Fundamentals of Engineering Program

E-mail: Statler-freshman@mail.wvu.edu

Nature of Program
The Benjamin M. Statler College of Engineering and Mineral Resources Fundamentals of Engineering Program (FEP) is designed to support beginning engineering students as they build foundational engineering skills and discern their career interests within the field of engineering. The mission of this student-oriented program is to advise, prepare, and retain qualified students for degree programs in the Statler College. More specifically, the FEP provides the academic and co-curricular support students need for success in their: transition to college life; development of academic discipline and skills needed to succeed as an engineering student; foundational courses (Mathematics, Chemistry, Physics, and basic engineering); and selection of a Computer Science, Biometric Systems, or Engineering discipline major.

Program Objectives
The FEP uses both curricular and co-curricular programmatic elements to meet its educational objectives. Students who successfully complete the requirements of the WVU Fundamentals of Engineering Program:

- Apply their knowledge of mathematics, science, and engineering, as well as problem-solving techniques, to define, formulate, and solve engineering problems.
- Use Word® , Excel®, Power Point®, and MATLAB® as engineering tools to perform computations, analyze and plot data, and model a simple system as part of solving an engineering problem.
- Communicate effectively, orally, in writing, and with the use of technical tools such as Microsoft Word®, Excel®, Power Point®, and MATLAB® to analyze, report, and present data.
- Work collaboratively on a team.
- Demonstrate their understanding of professional and ethical responsibility by applying ethical principles and professional standards to making engineering decisions.
- Demonstrate an understanding of the impact of engineering solutions and actions in a global, economic, environmental, and societal context.
- Demonstrate the academic maturity and skills necessary to manage their time and use available resources, as necessary, to succeed in their coursework and to engage in life-long learning.
- Identify ways to become involved in and engaged with the Statler College community.
- Select a major that fits with their career goals.

The FEP focuses on: (1) careful advising and accurate placement of students into courses that are at an appropriate level to facilitate academic success; (2) communication between students, faculty, advisors, and parents; (3) academic support services to help students in the fundamental math, science and engineering courses; (4) provision of a co-curricular and social environment that facilitates successful transition to the college environment, provides career exploration opportunities, and supports students’ academic endeavors; and (5) quality and engaging fundamental engineering instruction.

The FEP provides a vibrant and supportive community for beginning engineering students centered in the Engineering Learning Center (ELC). Freshmen have a “one-stop” place to get the answers they need as they navigate through the transition from high school to college. In the ELC, students receive free tutoring, find information about upcoming guest speakers and other College events, get advising questions answered, and spend a significant amount of time studying, doing homework, and working on team projects for their engineering classes.

Academic support is provided to all FEP students in the following subjects: Math, Chemistry, Physics, and Engineering. Academic support takes several forms: special engineering sections of MATH 155, Calculus I, with two problem-solving recitations each week; free tutoring available at the ELC, the Math Learning Center, the Chemistry Learning Center, and other campus learning centers; special review sessions for math, chemistry, physics, and engineering courses hosted by the ELC; and support from faculty who care about their students’ learning and who are willing to meet with students during office hours and in the ELC. All students taking any 100-level ENGR course must spend two hours each week studying, working on homework or class assignments in an approved and supervised environment that provides tutoring support services.

To facilitate engagement with the engineering community and development as engineering professionals, FEP students are required to participate in and reflect upon engineering-related “Out of Class Experiences” (OCEs). Typical OCE opportunities include: EngineerFEST, an engineering student organization fair held at the beginning of the year to encourage students to learn about and become involved in one of the College’s many student chapters of the professional engineering societies; Department Visitations, in which each department hosts freshmen in an informational seminar describing their majors, relevant research opportunities, and the career paths of graduates; and Student Success Seminars where students learn academic skills and strategies that promote success in engineering disciplines.

All policies, procedures, upcoming events and activities, and academic resources are listed on the FEP website. All of these efforts, academic and co-curricular, work together to create a coherent program designed to facilitate student success in engineering.
FACULTY

ASSISTANT DEAN
• Robin A. M. Hensel - Ed.D. (West Virginia University)
  STEM education K-16, Student retention, Curriculum development

TEACHING ASSOCIATE PROFESSORS
• Ordel J. Brown - Ph.D. (University of West Indies)
  STEM education, Curriculum development, Underrepresented minorities in STEM fields, Service-learning
• Lizzie Y. Santiago - Ph.D. (The Pennsylvania State University)
  Bioengineering, Engineering education, Curriculum development, STEM education, Retention

TEACHING ASSISTANT PROFESSORS
• Gerald M. Angle, II - Ph.D. (West Virginia University)
  Aerospace engineering, STEM education K-16
• Todd R. Hamrick - Ph.D. (West Virginia University)
  STEM education, Robotics, Industrial applications, Curriculum development
• Melissa L. Morris - Ph.D. (West Virginia University)
  Thermodynamics, Fluid mechanics, K-12 outreach, Curriculum development

TEACHING INSTRUCTORS
• Michael K. Brewster - M.A. (West Virginia University)
  Mathematics, Statistics, STEM education K-16

Admission to the Fundamentals of Engineering Program (Internal Transfer Student, FTFT)
To be admitted into the Engineering Track 3 major, a student must have:
• Successfully completed CHEM 115 and ENGL 101
• A WVU and overall GPA of at least 2.25
• Completed the prerequisites for or be ready to take MATH 153 or MATH 155

Admission to the Fundamentals of Engineering Program (External Transfer Student)
To be admitted into the Engineering Track 3 major, a student must have:
• Successfully completed CHEM 115 and ENGL 101
• A cumulative GPA of 2.5 or higher
• Completed the prerequisites for or be ready to take MATH 153 or MATH 155

Admission to a Discipline Major
to be admitted into an engineering major, a student must have:
• Successfully completed MATH 155, CHEM 115, ENGL 101, ENGR 101, ENGR 102, and ENGR 199, all with a grade of C- or better
• A WVU and overall GPA of at least 2.25

The criteria listed above are minimum requirements.

Admission to Programs Under Enrollment Management
Currently, the program in Biomedical Engineering (BMEG) is under enrollment management. Admission to programs under enrollment management will follow the priority structure listed below. If the number of eligible first priority students exceeds the number of admission slots, students will be admitted into the program based on review and consideration of their cumulative GPAs.

1. First priority will be given to first-time, full-time (FTFT) freshmen entering Statler College and students matriculating through the engineering articulation program at Potomac State and students matriculating through other specifically designated program curricula established through articulation agreements at other colleges/universities. Students considered to be FTFT freshmen and in this category include:
   a. Students who entered Statler College as FTFT freshmen and who are in a discipline major for less than one-semester.
   b. Students who entered WVU as FTFT freshmen.
   c. Students outside the WVU system transferring to WVU with less than 24 credit hours.
2. Second priority will be given to internal transfer students from other Statler College discipline majors or WVU Tech students.
3. Third priority will be given to students previously enrolled in Statler College.
4. Fourth priority will be given to students wishing to transfer from outside WVU and all second degree students.

**Early Admission to Discipline Major**

Freshman students having outstanding academic performance during their first semester may elect to move into their selected major at the end of the first semester. These students have the option of taking ENGR 102|Code or an approved department-specific ENGR 102|Code substitute course during the second semester. Early admission is based on a combination of prior credit and academic performance. For early admission to a discipline major, students must:

- Have seven credit hours or more of AP or prior college credit including at least four credits of CHEM 115, CHEM 116, PHYS 111, or PHYS 112;
- Pass all first semester math (MATH 155 and above) and science courses (CHEM 115 or CHEM 116; PHYS 111 or PHYS 112; or GEOL 101, GEOL 102) plus ENGR 199 and ENGR 101 with a C or better; and
- Achieve a cumulative GPA # 3.0.

Or advancement can be based on the following exceptional performance:

- Pass all first semester math (MATH 155 and above) and science courses (CHEM 115 or CHEM 116; PHYS 111 or PHYS 112; or GEOL 101, GEOL 102) plus ENGR 199 and ENGR 101 with a C or better, and
- Achieve a cumulative GPA # 3.5.

**Curriculum**

**In this Section**

- Engineering Track 1 Program Curriculum (p. 3)
- Engineering Track 2 Program Curriculum (p. 4)
- Engineering Track 3 Program Curriculum (p. 6)
- First Year Computer Science Curriculum (p. 7)

**Engineering Track 1 Program Curriculum**

The Engineering Track 1 program curriculum is designed for students who have similar math and science backgrounds so they can effectively work in teams, solve problems, and undertake challenging projects in the Fundamentals of Engineering Problem Solving course, ENGR 101. While Engineering students are accepted based on a combination of ACT/SAT-Math scores, ACT/SAT Composite/Total scores, and high school GPA, students entering WVU may be required to use the ALEKS assessment and preparation system to determine initial course placement in math and chemistry. Engineering Track 1 students are expected to have the math background necessary to place into MATH 155 and CHEM 115. Credit hours for chemistry courses below CHEM 115, mathematics courses below MATH 154/155, and physics courses below PHYS 111 do not count toward meeting degree credit hour requirements for chemistry, mathematics or physics; students placing below MATH 155 and CHEM 115 will be placed in either Engineering Track 2 or Engineering Track 3.

**GENERAL EDUCATION FOUNDATIONS**

Please use this link to view a list of courses that meet each GEF requirement. [http://registrar.wvu.edu/gef](http://registrar.wvu.edu/gef)

NOTE: Some major requirements will fulfill specific GEF requirements. Please see the curriculum requirements listed below for details on which GEFs you will need to select.

**General Education Foundations**

<table>
<thead>
<tr>
<th>GEF</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>F1</td>
<td>Composition &amp; Rhetoric</td>
</tr>
<tr>
<td>&amp;</td>
<td>ENGL 101</td>
</tr>
<tr>
<td>or</td>
<td>ENGL 102</td>
</tr>
<tr>
<td></td>
<td>ENGL 103</td>
</tr>
<tr>
<td>F2A/F2B</td>
<td>Science &amp; Technology</td>
</tr>
<tr>
<td>F3</td>
<td>Math &amp; Quantitative Skills</td>
</tr>
<tr>
<td>F4</td>
<td>Society &amp; Connections</td>
</tr>
<tr>
<td>F5</td>
<td>Human Inquiry &amp; the Past</td>
</tr>
<tr>
<td>F6</td>
<td>The Arts &amp; Creativity</td>
</tr>
<tr>
<td>F7</td>
<td>Global Studies &amp; Diversity</td>
</tr>
</tbody>
</table>
Please note that not all of the GEF courses are offered at all campuses. Students should consult with their advisor or academic department regarding the GEF course offerings available at their campus.

### Engineering Curriculum Requirements

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 115</td>
<td>Fundamentals of Chemistry</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 116</td>
<td>Fundamentals of Chemistry</td>
<td>4</td>
</tr>
<tr>
<td>or BIOL 115</td>
<td>Principles of Biology</td>
<td>4</td>
</tr>
<tr>
<td>Select one of the following:</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>ENGL 101</td>
<td>Introduction to Composition and Rhetoric</td>
<td>3</td>
</tr>
<tr>
<td>or ENGL 103</td>
<td>Accelerated Academic Writing</td>
<td></td>
</tr>
<tr>
<td>ENGR 101</td>
<td>Engineering Problem Solving 1</td>
<td>2</td>
</tr>
<tr>
<td>ENGR 102</td>
<td>Engineering Problem-Solving 2</td>
<td>3</td>
</tr>
<tr>
<td>ENGR 191</td>
<td>First-Year Seminar</td>
<td>1</td>
</tr>
<tr>
<td>MATH 155</td>
<td>Calculus 1 (minimum grade C)</td>
<td>4</td>
</tr>
<tr>
<td>MATH 156</td>
<td>Calculus 2</td>
<td>4</td>
</tr>
<tr>
<td>PHYS 111</td>
<td>General Physics</td>
<td>4</td>
</tr>
<tr>
<td>GEF Elective</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Total Hours</td>
<td></td>
<td>35</td>
</tr>
</tbody>
</table>

### SUGGESTED PLAN OF STUDY

**First Year**

<table>
<thead>
<tr>
<th></th>
<th>Fall</th>
<th>Hours</th>
<th>Spring</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 155</td>
<td>4</td>
<td>MATH 156</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>ENGR 101</td>
<td>2</td>
<td>ENGR 102</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>ENGR 191</td>
<td>1</td>
<td>PHYS 111</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Select one of the following:</td>
<td>4</td>
<td>Select one of the following:</td>
<td>3-4</td>
<td></td>
</tr>
<tr>
<td>CHEM 115</td>
<td>CHEM 116</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BIOL 115</td>
<td>CHEM 115</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Select one of the following:</td>
<td>3</td>
<td>Select one of the following:</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>ENGL 103</td>
<td>GEF Elective</td>
<td>ENGL 101</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ENGL 101</td>
<td>GEF Elective</td>
<td>ENGL 103</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GEF Elective</td>
<td>GEF Elective</td>
<td>***</td>
<td>***</td>
<td></td>
</tr>
</tbody>
</table>

Total credit hours: 34-35

* Students intending to pursue a biometric systems degree should take BIOL 115 in place of CHEM 115 first semester and CS 110 in place of a second semester GEF elective.

** Students intending to pursue a chemical engineering degree or petroleum and natural gas engineering degree must take CHEM 116. Students intending to pursue an industrial engineering degree can take either PHYS 112 (taken in sophomore year) or CHEM 116 but do not need both. Students intending to pursue a civil engineering degree must take only one of: CHEM 116, PHYS 112 or BIOL 115. Students wishing to pursue single or dual degrees in aerospace, computer, electrical, mechanical, mining, biometric systems or computer science do not need CHEM 116.

*** Students intending to pursue a petroleum and natural gas engineering degree should take GEOL 101 in place of one GEF elective. Students intending to pursue a mining engineering degree should take GEOL 101, GEOL 102, and STAT 211 in place of two GEF electives. Students pursuing dual mining engineering and geology degrees need to take GEOL 101, 102, 103 and 104 in place of both GEF electives.

### Engineering Track 2 Program Curriculum

The Engineering track 2 program curriculum is tailored for those students who are not ready to take MATH 155 and ENGR 101. While Engineering students are accepted based on a combination of ACT/SAT-Math scores, ACT/SAT Composite/Total scores, and high school GPA, students entering WVU may be required to use the ALEKS assessment and preparation system to determine initial course placement in math and chemistry. Engineering Track 2 students are expected to have the math background necessary to place into MATH 128 or MATH 129, and CHEM 110A, and must earn a grade of C or better in each math course to move to MATH 155. These students will need to complete ENGR 102 either in the summer following their first year
or during the fall of the second year before they will be accepted into an engineering discipline major. Credit hours for chemistry courses below CHEM 115, mathematics courses below MATH 154/155, and physics courses below PHYS 111 do not count toward meeting degree credit hour requirements for chemistry, mathematics or physics.

**General Engineering Curriculum Requirements**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 110A</td>
<td>Introduction to Chemistry A</td>
<td>1</td>
</tr>
<tr>
<td>CHEM 110B</td>
<td>Introduction to Chemistry B</td>
<td>1</td>
</tr>
<tr>
<td>CHEM 115</td>
<td>Fundamentals of Chemistry</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 116</td>
<td>Fundamentals of Chemistry</td>
<td>4</td>
</tr>
<tr>
<td>or BIOL 115</td>
<td>Principles of Biology</td>
<td>4</td>
</tr>
<tr>
<td>ENGL 101</td>
<td>Introduction to Composition and Rhetoric</td>
<td>3</td>
</tr>
<tr>
<td>or ENGL 103</td>
<td>Accelerated Academic Writing</td>
<td></td>
</tr>
<tr>
<td>ENGR 100</td>
<td>Introduction to Engineering Applications</td>
<td>3</td>
</tr>
<tr>
<td>ENGR 101</td>
<td>Engineering Problem Solving 1</td>
<td>2</td>
</tr>
<tr>
<td>ENGR 102</td>
<td>Engineering Problem-Solving 2</td>
<td>3</td>
</tr>
<tr>
<td>ENGR 191</td>
<td>First-Year Seminar</td>
<td>1</td>
</tr>
</tbody>
</table>

Select from the following based on Placement:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 128</td>
<td>Plane Trigonometry (minimum grade C)</td>
<td>4</td>
</tr>
<tr>
<td>MATH 129</td>
<td>Pre-Calculus Mathematics (minimum grade C)</td>
<td>4</td>
</tr>
<tr>
<td>MATH 153</td>
<td>Calculus 1a with Precalculus (minimum grade C)</td>
<td>4</td>
</tr>
<tr>
<td>MATH 154</td>
<td>Calculus 1b with Precalculus (minimum grade C)</td>
<td>4</td>
</tr>
<tr>
<td>MATH 155</td>
<td>Calculus 1 (minimum grade C)</td>
<td>4</td>
</tr>
<tr>
<td>MATH 156</td>
<td>Calculus 2</td>
<td>4</td>
</tr>
<tr>
<td>PHYS 111</td>
<td>General Physics</td>
<td>4</td>
</tr>
</tbody>
</table>

Total Hours: 34

**SUGGESTED PLAN OF STUDY**

**First Year**

**Fall**

Select one of the following:

- MATH 128
- MATH 129
- MATH 153

ENGR 191

CHEM 110A

CHEM 110B

Select one of the following:

- ENGL 101
- ENGL 103
- GEF Elective

Select one of the following:

- BIOL 115
- ENGR 100
- GEF Elective

**Spring**

Select one of the following:

- MATH 154
- MATH 155

Select one of the following:

- ENGR 101
- GEF Elective

Select one of the following:

- CHEM 115

Select one of the following:

- ENGL 101
- ENGL 103
- GEF Elective

Select one of the following:

- BIOL 115
- ENGR 100
- GEF Elective

12-14

15-17

**Second Year**

**Fall**

MATH 156

ENGR 102

PHYS 111

Select one of the following:

- CHEM 116
- BIOL 115
Fundamentals of Engineering Program

GEF Elective ***
GEF Electives ***

Total credit hours: 44-49

* Students intending to pursue Biometrics should take BIOL 115 in the first semester and should also take CS 110 in place of a GEF Elective.

** Students intending to pursue a chemical engineering degree or petroleum and natural gas engineering degree must take CHEM 116. Students intending to pursue an industrial engineering degree can take either PHYS 112 (taken in sophomore year) or CHEM 116, but do not need both. Students intending to pursue a civil engineering degree must take one of: CHEM 116, PHYS 112 or BIOL 115. Students wishing to pursue single or dual degrees in aerospace, computer, electrical, mechanical, mining, biometric systems or computer science do not need CHEM 116.

*** Students intending to pursue a petroleum and natural gas engineering degree should take GEOL 101 in place of one GEF elective. Students intending to pursue a mining engineering degree should take GEOL 101, GEOL 102, and STAT 211 in place of two GEF electives. Students pursuing dual mining engineering and geology degrees need to take GEOL 101, 102, 103 and 104 in place of both GEF electives.

**** Students taking MATH 153 should take ENGR 100.

Engineering Track 3 Program Curriculum

The Engineering Track 3 program curriculum is tailored for those students who demonstrate the need to take more than one math course before MATH 155. While Engineering students are accepted based on a combination of ACT/SAT-Math scores, ACT/SAT Composite/Total scores, and high school GPA, students entering WVU may be required to use the ALEKS assessment and preparation system to determine initial course placement in math and chemistry. Based on the ALEKS assessment, students are placed into algebra, trigonometry, or pre-calculus courses and must earn a grade of C or better in each course in sequence to move into MATH 155. The student’s ALEKS assessment results also determine initial placement into a chemistry course. Typically, Engineering Track 3 students have the background necessary to place into CHEM 110A and either MATH 126A or MATH 126B. Engineering Track 3 students should expect to take more than one year to complete the six courses that are pre-requisite to entering an engineering discipline major. Credit hours for chemistry courses below CHEM 115, mathematics courses below MATH 154/155, and physics courses below PHYS 111 do not count toward meeting degree credit hour requirements for chemistry, mathematics or physics.

Pre-Engineering Curriculum Requirements

<table>
<thead>
<tr>
<th>Course</th>
<th>Description</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 110A</td>
<td>Introduction to Chemistry A</td>
<td>1</td>
</tr>
<tr>
<td>CHEM 110B</td>
<td>Introduction to Chemistry B</td>
<td>1</td>
</tr>
<tr>
<td>CHEM 115</td>
<td>Fundamentals of Chemistry</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 116</td>
<td>Fundamentals of Chemistry</td>
<td>4</td>
</tr>
<tr>
<td>or BIOL 115</td>
<td>Principles of Biology</td>
<td></td>
</tr>
<tr>
<td>ENGL 101</td>
<td>Introduction to Composition and Rhetoric</td>
<td>3</td>
</tr>
<tr>
<td>or ENGL 103</td>
<td>Accelerated Academic Writing</td>
<td></td>
</tr>
<tr>
<td>ENGR 100</td>
<td>Introduction to Engineering Applications</td>
<td>3</td>
</tr>
<tr>
<td>ENGR 101</td>
<td>Engineering Problem Solving 1</td>
<td>2</td>
</tr>
<tr>
<td>ENGR 102</td>
<td>Engineering Problem-Solving 2</td>
<td>3</td>
</tr>
<tr>
<td>ENGR 191</td>
<td>First-Year Seminar</td>
<td>1</td>
</tr>
</tbody>
</table>

Select from the following based on Placement:

<table>
<thead>
<tr>
<th>Course</th>
<th>Description</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 126</td>
<td>College Algebra</td>
<td></td>
</tr>
<tr>
<td>MATH 128</td>
<td>Plane Trigonometry (minimum grade C)</td>
<td></td>
</tr>
<tr>
<td>MATH 129</td>
<td>Pre-Calculus Mathematics (minimum grade C)</td>
<td></td>
</tr>
<tr>
<td>MATH 153</td>
<td>Calculus 1a with Precalculus (minimum grade C)</td>
<td></td>
</tr>
<tr>
<td>MATH 154</td>
<td>Calculus 1b with Precalculus (minimum grade C)</td>
<td></td>
</tr>
<tr>
<td>MATH 155</td>
<td>Calculus 1 (minimum grade C)</td>
<td></td>
</tr>
<tr>
<td>MATH 156</td>
<td>Calculus 2</td>
<td>4</td>
</tr>
<tr>
<td>PHYS 111</td>
<td>General Physics</td>
<td>4</td>
</tr>
</tbody>
</table>

Total Hours 34

SUGGESTED PLAN OF STUDY

First Year

<table>
<thead>
<tr>
<th>Course</th>
<th>Description</th>
<th>Fall Hours</th>
<th>Spring Hours</th>
<th>Total Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 126</td>
<td></td>
<td>3</td>
<td>MATH 128</td>
<td>3</td>
</tr>
<tr>
<td>ENGR 191</td>
<td></td>
<td>1</td>
<td>GEF Elective</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 110A</td>
<td></td>
<td>1</td>
<td>CHEM 115</td>
<td>4</td>
</tr>
</tbody>
</table>
CHEM 110B 1
Select one of the following: 3
ENGL 101
ENGL 103
GEF Elective ***
GEF Electives ***
3
Select one of the following: 3
BIOL 115*
GEF Elective ***

15
16

Second Year
Fall
ENGR 101 2
Select one of the following: 4
CHEM 115
CHEM 116**
GEF Electives ***

16
17

Total credit hours: 64

* Students intending to pursue Biometrics should take BIOL 115 in the first semester and should also take CS 110 in place of a GEF elective.

** Students intending to pursue a chemical engineering degree or petroleum and natural gas engineering degree must take CHEM 116. Students intending to pursue an industrial engineering degree can take either PHYS 112 (taken in sophomore year) or CHEM 116 but do not need both. Students intending to pursue a civil engineering degree must take only one of: CHEM 116, PHYS 112 or BIOL 115. Students wishing to pursue single or dual degrees in aerospace, computer, electrical, mechanical, mining, biometric systems or computer science do not need CHEM 116.

*** Students intending to pursue a mining engineering degree should take GEOL 101 in place of one GEF elective. Students intending to pursue a petroleum and natural gas engineering degree should take GEOL 101, GEOL 102, and STAT 211 in place of two GEF electives. Students pursuing dual mining engineering and geology degrees need to take GEOL 101, 102, 103 and 104 in place of both GEF electives.

First Year Computer Science Curriculum

The complete Computer Science curriculum, including the suggested first year plan of study, is presented under the Computer Science major subsection of the Lane Department of Computer Science and Electrical Engineering section. Computer Science students are expected to have the math background necessary to place into MATH 155.

Policies

In this Section

• Adequate Academic Progress (p. 7)
• Dismissal from the Statler College (p. 8)

Adequate Academic Progress

All students need to make adequate academic progress. Adequate academic progress for Track 1, Track 2, and Track 3 engineering students is defined as meeting the prerequisites to take MATH 153 or MATH 155 by the beginning of the third semester within the Fundamentals of Engineering Program and meeting the criteria for admission to an engineering discipline major within four semesters of the date of entrance to the Statler College. Because each student's case is unique, the academic progress of all students who have not started MATH 153/MATH 155 by the start of their third semester and all students who have not moved to an engineering discipline major by the end of their fourth semester will be reviewed by the Fundamentals of Engineering Program Academic Standards Committee. Upon review, the committee will either:

1. Transfer the student out of the Statler College to the Center for Learning, Advising, and Student Success and specify the conditions which must be met before the student may return to the Statler College; or
2. Retain the student in the Statler College and specify the academic progress which must be met within one semester.

Students will not be permitted to enroll, without college approval, in courses carrying a discipline major code until they have been accepted into an engineering discipline major.
DISMISSAL FROM THE STATLER COLLEGE

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 a minimum of 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 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 from the Fundamentals of Engineering program for low academic performance (overall and/or WVU grade point average less than 2.25) must petition to be readmitted to the Statler College; the decision to readmit will be on a case-by-case basis.

A student may also be dismissed from the Statler College for violating the WVU Student Code of Conduct.

ENGR 100. Introduction to Engineering Applications. 3 Hours.
PR or CONC: MATH 129 or MATH 153. Introduction to basic problem solving of engineering applications using algebra and trigonometry.

ENGR 101. Engineering Problem Solving 1. 2 Hours.
PR or CONC: MATH 154 or MATH 155. Engineering problem solving methodologies and analysis. Use of computers in problem solving, technical report writing, team based project work and presentations.

ENGR 102. Engineering Problem-Solving 2. 3 Hours.
PR: ENGR 101 and (MATH 154 or MATH 155) with a C- in each. Continued development of engineering problem-solving, teamwork, and communication skills with emphases on using the computer as a tool and algorithm development with a high-level language such as MATLAB.

ENGR 103. Introduction to Nanotechnology Design. 3 Hours.
PR: ENGR 101 and (MATH 154 or MATH 155 with a C or better) or Consent. Continued development of engineering problem-solving, teamwork, and communication skills with emphasis on the fundamentals of nanotechnology design, using the computer as a tool, and algorithm development with a high-level language such as MATLAB.

ENGR 112. Professional Development in Engineering. 2 Hours.
Professional development and academic success strategies for first-year students enrolled in the Freshman Engineering summer bridge program - Academy of Engineering Success (AcES).

ENGR 129. Engineering Mathematics. 1 Hour.
PR: Consent. Review of key pre-calculus and early calculus concepts and topics for engineering students.

ENGR 140. Engineering in History. 3 Hours.
Impact of engineering on society throughout history. Developments in warfare, architecture, agriculture, manufacturing, communication, transportation, and their impacts on society.

ENGR 142. Engineering Seminar. 1 Hour.
Faculty, alumni, graduate students, and industry representatives will provide presentations on various engineering research, career, and experience topics. Students will reflect and discuss the presentations on instructor monitored discussion boards.

ENGR 143. Engineering Concepts. 3 Hours.
Course covers engineering approaches to problem solving, design process, understanding technical communication, estimation, international standards and units, manufacturing processes and intellectual property, useful to students pursuing a career related to the engineering profession. Introduces the engineering disciplines and areas of application.

ENGR 150. Academic Success Skills. 1 Hour.
The development of academic skills that are needed to be a successful engineering student.

ENGR 151. Introduction to Engineering Reasoning. 3 Hours.
PR or CONC: MATH 126. An introduction to skills of critical reasoning. Application of reasoning skills to engineering problem solving, research and experimentation in engineering, and to the engineering design process. The course emphasizes the importance of elements of thought, universal intellectual standards, and essential intellectual traits in reasoning.

ENGR 155. Spatial Visualization. 1 Hour.
Introductory course offered to engineering students to strengthen their spatial thinking skills. These 3D visualization skills are beneficial for future engineering classes. Topics include: isometric drawing, orthographic projections, 3D object rotations, flat pattern developments, and surfaces and solids of revolution.

ENGR 199. Orientation to Engineering. 1 Hour.
Orientation to degree programs and requirements, departmental resources, curriculum options, students’ responsibilities, and opportunities. Development of academic success strategies and University experiences to equip students to make life decisions.

ENGR 210. Engineering Decision Making. 2 Hours.
PR: ENGR 143. Examines engineering ethics, critical reasoning, and problem solving. Applies these ideas to questions, challenges, and issues in a variety of areas, including engineering applications. Covers important and controversial decisions made previously in the engineering field, and the related impacts and consequences.
ENGR 230. Exploring Culture and Technology of Germany Study Abroad. 3 Hours.
PR: Consent. Expose students to engineering as a global profession including language, culture, customs, and history of Germany, especially relating to engineering, through travel to Germany to visit factories, museums and universities.

ENGR 280. Sophomore Nanoscience Seminar. 1 Hour.
PR: ENGR 103. Introduces students to the original nanoscale science and engineering literature, including research on social, ethical and economic issues, and develops skills in interdisciplinary team building.

ENGR 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ENGR 310. Energy Engineering. 3 Hours.
An introduction to the basic principles governing energy use, energy sources, and the impact of energy production on the environment. Examines the amount of energy used by society, fossil fuels and alternative energy sources, and methods of energy production.

ENGR 380. Junior Nanoscience Seminar 1. 1 Hour.
PR: ENGR 280. Familiarizes students with science and engineering that is being carried out in the laboratories at WVU, and helps students understand the importance of other disciplinary approaches to Nanoscale Science and Engineering.

ENGR 381. Junior Nanoscience Seminar 2. 1 Hour.
PR: ENGR 380. This course matches students with appropriate host laboratories in preparation for their senior research project. It fosters appreciation for the importance of the disciplinary fundamentals learned in the development of nanoscale science and engineering.

ENGR 393. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ENGR 450. Technology Entrepreneurship and Enterprise Development. 3 Hours.
PR: Senior level or consent. Introduction to concepts, methods, and strategies involved in starting a successful business that is based upon new technology, products, and services. The course assists in identifying opportunities for existing markets, understanding how investors look at technology companies, managing intellectual property, financial and legal issues, commercializing real technologies, and information required for preparing a business plan to guide the enterprise.

ENGR 463. Find an Engineering Job/Internship. 1 Hour.
Assist engineering or computer science students in finding an engineering job or internship. Topics covered are resume and cover letter writing, interviewing skills, looking for a job, and assessing job offers.

ENGR 470. Fluid Mechanics Videos 1. 1 Hour.
Videos and discussion illustrate phenomena such as turbulence, compressibility and surface tension. Supplements MAE 331 and MAE 335 and CE 321 and CE 322 and CE 522. Does not satisfy AE, CE or ME technical elective requirement.

ENGR 471. Fluid Mechanics Videos 2. 1 Hour.
Videos and discussion illustrate phenomena such as turbulence, compressibility and surface tension. Supplements MAE 331 and MAE 335 and CE 321, CE 322 and CE 522. Does not satisfy AE, CE, or ME technical elective requirement.

PR: Consent. Prearranged co-op experience in student's major. Involves placement in public or private enterprise, supervision, and evaluation for credit by faculty and employer.

ENGR 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

ENGR 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ENGR 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

ENGR 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

ENGR 496. Senior Thesis. 1-3 Hours.
PR: Consent.

ENGR 497. Research. 1-6 Hours.
Independent research projects.

ENGR 498. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study, or research.