Nutritional and Food Sciences

Peter Schaeffer, Division Director of Animal and Nutritional Sciences
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Degree Offered

• Master of Science

Nature of the Program

The master of science in nutritional and food science in the Davis College of Agriculture, Natural Resources and Design allows maximum flexibility in courses and research problems. They may work with with issues in human health and nutrition. Research problems in human nutrition issues form the basis for many studies, but a comparative approach is emphasized. A master of science degree is available as a thesis or coursework option. For additional information, contact Dr. Hillar Klandorf, at (304) 293-1897 or Hillar.Klandorf@mail.wvu.edu.

The division offers the graduate dietetic internship program as a component of the masters of science degree program (see below). For additional information, contact Ms. Nettie Freshour at (304) 293-2651 or Nettie.Freshour@mail.wvu.edu.

Graduate Dietetic Internship

The Graduate Dietetic Internship is a two-year combined master’s/internship program for individuals who have completed at least a bachelor’s degree, as well as the Accreditation Council for Education in Nutrition and Dietetics (ACEND) coursework requirements from a Didactic Program in Dietetics (DPD). The dietetic internship provides the supervised practice experience that is required to be eligible to take the registration examination for dietitians. The combined program offers interns the opportunity to complete a Master of Science degree in addition to the required supervised practice component. There is a thesis as well as a non-thesis option for the master’s degree. The program will provide interns with at least 1,200 hours of supervised practice experience. For additional information contact the program director Ms. Nettie Freshour at (304) 293-2651 or Nettie.Freshour@mail.wvu.edu.

Admissions

Requirements are similar to those in other biological sciences. The student should have completed basic courses in the physical and biological sciences, including genetics, nutrition, and physiology. Deficiencies may prolong the time needed to complete degree programs.

Applications must be submitted by October 15 for fall semester and March 15 for spring semester for the M. S. in Nutrition and Food Science. A composite graduate record examination score of 1,000 or better will be considered as a basis for admission. Meeting the above requirements shall not guarantee the applicant admission since each professor will accept only the number of students that can be supervised adequately with available facilities, time, and funds.

A candidate for the M.S. degree in Nutritional and Food Science must meet all University, College, Division, and Program requirements as outlined in the WVU Graduate Catalog.

Program Requirements

All M.S. degree candidates are required to follow a planned program of study. The student develops the plan of study during their first year in the program in conjunction with the graduate committee. The plan must be approved by the Director of the Division and the Associate Dean for Academic Affairs of the Davis College.

Thesis option: The thesis option will require 30 credit hours, 24 hours of regular course work plus 6 hours credit for a thesis. A student must maintain a grade point average of 3.0 or better to remain in good standing. There will be a common core curriculum for the two majors. All additional course requirements will be determined by the student in consultation with the major advisor and graduate committee members.

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<thead>
<tr>
<th>Core Courses</th>
<th>Additional Coursework Requirements</th>
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<tr>
<td>STAT 511</td>
<td>Statistical Methods 1</td>
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<td>STAT 512</td>
<td>Statistical Methods 2</td>
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<tr>
<td>ANNU 696</td>
<td>Graduate Seminar</td>
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<td>Total Hours: 30</td>
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<th>Research</th>
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<td>HN&amp;F 697</td>
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Nutritional and Food Sciences

Non-Thesis option: The non-thesis option will require 36 hours of course work. A student must maintain a grade point average of 3.0 or better to remain in good standing. There will be a common core curriculum for the non-thesis masters. Additional courses to meet the degree requirements will be determined by the student in consultation with the major advisor and the graduate committee members and presented in the student’s Plan of Study.

Core Courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
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<tr>
<td>STAT 511</td>
<td>Statistical Methods 1</td>
<td>3</td>
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<tr>
<td>STAT 512</td>
<td>Statistical Methods 2</td>
<td>3</td>
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<tr>
<td>ANNU 696</td>
<td>Graduate Seminar</td>
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Additional Coursework Requirements

Total Hours: 36

Students in the MS-Thesis Option will be required to complete a thesis. They may identify a problem for study on their own, with approval from their graduate committee or they may work on a faculty member’s research study. The scope of the research problem must be approved by the student’s graduate committee. Students are required to defend their thesis in an open seminar presentation. Students in either the thesis or the non-thesis option must pass an oral examination to be approved for graduation. No more than three hours of research/problem report credits can be applied to the Non-Thesis option.

* Students must complete a minimum of 30 total hours, of which at least 24 hours must be coursework other than research, thesis, project, internship, etc. credits.

Major Learning Outcomes

NUTRITIONAL AND FOOD SCIENCES

Students who complete a Master of Science degree in Animal and Nutritional Sciences with a major in Nutrition and Food Sciences will:

- Critically evaluate the literature in their field of study as new knowledge is accumulated.
- Identify research needs relevant to providing answers to societal problems.
- Apply research findings to professional practice in their fields.
- Effectively use oral and written communication to share information and ideas.
- Be qualified to take advanced-level professional positions in their respective fields of study.
- Be qualified for doctoral studies in their fields.

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 591. Advanced Topics. 1-6 Hours.
PR: Consent. Investigation in advanced topics that are not covered in regularly schedules courses.

AGBI 592. Directed Study. 1-6 Hours.
Directed study, reading, and/or research.

AGBI 593. Special Topics. 1-6 Hours.
A study of contemporary topics selected from recent developments in the field.

AGBI 594. 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 691. Advanced Topics. 1-6 Hours.
PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

AGBI 692. Directed Study. 1-6 Hours.
Directed study, reading, and/or research.

AGBI 693. Special Topics. 1-6 Hours.
A study of contemporary topics selected from recent developments in the field.

AGBI 694. 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 791. Advanced Topics. 1-6 Hours.
PR: Consent. Investigation in advanced topics that are not covered in regularly scheduled courses.

AGBI 792. Directed Study. 1-6 Hours.
Directed study, reading, and/or research.

AGBI 793. Special Topics. 1-6 Hours.
A study of contemporary topics selected from recent developments in the field.

AGBI 794. 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.
ANIMAL NUTRITION COURSES

ANNU 591. Advanced Topics. 1-6 Hours.
PR: Consent. Investigation in advanced topics that are not covered in regularly scheduled courses.

ANNU 592. Directed Study. 1-6 Hours.
Directed study, reading, and/or research.

ANNU 593. Special Topics. 1-6 Hours.
A study of contemporary topics selected from recent developments in the field.

ANNU 594. 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 691. Advanced Topics. 1-6 Hours.
PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

ANNU 692. Directed Study. 1-6 Hours.
Directed study, reading, and/or research.

ANNU 693. Special Topics. 1-6 Hours.
A study of contemporary topics selected from recent developments in the field.

ANNU 694. 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 794. Seminar. 1-6 Hours.
Special seminars arranged for advanced graduate students.

ANNU P260. . 3 Hours.

ANIMAL PHYSIOLOGY COURSES

ANPH 591. Advanced Topics. 1-6 Hours.
PR: Consent. Investigation in advanced topics that are not covered in regularly scheduled courses.
ANPH 592. Directed Study. 1-6 Hours.
Directed study, reading, and/or research.

ANPH 593. Special Topics. 1-6 Hours.
A study of contemporary topics selected from recent developments in the field.

ANPH 594. 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 691. Advanced Topics. 1-6 Hours.
PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

ANPH 692. Directed Study. 1-6 Hours.
Directed study, reading, and/or research.

ANPH 693. Special Topics. 1-6 Hours.
A study of contemporary topics selected from recent developments in the field.

ANPH 694. 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 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 791. Advanced Topics. 1-6 Hours.
PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

ANPH 792. Directed Study. 1-6 Hours.
Directed study, reading, and/or research.

ANPH 793. Special Topics. 1-6 Hours.
A study of contemporary topics selected from recent developments in the field.

ANPH 794. 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.

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 595. . 1-6 Hours.

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.

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 591. Advanced Topics. 1-6 Hours.
PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

HN&F 592. Directed Study. 1-6 Hours.
Directed study, reading and/or research.

HN&F 593. 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 691. Advanced Topics. 1-6 Hours.
PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

HN&F 692. Directed Study. 1-6 Hours.
Directed study, reading, and/or research.
HN&F 693. 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.

HN&F P171. 3 Hours.

HN&F P493. 3 Hours.