

B.S. Geological Engineering Degree (Fall 2025 and later)

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

First Year

Fall

Course	Prerequisites	Credit
MA1160 Calculus with Technology 1		4
CH1150 University Chemistry 1	CH1151 (Corequisite)	3
CH1151 University Chemistry Lab 1	CH1150 (Corequisite)	1
PH1100 Physics 1 Lab	MA1160 (Concurrent)	1
ENG1101 Engineering Analysis & Problem Solving	MA1160 (Concurrent)	3
GE1100 Geo Eng & Sci Orientation		1
UN1015 Composition		3
Total		16

Second Year

Fall

Course	Prerequisites	Credit
GE2300 Mineral Science	CH1150/51	3
PH2200 University Physics 2	MA2160, PH2100, PH1200 (Concurrent)	3
GE2010 Intro to GIS		3
GE1200 Intro Data Sci/Earth Resc		1
PH1200 Physics Lab II	PH1100	1
Essen. Education – Comm. Intensive		3
Essen. Education - Activities for Well-Being and Success		1
Total		15

Third Year

Fall

Course	Prerequisites	Credit
GE3100 Depositional Systems	GE2000, GE2310	2
GE3890 Engineering Geology & Rock Mechanics	GE3050	3
GE3010 Intro to Field Methods	GE2310, GE3050	1
CEE3200 Thermo/Fluids	MA2160, CH1150/51, PH2100, ENG1101	4
Essen. Education – Arts & Culture (3000+)		3
Total		13

Summer

Course	Prerequisites	Credit
GE4091 Field Geology w/ Eng App	GE2310, GE3050, GE3010	5
GE4090 Field Geophysics	GE3040, GE3010	5
Total		10

Fourth Year

Fall

Course	Prerequisites	Credit
GE4900 Capstone	Senior Standing	3
Adv Geophysics (Eng) Elective		3
MA3521 Differential Eq	MA2160, MA2321 (co-req)	3
EC3400 Econ Decision Analysis	Junior Standing	3
Essen. Education - Activities for Well-Being and Success		1
Total		13

Spring

Course	Prerequisites	Credit
MA2160 Calculus with Technology 2	MA1160	4
ENG1102 Engineering Modeling & Design	ENG1101, MA1160	3
PH2100 University Physics 1	MA1160, PH1100 (Concurrent)	3
GE2000 Understanding the Earth		3
Essen. Education - Foundations in the Human World		3
Total		16

Spring

Course	Prerequisites	Credit
ENG2120 Statics-Strength of Materials	MA2160, PH2100, ENG1101	4
GE3040 Fundamentals of Geophysics	PH2200	3
GE2310 Intro to Petrology	GE2300	3
GE3050 Structural Geology	GE2000	3
Essen. Education – Intercultural Competency (3000+)		3
Total		16

Spring

Course	Prerequisites	Credit
MA2321 Elem Linear Algebra	MA2160, MA3521 (co-req)	2
CEE3810 Soil Mechanics for Engineers	GE2000, CEE2120, CEE3200	4
GE3850 Geohydrology	GE2000, MA2160	3
Essen. Education Experience (3000+)		3
Total		12

Spring

Course	Prerequisites	Credit
GE4910 Capstone II	GE4900	3
Geo Engineering Approved Elective		3
Geo Engineering Approved Elective		3
GE3250 Computational Geosciences	MA1160	3
Essen. Education - Activities for Well-Being and Success		1
Total		13

Grand Total = 124 Credits

1. **Essential Education Requirements:** 24 total credits. Required courses are *UN1015-Composition* (3 credits), a *Foundations in the Human World* course (3 credits), a *Communication Intensive* course (3 credits), an *Arts & Culture* course (3 credits), an *Intercultural Competency* (3000+) course (3 credits), a *SHAPE* course (EC3400, 3 credits), an *Essential Education Experience* (3000+) course (3 credits), and 3 credits of *Activities for Well-being and Success*. The Essential Education and Activities for Well-Being list is available online at: <https://www.mtu.edu/registrar/pdfs/essential-education-course-lists-2025-2026.pdf>

2. **Geology Engineering Approved Electives:** 6 total credits (Courses are 3 credits unless indicated otherwise)

<ul style="list-style-type: none"> • CEE3331 Professional Practice (2cr) • CEE3332 Fundamentals of Construction Eng. • CEE3503 Environmental Engineering • CEE3620 Water Resources Engineering (4cr) • CEE4501 Environmental Eng. Chem. Proc. (4cr) • CEE4511 Solid & Hazardous Waste Eng. • CEE4640 Stormwater Management • CEE4820 Foundation Engineering • CEE4830 Geosynthetics Engineering • CEE4850 Rock Engineering for Civil Engineers • GE3440 Drill/Blasting/Mine Safety (4cr) (odd yrs) • GE3870 Resource & Reserve Estimation 	<ul style="list-style-type: none"> • GE3880 Mine Planning and Design • GE4150 Natural Hazards • GE4220 Mining Systems and The Environment • GE4290 Mine Ventilation Engineering • GE4360 Bulk Materials Dynamics & Eng. (4cr) • GE4610 Formation Eval & Petro Engineering • GE4680 Reliability/Optimize in Mining (even yrs) • GE4800 Groundwater Engineering • GE4860 Comp. Methods in Geomech (odd yrs) • GE4930 Special Topics in Geo Engineering • GE4934 Special Topics in Mining Engineering
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3. **Advanced Geophysics Electives:** 3 total credits (Courses are 3 credits)
 - GE4560 Earthquake Seismology
 - GE4600 Reflect Seismology
 - GE4610 Formation Evaluation and Petroleum Engineering

4. **Prerequisite** (pre-req) course must be successfully completed **PRIOR** to taking the subsequent course.
Concurrent Prerequisites (concurrent) may be taken at the same time, although it is not necessary if the prerequisite course is completed first.
Required Corequisite (co-req) courses that **MUST** be taken together in the same semester.

5. **Engineering Fundamentals:** MA1160/1161 is a concurrent prerequisite for ENG1101 and ENG1102. ENG1102 project content varies by section number.

6. **Math:** Students are placed into an initial math course based on ACT/SAT math score, the online ALEKS assessment, or a math placement exam score for credit (AP, IB, CLEP). MA1160 (4 credits) or MA1161 (5 credits) satisfy the Calculus 1 requirement. Linear Algebra and Differential Equations are offered as full semester courses for students taking these courses in separate semesters (MA2320 – Linear Algebra, MA3520 – Differential Equations). The Math department also teaches Linear Algebra and Differential Equations as accelerated courses. In the first half of a given semester MA2321 – Linear Algebra, and MA3521 – Differential Equations, in the second half of the same semester (registration must be for the same section number of both MA2321 and MA3521 in that semester). MA2320, MA2321, and MA2330 are all equivalent and are approved prerequisites for MA3520 or MA3521. MA3530 and 3560 are also equivalent to MA3520/3521. MA2710, 2720 and 3715 are all acceptable in place of MA3710.

7. **Transfer, Advanced Placement, or study abroad courses** are not included in credit hours used for GPA calculations. 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 based on passing a course according to equivalent international standards. Advanced Placement credit is awarded according to published AP Exam score standards (also IB and CLEP).

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