Engineering

Degree Offered

- Master of Science, Engineering (M.S.E.)

Nature of the Program

The master of science in engineering (M.S.E) program is available to students holding a baccalaureate degree in a field of engineering different from the M.S. major they are seeking. It is also open to students holding a baccalaureate degree in the physical sciences wishing to pursue a broad interdisciplinary M.S. degree in an engineering program (for example, a student with a B.S. in chemistry can pursue an M.S.E. with an emphasis in chemical engineering). The M.S.E. is a college-wide undesignated program that compliments the designated master’s program in each of the eight individual engineering discipline majors, namely, aerospace engineering, chemical engineering, civil engineering, electrical engineering, industrial engineering, mechanical engineering, mining engineering or petroleum and natural gas engineering.

It is important to note that the M.S. in specific disciplines requires an equivalent bachelor's degree-level of knowledge to pursue; students may pursue the M.S.E. degree with a more basic level of knowledge in that field, the difference of which could be the equivalent of several semesters of undergraduate work. The M.S.E., therefore, is an important element in providing students with additional professional options, allowing for a broad and diverse masters experience and preparing students from the physical sciences with the basis to pursue doctoral work in engineering.

Due to the interdisciplinary nature of the degree program, the M.S.E. can also serve as an avenue to explore and develop potential future M.S. programs in a new engineering discipline on an experimental basis.

There are no specific faculty lines tied to the M.S.E. program. The faculty contributing to a student pursuing an M.S.E. program in a specific discipline area is the same faculty contributing in that M.S. discipline major program.

Curriculum in Master of Science in Engineering

The following programs participate in the Master of Science in Engineering Program:

- Chemical Engineering
- Civil Engineering
- Computer Science
- Electrical Engineering
- Industrial Engineering

A candidate for the M.S. degree in engineering must comply with the rules and regulations as outlined in the WVU Graduate Catalog and the specific requirements of the Statler College and the specific department in which the student’s concentration is in.

Program Requirements

All M.S. degree candidates are required to perform research and follow a planned program of study. The student’s research advisor, in conjunction with the student’s Advising and Examining Committee (AEC) will be responsible for determining the plan of study appropriate to the student’s needs. The underlying principle of the planned program is to provide the students with the necessary support to complete their degree and prepare them for their career.

Curriculum Requirements

A minimum cumulative GPA of 3.0 is required in all courses

Course Requirements

A minimum of 60% of courses must be from 500 level or above

Select from the following based on degree path:

<table>
<thead>
<tr>
<th>Course Path</th>
<th>Minimum Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any BIOM, CE, CHEM, CPE, CS, EE, IENG, IH&amp;S, MAE, MATH, MINE, PNGE, PHYS, SAFM, SENG, or STAT courses 400-799</td>
<td>24</td>
</tr>
</tbody>
</table>

Complete 1 of the following options:

<table>
<thead>
<tr>
<th>Option</th>
<th>Minimum Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thesis - any 697 (6 hours)</td>
<td>6-9</td>
</tr>
<tr>
<td>Written Research Proposal</td>
<td></td>
</tr>
<tr>
<td>Thesis</td>
<td></td>
</tr>
<tr>
<td>Final Oral or Written Examination</td>
<td></td>
</tr>
</tbody>
</table>

Problem Report Option - 9 hours

Complete 6 additional hours of coursework
<table>
<thead>
<tr>
<th>Research - any 697 (3 hours)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Written Research Proposal</td>
</tr>
<tr>
<td>Formatted written report or professional report/paper</td>
</tr>
<tr>
<td>Final Oral or Written Examination</td>
</tr>
<tr>
<td><strong>Coursework Option - 9 hours</strong></td>
</tr>
<tr>
<td>Complete 8 additional hours of coursework</td>
</tr>
<tr>
<td>Final Oral or Written Examination</td>
</tr>
</tbody>
</table>

**Total Hours:** 30-33

* Students who do not hold a baccalaureate degree in engineering may be required to take a set of undergraduate engineering courses above and beyond the minimum coursework requirements.

### Final Examination

M.S. students following the thesis or problem report option must prepare a written research proposal. The proposal must be approved by the student's AEC at least one semester prior to the final oral examination.

All students, regardless of option, are required to pass a final oral or written examination, administered by their AEC, covering the thesis or problem report and/or related course material.

### Suggested Plan of Study

The plan below illustrates the Thesis Option. It is important for students to take courses in the order specified as much as possible; all prerequisites and concurrent requirements must be observed. A typical M.S.E degree program that completes degree requirements in two years is as follows.

**First Year**

<table>
<thead>
<tr>
<th>Fall</th>
<th>Hours</th>
<th>Spring</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Course</td>
<td>3</td>
<td>Course</td>
<td>3</td>
</tr>
<tr>
<td>Course</td>
<td>3</td>
<td>Course</td>
<td>3</td>
</tr>
<tr>
<td>Course</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>9</td>
<td></td>
<td>9</td>
</tr>
</tbody>
</table>

**Second Year**

<table>
<thead>
<tr>
<th>Fall</th>
<th>Hours</th>
<th>Spring</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Course</td>
<td>3</td>
<td>Research</td>
<td>9</td>
</tr>
<tr>
<td>Course</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Research</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>9</td>
<td></td>
<td>9</td>
</tr>
</tbody>
</table>

**Total credit hours:** 36

### Major Learning Outcomes

Upon graduation, with a masters of science degree in engineering, students will have:

- An expert level understanding of the advanced principles of their engineering specialty
- Ability to apply advanced methodologies in their specialty area
- Ability to design and conduct original experiments, analyze and interpret data, and develop recommendations with a high degree of independence
- Advanced ability to use contemporary techniques, skills, and tools necessary for engineering practice in education, industry, and/or government
- Ability to effectively communicate technical information in the form of a thesis, scientific publication or presentation
- Understanding of professional and ethical responsibility
- Ability to understand the impact of engineering solutions in global and societal context
- Recognition of the need to engage in life-long learning
- Foundational preparation to pursue doctoral studies