving legislative mandates and service paradigms in special education and disability services; planning, implementing and evaluating systems change; collaborative, team building and conflict resolution during innovation.

SPED 779. Contemporary Issues and Trends. 3 Hours.

Analysis, discussion and research review of contemporary issues and trends in special education and disability services; selecting and defending a position on a variety of legal, ethical, social and programmatic issues.

SPED 781. Orientation to Doctoral Study. 1 Hour.

Introduction to doctoral study in special education; University, college, department and program option requirements; leadership roles/responsibilities for teacher education faculty or special education administrators/ supervisors; planning for committee selection and program of study preparation.

SPED 782. Professional Practice in Systems Advocacy. 1 Hour.

Supervised experience in advocating for change in current emerging areas of state and federal policy as it applies to special education or disability services.

SPED 783. Professional Practice in College Instruction. 1 Hour.

(May be repeated for a maximum of 3 hours.) Supervised experience in design, delivery, and evaluation of a college or university course in special education or disability services.

SPED 784. Professional Practice in Clinical Supervision. 1 Hour.

Supervised experiences in observing, supervising and evaluating student or practicing educator performance in a practicum setting in special education or disability services.

SPED 785. Professional Practice in Empirical Research. 1 Hour.

(May be repeated for a maximum of 3 hours.) Supervised experience in designing, conducting and reporting research using quantitative and/or qualitative methods in special education or disability services.

SPED 786. Professional Practice in Service Activities. 1 Hour.

Supervised experiences in planning, implementing and evaluating service activities at local, state and/or national levels in special education or disability services.

SPED 787. Professional Practice in Program Administration. 1 Hour.

Supervised experiences in operation and management of programs and services related to special education in school systems and/or disability services in community agencies.

SPED 788. Professional Practice in Personnel Support. 1 Hour.

Supervised experiences in instructional supervision and personnel evaluation in programs related to special education in school systems and/or disability services in community agencies.

SPED 789. Professional Practice in Evaluation Practices. 1 Hour.

Supervised experiences in needs assessment and program evaluations related to special education in school systems and/or disability services in community agencies.

SPED 790. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of special education. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on assistantships to gain teaching experience. (Grading will be S/U.).

SPED 791A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

SPED 792A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

SPED 793A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

SPED 794A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

SPED 795. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

SPED 796. Graduate Seminar. 1 Hour.

PR: Consent. Designed to permit graduate students an opportunity to present research to the assembled faculty and graduate student body. (Graded as S/U).

SPED 797. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or the equivalent scholarly project, or a dissertation (Grading may be S/U).

SPED 798. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

SPED 799. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is S/U; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

SPED 900. Professional Development. 1-6 Hours.

Professional development courses provide skill renewal or enhancement in a professional field or content area (e.g. education, community health, geology.) The continuing education courses are graded on a pass/fail grading scale and do not apply as graduate credit toward a degree program.

SPED 930. Professional Development. 1-6 Hours.

Professional development courses provide skill renewal or enhancement in a professional field or content area (e.g., education, community health, geology.) These tuition waived continuing education courses are graded on a pass/fail grading scale and do not apply as graduate credit toward a degree program.

SPORT MANAGEMENT COURSES**SM 616. Sport Marketing Research Methods. 3 Hours.**

PR: Graduate standing or consent. Application of the scientific method to sport marketing; emphasis on evaluating and conducting survey research in sport marketing; marketing project includes consumer behavior research in sport settings.

SM 621. Sport Publicity/Public Relations. 3 Hours.

The course provides an in-depth understanding of effective public relations and publicity in the sport organizational context. In particular, the course focuses on the communication modalities for sport information through public mediums.

SM 627. Legal Issues in Sport Administration. 3 Hours.

The NCAA, its rules, and its regulations: In-depth study of professional sport leagues, their constitution, by-laws, regulations, collective bargaining agreements, standard player contracts; legal issues involving sport agents.

SM 630. Sport Sponsorship and Sales Management. 3 Hours.

The project-based course develops an in-depth understanding of sport sponsorship and sales management processes including strategic communication, direct and indirect selling protocols, and brand development.

SM 635. Sport Management Processes. 3 Hours.

PR: Consent. Analysis of management processes utilized in sport businesses. A focus is on the planning, organization, leading, and evaluation processes that are unique to the sport industry. Discussion, debate, and position papers on these four management processes.

SM 640. International Sport Governance. 3 Hours.

This course is focused on ways in which sport is organized and managed internationally; it aims to foster critical thinking, research, exchange of ideas, and writing about governance.

SM 646. Sport Marketing. 3 Hours.

PR: Graduate standing. Advanced analysis of marketing sport enterprises, the marketing planning process, and marketing information systems.

SM 660. NCAA Compliance and Current Issues. 3 Hours.

PR: Graduate standing. An in-depth analysis of compliance issues impacting collegiate administrators and the NCAA.

SM 670. Sport Finance. 3 Hours.

PR: Graduate standing or consent. Financial operations and economic impact of scholastic, intercollegiate, and professional sport administration; concepts of budgeting, auditing, reporting, and computer use; current developments in the field.

SM 675. Fund-Raising. 3 Hours.

Provides information to raise money through sales and other financial means. Addresses needs at all sporting levels, from independent team fund-raising to fund-raising at the professional level.

SM 680. History and Philosophy of Sport. 3 Hours.

This course is designed to acquaint students with philosophical issues related to sport and sport management and with individuals and events that helped shape the history of sport.

SM 685. Internship in Sport Management. 1-6 Hours.

Sport management on-site working relationship with a sport organization to gain practical hands-on experience in a collegiate athletic organization, professional sport franchise, or variety of sport-related businesses.

SM 686. Facility Planning and Management. 3 Hours.

Acquaint students with the basic concepts in the areas of sport facilities: planning, design and construction, management, marketing, advertising and public relations and event operations.

SM 690. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of sport studies. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It also provides a mechanism for students not on assistantships to gain teaching experience. (Grading will be P/F.).

SM 691A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

SM 692A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

SM 693A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

SM 694A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

SM 695. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

SM 696. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

SM 697. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

SM 698. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

SM 699. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is P/F; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

SM 790. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of sport studies. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on assistantships to gain teaching experience. (Grading will be P/F.).

SM 791A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

SM 792A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

SM 793A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

SM 794A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

SM 795. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

SM 796. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

SM 797. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

SM 798. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

SM 799. Graduate Colloquium. 1-6 Hours.

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SPORT STUDIES COURSES**SS 722. Exercise and Health Psychology. 3 Hours.**

Major theories and techniques of health behavior change and health behavior assessment especially with respect to exercise.

SPORT AND EXERCISE PSYCHOLOGY COURSES**SEP 615. Research Methodology in Physical Education. 3 Hours.**

PR: Graduate standing or consent. Application of historical, descriptive, and experimental research strategies and designs to physical education. (Also listed as PET 615.).

SEP 620. Individual Interaction in Sport and Physical Activity. 3 Hours.

PR: SEP 615. Designed to acquaint the student with the reciprocal relationships between sport and physical activity and the societies and culture from which sport emerges.

SEP 640. Psychology of Sport and Physical Activity. 3 Hours.

PR: SEP 615. Psychological effects and implications of participation in sport and physical activity. Emphasis is on the personality and behavior and motivational dynamics of sport involvement.

SEP 647. Supervision Sport Psychology. 1-6 Hours.

Supervision of graduate-level applied sport psychology consultation.

SEP 686. Internship in Sport and Exercise Psychology. 1-6 Hours.

PR: Graduate student status in SEP PhD Program. Sport behavior supervised experiencing various aspects of sport psychology teaching, research, and/or practice at on-campus or off-campus sites.

SEP 690. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of sport studies. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It also provides a mechanism for students not on assistantships to gain teaching experience. (Grading will be P/F.).

SEP 691A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

SEP 692A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

SEP 693A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

SEP 694A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

SEP 695. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

SEP 696. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

SEP 697. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

SEP 698. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

SEP 699. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is P/F; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

SEP 719. Group Influences in Sport. 3 Hours.

PR: SS 640. An examination of how and why behavior and performance are affected by interactions with others in sport. An emphasis is placed upon group functioning.

SEP 720. Psychological Sport Performance Enhancement. 3 Hours.

An in-depth examination of commonly used interventions designed to maximize the performance of individual athletes and teams.

SEP 721. Counseling College Student-Athletes. 3 Hours.

An exploration of psycho-social aspects of college student- athletes' life experiences and common counseling concerns to include individual and systems intervention used to assist this at-risk group.

SEP 722. Exercise and Health Psychology. 3 Hours.

Major theories and techniques of health behavior change and health behavior assessment especially with respect to exercise.

SEP 723. Psychological Aspects of Sport Injury. 3 Hours.

Explores the psychosocial antecedents to athletic injury and factors related to the psychological experience and treatment of the injured athlete.

SEP 726. Advanced Measurement and Research in Physical Education. 3 Hours.

PR: SS 615. Extension and application of basic concepts of measurement and statistical evaluation to physical education.

SEP 727. Ethical/Legal Issues in sport Psychology. 3 Hours.

Graduate-level seminar on ethical and legal aspects of research, teaching and practice in sport and exercise psychology.

SEP 765. Dissertation and Thesis Seminar. 3 Hours.

PR: Graduate standing. Critical analysis of the graduate student's dissertation or research proposal. (Required for all doctoral students.).

SEP 790. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of sport studies. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on assistantships to gain teaching experience. (Grading will be S/U.).

SEP 791A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

SEP 792A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

SEP 793A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

SEP 794A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

SEP 795. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

SEP 796. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

SEP 797. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

SEP 798. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

SEP 799. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is P/F; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

STATISTICS COURSES

STAT 505. Foundations of Probability and Statistics. 3 Hours.

PR: MATH 156 or consent. Probability, random variables, discrete and continuous probability distributions, point and interval estimation, chi-square tests, linear regression, and correlation.

STAT 511. Statistical Methods 1. 3 Hours.

PR: MATH 126. Statistical models, distributions, probability, random variables, tests of hypotheses, confidence intervals, regression, correlation, transformations, F and Chi-square distributions, analysis of variance and multiple comparisons. (Equivalent to EDP 613 and PSYC 511.).

STAT 512. Statistical Methods 2. 3 Hours.

PR: STAT 511 or equivalent. Completely random, randomized complete block, Latin square, and split-plot experimental designs. Unplanned and planned multiple and orthogonal comparisons for qualitative and quantitative treatments and factorial arrangements. Multiple linear regression and covariance analysis. (Equivalent to EDP 614 and PSYC 512.).

STAT 513. Design of Experiments. 3 Hours.

PR: STAT 512 or equivalent. Expected mean squares, power of tests and relative efficiency for various experimental designs. Fixed, random, and mixed models. Use of sub-sampling, covariance, and confounding to increase power and efficiency.

STAT 516. Forensic Statistics. 3 Hours.

PR: STAT 215 or equivalent. Probabilistic and statistical evaluation of evidence in forensic science: concepts of uncertainty variation, discriminating power, coincidence/significance probabilities, historical overview, transfer evidence, DNA profiling, fingerprint identification, biometric identification, and case studies.

STAT 521. Statistical Analysis System Programming. 3 Hours.

PR: STAT 511 or equivalent. Topics in Statistical Analysis System (SAS). Students perform statistical data analyses, data modifications and manipulations, file operations, and statistical report writing. Prepares students for the SAS Base Programming certification exam.

STAT 522. Advanced Statistical Analysis System Programming. 3 Hours.

PR: STAT 521 or consent. Advanced topics in Statistical Analysis System (SAS); SAS SQL to generate reports, join tables, construct queries; SAS Macrolanguage basics; write/implement SAS macro programs. Prepares students for SAS Advanced Programmer Certification Exam.

STAT 523. Statistical Computing. 3 Hours.

PR: STAT 512. Monte Carlo methods; randomization, partitioning, and the bootstrap; identifying data structures, estimating functions, including density functions; statistical models of dependencies. R programming.

STAT 525. Statistical Graphics. 3 Hours.

PR: STAT 512. Introduction to R graphics; traditional graphs; the grid graphics model; lattice graphics; developing new graphics functions and objects in R. Visualizing large datasets.

STAT 531. Sampling Theory and Methods. 3 Hours.

PR: STAT 511 or consent. Survey components, methods of sampling for finite and infinite populations, single and multi-stage procedures, confidence limits for estimating population parameters, sample size determination, area sampling sources of survey error, and basic inference derived from survey design.

STAT 540. Introduction to Exploratory Data Analysis. 3 Hours.

PR: An introductory statistics course. Basic ways in which observations given in counted and measured form are approached. Pictorial and arithmetic techniques of display and discovery. Methods employed are robust, graphical, and informal. Applications to social and natural sciences. (Alternate years.).

STAT 541. Applied Multivariate Analysis. 3 Hours.

PR: STAT 511 or equivalent. Introduction to Euclidean geometry and matrix algebra; multiple and multivariate regression including multiple and canonical correlation; the k-sample problem including discriminant and canonical analysis; and structuring data by factor analysis, cluster analysis, and multi-dimensional scaling.

STAT 543. Bioinformatics Data Analysis. 3 Hours.

PR: STAT 512 or equivalent. Statistical analyses of high-throughput experiments using data visualization, clustering, multiple testing, classification and other unsupervised and supervised learning methods. Data processing, including background adjustment and normalization. Case studies.

STAT 545. Applied Regression Analysis. 3 Hours.

PR: STAT 512 or equivalent. Matrix approach to linear and multiple regression, selecting the best regression equation, model building, and the linear models approach to analysis of variance and analysis of covariance.

STAT 547. Survival Analysis. 3 Hours.

PR: STAT 512. Survival model methodology, including model selection for incomplete data with censored, truncated, and interval censored observations. Applications to many real life problems using R.

STAT 551. Nonparametric Statistics. 3 Hours.

PR: STAT 511 or equivalent. Distribution-free procedures of statistical inference. Location and scale tests for homogeneity with two or more samples (related or independent); tests against general alternatives. (Alternate years.).

STAT 555. Categorical Data Analysis. 3 Hours.

PR: STAT 512 or equivalent. Bivariate association for ordinal and nominal variables, models for categorical or continuous responses as a special case of generalized linear models, methods for repeated measurement data, exact small-sample procedures.

STAT 561. Theory of Statistics 1. 3 Hours.

PR: MATH 251. Probability and random variables, univariate and multivariate distributions, expectations, generating functions, marginal and conditional distributions, independence, correlation, functions of random variables, including order statistics, limiting distributions, and stochastic convergence.

STAT 562. Theory of Statistics 2. 3 Hours.

PR: STAT 561. Techniques of point and interval estimation; properties of estimates including bias, consistency, efficiency, and sufficiency; hypothesis testing including likelihood ratio tests and Neyman-Pearson Lemma; Bayesian procedures; analysis of variance and nonparametrics.

STAT 582. Statistical Consulting. 1 Hour.

PR: STAT 513 or Consent. Statistical consulting principles and procedures. The entire consulting experience, including design, models, communication skills, ethics, tracking, and documentation, is presented in a series of case studies, including student presentations and reports on assigned cases.

STAT 590. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of statistics. Note: This courses is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on assistantships to gain teaching experience. (Grading may be S/U.).

STAT 591A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation in advanced topics not covered in regularly scheduled courses.

STAT 593A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

STAT 595. Independent Study. 1-6 Hours.

STAT 595. Independent Study. 1-6 HR. Faculty supervised study of topics not available through regular course offerings.

STAT 623. Data Technologies. 3 Hours.

PR: STAT 512 or consent. R data manipulation and processing. Topics include: R operators, functions, data structures, and objects; R data input and output, package development, and text processing; R interfaces to XML and SQL databases.

STAT 624. High Performance Analytics. 3 Hours.

PR: STAT 623. High performance and data-stream computing using R. Topics include: parallel R packages; Hadoop clusters; MapReduce R scripting; shared R network spaces; beyond-memory data analysis; data-stream modeling and visualization.

STAT 641. Multivariate Statistical Theory. 3 Hours.

PR: STAT 541, and STAT 561 or consent. Euclidean vector space theory and matrix algebra, multivariate normal sampling theory, the theory of the multivariate general linear hypothesis including multivariate regression, MANOVA, and MANCOVA, and the theory of factor analysis.

STAT 645. Linear Models. 3 Hours.

PR: STAT 545 and STAT 362 or consent. Multivariate normal distribution, distribution of quadratic forms, linear models, general linear hypotheses, experimental design models, components of variance for random effects models.

STAT 682. Statistics Practicum. 1 Hour.

PR: STAT 582. Statistical consulting on university-related research projects under the direction of a statistics faculty member.

STAT 689. Professional Field Experience. 1-6 Hours.

PR: Consent. (May be repeated up to a maximum of 18 hours). Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

STAT 690. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of statistics. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It also provides a mechanism for students not on assistantships to gain teaching experience. (Grading may be S/U.).

STAT 691A-Z. Advanced Topics. 0-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

STAT 692A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

STAT 693A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

STAT 694A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

STAT 695. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

STAT 696. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

STAT 697. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U).

STAT 698. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

STAT 699. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use of the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is P/F; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement in the semester in which graduation occurs.

STAT 745. Data Mining. 3 Hours.

PR: STAT 545 or equivalent. Development of predictive models for large datasets, including logistic and linear models, regression and classification trees, and neural networks. Data preparation, including imputation and filtering.

STAT 761. Theoretical Statistics 1. 3 Hours.

PR: STAT 562 or consent. Advanced statistical theory including: consistent estimators; limiting distributions; asymptotic properties; goodness-of-fit tests; maximum likelihood estimation, moment generating functions; properties of statistical tests and procedures for finite-dimensional and infinite-dimensional spaces.

STAT 762. Theoretical Statistics 2. 3 Hours.

PR: STAT 761. Continuation of STAT 761 including: asymptotic optimality, contiguity of probability measures, local asymptotic normality of likelihood ratio test, Bayesian estimation, general linear models estimation and testing, and kernel smoothing methods in density and regression estimation.

STAT 763. Stochastic Processes. 3 Hours.

PR: STAT 561. Modeling of random phenomenon occurring over time, space, or time and space simultaneously. Modern techniques, such as the martingale decomposition, are applied to different statistical models.

STAT 765. Statistical Methods-Bioinformatics. 3 Hours.

PR: STAT 561. Constructions of probabilistic models describing biological DNA and protein sequence data. Investigation of asymptotic properties of various test statistics.

STAT 791A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

STAT 797. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading will be S/U).

STRATEGIC COMMUNICATION COURSES**STCM 521. Advertising and Public Relations Research. 3 Hours.**

this course introduces students to the multi-faceted world of advertising and public relations research, and the array of complex tools used to produce meaningful results. (Also listed as STCM 421).

STCM 559. Strategic Communication and Public Relations Campaigns. 3 Hours.

Graduate students develop a Strategic Communication campaign in real-world environment and conduct research on a real-life advertising campaign issue. (Also listed as STCM 459.).

SURGERY COURSES**SURG 741. Clinical Clerkship in Surgery. 8 Hours.**

SURG 741. Clinical Clerkship in Surgery. (Third year.) PR: Required of third-year medical students. Clinical clerks are assigned responsibility for hospitalized surgical patients under supervision of house staff and attending surgeons. Students are an integral part of the team providing diagnostic and treatment services and are expected to take histories, perform physical examinations, and participate in ward and laboratory procedures. A course of surgical lectures, designed to outline surgical core curriculum, is given concurrently. The student is expected to attend the daily rounds and conferences arranged by the department.

SURG 791A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

SURG 797. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

SURG 799. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use of the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is S/U; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

THEATRE COURSES**THET 520. Principles of Stage Lighting. 2 Hours.**

An exploration of lighting as a creative tool with emphasis on design development and equipment.

THET 523. Costume Crafts Studio. 3 Hours.

This course will allow the graduate student to pursue research and intensive projects in the area of costume crafts through course work and lecture.

THET 540. Graduate Vocal Techniques. 2 Hours.

In-depth vocal work, with special care taken to address each actor's individual qualities, beginning with breath, alignment, and release of habitual tension. Open resonance and free articulation to support the actor's voice.

THET 541. Graduate Voice Techniques. 2 Hours.

PR: THET 540. Continue the work introduced in THET 540 with text exploration. Introduce the International Phonetic Alphabet (IPA) and structure.

THET 542. Graduate Stage Movement 1. 2 Hours.

Study of human movement in performance, including basic body awareness and anatomy, as well as Viewpoints and Suzuki training.

THET 543. Graduate Stage Movement 2. 2 Hours.

PR: THET 542. An intensive study of compositional techniques through the development of original performance materials using movement as a basis. Will include a study of the history of theatrical performance art works and artists.

THET 544. Graduate Acting Studio 1. 3 Hours.

Foundation of the craft of acting including sensory elements ensemble building, environment, personalization, imagination, communication, conflict, and audition skills. Concentration is on modern and contemporary theatre.

THET 545. Graduate Acting 2. 3 Hours.

PR: THET 544. Exploration of acting techniques applicable to late 19th century, early 20th century European playwrights.

THET 546. Graduate Scene Study 1. 1 Hour.

The presentation of scenes before a panel of acting, voice and movement faculty for critique. May be repeated four times for credit.

THET 547. Graduate Scene Studio 2. 1 Hour.

PR: THET 546. The presentation of scenes chosen from Shakespeare and other plays of heightened text, before a panel of acting, voice, and movement faculty for critique.

THET 590. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of theatre. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It also provides a mechanism for students not on assistantships to gain teaching experience. (Grading will be P/F.).

THET 591A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses. Study may be independent or through specially scheduled lectures.

THET 592A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

THET 593A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

THET 594A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

THET 595. Independent Study. 1-6 Hours.

Faculty-supervised study of topics not available through regular course offerings.

THET 600. Graduate Production Practicum. 1 Hour.

PR: Consent. (May be repeated for a maximum of 6 credit hours.) Participation in assigned performance or production projects.

THET 610. Research Methods. 3 Hours.

Methods of production research for graduate students in acting and design, with particular emphasis on writing, library use, and manuscript preparation.

THET 613. Stage Management. 3 Hours.

An exploration of stage managers' techniques, skills, and responsibilities through exercises, research into the profession, and experience stage managing an actual production.

THET 615. Graduate Portfolio Development. 3 Hours.

Lab course on the techniques of portfolio development, focusing on both digital and traditional portfolio formats and related general techniques of graphic and image preparation.

THET 621. Graduate Theatre Make-up. 2 Hours.

PR: Consent. Lecture/laboratory course exploring practical and physical applications of a stage character with makeup. In-depth study of facial anatomy and potential alterations through two- and three-dimensional appliances.

THET 622. Graduate Scene Design. 3 Hours.

Graduate-level study of scenic design including conceptualization, mechanical perspective, drafting, model building, and color rendering. Emphasis placed on translating the script into a visual design.

THET 623. Advanced Graduate Scene Design. 3 Hours.

PR: THET 622. Continued study of conceptualization and techniques of presentation used in the creation of scenic environments. Emphasis on alternative forms including opera, ballet, display, and industrial venues. (May be repeated for a maximum of 9 credit hours.).

THET 624. Graduate Costume Design 1. 3 Hours.

Intensive study of basic design elements as applied to costume design. Script analysis leading to conceptualization and communication through visual language. Experience in practical organization skills, paperwork, and budgeting. Studio/rendering work.

THET 625. Graduate Lighting Design. 3 Hours.

PR: THET 427 or consent. (May be repeated for a maximum of 9 credit hours.) Lecture/studio; intensive practical experience of lighting design for the theatre. Emphasis is placed on conceptualization, drafting, and rendering techniques related to the development and presentation of lighting design.

THET 626. Graduate Costume Design 2. 3 Hours.

PR: THET 624. Intensive studio/practical study of costume design. Exploring conceptual process of design for text, movement, dance, opera, and puppetry. Emphasis on rendering, composition, and fabric applications. (May be repeated for maximum of 6 credit hours.).

THET 627. Graduate Costume and Decoration 1. 3 Hours.

A historical survey of clothing, artistic style, and decoration from ancient Egypt to 1750. Emphasis on how stage designers employ period style in the design of costumes, scenery, and properties. (Field trip required.).

THET 628. Graduate Costume and Decoration 2. 3 Hours.

A historical survey of clothing, artistic style, and decoration from 1750 to the present. Emphasis on how stage designers employ style in the design of costumes, scenery, and properties. (Field trip required.).

THET 629. Graduate Computer Assisted Design Seminar. 3 Hours.

PR: THET 631 and THET 622 or consent. Advanced study of the computer- assisted graphic design for the stage.

THET 630. Graduate Rendering Techniques. 3 Hours.

This course allows the graduate student to explore and develop rendering techniques for scenic, costume and lighting designs. Students will work in watercolor, acrylic, marker, and other media.

THET 631. Graduate Drafting for the Stage. 3 Hours.

Advanced techniques in drafting in accordance with current graphic standards for stage design and technology. Refinement of technique and graphic style through projects and exercises.

THET 633. Graduate Stage Properties. 3 Hours.

An advanced studio course on the creation and organization of properties for the stage covering materials and construction techniques as well as research methods and keeping accurate paperwork.

THET 635. Graduate Scene Painting. 3 Hours.

Course will provide scene painting skills needed in the execution of any kind of scene design and art skills that crossover into rendering and design. Scene painting skill enhances the artistic range and marketability of scene designers and technicians.

THET 636. Advanced Stagecraft. 3 Hours.

Study and research into advanced technical procedures including welding, materials, wood joinery, and practical construction problem solving. Emphasis on the practices and development of skills through projects.

THET 640. Advanced Graduate Vocal Techniques. 2 Hours.

PR: THET 541 or consent. Intensive vocal exploration with Shakespearean text, character choices, and dialect work.

THET 641. Advanced Graduate Vocal Techniques 2. 2 Hours.

PR: THET 640 or consent. Continuation of THET 640 with emphasis on period style texts, vocalization during emotionally intense scenes and fights. Includes technical analysis of text with attention to screaming, crying, and other moments of emotional intensity.

THET 642. Advanced Graduate Stage Movement. 2 Hours.

PR: THET 543 or consent. Advanced study of movement techniques for character work, including rhythms of basic language/movement connections and period styles of movement.

THET 643. Advanced Graduate Stage Movement 2. 1 Hour.

PR: THET 642 or consent. Continuation of THET 642 through work on directed projects; special topics in issues related to physicality in performance.

THET 644. Advanced Graduate Acting Studio 1. 3 Hours.

PR: THET 545. Continued exploration of the acting process focusing on heightened text and issues of period and style using the works of William Shakespeare.

THET 645. Advanced Acting Studio. 3 Hours.

PR: THET 644. Exploration of acting techniques specific to comedy, comedy of manners, physical comedy and sketch comedy.

THET 650. Graduate Study in Musical Theatre. 2 Hours.

PR: THET 645. Advanced musical theatre performance study with solos and scenes focusing on Stanislavski principles of objective and action along with interpretation choices within music composition.

THET 651. Graduate Acting for the Camera. 2 Hours.

PR: THET 645. Exploration of the principles of acting for the camera using multiple on-camera acting exercises. The course includes performance as well as audition skills.

THET 680. Dramatic Theory and Criticism. 3 Hours.

A survey of the major documents addressing the theories of drama and theatre from the ancient Greeks to the present.

THET 690. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of theatre. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It also provides a mechanism for students not on assistantships to gain teaching experience. (Grading will be P/F.).

THET 691A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses. Study may be independent or through specially scheduled lectures.

THET 692A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

THET 693A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

THET 694A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

THET 695. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

THET 696. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

THET 697. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

THET 698. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

THET 699. Graduate Colloquium. 1-6 Hours.

THET 699. Graduate Colloquium. 1-6 hr. PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is P/F; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

THET 712. Entertainment Rigging. 3 Hours.

Examines the tools, equipment, hardware, and safety practices in the entertainment industry. Rigging exploration ranges from traditional theatrical houses to concert settings.

THET 720. Seminar in Production Research. 3 Hours.

PR: THET 610 and THET 622 or THET 626 or THET 625. Seminar approach to individual design projects with oral and written presentations of research materials. Intensive critique within class by faculty and peers.

THET 721. Professional Aspects of Design. 3 Hours.

PR: THET 622 and THET 624 and THET 625. An in-depth work in the packaging and presentation of the design portfolio, resume writing, and job opportunities. Emphasis is placed on methods of making a successful transition from an academic environment into the performance industry.

THET 725. Portfolio Development. 1 Hour.

Independent studio work supervised by faculty mentor to prepare the designer portfolio for professional presentations and interviews.

THET 726. Graduate Automation. 3 Hours.

PR: THET 629. Graduate Automation is the exploration of motorized equipment used in the arts and how it can be utilized for production purposes. Topics from electricity to mechanical design will be discussed.

THET 740. Advanced Graduate Vocal Techniques 3. 2 Hours.

PR: THET 640. The student will focus on more advanced dialect and vocal techniques to refine and ready the student's skills for the professional world. Microphone techniques will be introduced as well as development of voiceover techniques and copy.

THET 750. Graduate Showcase 1. 1 Hour.

PR: THET 645. Preliminary preparation for Graduate Actor's Showcase. The showcase gives the graduating MFA actor the opportunity to demonstrate his/her skills for an audience of professional agents, casting directors, producers, and directors.

THET 751. Showcase Development. 2 Hours.

PR: THET 624. Using skills learned in monologue and scene work, students will develop a performance of selected works, develop a mailing list of professional agents, and perform two showcases.

THET 771. Contemporary Theatre Organizations. 3 Hours.

PR: THET 610. This course studies the philosophical and organizational structure of modern and contemporary theatres (1898-present). The class will function as a graduate seminar.

THET 790. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of theatre. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on assistantships to gain teaching experience. (Grading will be P/F.).

THET 791A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation in advanced topics not covered in regularly scheduled courses. Study may be independent or through specially scheduled lectures.

THET 792A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

THET 793A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

THET 794A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

THET 795. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

THET 796. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

THET 797. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

THET 798. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

THET 799. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is P/F; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

THET 900. Professional Development. 1-6 Hours.

Professional development courses provide skill renewal or enhancement in a professional field or content area (e.g., education, community health, geology). The continuing education courses are graded on a pass/fail grading scale and do not apply as graduate credit toward a degree program.

THET 930. Professional Development. 1-6 Hours.

Professional development courses provide skill renewal or enhancement in a professional field or content area (e.g., education, community health, geology). These tuition waived continuing education courses are graded on a pass/fail grading scale and do not apply as graduate credit toward a degree program.

VETERINARY SCIENCE COURSES**VETS 691A-Z. Advanced Topics. 1-6 Hours.**

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

VETS 693A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

VETS 697. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

WV UNIVERSITY EXPERIENCE COURSES**WVUE 690. Teaching Practicum. 1-3 Hours.**

PR: Consent. Supervised practice in college teaching of WVUE. This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It also provides a mechanism for students not on assistantships to gain teaching experience. (Grading will be S/U).

WILDLIFE AND FISHERIES MGMT COURSES**WMAN 512. Advanced Wildlife Population Ecology. 3 Hours.**

PR: WMAN 313 or equivalent, or consent. Case history approach to wildlife population ecology with emphasis on ungulates, gallinaceous birds, large predators; forest invertebrates and their vertebrate predators; endangered species; genetics and conservation of wildlife populations. Emphasis on current and historical literature. (3 hr. lec.).

WMAN 534. Ecology and Management of Upland Wildlife. 4 Hours.

PR: Consent. Ecology and management of upland game birds and mammals with emphasis on recent literature. (Offered in fall of even years.).

WMAN 536. Ecology and Management of Wetland Wildlife. 4 Hours.

PR: Consent. Ecology and management of waterfowl and wetland fur bears with emphasis on recent research and management literature.

WMAN 547. Applied Wetlands Ecology and Management. 3 Hours.

The management and ecology of wetland vegetation, soils, hydrology, and wildlife. (Cross listed as CE 547 and PLSC 547.).

WMAN 550. Fish Ecology. 3 Hours.

PR: WMAN 445. Study of the interrelations between fish and the biotic and abiotic environment and the influence of these interactions upon fisheries. Includes trophic dynamics, reproductive ecology, predatory-prey interactions, and anthropogenic factors.

WMAN 630. Conservation Genetics. 3 Hours.

Study of population genetic concepts relevant to small fish and wildlife populations, with a focus on interpretation of the management implications of genetic data and current application of conservation genetics.

WMAN 633. Quantitative Ecology. 3 Hours.

PR: STAT 511 or equivalent, and WMAN 313 or equivalent. A survey of techniques and strategies for the quantitative analysis of complex ecological data sets.

WMAN 639. Conservation Biology. 3 Hours.

Discussion of current topics in conservation biology, the applied science of maintaining earth's biological diversity. Emphasis is on current literature with some guest lectures by topic experts.

WMAN 640. Fish Physiology. 3 Hours.

This course will cover all of the physiological systems in fish. Included are sensory, digestive, circulatory, nervous and endocrine, feeding, osmoregulation, movement, reproduction, and development systems.

WMAN 641. Aquatic Toxicology. 3 Hours.

Class will cover toxicity testing, the environmental fate of contaminants and toxicological assessment. The class will emphasize fish toxicity.

WMAN 642. Advanced Fish Management. 3 Hours.

Class covers important topics in fisheries assessment and management. Primary areas discussed include fish sampling, indices, and exploitation and harvest regulations.

WMAN 643. Advanced Ichthyology. 3 Hours.

An in-depth study of fishes, with emphasis on ecology, morphology, systematics, and zoogeography. Identification of fishes within the Appalachian region is emphasized through lab and field study.

WMAN 644. Wildlife Data Analysis 1. 3 Hours.

This course will cover data interpretations, statistical power, data techniques, use of correct data methods and alternatives, and interpretation of results.

WMAN 645. Wildlife Data Analysis 2. 3 Hours.

PR: WMAN 644. This course will cover statistical power and sample size, selection of proper methods, identify assumptions of methods and use of proper alternatives, and identify results.

WMAN 691A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

WMAN 692A-Z. Directed Study. 0-6 Hours.

Directed study, reading, and/or research.

WMAN 693A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

WMAN 694A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

WMAN 695. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

WMAN 696. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

WMAN 697. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

WMAN 770. Wildlife Seminar. 1 Hour.

Per semester; PR: Consent. May be repeated for a maximum of 4 credit hours.) Discussion of current developments in wildlife management.

WMAN 790. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in the college teaching of wildlife and fisheries management. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on assistantships to gain teaching experience. (Grading will be S/U.).

WMAN 791A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

WMAN 792A-Z. Directed Study. 1-6 Hours.

Directed study, reading and/or research.

WMAN 793A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

WMAN 797. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading will be S/U.).

WMAN 798. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

WMAN 799. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use of the University's facilities and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is S/U; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

WMAN 900. Professional Development. 1-6 Hours.

Professional development courses provide skill renewal or enhancement in a professional field or content area (e.g., education, community health, geology). The continuing education courses are graded on a pass/fail grading scale and do not apply as graduate credit toward a degree program.

WOMEN AND GENDER STUDIES COURSES

WGST 530. Feminist Theory. 3 Hours.

Explores feminist theory through works of diverse scholars, focusing on questions of essentialism, difference, sexuality, bodies, language, power, economic and ecological justice; intersections of race, class, and gender, as well as global social justice struggles.

WGST 592A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

WGST 593A-Z. Special Topics. 1-6 Hours.

PR: Consent. A study of contemporary topics selected from recent developments in the field.

WGST 595. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

WGST 693A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

WGST 694A-Z. Seminar. 1-6 Hours.

Seminars arranged for advanced graduate students.

WGST 790. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of women's studies. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on assistantships to gain teaching experience. (Grading will be S/U.).

WGST 791A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

WGST 792A-Z. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

WGST 793A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

WGST 794A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

WGST 795. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

WGST 796. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

WGST 797. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

WGST 798. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

WGST 799. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use of the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is P/F; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

WOOD SCIENCE COURSES**WDSC 540. Advanced Physical Behavior of Wood. 3 Hours.**

PR: WDSC 340 or equivalent or consent. Physical relationships of water and wood; fluid flow through wood; thermal, electrical, and acoustical behavior of wood. Theories of wood drying and their application.

WDSC 555. Computer Applications in Forest Resource Management. 3 Hours.

Computer programming/system modeling in forest resource management. Emphasis on basic programming/modeling skills and application examples in forest operations, management, and engineering.

WDSC 623. Anatomy of North American Wood. 3 Hours.

Anatomy and identification of commercially important North American woods. For students who have not completed a course in the anatomy of American woods.

WDSC 690. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in the college teaching of wood science. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It also provides a mechanism for students not on assistantships to gain teaching experience. (Grading will be S/U.).

WDSC 691A-Z. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

WDSC 692A-Z. Directed Study. 1-6 Hours.

Directed study, reading and/or research.

WDSC 693A-Z. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

WDSC 694A-Z. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

WDSC 695. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

WDSC 696. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

WDSC 697. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading will be S/U.).

WDSC 698. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

WDSC 699. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking course work credit but who wish to meet residency requirements, use of the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is S/U; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

WDSC 796. Graduate Seminar. 1 Hour.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

WDSC 797. Research. 1-15 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

WDSC 798. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

WDSC 930. Professional Development. 1-6 Hours.

Professional development courses provide skill renewal or enhancement in a professional field or content area (e.g., education, community health, geology.) These tuition-waived continuing education courses are graded on a pass/fail grading scale and do not apply as graduate credit toward a degree program.