### Engineering Elective List (3 credits)
- CEE3101 Civil Engineering Materials (3 cr) F, S
- CEE3332 Fundamentals of Construction (3 cr) F, S
- CEE3401 Transportation Engineering (3 cr) F, S
- CEE3810 Soil Mechanics (4 cr) F, S

### Science Elective List (3 credits)
- CH1153 Chemistry Recitation I (1 cr) F, S, Su
- FW2010 Vegetation of North America (4 cr) F
- PH1200/2200 Physics II (4 cr – 1 cr lab, 3 cr lecture) F, S, Su
- PH1600/1610 Introductory Astronomy & Lab (3 cr – 1 cr lab, 2 cr lecture) F, S, Su

### Technical Elective List (1-2 credits)
- CEE3331 Professional Practice (2 cr) F, S
- ENG3200 Thermo/Fluids (4 cr) F, S
- ENTXXXX Enterprise (Except 3960/4950) (var) F, S
- UN3002 Co-op (1-2 cr) F, S, Su

### Surveying Elective List (3 credits)
- SU4010 Geospatial Concepts, Technologies, and Data (3 cr) Spring
- SU4011 Cadastre and Land Information Systems (3 cr) Fall (alt)
- SU4012 Geospatial Data Mining and Crowd Sourcing (3 cr) Spring (alt)
- SU4013 Hydrographic Mapping (3 cr) Spring
- SU4142 3D Surveying and Modeling w/ Laser Scanner Data (3 cr) On Demand
- SU4996 Special Topics in Geospatial Technologies (var) On Demand
- SU4997 Independent Study in Geospatial Technologies (var) On Demand
- SU4998 Undergrad Research in Geospatial Technologies (var) On Demand

### GENERAL EDUCATION REQUIREMENTS

#### A. CORE COURSES (12 CREDITS)
1. **UN1015** (COMPOSITION)
2. **UN1025** (GLOBAL ISSUES)
3. **CRITICAL AND CREATIVE THINKING**
   - FA2330, FA2520, FA2720, FA2820, HU2130, HU2324, HU2501, HU2503, HU2538, HU2700, HU2820, HU2910, SS2300
4. **SOCIAL RESP. & ETHICAL REASONING**
   - EC2001, ED2000, PSY2000, SS2100, SS2200, SS2400, SS2500, SS2501, SS2502, SS2503, SS2504, SS2505, SS2600, SS2610, SS2700

#### B. HASS COURSES (12 CREDITS) (General Ed Website, left)
1. COMMUNICATION/COMP: __________________________
2. HU OR FA COURSE: ____________________________
3. SS OR EC OR PSY COURSE: _______________________
4. ANY HASS OR HASS RESTRICTED COURSE: ________________
   - 6 credits must be upper division 3000-4000 level courses
   - No more than 3 credits from the HASS Restricted list can be used to satisfy HASS requirements.
   - Each course can satisfy only one requirement.

#### C. CO-CURRICULAR ACTIVITIES (3 UNITS)
(General Ed Website, left)
- PE/FA/AR/AF______
- PE/FA/AR/AF______
- PE/FA/AR/AF______
- PE/FA/AR/AF______

### UNDERGRADUATE CATALOG:
http://www.mtu.edu/catalog/courses/

### GENERAL EDUCATION (CO-CURRICULAR & HASS LIST):
https://www.mtu.edu/registrar/faculty-staff/advisors/gen-ed/
SURVEYING ENGINEERING FLOWCHART
Geoinformatics Emphasis
Academic Year 2019-20

This is not an official list of degree requirements. Adjustments may be required due to curriculum changes.

F INDICATES COURSE IS OFFERED FALL SEMESTER
S INDICATES COURSE IS OFFERED SPRING SEMESTER
Su INDICATES COURSE IS OFFERED SUMMER SEMESTER
(L) INDICATES A COURSE WHICH INCLUDES A LAB MUST BE SCHEDULED IN ADDITION TO THE LECTURE
(C) INDICATES THE COURSE CAN EITHER BE TAKEN AT THE SAME TIME (CO-REQ) OR TAKEN PRIOR TO THE COURSE (PRE-REQ)

Total Academic Credits: 127
Total Co-Curricular Units: 3

Fall Year 1 Spring
MA1160/1161 CALCULUS I (4/5 CREDITS) F, S, Su
MA2160 CALCULUS II (4 CREDITS) F, S, Su
PHI100 (L) PHYSICS LAB I (2 CREDIT) F, S
PHI100 PHYSICS LECTURE I (3 CREDITS) F, S, Su
CHI150 UNIVERSITY CHEMISTRY (3 CREDITS) F, S
CS1212 INTRO TO PROGRAMMING (3 CREDITS) F, S, Su
SU1000 SU ENGRG ORIENTATION (1 CREDIT) F
SU2000 (L) SURVEYING (2 CREDITS) F, S

Fall Year 2 Spring
MA3160 CALCULUS III (4 CREDITS) F, S, Su
MA2320 LINEAR ALGEBRA (3 CREDITS) F, S, Su
MA2160 CALCULUS II (4 CREDITS) F, S, Su
SU2000 (L) SURVEYING (2 CREDITS) F, S
SU3000 GEOSPATIAL MONITORING (3 CREDITS) F, S, Su
SU3100 GEOSPATIAL CONCEPTS (3 CREDITS) F, S, Su
SU3210 SITE PLANNING & DEVELOPMENT (4 CREDITS) F, S
SU4120 3D SURVEYING & MODELING (4 CREDITS) F, S, Su
SU4142 ENGINEERING ELECTIVE SEE BACK (3 CREDITS) F, S, Su
SU4200 3D SURVEYING & MODELING (4 CREDITS) F, S

Fall Year 3 Spring
MA3710 STATISTICS (3 CREDITS) F, S, Su
SU3600 (L) SU COMP. & ADJUSTMENTS (4 CREDITS) F, S, Su
SU3710 GEO SPATIAL INFO (4 CREDITS) F (even years)
SU3800 GEODESY (3 CREDITS) F
SU3900 3D SURVEYING & MODELING (4 CREDITS) F
SU4010 GEOSPATIAL CONCEPTS (3 CREDITS) F, S, Su
SU4060 GEODESY (3 CREDITS) F

Fall Year 4 Spring
MA1160/1161 Coreq.
MA1160/1161 (C or better)
PHI100 (L) PHYSICS LAB I (2 CREDIT) F, S
PHI100 PHYSICS LECTURE I (3 CREDITS) F, S, Su
CHI150 (L) UNIVERSITY CHEMISTRY LAB I (3 CREDITS) F, S
SU2000 (L) SURVEYING (2 CREDITS) F, S
SU3110 (C) GEOSPATIAL DATA MANAGEMENT (4 CREDITS) F, S, Su
SU4200 3D SURVEYING & MODELING (4 CREDITS) F, S, Su
SU4800 GEOSPATIAL DATA MINING (3 CREDITS) F (even years)
SU4900 (L) CAPSTONE DESIGN PROJECT (3 CREDITS) F, S
SU4012 CADASTRE & LAND INFO (3 CREDITS) F, S, Su
SU4013 GEOSPATIAL DATA MINING (3 CREDITS) F
SU4013 FREE ELECTIVE (1 CREDIT) F, S, Su
SU4013 HYDROGRAPHIC MAPPING (3 CREDITS) F
SU4013 TECHNICAL ELECTIVE SEE BACK (3 CREDITS) F, S, Su
SU4013 HU/FA COURSE (SEE HASS LIST) (3 CREDITS) F, S, Su
SU4013 SS/EC/PSY COURSE (SEE HASS LIST) (3 CREDITS) F, S, Su
SU4013 COMP/COMM (SEE HASS LIST) (3 CREDITS) F, S, Su

ANY HASS/HASS RESTRICTED COURSE (3 CREDITS) F, S, Su

HASS ELECTIVES
6 credits must be upper level (3000-4000)
UN1015 and UN1025 are prerequisites for all upper level HASS courses

Sample = Gen Ed Requirements

CRIT/CREATIVE THINKING (SEE LIST) (3 CREDITS) F, S, Su
SOC RESP/ETHICAL REASONING (SEE LIST) (3 CREDITS) F, S, Su

Note: See reverse side for explanation of professional electives, general education and co-curricular courses

Updated 05/22/19
**Engineering Elective List (3 credits)**

<table>
<thead>
<tr>
<th>Code</th>
<th>Course</th>
<th>Credits</th>
<th>Offered</th>
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</thead>
<tbody>
<tr>
<td>CEE3101</td>
<td>Civil Engineering Materials (3 cr)</td>
<td>F, S</td>
<td></td>
</tr>
<tr>
<td>CEE3332</td>
<td>Fundamentals of Construction (3 cr)</td>
<td>F, S</td>
<td></td>
</tr>
<tr>
<td>CEE3401</td>
<td>Transportation Engineering (3 cr)</td>
<td>F, S</td>
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</tr>
<tr>
<td>CEE3810</td>
<td>Soil Mechanics (4 cr)</td>
<td>F, S</td>
<td></td>
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</tbody>
</table>

**Science Elective List (3 credits)**

<table>
<thead>
<tr>
<th>Code</th>
<th>Course</th>
<th>Credits</th>
<th>Offered</th>
</tr>
</thead>
<tbody>
<tr>
<td>CH1153</td>
<td>Chemistry Recitation I (1 cr)</td>
<td>F, S, Su</td>
<td></td>
</tr>
<tr>
<td>FW2010</td>
<td>Vegetation of North America (4 cr)</td>
<td>F</td>
<td></td>
</tr>
<tr>
<td>PH1200/2200</td>
<td>Physics II (4 cr – 1 cr lab, 3 cr lecture)</td>
<td>F, S, Su</td>
<td></td>
</tr>
<tr>
<td>PH1600/1610</td>
<td>Introductory Astronomy &amp; Lab (3 cr – 1 cr lab, 2 cr lecture)</td>
<td>F, S, Su</td>
<td></td>
</tr>
</tbody>
</table>

**Technical Elective List (1-2 credits)**

<table>
<thead>
<tr>
<th>Code</th>
<th>Course</th>
<th>Credits</th>
<th>Offered</th>
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</thead>
<tbody>
<tr>
<td>CEE3331</td>
<td>Professional Practice (2 cr)</td>
<td>F, S</td>
<td></td>
</tr>
<tr>
<td>ENG3200</td>
<td>Thermo/Fluids (4 cr)</td>
<td>F, S</td>
<td></td>
</tr>
<tr>
<td>ENTXXX</td>
<td>Enterprise (Except 3960/4950) (var)</td>
<td>F, S</td>
<td></td>
</tr>
<tr>
<td>UN3002</td>
<td>Co-op (1-2 cr)</td>
<td>F, S, Su</td>
<td></td>
</tr>
</tbody>
</table>

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**GENERAL EDUCATION REQUIREMENTS**

**A. CORE COURSES (12 CREDITS)**

1. **UN1015** (COMPOSITION)
2. **UN1025** (GLOBAL ISSUES)
3. **CRITICAL AND CREATIVE THINKING**
   
   FA2330, FA2520, FA2720, FA2820, HU2130, HU2324, HU2501, HU2503, HU2538, HU2700, HU2820, HU2910, SS2300
4. **SOCIAL RESP. & ETHICAL REASONING**
   
   EC2001, ED2000, PSY2000, SS2100, SS2200, SS2400, SS2500, SS2501, SS2502, SS2503, SS2504, SS2505, SS2600, SS2610, SS2700

**B. HASS COURSES (12 CREDITS)**

1. **COMMUNICATION/COMP:** ___________________________
2. **HU OR FA COURSE:** ___________________________
3. **SOCIAL & BEHAVIORAL STUDIES COURSE:** ___________________________
4. **ANY HASS OR HASS RESTRICTED COURSE:** ___________________________
   
   - 6 credits must be upper division 3000-4000 level courses
   - No more than 3 credits from the HASS Restricted list can be used to satisfy HASS requirements.
   - Each course can satisfy only one requirement.

**C. CO-CURRICULAR ACTIVITIES (3 UNITS)**

PE/FA/AR/AF_____ PE/FA/AR/AF_____ PE/FA/AR/AF_____ PE/FA/AR/AF_____