Bachelor of Science – Surveying Engineering
(Professional Surveying Emphasis)
Academic Year 2018-19 – Recommended Course Sequence

**Semester 1**
- FALL
  - 16-17 Cr
  - UN 1015 Composition (3 [f,s,su])
  - HASS Elective (Course from Any List) (3 *)
  - MA 1160 Calculus with Technology I (4) [f]
    - or--
  - MA 1161 Calculus Plus w/ Technology I (5) [f,s,su]
  - CS 1121 Intro to Prgrm I (3 [f,s,su])
    - or--
  - MA 3210 Calculus with Technology II (4) [f,s,su]

**Semester 2**
- SPRING
  - 15 Cr
  - UN 1025 Global Issues (3) [f,s,su]
    - or--
  - Modern Language Option *
  - SU 2000 Introduction to Surveying (2) [f,s]
  - SU 3300 Geospatial Monitoring (3) [f]
  - SU 2220 Route and Construction Surveying (3) [s]

**Semester 3**
- FALL
  - 16 Cr
  - Critical and Creative Thinking (3) *
  - Social Responsibility & Ethical Reasoning (3) *
  - SU 3210 Site Planning and Development (4) [s]
  - SU 3600 Surveying Computations & Adjustments (4) [f]
  - SU 3110 Surveying Field Practice (4) [f]

**Semester 4**
- FALL
  - 18 Cr
  - HU 3120 Technical and Professional Communication (3) [f,s,su]
  - Social & Behavioral Sciences (3) *
  - SU 3540 Geospatial Info. Technology with Elements of Field Cartography (4) [s]
    - or--
  - SU 3710 Geomatics Positioning (3) [f]
    - or--
  - GE 3860 Eng. Geology & Geoinformatics (3) [s]
  - SU 4060 Geodesy (3) [s]

**Semester 5**
- SPRING
  - 16 Cr
  - SU 4100 Geodetic Positioning (3) [f]
    - or--
  - GE 3860 Eng. Geology & Geoinformatics (3) [s]
  - BUS 2200 Business Law (3) [f,s]
  - CEE 3100 Statics and Strength of Materials (4) [f]

**Semester 6**
- FALL
  - 16-17 Cr
  - SU 4180 Land Subdivision Design (3) [s]
  - SU 4900 Capstone Design Project (3) [f,s]
    - or--
  - ENT 3960 & ENT 4950 (2) [f,s,su]
  - GE 2000 Understanding the Earth (3) [f,s]
    - or--
  - MA 2230 Elementary Linear Algebra (2) [f,s,su]
  - MA 3160 Engineering Calculus (4) [s]
    - or--
  - MET 2120 Statistics and Strength of Materials (4) [f]
  - Engineering Elective (3)

**Semester 7**
- SPRING
  - 13 Cr
  - Communication/Composition (3) *
  - SU 3180
  - SU 4999 Professional Practice Review (1) [f,s]
    - or--
  - Surveying Elective -- Digital Mapping (3) *
  - CO-CURR ½ UNIT *
  - CO-CURR ½ UNIT *
  - CO-CURR ½ UNIT *
  - CO-CURR ½ UNIT *
  - CO-CURR ½ UNIT *

**Semester 8**
- SPRING
  - 16 Cr
  - SU 4140 Photogrammetry (3) [f,s]
  - ACC 2000 Accounting Principles I (3) [f,s]
  - ACC 2000 Accounting Principles II (3) [f,s]
  - Engineering Elective (3)
  - Science Elective (3)
  - Technical Elective (1-2)
  - Surveying Elective -- Digital Mapping (3) *
  - CO-CURR ½ UNIT *
  - CO-CURR ½ UNIT *
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**Electives** (Prerequisite/s)
(Choose 10-12 credits)

- CEE 3101 - 3 [f,s] (Engineering)
  - ENG 2120
  - Civil Engineering Materials
- CEE 3331 - 2 [f,s]
  - Professional Practice
- CEE 3332 - 3 [f,s,su] (Engineering)
  - Fundamentals of Construction Engineering
- CEE 3401 - 3 [s] (Engineering)
  - Transportation Engineering
- CEE 3810 - 4 [s,su] (Engineering)
  - (GE 3200 & ENG 2120 & ENG 3200)
  - Soil Mechanics for Engineers
- CH 1151 - 3 [f,s,su] (Science)
  - Compreh. CH 1150
  - (MA 1160(C) or MA 1161(C))
  - University Chemistry Recitation I
- ENG 3200 - 4 [s]
  - (MA 2160 & CH 1150 & CH 1151 &
    - PH 2100 & ENG 1102)
  - Thermodynamics/Fluid Mechanics
- ENT XXXX variable 1-2
  - Enterprise Project Work
- ENT 1960 - 1 [f,s,su] (Science)
  - Enterprise Orientation-Spring
- EN 2000 level
  - EN 3000 level (except ENT 3960)
  - EN 4000 level (except ENT 4950)
  - FW 2100 - 4 [f] (Science)
  - Vegetation of North America
  - PH 1200/PH 2200 - 4 [f,s,su] (Science)
  - (PH 1100 & PH 2100 & MA 2160)
  - Physics by Inquiry II/Univ. Physics II -- Electricity & Magnetism
- PH 1600 & PH1610 - 3 [f,s,su] (Science)
  - Introductory Astronomy & Lab
- SU 4010 - 3 ** (Surveying)
  - Geospatial Concepts, Technologies, and Data
- SU 4011 - 3 ** (Surveying)
  - (MA 3710)
  - Cadastre and Land Information Systems
- SU 4012 - 3 [s] (Surveying)
  - (SU 3540 OR FW 3540)
  - Geospatial Data Mining and Crowd Sourcing
- SU 4013 - 3 ** (Surveying)
  - Hydrographic Mapping
- SU 4045 - 3 [s] (Engineering or Surveying)
  - (SU 4140)
  - Geospatial Data Fusion
- SU 4142 - 3 [s] (Surveying)
  - 3D Surveying and Modeling with Laser Scanner Data
- SU 4996 - 1--3 ** (Surveying)
  - Special Topics in Geospatial Technologies
- SU 4997 - 1--3 ** (Surveying)
  - Independent Study in Geospatial Technologies
- SU 4998 - 1--6 ** (Surveying)
  - Undergraduate Research in Geospatial Technologies
- UN 3002 - 1-2 [f,s,su]
  - Undergraduate Cooperative Education I

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* See Notes on Back

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127 Total Credits
1. **General Education Requirements**: 24 total credits. Required courses: UN 1015-Composition (3 credits); UN1025-Global Issues (3 credits); Critical and Creative Thinking (3 credits); Social Responsibility & Ethical Reasoning (3 credits); and 12 HASS credits. Approved lists are available in EERC 423 and linked on the School of Technology’s “Advising” web page. [http://www.mtu.edu/registrar/pdfs/core-and-hass-list-18-19-v2.pdf](http://www.mtu.edu/registrar/pdfs/core-and-hass-list-18-19-v2.pdf)

2. **UN 1025 Global Issues Language Option**: 3 credits of 3000-level or higher modern language may be substituted directly for UN 1025. Any students with previous language experience in Spanish, French, German, or Mandarin must take the Modern Language Online Placement Test.

3. **HASS (Humanities, Arts, & Social Sciences)**: 12 total credits that include a minimum of 3 credits each in: Communication/Composition, Humanities/Fine Arts, and Social & Behavioral Sciences. Approved lists are available in EERC 423 and are linked on the School of Technology’s “Advising” web page. [http://www.mtu.edu/registrar/pdfs/core-and-hass-list-18-19-v2.pdf](http://www.mtu.edu/registrar/pdfs/core-and-hass-list-18-19-v2.pdf)  
   Six (6) credits must be 3000 level or higher (does not include HU 3120). HU 3120 is not a HASS course for School of Technology students, but still is a degree requirement. No more than 3 credits may be used from the HASS Restricted List. All 3000-level or higher HASS courses require UN 1015 and UN 1025 as prerequisites.


5. **Math**: Students are placed into an initial math course based on required assessment using the ALEKS software program, or a math placement exam score (AP, IB, CLEP). MA 1160 (4 credits) or MA 1161 (5 credits) satisfy the Calculus I requirement. MA 2320, MA 2321, or MA 2330 are equivalent Linear Algebra courses. MA 2710, MA 2720, and MA 3710 are all approved Statistics courses.


7. **Free Electives**: Any Michigan Tech course(s) or approved transfer course(s) that are 1000-level or above, and are not duplicated or equivalent courses.

8. **Co-curricular Activities**: Mainly physical education courses with some additions. Three units (or six half units) are required for graduation. These units will be included as earned hours and may be used to determine full-time enrollment status. These are in addition to the total credits required for the degree. A co-curricular list is available in EERC 423 and is linked on the School of Technology’s “Advising” web page. These units are graded pass/fail and are not included in credit hours used for calculation of any grade point averages (cumulative or departmental).

9. **Pre-requisite** courses are noted by a plain arrow. The pre-requisite course must be successfully completed **prior** to taking the subsequent course.

10. **Concurrent Pre-requisites** are noted by a ‘C’ by the arrow and may be taken at the same time, although it is not necessary to take these courses together if the pre-requisite course is completed first.

11. **Co-requisite** courses are courses that **must** be taken together in the same semester.

12. **Transfer, Advanced Placement, or Study Abroad Courses** are not included in credit hours used for GPA calculations. Transfer credit is awarded for Michigan Tech equivalent course work only if a grade of ‘C’ or better (2.00/4.00) or equivalent is earned at a transfer institution. Study abroad credit will be awarded by International Programs and Services based on passing a course according to equivalent international standards. Advanced Placement credit is awarded according to published AP Exam score standards.

This flow chart is not an official list of degree requirements. Adjustments may be required due to curriculum changes.  
Advising web page: [http://www.mtu.edu/technology/resources/undergraduate/advising/](http://www.mtu.edu/technology/resources/undergraduate/advising/)

*May 2018*