

# Benjamin M. Statler College of Engineering and Mineral Resources

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## Contact Information

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## Degrees Offered

- Bachelor of Science in Aerospace Engineering (B.S.A.E.)
- Bachelor of Science in Biomedical Engineering (B.S.Bm.E.)
- Bachelor of Science in Biometric Systems (B.S.B.S.)
- Bachelor of Science in Chemical Engineering (B.S.Ch.E.)
- Bachelor of Science in Civil Engineering (B.S.C.E.)
- Bachelor of Science in Computer Engineering (B.S.Cp.E.)
- Bachelor of Science in Computer Science (B.S.C.S.)
- Bachelor of Science in Electrical Engineering (B.S.E.E.)
- Bachelor of Science in Industrial Engineering (B.S.I.E.)
- Bachelor of Science in Mechanical Engineering (B.S.M.E.)
- Bachelor of Science in Mining Engineering (B.S.Min.E.)
- Bachelor of Science in Petroleum and Natural Gas Engineering (B.S.P.N.G.E.)

## Dual Degrees Offered

- Aerospace Engineering and Mechanical Engineering
- Biometric Systems and Computer Engineering
- Biometric Systems and Electrical Engineering
- Civil Engineering and Mining Engineering
- Computer Engineering and Computer Science
- Computer Engineering and Electrical Engineering
- Mining Engineering and Geology

## Nature of Program

The Benjamin M. Statler College of Engineering and Mineral Resources (Statler College) undergraduate degree programs are administered through seven academic departments:

- Chemical and Biomedical Engineering
- Civil and Environmental Engineering
- Lane Department of Computer Science and Electrical Engineering
- Industrial and Management Systems Engineering
- Mechanical and Aerospace Engineering
- Mining Engineering
- Petroleum and Natural Gas Engineering

All undergraduate programs are recognized by industry as providing excellent preparation for the engineering profession. They are planned to give students a balanced background in the basic sciences, engineering sciences, engineering analysis, the humanities, and the social sciences. In addition, each curriculum features creative programs in engineering synthesis and design. This blend of science and practice gives students the tools to solve today's problems and the background to develop the expertise needed for their future success in the profession. Our graduates enjoy a multitude of career opportunities in our nation's most vital industries.

The Statler College is committed to providing high-quality educational programs for all undergraduate students, so that graduates of the College will:

- Be proficient in their chosen field
- Develop and maintain professional ethics and understand the comprehensive impact of engineering solutions on a diverse and global society

- Continue in their education on a life-long basis through both formal study and self-directed inquiry

The faculty uses modern teaching techniques including programmed material, guest lectures by visiting authorities, team projects, and in-house industrial assignments to provide a breadth of training experiences. Teaching laboratories are equipped with modern instruments, machines, and tools to improve and enrich the student's understanding of engineering principles and problems. Numerous computer laboratories and facilities are available for classroom work.

College programs are geared to provide graduates with a sound background upon which to enter the industrial workforce or to pursue graduate study in engineering, medicine, law, or business. A number of industries in West Virginia and the region provide meaningful and financially rewarding summer employment for students. These training opportunities often lead to professional positions upon graduation.

## Accreditation

ABET is recognized by the U.S. Department of Education and the Council on Post-secondary Accreditation (COPA) as the sole agency responsible for accreditation of educational programs leading to degrees in engineering and computer science. ABET accomplishes its accreditation mission through its commissions, the Engineering Accreditation Commission (EAC) and the Computing Accreditation Commission (CAC). ABET, through its commission, establishes criteria and standards for accreditation of engineering and computer science programs at colleges and universities. The following baccalaureate programs in the Benjamin M. Statler College of Engineering and Mineral Resources are accredited by ABET (<http://www.abet.org>).

- Bachelor of Science in Aerospace Engineering (B.S.A.E.)
- Bachelor of Science in Chemical Engineering (B.S.Ch.E.)
- Bachelor of Science in Civil Engineering (B.S.C.E.)
- Bachelor of Science in Computer Engineering (B.S.Cp.E.)
- Bachelor of Science in Computer Science (B.S.C.S.)
- Bachelor of Science in Electrical Engineering (B.S.E.E.)
- Bachelor of Science in Industrial Engineering (B.S.I.E.)
- Bachelor of Science in Mechanical Engineering (B.S.M.E.)
- Bachelor of Science in Mining Engineering (B.S.Min.E.)
- Bachelor of Science in Petroleum and Natural Gas Engineering (B.S.P.N.G.E.)

## Curricula

During the first two years, students acquire fundamental knowledge in mathematics, basic sciences, and introductory engineering topics. Engineering design, computer-based experience, and communication skills are integrated throughout the curriculum. In the third and fourth years, the curriculum builds upon the fundamental engineering concepts toward an integrated educational experience, preparing students to pursue a successful professional career and life-long learning. Technical electives allow students to develop depth in a specialty area or breadth among several fields. Study in the humanities and social sciences play an integral part of our programs, enabling students to understand and appreciate the technological, social, and cultural changes that challenge the world and providing the context of our ethical and responsible duties to society.

## Time to Completion of Degree

All undergraduate, single degree programs in the college are structured so that they can be completed in eight semesters of full-time study. However, students who are not prepared to enter MATH 155 in their first semester may not be able to complete an engineering degree within eight semesters. Applicants to the college are strongly urged to take the required prerequisites to calculus and chemistry in the summer before entering WVU or plan on attending summer school after their freshman year in order to avoid delays in their graduation.

## Degree Requirements

To be eligible to receive a bachelor's degree, a student is required to complete satisfactorily the number of semester hours of work as specified in the program curriculum. Students must achieve a minimum grade point average of 2.00 for all courses taken at WVU, a major grade point average of 2.00 or better (2.25 in mining engineering, and in petroleum and natural gas engineering) in courses completed within the student's major, and a minimum overall grade point average of 2.00. Courses included in the major GPA calculation and how grades for repeated courses are handled for the GPA calculation are specified by individual program requirements.

Graduating students are expected to complete a survey regarding their academic and professional experiences at WVU, as well as post-graduation job placement or continuing education plans.

## Academic Minor

The Statler College offers minors in Chemical Engineering, Computer Science, and Nanosystems to all undergraduate students. A student must consult with his or her major advisor to develop a scheduling plan for courses that satisfy the requirements for these minors. The completed minor will be recorded on the student's permanent transcript.

## Cooperative (Co-op) Education and Internship Programs

The co-op opportunity is available to any qualified student interested in pursuing a degree in any engineering major offered by the college or computer science. The five-year professional development experience combines practical on-the-job experience with the classroom education of a four-year engineering curriculum. Internships are arranged with an employer for various work periods and may involve an academic semester or summer term.

## International Exchange Programs

Students are strongly encouraged to prepare for their careers through learning abroad. The college participates in numerous international exchange programs for undergraduates, as well as the International Student Exchange Program (ISEP) managed through the WVU International Programs Office. There are short-term classes led by WVU faculty, semester and year-long exchange programs, study abroad programs, and service learning opportunities via Engineers Without Borders. The college strongly encourages students to participate in these unique study abroad opportunities. Individual program details vary, but in general, provide Statler College students the opportunity to take part in a study abroad experience that may be for a summer, semester, or full academic year taking courses that count toward their degree so graduation need not be delayed. The Statler College offers its students the opportunity to earn a Certificate in Global Competency which, if successfully completed, is recorded on the student's transcript. Students are encouraged to visit the International Programs website for more detailed information.

## Scholarships

### FIRST YEAR STUDENTS

The Statler College awards four-year scholarships to incoming first year students based on academic performance in high school and standardized test scores (ACT/SAT). These scholarships are automatic and students do not need to apply. Requirements can be found at <http://statler.wvu.edu/undergraduate/paying-for-college>. These scholarships would be awarded in conjunction to any other WVU scholarship a student may be receiving.

### CONTINUING STUDENTS

The Statler College and its constituent departments offer numerous competitive scholarships to undergraduate students who have been in the college for at least one year. Scholarships are based on several factors including academic performance, financial need, and research involvement. These scholarships require applications to be completed by the end of the fall semester. More information can be found at <http://www.statler.wvu.edu/undergraduate/paying-for-college/scholarships>. These scholarships would be awarded in conjunction to any other WVU scholarship a student may be receiving.

## ADMINISTRATION

### DEAN

- Eugene V. Cilento - Ph.D. (University of Cincinnati)  
Glen H. Hiner Dean

### ASSOCIATE DEAN FOR ACADEMIC AFFAIRS

- David A. Wyrick - Ph.D. (University of Missouri-Rolla)

### ASSOCIATE DEAN OF RESEARCH

- Pradeep Fulay - Ph.D. (University of Arizona)

### ASSISTANT DEAN FOR FRESHMAN EXPERIENCE

- Robin A. M. Hensel - Ed.D. (West Virginia University)

### ASSISTANT DEAN FOR ADMINISTRATION

- R. Jason Dean - M.A. (West Virginia University)

## Degree Designation Learning Goals

### BACHELOR OF SCIENCE IN AEROSPACE ENGINEERING (BSAE)

Upon graduation, all Bachelor of Science students in Aerospace Engineering will have the:

- Ability to apply knowledge of mathematics, science and engineering
- Ability to design and conduct experiments, as well as to analyze data
- Ability to design a system, component or process to meet desired needs
- Ability to function on multidisciplinary teams
- Ability to identify, formulate, and solve engineering problems
- Understanding of professional and ethical responsibility
- Ability to communicate effectively
- A broad education necessary to understand the impact of engineering solutions in a global and societal context

- Recognition of the need for, and an ability to engage in, life-long learning
- Knowledge of contemporary issues
- Ability to use the techniques, skills, and modern engineering tools necessary for engineering practice

## **BACHELOR OF SCIENCE IN BIOMEDICAL ENGINEERING (BSBME)**

Upon graduation, all Bachelors of Science students in Biomedical Engineering will have:

- An ability to apply knowledge of mathematics, science and engineering
- An ability to design and conduct experiments, as well as to analyze and interpret data
- An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
- An ability to function on multidisciplinary teams
- An ability to identify, formulate, and solve engineering problems
- An understanding of professional and ethical responsibility
- An ability to communicate effectively
- The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
- A recognition of the need for, and an ability to engage in life-long learning
- A knowledge of contemporary issues
- An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

## **BACHELOR OF SCIENCE IN BIOMETRIC SYSTEMS (BSBS)**

Upon graduation, all Bachelor of Science students in Biometric Systems will have:

- Ability to apply knowledge of math, engineering, and science
- Ability to design and conduct experiments on both hardware and software
- Ability to analyze and interpret data
- Ability to design a system, component, or process to meet desired needs, including the planning, specification, detail design, implementation, and evaluation to meet the following needs: cost, environmental, performance, safety, and quality requirements
- Ability to function on multidisciplinary teams
- Ability to identify, formulate, and solve a range of biometrics problems
- Understanding of professional and ethical responsibility
- Ability to communicate effectively, i.e., to convey technical material through formal written papers/reports that satisfy accepted standards for writing style and to convey technical material through oral presentation and interaction with an audience
- A broad education necessary to understand the impact of engineering solutions in a global and societal context
- Recognition of the need for, and ability to engage in, life-long learning
- Knowledge of contemporary issues
- Ability to use the techniques, skills, and modern engineering tools necessary for engineering practice, in the field of biometrics
- Knowledge of the breadth and depth across a range of biometrics and computer engineering topics
- Knowledge of mathematics through differential and integral calculus, basic sciences, computer science, and engineering sciences necessary to analyze and design complex electrical and electronic devices, software, and systems containing hardware and software components
- Knowledge of probability and statistics

## **BACHELOR OF SCIENCE IN CHEMICAL ENGINEERING (BSCHE)**

Upon graduation, all Bachelors of Science students in Chemical Engineering will:

- Understand and be able to analyze entire chemical processes, including those with life science applications.
- Be proficient in the oral and written communication of their work and ideas.
- Be proficient in the use of computers, recent computer software, and computer-based information systems.
- Have the ability to learn independently but will also be able to participate effectively in groups.
- Be able to design effective laboratory experiments, to perform laboratory experiments, to gather data, to analyze data, and to test theories.
- Be prepared for a lifetime of continuing education.
- Understand the safety and environmental consequences of their work as chemical engineers and will be able to design safe processes.
- Understand their professional and ethical responsibilities.
- Have the broad education necessary to understand the impact of engineering solutions in a global and societal context.

## **BACHELOR OF SCIENCE IN CIVIL ENGINEERING (BSCE)**

Upon graduation, all Bachelor of Science students in Civil Engineering will have:

- An ability to apply knowledge of mathematics, science, and engineering.
- An ability to design and conduct experiments, as well as to analyze and interpret data.
- An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.
- An ability to function on multidisciplinary teams.
- An ability to identify, formulate, and solve engineering problems.
- An understanding of professional and ethical responsibility.
- An ability to communicate effectively.
- The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context.
- A recognition of the need for, and an ability to engage in life-long learning.
- A knowledge of contemporary issues.
- An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice

## **BACHELOR OF SCIENCE IN COMPUTER ENGINEERING (BSCPE)**

Upon graduation, all Bachelor of Science students in Computer Engineering will have the:

- Ability to apply knowledge of math, science, and engineering
- Ability to design, conduct experiments, analyze and interpret data
- Ability to design a system, component, or process to meet desired needs
- Ability to function on multi-disciplinary teams
- Ability to identify, formulate, and solve engineering problems
- Understanding of professional and ethical responsibility
- Ability to communicate effectively in writing
- Ability to communicate effectively orally
- Understanding of the impact of engineering solutions in a global and societal context
- Ability to engage in life-long learning
- Knowledge of contemporary issues in computer engineering
- Ability to use the techniques, skills, and modern tools in engineering practice
- Knowledge of the breadth and depth across the range of computer engineering topics
- Knowledge of mathematics to analyze and design complex hardware, software, and systems
- Knowledge of probability and statistics
- Knowledge of discrete mathematics

## **BACHELOR OF SCIENCE IN COMPUTER SCIENCE (BSCS)**

Upon graduation, all Bachelor of Science students in Computer Science will:

- Be exposed to a variety of programming languages and systems and will be proficient in programming in at least two languages
- Have knowledge of the basic principles and methods of programming language translation, formal languages, and automata
- Have knowledge of the basic principles of data structures, discrete mathematics and algorithms, and be able to apply this knowledge to problem solving in relevant application areas
- Be familiar with principles of computer organization, operating systems, and networks
- Have knowledge of software engineering principles and be able to design, implement, and analyze moderately complex and robust systems.
- Be able to communicate ideas effectively in writing
- Be able to communicate ideas effectively verbally
- Be able to work and learn effectively as members of a team
- Have knowledge of and a commitment to the social and ethical responsibilities of computing professionals
- Have experienced a well-rounded education in areas outside of the computer science major, with emphasis on the arts, sciences, and humanities
- Be familiar with laboratory procedures and use of the scientific method in at least two different physical or biological sciences
- Be familiar with advanced concepts of some specialized computer science areas
- Have knowledge of mathematics through differential and integral calculus, discrete mathematics, and probability and statistics

## **BACHELOR OF SCIENCE IN ELECTRICAL ENGINEERING (BSEE)**

Upon graduation, all Bachelor of Science students in Electrical Engineering will have:

- An ability to apply knowledge of mathematics, science, and engineering
- An ability to design and conduct engineering and scientific experiments
- An ability to analyze and interpret engineering and scientific data
- An ability to design, including the planning, specification, detail design, implementation, and evaluation of components, processes, or systems to meet performance, cost, safety, and quality requirements
- An ability to function on multi-disciplinary teams
- An ability to identify, formulate, and solve a range of electrical engineering problems
- An understanding of professional and ethical responsibility
- An ability to convey technical material through formal written papers/reports that satisfy accepted standards for writing style
- An ability to convey technical material through oral presentation and interaction with an audience
- The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental and societal context.
- Recognition of the need for, and an ability to engage in, life-long learning
- Knowledge of contemporary social issues necessary to understand the impact of electrical/computer engineering solutions in a global and societal context
- An ability to use modern engineering techniques and tools, including computer based tools, for analysis and design
- Knowledge of electrical engineering fundamental concepts, with advanced knowledge in at least one sub-discipline of electrical engineering
- Knowledge of probability and statistics, including electrical engineering applications
- Knowledge of mathematics through differential and integral calculus, basic sciences, computer science, and engineering sciences necessary to design complex electrical and electronic devices and systems containing hardware and software components
- Knowledge of differential equations and other advanced mathematics such as linear algebra, complex variables, or discrete mathematics

## **BACHELOR OF SCIENCE IN INDUSTRIAL ENGINEERING (BSIE)**

Upon graduation, all Bachelor of Science students in Industrial Engineering will have acquired the:

- Ability to use modern and classical industrial engineering methodologies such as operations research, manufacturing systems, computer programming and simulation, production systems, human factors and ergonomics, engineering statistics and quality control, and engineering economics
- Ability to apply knowledge of math, science, and general engineering
- Ability to design and conduct experiments, analyze and interpret data, develop implementation strategies, and shape recommendations so that results will be achieved and findings will be communicated effectively
- Ability to work individually, in teams, and/or in multi-disciplinary teams to identify, formulate, and solve problems using knowledge, skills, and tools of industrial hygiene, safety, and ergonomics.
- Ability to design and implement or improve integrated systems that include people, materials, information, equipment, and energy using appropriate analytical, computational, and experimental practices
- Broad education necessary to develop and maintain professional ethics and understand the comprehensive impact of their solutions on individuals and the society
- Recognition of the need for and an ability to engage in life-long learning
- Professional characteristics expected of a successful industrial engineer

## **BACHELOR OF SCIENCE IN MECHANICAL ENGINEERING (BSME)**

Upon graduation, all Bachelor of Science students in Mechanical Engineering will have:

- Ability to apply knowledge of mathematics, science and engineering.
- Ability to design and conduct experiments, as well as to analyze data.
- Ability to design a system, component or process to meet desired needs.
- Ability to function on multidisciplinary teams.
- Ability to identify, formulate and solve engineering problems.
- Understanding of professional and ethical responsibility.
- Ability to communicate effectively.
- A broad education necessary to understand the impact of engineering solutions in a global and societal context.
- Recognition of the need for, and an ability to engage in, life-long learning.
- Knowledge of contemporary issues.

- Ability to use the techniques, skills and modern engineering tools necessary for engineering practice.

## **BACHELOR OF SCIENCE IN MINING ENGINEERING (BSMINE)**

Upon graduation, all Bachelor of Science students in Mining Engineering will:

- Be well prepared in application of mathematics, science, and engineering.
- Be well prepared to design and conduct experiments, as well as to analyze and interpret data.
- Be well prepared to design a system, component, or process to meet desired needs.
- Have an ability to function on multidisciplinary teams.
- Have an ability to identify, formulate, and solve engineering problems.
- Have an understanding of professional and ethical responsibility.
- Have an ability to communicate effectively.
- Have the broad education necessary to understand the impact of engineering solutions in a global and societal context.
- Have recognition of the need for, and an ability to engage in, life-long learning.
- Have knowledge of contemporary issues.
- Have an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.
- Have an understanding of the importance of economics, environmental, health, and safety issues in the operations of modern mines.
- Have an ability to learn independently.

## **BACHELOR OF SCIENCE IN PETROLEUM AND NATURAL GAS ENGINEERING (BSPNGE)**

Upon graduation, all Bachelor of Science students in Petroleum and Natural Gas Engineering will have:

- A thorough understanding of scientific and engineering principles and their application to petroleum and natural gas engineering problems.
- The ability to integrate their scientific and engineering knowledge to design and conduct experiments, and interpret and analyze data.
- The ability to apply scientific and engineering fundamentals to formulate solutions to petroleum and natural gas engineering problems.
- The ability to use techniques, skills, and modern petroleum and natural gas engineering tools.
- The ability to integrate their scientific and engineering knowledge to solve petroleum and natural gas engineering design problems.
- The ability to communicate effectively.
- The ability to function on multidisciplinary teams.
- Recognition of the professional and ethical responsibilities of a petroleum engineer.
- An understanding of the impact of petroleum and natural gas engineering solutions in a societal and global context.
- Recognition of the need to acquire the knowledge of contemporary issues.
- Recognition of the need to engage in life-long learning.

## **Admission Requirements**

The Statler College will admit first year students to study under one of four distinct programs: Computer Science, Engineering Track 1, Engineering Track 2, or Engineering Track 3. Admission is based on high school grade point average and math readiness. The objective of having these individual tracks is to provide a first year curriculum tailored to the level of academic preparation of the student which maximizes the opportunity for success. Each track provides students the coursework necessary to meet the requirements to move into their intended major.

The following summarizes the admission requirements of each track to coincide with placement into the appropriate math, science, and engineering courses. Students must meet all of the criteria listed; these criteria are minimum requirements for admission to the Statler College. Admission to a discipline major is competitive and dependent on enrollment availability. Students must also meet all other WVU admission requirements (<http://adm.wvu.edu>).

### **COMPUTER SCIENCE**

- High School GPA should be at least 3.00
- Math placement of MATH 155
- Students on this track can typically graduate in 4 years

### **ENGINEERING TRACK 1**

- High School GPA should be at least 3.00
- Math placement of MATH 155
- Students on this track can typically graduate in 4 years

## **ENGINEERING TRACK 2**

- High School GPA should be at least 2.50
- Math placement of MATH 129 or MATH 153
- Students on this track can typically graduate in 4 to 4.5 years

## **ENGINEERING TRACK 3**

- High School GPA should be at least 2.50
- Math placement of MATH 126
- Students on this track can typically graduate in 5 years

## **Transfer Students**

### **TRANSFERRING FROM WITHIN WVU**

#### **ENGINEERING**

Students wishing to transfer into engineering from another program at WVU must have a GPA of at least a 2.25 in all college coursework attempted. Students with less than 24 credit hours can be admitted based on freshman admissions criteria (shown in table above). Otherwise, students must have completed at least one semester of college coursework and present evidence that they are eligible to enroll in MATH 155. These criteria are minimum requirements for admission into the Statler College, and at times a student's full transcript can be taken into account during the admission process. Students meeting this criteria will be admitted into Engineering Track 2. Admission to a discipline major is competitive and dependent on enrollment availability.

#### **COMPUTER SCIENCE**

Students wishing to transfer into computer science from another program at WVU must have a GPA of at least a 2.25 in all college coursework attempted. Students with less than 24 credit hours can be admitted based on freshman admission criteria (shown in table above). Otherwise, students must have completed at least one semester of college coursework, and have completed MATH 154 or 155, ENGR 101, ENGR 199, ENGL 101, and CS 110 all with a C or better. These criteria are minimum requirements for admission into the Statler College, and a student's full transcript can be taken into account during the admission process. Admission to a discipline major is competitive and dependent on enrollment availability.

### **TRANSFERRING FROM OUTSIDE WVU**

#### **ENGINEERING**

Students wishing to transfer into engineering or computer science from outside WVU must have a GPA of at least a 2.50 in all college coursework attempted. Students with less than 24 credit hours can be admitted based on freshman admission criteria (shown in table above). Otherwise, students must have completed at least one semester of college coursework and present evidence that they are eligible to enroll in MATH 155. Students meeting this criteria will be admitted into Engineering Track 2.

Students wishing to transfer directly into an engineering discipline must have a GPA of at least a 2.50 and have completed MATH 155, CHEM 115, ENGL 101, ENGR 101, ENGR 102, and ENGR 199 all with a C or better (students transferring in with more than 28 credit hours are exempt from ENGR 199).

If students are sophomore level or above, and have earned a C or better in CHEM 115, MATH 155, MATH 156, and PHYS 111, and have completed at least three credit hours in a discipline specific course, then they may take an approved elective (or approved transfer credit) as a substitute for either ENGR 101 or 102. If the combination of multiple engineering courses transferred to WVU matches the content of ENGR 101 and/or 102, those courses may be approved as a course substitution for ENGR 101 and/or 102. Other transfer courses that are not an exact match may be approved as a technical elective to substitute for ENGR 101 or 102 at the discretion of the Assistant Dean for Fundamentals of Engineering. These criteria are minimum requirements for admissions into the Statler College, and a student's full transcript can be taken into account during the admission process. Admission to a discipline major is competitive and dependent on enrollment availability.

#### **COMPUTER SCIENCE**

Students wishing to transfer into computer science from another program at WVU must have a GPA of at least a 2.50 in all college coursework attempted. Students with less than 24 credit hours can be admitted based on freshman admissions criteria (shown in table above). Others must have completed at least one semester of college coursework, and have completed MATH 154 or 155, ENGR 101, ENGR 199, ENGL 101, and CS 110 all with a C or better. These criteria are minimum requirements for admission into the Statler College, and a student's full transcript can be taken into account during the admission process.

## **Biomedical Engineering Certificate**

Please refer to the Chemical Engineering section for information and requirements for the Biomedical Engineering Certificate.



## Global Competency Certificate

### CERTIFICATE CODE - CU01

#### OBJECTIVE

To provide students the opportunity to develop global competencies by working effectively across cultural and linguistic barriers while focusing on engineering and computer science issues that transcend their own culture.

#### LEARNING OUTCOMES

- Students will acquire basic knowledge of other languages and cultures while acquiring or applying engineering or computer science skills consistent with their programs of study.
- Students will develop communication and interpersonal skills to work with people of different backgrounds.
- Students will acquire an appreciation for contemporary issues and of the role of engineering or computer science solutions in a societal context.

#### GLOBAL COMPETENCIES DEFINED

- The ability to work effectively in different international settings
- An awareness of the major currents of global change and the issues arising from such changes
- Knowledge of global organizations and business activities
- The capacity for effective communication across cultural and linguistic boundaries
- Personal adaptability to diverse cultures

#### COMPONENTS OF THE CERTIFICATE PROGRAM

- Language and Culture Component: six-nine credit hours completed at either WVU or a foreign academic institution (recognized by WVU's Office of International Programs) in international language, culture, literature, art or history. The courses need to be associated with the host country or region. If the foreign academic institution has a primary language requirement other than English the student can count no more than six credit hours of language in the language of the foreign academic institution toward the certificate. These credit hours can be applied to WVU's GEF requirement as appropriate.
- Engineering or Computer Science Major Coursework Component: six-nine credit hours of engineering or computer science course work completed internationally, either from a foreign academic institution or through a WVU sponsored program applicable to the student's major at WVU. A minimum of six credit hours need to be equivalent to WVU upper division courses (300 and above). The student's course work must include significant mentorship of engineering or computer science learning activity, involving both WVU students and foreign students. At least three credit hours must involve experiential learning activities, which may include an industry based internship, design class, or project with report and presentation or other team based activities, for example. Each individual Statler College department will be responsible for selecting the admissible graded coursework through the respective curriculum committee.
- Social Service Component: one credit hour, minimum of social or civic engagement. This can include participation in Engineers without Borders or participation in activities in professional society student chapters with a social impact. The community service must include oversight at a professional or academic level (in other words, either a faculty member, or engineering or computer science professional should be involved).

After the aforementioned requirements are fulfilled, the Certificate of Global Competencies will only be issued to participating students upon graduation from the degree program involved with the international activity.

#### COMPLETION OF DEGREE REQUIREMENTS

Individual departments will be responsible for assessing student performance to ensure achievement of ABET accreditation outcomes.

#### GENERAL COMMENTS

- This is a one-way semester abroad, not a student exchange in engineering or computer science (WVU exchange programs can be used, though).
- International institutions that have an existing agreement with WVU are preferred, however "new" institutions can be considered as well. The responsibility for course evaluation will rest with the individual department, however.
- If a student decides to attend a school that doesn't have a WVU exchange agreement in place, he or she will be responsible for paying the local tuition and fees, housing, etc.

#### NANOSYSTEMS MINOR

##### MINOR CODE - U105

Using nano devices and systems as naturally integrative learning vehicles, technical, social, ethical and economic considerations are introduced and developed, enabling students to understand the role of their discipline and the value of others. The Nanosystems Minor culminates with students fulfilling their majors' capstone requirement by engaging in authentic interdisciplinary NSE nanosystems research within host faculty labs. As a result, engineering

and science students grow together as young collaborating professionals using the unique environment afforded by NSE as they at the same time grow and form in their own disciplines.

ENGR 103	Introduction to Nanotechnology Design	3
ENGR 280	Sophomore Nanoscience Seminar	1
ENGR 380	Junior Nanoscience Seminar 1	1
ENGR 381	Junior Nanoscience Seminar 2	1
Project <sup>1</sup>		3
Tech Elective <sup>2</sup>		3
Tech Elective <sup>2</sup>		3
Total Hours		15

<sup>1</sup> 400 level course, senior rank, eg. Capstone Project, Honors Thesis or Undergraduate research on an authentic research topic (see following definition for clarification).

<sup>2</sup> 300 level course or above from the student's major which would be required/needed to work in the area of Nanotechnology

### **Authentic Research Topic**

For the purposes of the Nanosystems Minor, an authentic research topic is defined as one that is part of a funded project and/or its results can be published and therefore it is of interest to the scientific community.

## **Procedures and Guiding Principles for Handling Transfer/Transient Credit**

The Statler College strives to manage student transfer/transient credits in a fair, consistent, and uniform manner relative to students in the College who do not seek transfer/transient course credit and to exercise due diligence with meeting ABET prerequisite and curricular requirements for transfer credit. The College has adopted the following procedures/guiding principles to deal with transfer/transient credit issues.

### **CREDIT TRANSFER PROCEDURE**

Chemistry, engineering, geology, math, or physics courses transferred to WVU for consideration of academic credit in the Statler College will be transferred as "Open Credit" (e.g. MATH 000). The "open credit" will be reviewed to determine if it meets the academic requirements of the College and if so, processed by a course substitution action. The only exceptions to this policy will be if a student is transferring into the College:

- Advanced Placement Program (AP) credit
- International Baccalaureate (IB) credit
- College Level Examination Program (CLEP) credit
- Credit based on an approved Transient Approval Form by the dean or his designee before the course was taken
- Credit from a college or university with which Statler College has an approved articulation agreement

### **GUIDELINES FOR COLLEGE APPROVAL OF REQUESTS FOR TRANSIENT COURSE CREDIT**

An Undergraduate Transient Application will typically be approved if:

- The student has met all the requirements (rank, prerequisite/co-requisites, etc.) to take the course at WVU
- The requested course has the same number of credit hours and pre or co-requisites as the WVU course or has otherwise been deemed academically equivalent by Statler College

An Undergraduate Transient Application will not be approved if:

- The student has previously earned a D, F, or W in the equivalent course at WVU
- Any online course fails to have proctored exams.
- The student is currently enrolled at WVU to take coursework in the same term/semester in which they are applying to be a transient student at another institution.

Meeting the guidelines for a transient application does not guarantee approval of the transient application. The associate dean for academic affairs has the right to set conditions more stringent than those set forth in these guidelines, as well as the right to limit transient course credit.

### **COURSE SUBSTITUTION APPROVAL PROCESS**

A course designated as "open credit" can be petitioned for specific course credit through the established course substitution approval process. The student must present sufficient evidence that the course is equivalent to the specified WVU course. A course syllabus and transcript showing the student's grade in that course must be presented with the application for the course to be reviewed to determine equivalency. Since this review process

may take significant time to complete, credit for courses presented for review within two weeks of the beginning of a semester may not be awarded credit in time for the student to register for a subsequent course for which the transfer course is a prerequisite.

## Probation, Dismissal and Readmission Policy

### UNIVERSITY PROBATION AND SUSPENSION

Students with a cumulative grade point average below 2.00 in all University coursework will be subject to probation and suspension by the University. Please refer to the Undergraduate Academic Probation and Suspension Policy found in the Undergraduate Information section of this catalog for further information on WVU probation and suspension.

### STATLER COLLEGE DISMISSAL

Academic program dismissal identifies the status of a student who has failed to meet the minimum academic standards of the college and has been transferred to the Center for Learning, Advising, and Student Success. Dismissal from the Statler College means that a student will not be permitted to register for any classes in the college until the student has been officially reinstated to the college. Students with a major grade point average below 2.00 (2.25 in mining engineering, and in petroleum and natural gas engineering) in their major coursework and/or an overall grade point average of courses taken at WVU below 2.00 receive a notice of academic warning and may be subject to dismissal. Students whose academic major GPA and/or WVU-earned GPA continues below the minimum standards outlined in the following table will be subject to dismissal from the Statler College. If a major course is repeated, only the last grade received is counted in computing the major grade point average and the major credit hours attempted. Students eligible for dismissal are not eligible to transfer to another engineering program in the college. A student who has preregistered for classes and is subsequently dismissed shall have their registration in Statler College courses automatically canceled.

Additionally, a student may be dismissed from the Statler College for violations of the WVU Student Code of Conduct.

The duration of the first dismissal from the Statler College is one academic semester. The duration of subsequent dismissals will be one calendar year for a second dismissal and five years for a third dismissal. If a student appeal of dismissal is granted, the duration of any subsequent dismissal will be at the greater level. A student who has been dismissed from the Statler College, including from the Fundamentals of Engineering program, cannot transfer academic major course work taken at another institution, during the period of dismissal, for credit toward meeting their degree requirements. A student who has been dismissed must petition to be readmitted to the Statler College; the decision to readmit will be on a case-by-case basis.

### AEROSPACE ENGINEERING, BIOMEDICAL ENGINEERING, BIOMETRIC SYSTEMS, CHEMICAL ENGINEERING, CIVIL ENGINEERING, COMPUTER ENGINEERING, COMPUTER SCIENCE, ELECTRICAL ENGINEERING, INDUSTRIAL ENGINEERING, AND MECHANICAL ENGINEERING

Total Hours Attempted*	Minimum cumulative GPA*
0 to 9	N/A
10 and more	2.00

### MINING ENGINEERING AND PETROLEUM AND NATURAL GAS ENGINEERING

Total Hours Attempted*	Minimum cumulative GPA*
0 to 13	N/A
14 to 29	2.00
30 to 39	2.10
40 and more	2.25

\* Attempted departmental credit hours e.g. CE or IENG or MAE.

## Graduation Requirements

To be eligible to receive a bachelor's degree, a student is required to complete satisfactorily the number of semester hours of work as specified in the program curriculum. Students must achieve a minimum grade point average of 2.00 for all courses taken at WVU, a major grade point average of 2.00 or better (2.25 in mining engineering, and in petroleum and natural gas engineering) in courses completed within the student's major, and a minimum overall grade point average of 2.00. Courses included in the major GPA calculation and how grades for repeated courses are handled for the GPA calculation are specified by individual program requirements.

Graduating students are expected to complete a survey regarding their academic and professional experiences at WVU, as well as post-graduation job placement or continuing education plans.