Benjamin M. Statler College of Engineering and Mineral Resources

Degrees Offered

- Bachelor of Science in Aerospace Engineering (B.S.A.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 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 programs of engineering science education 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. All baccalaureate engineering programs in the Benjamin M. Statler College of Engineering and Mineral Resources as well as its baccalaureate degree with a major in computer science are accredited by ABET.

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 curriculum of the program leading to the degree for which the student is a candidate. Students must achieve an overall University grade point average of 2.0 or better and also must achieve a major grade point average of 2.0 or better (2.25 in mining engineering, and in petroleum and natural gas engineering) in courses completed within the student’s major. 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.

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

The college participates in numerous international exchange programs for undergraduates as well as the International Student Exchange Program (ISEP) managed through WVU’s International Programs Office. 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. In exchange programs, the typical additional cost to students is travel to their host institution and other incidental expenses. 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.

Procedures and Guiding Principles for Handling Transfer/Transient Credit

In order 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

1. An Undergraduate Transient Application will normally be approved if:
   A. The student has met all the requirements (rank, prerequisite/co-requisites, etc.) to take the course at WVU
   B. 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

2. An Undergraduate Transient Application will normally be approved for courses taken “on-line” if the College is provided a copy of the course syllabus (preferred) or catalog description and a D or F has not been previously earned in the equivalent course at WVU.

3. An Undergraduate Transient Application will normally not be approved for a student to take a required course in the student’s major (those with major designation, e.g. ChE, MAE, IENG, etc.) if a D or F has been previously earned in the equivalent course at WVU.

4. An Undergraduate Transient Application will normally not be approved for a student currently enrolled at WVU to take coursework in the same semester as a transient student at another institution.

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 pre-requisite.

Probation, Dismissal and Readmission Policy

University Probation and Suspension
Students with a cumulative grade point average below 2.0 in all University coursework will be subject to probation 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 University general studies program. 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 2.0 (2.25 in mining engineering, and in petroleum and natural gas engineering) in their major coursework may be subject to dismissal. Students whose academic major 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. The normal period of dismissal is a minimum of one academic semester from the date of the student’s first dismissal. The duration of subsequent dismissals will be one calendar year for a second dismissal and a minimum of five years for a third dismissal. A student who has been dismissed from the College cannot transfer academic major course work taken at another institution, during the period of dismissal, for credit toward meeting their degree requirements.

Biometric Systems, Computer Science, Computer Engineering, and Electrical Engineering

<table>
<thead>
<tr>
<th>Total Hours Attempted*</th>
<th>Minimum cumulative GPA*</th>
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</thead>
<tbody>
<tr>
<td>10 to 25</td>
<td>1.70</td>
</tr>
<tr>
<td>26 to 39</td>
<td>1.85</td>
</tr>
<tr>
<td>40 and more</td>
<td>1.93</td>
</tr>
</tbody>
</table>

Aerospace engineering, Chemical Engineering, Civil Engineering, Industrial Engineering, and Mechanical Engineering

<table>
<thead>
<tr>
<th>Total Hours Attempted*</th>
<th>Minimum cumulative GPA*</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 to 21</td>
<td>1.70</td>
</tr>
<tr>
<td>22 to 33</td>
<td>1.85</td>
</tr>
<tr>
<td>34 and more</td>
<td>1.93</td>
</tr>
</tbody>
</table>
Mining Engineering and Petroleum and Natural Gas Engineering

<table>
<thead>
<tr>
<th>Total Hours Attempted*</th>
<th>Minimum cumulative GPA*</th>
</tr>
</thead>
<tbody>
<tr>
<td>14 to 29</td>
<td>1.95</td>
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<tr>
<td>30 to 39</td>
<td>2.10</td>
</tr>
<tr>
<td>40 and more</td>
<td>2.18</td>
</tr>
</tbody>
</table>

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

Administration

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

Associate Dean of Academic Affair
- Warren R. Myers - Ph.D. (WVU)

Associate Dean for Administration
- Royce J. Watts - M.S.

Associate Dean of Research
- Pradeep Fulay - Ph.D. (University of Arizona)

Admission Requirements

The Statler College will admit freshmen students to study under one of four distinct programs: Engineering, General Engineering, Pre-Engineering, or Pre-Computer Science. Admission is based on high school grade point average (unweighted 4.0 scale) and the best single set of standardized ACT/SAT test scores. The objective of having three engineering programs is to be able to provide a freshman curriculum suitably tailored to the level of academic preparation of the student which maximizes the opportunity for success. Each program provides students the coursework necessary to meet the requirements to move into their intended major.

The following table summarizes the admission requirements for each program. These criteria are minimum requirements for admission to the Statler College. Admission to a discipline major is competitive and dependent on enrollment availability.

<table>
<thead>
<tr>
<th>Engineering</th>
<th>Residents</th>
<th>High School GPA</th>
<th>ACT Composite</th>
<th>ACT Math</th>
<th>SAT Math</th>
<th>SAT Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>West Virginia</td>
<td>3.0</td>
<td>24</td>
<td>28</td>
<td>630</td>
<td>1110</td>
</tr>
<tr>
<td></td>
<td>Out-of-State</td>
<td>3.0</td>
<td>24</td>
<td>28</td>
<td>630</td>
<td>1110</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>General Engineering</th>
<th>Residents</th>
<th>High School GPA</th>
<th>ACT Composite</th>
<th>ACT Math</th>
<th>SAT Math</th>
<th>SAT Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>West Virginia</td>
<td>2.5</td>
<td>22</td>
<td>25</td>
<td>570</td>
<td>1030</td>
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<tr>
<td></td>
<td>Out-of-State</td>
<td>2.5</td>
<td>22</td>
<td>25</td>
<td>570</td>
<td>1030</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Computer Science</th>
<th>Residents</th>
<th>High School GPA</th>
<th>ACT Composite</th>
<th>ACT Math</th>
<th>SAT Math</th>
<th>SAT Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>West Virginia</td>
<td>3.0</td>
<td>24</td>
<td>28</td>
<td>630</td>
<td>1110</td>
</tr>
<tr>
<td></td>
<td>Out-of-State</td>
<td>3.0</td>
<td>24</td>
<td>28</td>
<td>630</td>
<td>1110</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pre-Engineering</th>
<th>Residents</th>
<th>High School GPA</th>
<th>ACT Composite</th>
<th>ACT Math</th>
<th>SAT Math</th>
<th>SAT Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>West Virginia</td>
<td>2.5</td>
<td>19</td>
<td>18</td>
<td>480</td>
<td>910</td>
</tr>
<tr>
<td></td>
<td>Out-of-State</td>
<td>2.5</td>
<td>21</td>
<td>18</td>
<td>480</td>
<td>990</td>
</tr>
</tbody>
</table>

Students must also meet all other WVU admission requirements (http://adm.wvu.edu) .
Transfer Students

Students wishing to transfer into the engineering or pre-computer science program from other programs must have a GPA of at least 2.25 in all college work attempted. Admission decisions will only be made on applications received by deadlines published by the University for transfer applications. Students who meet the freshman admission requirements to the engineering program (shown in the table) are eligible to transfer into the college at any time. Others must have completed at least one semester of college work and present evidence that they are eligible to enroll in MATH 155. Students wishing to transfer into an engineering discipline major must have a GPA of at least 2.25 and have completed ENGR 101, ENGR 199, ENGR 102, and MATH 155 with a grade of C or better, CHEM 115, and ENGL 101. If transfer students are sophomore level or above, have credit for completing CHEM 115, have earned a C or better in MATH 155, MATH 156, and PHYS 111, and have completed at least three credits in a discipline major course, then they may take a major elective as a substitute for either ENGR 101 or ENGR 102. If the combination of multiple engineering courses transferred to WVU matches the content of ENGR 101 or ENGR 102, those courses may be approved as a course substitution for ENGR 101 or ENGR 102. Other transferred courses that are not an exact match may be approved as technical electives to substitute for ENGR 101 or ENGR 102 at the discretion of the Assistant Dean for Freshman Experience. These criteria are minimum requirements for admission to the Statler College. Admission to a discipline major is competitive and dependent on enrollment availability.

Scholarships

The Statler College and its constituent departments offer numerous competitive scholarships to undergraduate students. Typically scholarships are based upon both academic performance and financial need and are awarded on a one-year basis unless the scholarship award specifies otherwise. Scholarship awards are typically made in June for the upcoming academic year. Certain scholarships for freshman require the recipient to be pursuing a specific major. In these cases, the student must be taking freshman courses consistent with those required for entry into that specific major. Four year freshman scholarships are available and are awarded automatically to qualified students. For more information, visit http://statler.wvu.edu/prospective/tuition.

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. Study in humanities and social sciences is also an integral part of the engineering education, enabling students to understand and appreciate the technological, social, and cultural changes that challenge the world.

Biomedical Engineering Certificate

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

Global Competency Certificate

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 GEC 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

The Nanosystems Minor is introduced to address the educational needs of the workforce in the interdisciplinary field of Nanoscale Science and Education (NSE). 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.

Based on a National Science Foundation (NSF) award to West Virginia University for developing a Nanotechnology Undergraduate Education (NUE) program, four new courses have been created and are being offered to students of the Science, Technology, Engineering and Mathematics (STEM) disciplines: ENGR 103 (three credits), ENGR 280 (one credit), ENGR 380 (one credit), ENGR 381 (one credit). These courses form the core for the Nanosystems Minor and lead the students to a three credit project which can be either their senior capstone project, an Honors Thesis, or an Undergraduate Research project; for example, a XX 497 course. The requirement for this project, as stated in the NUE award, is to be an authentic interdisciplinary research project that is conducted under the guidance of a faculty member who hosts the student in his/her laboratory. The additional requirements that are imposed on the students are to be experts in their field and have some knowledge from another area. That can be established by taking an elective course in their discipline that is related or needed in order to pursue a career in the area of Nanotechnology and another course related to Nanotechnology from another discipline.

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGR 103</td>
<td>Intro to Nanotechnology Design</td>
<td>3</td>
</tr>
<tr>
<td>ENGR 280</td>
<td>Sophomore Nanoscience Seminar</td>
<td>1</td>
</tr>
<tr>
<td>ENGR 380</td>
<td>Junior Nanoscience Seminar 1</td>
<td>1</td>
</tr>
<tr>
<td>ENGR 381</td>
<td>Junior Nanoscience Seminar 2</td>
<td>1</td>
</tr>
<tr>
<td>Project</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Tech Elective</td>
<td></td>
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</tr>
<tr>
<td>Tech Elective</td>
<td>3</td>
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<tr>
<td>Total Hours</td>
<td>15</td>
<td></td>
</tr>
</tbody>
</table>

1. 400 level course, senior rank, e.g. Capstone Project, Honors Thesis or Undergraduate research on an authentic research topic (see following definition for clarification).

2. 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.