B.S. Aerospace Engineering Degree

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

First Year

Fall

Course	Prerequisites	Credit
CH1150 University Chemistry 1	CH1151 *(Corequisite)*	3
CH1151 University Chemistry Lab 1	CH1150 *(Corequisite)*	1
PH1100 Physics 1 Lab	MA1160 *(Concurrent)*	1
MA1160 Calculus with Technology 1		4
ENG1101 Engineering Analysis & Problem Solving	MA1160 *(Concurrent)*	3
UN1015 Composition		3
Total		**15**

Spring

Course	Prerequisites	Credit
PH1200 Physics 2 lab	PH1100	1
PH2100 University Physics 1	MA1160, PH1100 *(Concurrent)*	3
MA 2160 Calculus with Technology 2	MA1160	4
ENG1102 Engineering Modeling & Design	MA1160 *(Concurrent)*, ENG1101	3
Essential Education - Foundations in the Human World		3
Essential Education - Activities for Well-Being and Success		1
Total		**15**

Second Year

Fall

Course	Prerequisites	Credit
AE2500 Principles of Aerospace Engineering **(FALL ONLY)**	ENG1102	3
PH2200 University Physics 2	PH1200 (*Concurrent*), PH2100, MA2160	3
MA3160 Multivariable Calculus 3	MA2160	4
ME2110 Statics	MA2160 (*C or better*)	3
ME2901 Mechanical and Aerospace Engineering Practice 1	UN1015, ENG1102, ME2110 (*Concurrent*)	3
Essential Education - Activities for Well-Being and Success		1
Total		**17**

Spring

Course	Prerequisites	Credit
ME2700 Dynamics	PH2100, ME2110	3
AE2550 Space Environment & Operations **(SPRING ONLY)**	PH2200, ENG1102	3
MA2321 Linear Algebra	MA1160, MA3521 (*Corequisite*)	2
MA3521 Differential Equations	MA2160, MA2321 (*Corequisite*)	2
ME2150 Mechanics of Materials	ME2110	3
Essential Education - Communication Intensive		3
Total		**16**

Third Year

Fall

Course	Prerequisites	Credit
AE4570 Space Mechanics **(FALL ONLY)**	ME2700	3
ME2201 Intro Thermodynamics	MA2160 (*C or better*), CH1150, CH1151	3
ME2911 Mechanical & Aerospace Engineering Practice 2	ME2201 (*Concurrent*), ME2110, ME2901	3
AE3501 Aerospace Systems Engineering Practice **(FALL ONLY)**	ME2150, ME2700, AE2500, AE2550 ME2911 (*Concurrent*)	3
Essential Education - Intercultural Competency (3000+)		3
Essential Education - Activities for Well-Being and Success		1
Total		**16**

Spring

Course	Prerequisites	Credit
AE3520 Aerodynamics & Lab **(SPRING ONLY)**	AE2500, MA3160, ME2201, ME2911	4
ME3750 Dynamic Systems	MA3521, ME2700	4
AE3511 Spacecraft Engineering Practice **(SPRING ONLY)**	AE3501	3
Essential Education - SHAPE		3
Essential Education – Arts & Culture		3
Total		**17**

Fourth Year

Fall

Course	Prerequisites	Credit
AE4530 Compressible Flow **(FALL ONLY)**	AE3520	3
AE4550 Spacecraft Thermal Engineering **(FALL ONLY)**	AE3520, AE3511	3
AE4560 Aerospace Materials & Structures **(FALL ONLY)**	AE2550, ME2150	3
MA3710 Statistics	MA2160	3
ME4901 Senior Design 1	AE3511, ME3750, AE4550 (*Concurrent*), AE4560 (*Concurrent*), MA3710 (*Concurrent*)	2
Essential Education - Experience (3000+)		3
Total		**17**

Spring

Course	Prerequisites	Credit
Technical Elective		3
Technical Elective		3
AE4540 Aerospace Propulsion & Lab **(SPRING ONLY)**	AE3520, AE4530 (*Concurrent*)	4
AE4580 Spacecraft Dynamics & Control **(SPRING ONLY)**	ME3750, AE4570 (*Concurrent*)	3
ME4911 Senior Design 2	MA3710, AE4550, AE4560, ME4901	2
Total		**15**

Grand Total = 128 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 (3 credits), an *Essential Education Experience* (3000+) course (3 credits), and 3 credits of *Activities for Wellbeing and Success* (*see note 7*).
2. ***Technical Electives***: Any 4000+ level courses in the College of Engineering except MET courses are acceptable for ME technical electives; **with the exception of MET4377.** Allowable COE prefixes include, AE, BE, CM, CEE, EE, ENG, GE, ME, MSE and may be used by BSME students for technical elective credits (if allowed to enroll in the course by the offering department) with the following exceptions: BE4000, BE4900, BE4901, BE4910, BE4930, BE5000, BE5900, BE5930, CEE4510, CEE4900, CEE4905, CEE4910, CEE4915, CEE4916, CEE4920, CEE4930, CEE4990, CEE5190, CEE5250, CEE5390, CEE5490, CEE5560, CEE5561, CEE5562, CEE5563, CEE5590, CEE5690, CEE5890, CEE5920, CEE5930, CEE5990, CEE5991, CEE5992, CEE5994, CEE5997, CEE5998, CEE5999, CM4000, CM4020, CM4040, CM4060, CM4080, CM4855, CM4860, CM4861, CM4900, CM4910, CM4990, CM5900, CM5950, CM5990, EE4000, EE4800, EE4805, EE4870, EE4901, EE4910, EE5290, EE5805, EE5900, EE5990, EE5991, EE5992, EE5994, ENG4060, ENG4070, ENG4900, ENG4905, ENG4910, ENG4990, ENG5060, ENG5100, ENG5200, ENG5300, ENG5400, ENG5990, ENG5998, GE4000, GE4900, GE4910, GE4916, GE4930, GE4931, GE4933, GE4934, GE4961, GE4962, GE4970, GE5187, GE5930, GE5940, GE5950, GE5960, GE5970, GE5994, GE5995, GE5998, GE5999, ME4990, ME4901, ME4911, ME4999, ME5010, ME5990, ME5994, ME5995, ME5999, ME6000, MSE4130, MSE4131, MSE4140, MSE4141, MSE4970, MSE4990, MSE5100, MSE5900, MSE5970, and MSE5990 or any other research/special topics/seminar/senior design/etc. credits (courses without a specific course description and/or syllabus). Undergraduate students cannot typically enroll in 6000-level courses. Special topics courses (4990, 5990, etc.) may be approved on an individual section/semester basis if a student/faculty member submits or creates a course syllabus for evaluation. OSM 4300 is also acceptable.
3. ***Prerequisite*** courses are noted by a plain arrow. The prerequisite course must be successfully completed ***PRIOR*** to taking the subsequent course.
   Concurrent Prerequisites ~ **(C)** ~ courses that may be taken at the same time, although it is not necessary if the prerequisite course is completed first.
   Required Corequisite courses ***MUST*** be taken together in the same semester.
4. ***Engineering Fundamentals:*** MA1160/1161 is a concurrent prerequisite for ENG1101 and ENG1102. ENG1102 project content varies by section number.
5. ***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. MA2320 and MA3520 are offered as full semester courses for students taking these courses in separate semesters. The Math department also teaches MA2321 as an accelerated course (equivalent to MA2320) in the first half of a given semester and MA3521 as an accelerated course (equivalent to MA3520) 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.
6. ***A grade of 'C' or better in MA2160 is required as a prerequisite for ME2110 and ME2201.***
7. ***Activities for Well-being and Success***: Mainly physical education courses with some additions. Three credits are required for graduation. These credits will be included as earned hours and may be used to determine full-time enrollment status. The *Activities for Wellbeing and Success* list is available in the MAE Advising Center and is linked on the MAE Advising web page.
8. ***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 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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MAE Advising web page: https://www.mtu.edu/mechanical-aerospace/undergraduate/advising/