2020-21 BSE with Systems Engineering

This is not an official list of degree requirements. Adjustments may be required due to curriculum changes. See back of academic plan for more information on requirements for elective courses.

Updated October 2019

**Year 1**

**Fall**
- MA1160 (4) or MA1161 (5) CA
culus I F, S, Su
- MA2160 (4) CALCULUS II F, S, Su
- PH1100 (1) PHYSICS LAB F, S, Su
- CH1150 (3) UNIVERSITY CHEMISTRY F, S, Su
- ENG1505 (1) INTRO TO SYSTEMS ENG
- ENG1101 or ENG1102 ENG1101 or test score
- MA1160/1 MA1160/1

**Spring**
- MA3160 (4) LINEAR ALGEBRA F, S, Su
- PH1100 (3) PHYSICS LECTURE I F, S, Su
- ENG2400 (3) CELLULAR & MOLECULAR BIO F
- CH1150 MA1160/1
- ENG1505 (C) MA2160 & (ENG1102 or CS1121 or CS1151)
- ENG1001 ENG1001
- ENG1002 ENG1002

**Year 2**

**Fall**
- MA1160/1 MA1160/1
- ENG2120 (4) ENG. MODELING & DESIGN F, S, Su
- MSE2100 (3) INTRO TO MATERIAL SCIENCE F, S, Su
- ENG2120 (4) STATICS STRENGTH MAT'L S F

**Spring**
- ENG2505 (3) INTRO TO LOW FIDELITY SYSTEM MODELING S
- ENG2120 CH1151 MA1160
- CEE3501 (3) ENVRON ENG F, S, Su
- MA1160/1 MA1160/1
- MA1160/1 MA1160/1

**Year 3**

**Fall**
- ENG3505 (3) INTERMEDIATE LOW FIDELITY SYSTEM MODELING F
- MA1160/1 MA1160/1
- CEE3501 CEE3501

**Spring**
- ENG4510 (3) SUSTAINABLE FUTURES F
- MA1160/1 MA3710
- ENG4505 (3) SYSTEMS ANALYSIS & DESIGN F
- ENG4505 (3) SYSTEMS ANALYSIS & DESIGN F

**Summer**
- SR DESIGN READY EE91 ON BACK

**Year 4**

**Fall**
- ENG3200 (1) THERMFLUIDS F, S, Su (on-line)
- ENG3200 (1) THERMFLUIDS F, S, Su (on-line)
- ENG4905 (3) SR DESIGN F
- ENG4905 (3) SR DESIGN F

**Spring**
- ENG4200 (3) APP OF SUSTAIN MANAGEMENT F, S, Su (on-line)
- ENG4450 (3) APP OF SUSTAIN MANAGEMENT F, S, Su (on-line)
- ENG4200 (3) APP OF SUSTAIN MANAGEMENT F, S, Su (on-line)
- ENG4200 (3) APP OF SUSTAIN MANAGEMENT F, S, Su (on-line)

**HASS Requirement**
- 2 credits must be upper division 3000-4000 level
- UN1015 & UN1025 are prerequisites for all upper division HASS courses
- HASS course may be taken in any order.

**UN1015 (3) COMPOSITION** F, S, Su

**UN1025 (3) GLOBAL ISSUES** F, S, Su

**EEC3501 (3) ENVRON ENG** F, S, Su (on-line)

**ENG4905 (3) SR DESIGN** F

**ENG4200 (3) SR DESIGN** F, S, Su (on-line)

**ENG4200 (3) SR DESIGN** F, S, Su (on-line)

**ENG4200 (3) SR DESIGN** F, S, Su (on-line)

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**Notes:**
- XX#### = Prerequisite
- XX####(cr) = cr
- **NAME**
- **Semester Offered**
- F = Fall
- S = Spring
- Su = Summer
- **Co-cur Unit**
- **Global Issues**

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**UN1015 or UN1025 MAY BE TAKEN IN EITHER ORDER IN THE FIRST YEAR.**

**UN1015 or UN1025 MAY BE TAKEN IN EITHER ORDER IN THE SECOND YEAR.**

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**Any List**

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BSE Systems Emphasis 2020-21  
(minimum of 125 credits)

Academic questions: E-mail efadvise@mtu.edu

1. Senior Design Ready:
   a. Senior Design Prerequisite courses:
      EE3010, ENG1101, ENG1102, ENG2120, ENG2505, ENG3200, ENG4505.
   b. Core Competency Check test - Take and pass the test; test topics include all ENG4905 prerequisite courses except ENG4505.

2. General Education Requirements (24 credits + 3 PE units):
   I. Core Courses (12 credits)
      ____ UN1015 Composition
      ____ UN1025 Global Issues or 3000+ Modern Language
      ____ Critical/Creative Think List
      ____ Social Resp./Ethical Reason List
   II. HASS Courses Requirements (12 credits)
      (www.admin.mtu.edu/em/documents/HASS Distribution List.pdf)
      - 6 credits upper level (3000-4999)
      - 3 credits from each listed below
      ___ Communication/Composition
      ___ Humanities/Fine Arts List (HU/FA)**
      ___ Social & Behavioral Science List (EC/PSY/SS)**
      ___ 3 credits from any list**
   * Either EC2001 or EC3400 is required by the degree, if both are taken only ONE may be counted as a Social Resp./Ethical Reason or HASS course. If one is taken it may NOT be counted as a Social Resp./Ethical Reason or HASS course.
   ** Optional Business Minor (BUSM) classes may double count here (see #5).

III. Co-curricular activities (3 units)
In the co-curricular requirement, the three semester units will be physical education activities. These units are required for graduation, but are not included in the calculation of the GPA, nor 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.
   PE_________ PE_________ PE_________
   PE_________ PE_________ PE_________

3. Systems Minor Requirements (ESEM) (20 credits):
   Required courses (14 credits)
   ____ ENG1505 (1) Introduction to Systems Engineering
   ____ ENG2505 (3) Low Fidelity Systems Modeling
   ____ ENG3505 (1) Modeling Laboratory for Sustainable Systems
   ____ ENG4300 (3) Engineering Project Management
   ____ ENG4505 (3) Systems Analysis, Modeling, and Design
   ____ ENG4510 (3) Sustainable Futures I
   Select 6 credits from one of the following groups (6 credits)
   A. Environmental Engineering and Sustainability
      ____ (CEE3501 OR CEE3503) AND CEE4506 (3)
   B. Supply Chain, Logistics, Procurement, and Management
      ____ (OSM3150 OR OSM4700) AND OSM3600 (3)
   C. Design, LEAN, and Six Sigma
      ____ MEEM4650 OR OSM4650 OR (ENT3959, ENT3967, & ENT3982) AND
      ____ HON3300 OR (3 of: ENT3953, ENT3958, ENT3963, ENT3983)

4. Systems (Focus) Directed Electives (12 credits):
   Select 12 credits from one of the following groups.
   Enterprise (12 credits)
   ____ ENT3950 (1) Enterprise Project Work III
   ____ ENT3960 (1) Enterprise Project Work IV
   ____ ENT4950 (2) Enterprise Project Work V Capstone
   ____ ENT4960 (2) Enterprise Project Work VI Capstone
   ____ ENT2961 (2) Teaming in the Enterprise
   ____ ENT2962 (1) Communication Contexts
   ____ ENT3984 (3) Lean Six Sigma Principles OR
      ____ ENT3959 (1) Fundamentals of Six Sigma I AND
      ____ ENT3967 (1) Design for Six Sigma AND
      ____ ENT3982 (1) Continuous Improvement Using Lean Principles
   Minor (12 credits): Select 12 credits in a coherent plan of study as partial fulfillment of a university minor, with BSE program approval.

5. Optional Business Minor (BUSM) – Add 3-6 credits (18 credits total):
   Courses counting toward Business minor:
   ____ ACC2000   ____ EC2001   ____ MKT3000   ____ OSM3000
   ADD 3 credits from Block III on Business Minor
   ADD 3 credits from any Block (many HASS classes)