2023-24 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.

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**Fall Year 1**

- **MA1160 (4) or MA1161 (5)** CALCULUS I F, S, Su
- **MA2160 (4)** CALCULUS II F, S, Su
- **PH1000 (1)** PHYSICS LAB I F, S, Su
- **BL1000 (3)** GENERAL BIOLOGY 1 F, Su
- **CH1150 (3)** UNIVERSITY CHEMISTRY F, S, Su
- **ENG1001 (3)** ENG. MODELING & PROB. SOLVING F, S, Su
- **MA1031 (C), MA1032 (C), or MA1160/61 (C)** or test score

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**Spring Year 1**

- **MA2610 (4)** LINEAR ALGEBRA F, S, Su
- **ACC2000 (3) BUSM ACCOUNTING PRINCIPLES I F, Su
- **ENG1102 (3)** ENG. MODELING & DESIGN F, S, Su
- **MSE2100 (3)** INTRO TO MATERIAL SCIENCE F, S, Su
- **ENG2120 (4)** STATICS-STRENGTH OF MAT'LS F, S, Su
- **CEE3501 (3) ESEM ENVIRON ENG F**

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**Fall Year 2**

- **MA1160 (4)** CALCULUS III F, S, Su
- **PH2100 (3)** PHYSICS LECTURE I F, S, Su
- **ENG1505 (C)** INTRO TO LOW FIDELITY SYSTEM MODELING F
- **ENG2520 (3) ESEM ENVRN ENG F**
- **CEE3503 or CEE3501 (3) ESEM ENVIRON ENG F**

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**Spring Year 2**

- **MA2320 (2)** ECONOMICS F, S, Su
- **ENG4505 (3) ESEM SYSTEMS ANALYSIS & DESIGN F**
- **CEE3332 (3) ESEM FUND OF CONSTRUCTION F, S, Su
- **ENG4555 (3) ESEM PROJECT MANAGEMENT F, S, Su
- **UN1015 (3) SOCIAL, ETHICAL & CRITICAL THINKING CORE S
- **UN1025 (3) GLOBAL ISSUES or 3000+ Language F, S, Su
- **MA3710 (3)** ECONOMIC DECISION ANALYSIS F, S, Su

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**Fall Year 3**

- **MA1160 (5)** CALCULUS IV F
- **ENG2505 (3) ESEM INTRO TO SUSTAINABILITY & RESILIENCE F, S, Su
- **CEE3200 (4)** THERMOFLUIDS F, S
- **ENG4515 (3) ESEM INTRO TO SUSTAINABILITY & RESILIENCE F**
- **ENG4525 (3) ESEM SYSTEMS ANALYSIS & DESIGN F**

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**Spring Year 3**

- **MA2160 (4)** LINEAR ALGEBRA F, S, Su
- **PH2100 (3)** PHYSICS LECTURE I F, S, Su
- **CEE3710 or MA3710 (3)** UNCERTAINTY ANALYSIS OR ENG STATISTICS F
- **ENG3010 (3)** POPULATION ECO OR CONSERVATION BIO F, S
- **ENG3332 (3) ESEM FUND OF CONSTRUCTION F, S, Su
- **ENG4300 (3) ESEM SYSTEMS THINKING & DESIGN MOD & ENG F**

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**Fall Year 4**

- **ENG4905 (3) ESEM SR DESIGN S**
- **UN1015 (3) SOCIAL, ETHICAL & CRITICAL THINKING CORE S**
- **UN1025 (3) GLOBAL ISSUES or 3000+ Language F, S, Su
- **MA3710 (3)** ECONOMIC DECISION ANALYSIS F, S, Su
- **ENG4530 (3) ESEM PROJECT MANAGEMENT F, S, Su
- **UN1015 or UN1025 MAY BE TAKEN IN EITHER ORDER IN THE FIRST YEAR**

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**Spring Year 4**

- **MA4160 (4)** CALCULUS V F, S, Su
- **ENG4905 (3) ESEM SR DESIGN S**
- **ENG4530 (3) ESEM PROJECT MANAGEMENT F, S, Su
- **MA3710 (3)** ECONOMIC DECISION ANALYSIS F, S, Su
- **ENG4515 (3) ESEM INTRO TO SUSTAINABILITY & RESILIENCE F**
- **ENG4525 (3) ESEM SYSTEMS ANALYSIS & DESIGN F**

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**Notes:**

- **XX8888 (cr)** NAME Semester Offered
  - **F** = Fall
  - **S** = Spring
  - **Su** = Summer

- **ESEM** = Co-cur Unit
- **BUSM** = Business Minor (optional)

- **EN1001 (3)** ENG. MODELING & PROB. SOLVING F, S, Su
- **EN1002 (3)** ENG. MODELING & DESIGN F, S, Su
- **CH1101 (3)** CHEMISTRY LAB F, S, Su
- **CH1102 (3)** CHEMISTRY LAB F, S, Su
- **CH1105 (3)** CHEMISTRY LAB F, S, Su
- **UN1015 (3)** COMPOSITION F, S, Su
- **UN1025 (3)** GLOBAL ISSUES or 3000+ Language F, S, Su

- **0 credits must be upper division 3000-4999 level**
- **UN1015 & UN1025 are prerequisites for all upper division HASS courses**

- **HASS Requirement:**
  - 6 credits must be upper division 3000-4999 level
  - UN1015 & UN1025 are prerequisites for all upper division HASS courses
BSE Systems Emphasis 2023-24
(minimum of 125 credits)
Academic questions: E-mail efadvise@mtu.edu

1  Senior Design Prerequisite courses:
   ENG1101, ENG1102, ENG2120, ENG2505, CEE3200, ENG3505, ENG4505,
   CEE3332, and EE3010.

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**
* EC3400 is required by the degree, and 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)  ___ ENG2505 (3)  ___ ENG3505 (1)
      ___ ENG4300 (3)  ___ ENG4505 (3)  ___ ENG4515 (3)
   Environmental Engineering and Sustainability (6 credits)
      ___ (CEE3501 OR CEE3503) (3)  ___ CEE4525 (3)

4  Systems (Focus) Directed Electives (12 credits):
Select 9 credits from one of the following groups.

   Enterprise (9 credits)
      ___ ENT3950 (1)  ___ ENT3960 (1)  ___ ENT4950 (2)  ___ ENT4960 (2)
      ___ ENT2961 (2)  Teaming  ___ ENT2962 (1)  Communication Contexts
      ___ ENT3959 (1)  ___ ENT3967 (1)  ___ ENT3982 (1)  Lean Six & Sigma

   ROTC Air Force (9 credits)
      ___ AF3002 (3)  ___ AF4001 (3)  ___ AF4002 (3)

   ROTC Army (9 credits)
      ___ AR2002 (1)  ___ AR3001 (2)  ___ AR3002 (2)  ___ AR4001 (2)
      ___ AR4004 (2)

   Minor (9 credits): Select 9 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  ___ EC3400  ___ MKT3000  ___ OSM3000
ADD 3 credits from Block III on Business Minor
   ENG/OSM4300 cannot count for both Systems and Business minors
ADD 3 credits from any Block (many HASS classes)