Bachelor of Science in Geological Engineering

2019-2020

Year 1

Fall
- MA 1160/1161 Calculus w/ Tech I (4 credits)
- PH 1100 Univ. Physics I (1 credit)
- CH 1150 Univ. Chemistry I (3 credits)
- ENG 1001 Eng. Analysis & Prob. Solving (3 credits)

Spring
- MA 2150 Calculus w/ Tech II (4 credits)
- PH 1100 Univ. Physics I (1 credit)
- CH 1150 Univ. Chemistry I (3 credits)
- ENG 1001 Eng. Analysis & Prob. Solving (3 credits)

Year 2

Fall
- ENG 2122 Statics Strength of Mat'l (4 credits)
- GE 1910 Field Geology w/ Eng App (6 credits)
- PH 1200 Univ. Physics II - Elec. & Mag (3 credits)
- GE 3040 Fundamental of Geophysics (3 credits)

Spring
- ENG 2122 Statics Strength of Mat'l (4 credits)
- GE 1910 Field Geology w/ Eng App (6 credits)
- PH 1200 Univ. Physics II - Elec. & Mag (3 credits)
- GE 3040 Fundamental of Geophysics (3 credits)

Year 3

Fall
- MA 2150 Calculus w/ Tech III (4 credits)
- CH 1150 Univ. Chemistry I (3 credits)
- GE 3050 Structural Geology (4 credits)
- ENG 1102 Eng. Modeling & Design (3 credits)

Spring
- MA 2150 Calculus w/ Tech III (4 credits)
- CH 1150 Univ. Chemistry I (3 credits)
- GE 3050 Structural Geology (4 credits)
- ENG 1102 Eng. Modeling & Design (3 credits)

Year 4

Fall
- MA 2150 Calculus w/ Tech III (4 credits)
- CH 1150 Univ. Chemistry I (3 credits)
- GE 3050 Structural Geology (4 credits)
- ENG 1102 Eng. Modeling & Design (3 credits)

Spring
- MA 2150 Calculus w/ Tech III (4 credits)
- CH 1150 Univ. Chemistry I (3 credits)
- GE 3050 Structural Geology (4 credits)
- ENG 1102 Eng. Modeling & Design (3 credits)

Note: This is not an official list of degree requirements. Adjustments may be required due to curriculum changes.
**BS in Geological Engineering 2019-2020**  
(Minimum of 132 Credits)

### Geological Engineering Electives

Nine credits of Geological Engineering Electives are required. Prerequisites not normally required must be satisfied by free electives or other courses not specifically listed. With approval of Geological Engineering ABET Coordinator, Geo Eng electives may be substituted with Independent Geological Engineering Research and/or Cooperative Lab.

### Enterprise Concentration (12 Credits)

With permission of Geological Engineering ABET Coordinator, enterprise may substitute 6 credits of interdisciplinary project for GE 4900 and GE 4910; 3 credits of required communication, teaming or business must be double counted as Distribution (HASS) credits; and 3 credits of enterprise instructional modules must be substituted for free electives.

### Second Degree Policy:

Candidates for a second degree must meet all the coursework requirements for the major in the second degree with a minimum of 25% of the credit hours required for the degree, beyond the primary degree.

#### General Education Requirements

(http://www.mtu.edu/registrar/pdfs/core-and-hass-list-17-18-v2.pdf)

**I. Core Courses (6 Credits)**

- **A.** 6 credits 3000- or 4000-level:
  1. __________________
  2. __________________

- **B.** 6 credits at any level:
  1. __________________
  2. __________________

**II. Sophomore Core Courses (6 Credits)**

Creative and Critical Thinking (HU/FA) ________________
Social Responsibility and Ethical Reasoning (SS) ________________

**III. Hass Course Requirements (12 Credits)**

(http://www.mtu.edu/registrar/pdfs/core-and-hass-list-17-18-v2.pdf)

- **A.** 6 credits 3000- or 4000-level:
  1. __________________
  2. __________________

- **B.** 3 credits required from each of these 3 lists:
  1. Communication and Composition, Humanities and Fine Arts (HU/FA),
  2. Social and Behavioral Sciences (EC/PSY/SS),
  3. No more than 3 credits on the Restricted HASS List

**IV. Co-curricular activities (3 units)**

The co-curricular requirement consists of three semester units of physical education activities. These units are required for graduation, but are not included in the overall degree-credit requirement.

**Note:** Most physical education activities will last for 7 ½ weeks or ½ semester. A student would need six of these ½-semester units to fulfill the 3-semester unit co-curricular requirement.

#### Advanced Geological Technical Electives

<table>
<thead>
<tr>
<th>Course Title</th>
<th>Offered</th>
<th>Prerequisite(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>GE 3400 Drilling and Blasting</td>
<td>FA</td>
<td>GE 2020, PH 2100</td>
</tr>
<tr>
<td>GE 4150 Natural Hazards</td>
<td>FA</td>
<td>(GE 2000 or GE 2100), UN 2002</td>
</tr>
<tr>
<td>GE 4360 Materials Handling</td>
<td>SP</td>
<td>PH 2100</td>
</tr>
<tr>
<td>GE 4504 Air Quality Engineering and Science</td>
<td>FA</td>
<td>ENVE 3501 or ENVE 3503</td>
</tr>
<tr>
<td>GE 4610 Formation Eval. &amp; Petrol. Eng.</td>
<td>FA</td>
<td></td>
</tr>
<tr>
<td>GE 4800 Groundwater Eng.</td>
<td>On Demand, typ. SP</td>
<td>GE 3850</td>
</tr>
<tr>
<td>GE 4860 Computer Methods in Geomechanics</td>
<td>SP</td>
<td>GE 2000, ENG 2120, (ENG 3200 or ENG 3507)</td>
</tr>
<tr>
<td>GE 3880 Mine Planning &amp; Design</td>
<td>SP</td>
<td>GE 2320, GE 3400, GE 3870</td>
</tr>
<tr>
<td>GE 4680 Open Research for Mining Engineers</td>
<td>On Demand</td>
<td>GE 2020 or GE 2320</td>
</tr>
<tr>
<td>ENVE 3503 Environmental Engineering</td>
<td>FA, SU, SP</td>
<td></td>
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<tr>
<td>GE 3870 Resource &amp; Reserve Estimation</td>
<td>FA alternate years</td>
<td>GE 2020, MA 3710</td>
</tr>
<tr>
<td>CE 3331 Professional Practice</td>
<td>FA, SP</td>
<td>(MA 2150 or MA 2160), (CH 1100 or CH 1110)</td>
</tr>
<tr>
<td>CE 3332 Fund. Constr. Engineering</td>
<td>FA, SU, SP</td>
<td></td>
</tr>
<tr>
<td>CE 3620 Water Resources Engineering</td>
<td>FA, SP</td>
<td></td>
</tr>
<tr>
<td>CE 4010 Introduction to Consulting Eng</td>
<td>SP</td>
<td>(ENG 3200 or ENG 3507), (MA 3710(C) or ENVE 3502(C) or CE 3710(C))</td>
</tr>
<tr>
<td>CE 4820 Foundation Engineering</td>
<td>FA</td>
<td></td>
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<tr>
<td>CE 4830 Geosynthetics Engineering</td>
<td>SP</td>
<td>CE 3201, CE 3810</td>
</tr>
<tr>
<td>CE 4850 Rock Engineering for Civil Eng</td>
<td>SP alternate years</td>
<td>CE 3810</td>
</tr>
</tbody>
</table>

**Note:** Special Topics Courses focusing predominantly on applications of engineering to geological engineering systems/projects may also be used with prior approval by a GE Advisor. Additionally, with prior approval from advisor, student may choose other technical electives. Many appropriate senior-level engineering courses are offered in Civil & Environmental Engineering on topics related to those listed above. Adv. Geophysics Elective Courses (see list below) can be taken as Technical Electives for BSGE students.

### Advanced Geophysics Electives

<table>
<thead>
<tr>
<th>Course Title</th>
<th>Offered</th>
<th>Prerequisite(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>GE 4560 Earthquake Seismology</td>
<td>FA</td>
<td>GE 3050, PH 2100, MA 3160</td>
</tr>
<tr>
<td>GE 4600 Reflection Seismology</td>
<td>SP</td>
<td>GE 3040</td>
</tr>
<tr>
<td>GE 4610 Formation Eval. &amp; Petrol. Eng.</td>
<td>FA</td>
<td>(depends on demand)</td>
</tr>
</tbody>
</table>

**Note:** a GE Advisor may also use special Topics Courses focusing predominantly on applications of geophysics in geological engineering projects with prior approval.