2022-23 BSE with Systems Engineering

KEY

XX#### = Prerequisite
XX#### (C) = prereq that can be taken concurrently

XX#### (cr)
NAME
Semester Offered

F = Fall
S = Spring
Su = Summer

ESEM Systems Eng Minor
BUSM Business Minor *(optional)*

Updated October 2022

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.

Year 1

Fall

MA1160 (4) or MA1161 (5)
CALCULUS I
F, S, Su

(C)

PH1100 (1)
PHYSICS LAB I
F, S, Su

CH1150 (3)
UNIVERSITY CHEMISTRY
F, S, Su

co-req

CH1151 (1)
CHEMISTRY LAB
F, S, Su

ENG1101 (3) or ENG1001 (2) & ENG1100 (2)
ENG. ANALYSIS & PROB. SOLVING
F, S, Su

MA1031 (C), MA1032 (C), or MA1160/61 (C) and ENG1002 (C) or test score

UN1015 (3)
COMPOSITION
F, S, Su

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

15

Co-cur Unit
F, S, Su

Spring

MA2160 (4)
CALCULUS II
F, S, Su

C or better in MA1160 or MA1161. If not need to take PH2110 with PH2100.

(C)

PH2100 (3)
PHYSICS LECTURE I
F, S, Su

ENG1505 (1) ESEM
INTRO TO SYSTEMS ENG
S

ENG1102 (3)
ENG. MODELING & DESIGN
F, S, Su

MA1031, MA1032, or MA1160/61 ENG1002 or test score

***UN1025 (3)**
GLOBAL ISSUES or 3000+ Language
F, S, Su

* ONE SEMESTER OF 3000 LEVEL OR HIGHER MODERN LANGUAGE MAY REPLACE UN1025.

14

Co-cur Unit
F, S, Su

Year 2

Fall

MA3160 (4)
CALCULUS III
F, S, Su

ACC2000 (3) BUSM
ACCOUNTING PRINCIPLES I
F,S,Su

BL1100 (3)
GENERAL BIOLOGY 1
F, Su

ENG1505
MA2160 (C) & (ENG1102 (C) or CS1121 or CS1131)

ENG2505 (3) ESEM
INTRO TO LOW FIDELITY SYSTEM MODELING
S

CH1150
CH1151

MSE2100 (3)
INTRO TO MATERIAL SCI/ENG
F,S,Su

ENG1102
MA2160
PH2100

ENG2120 (4)
STATICS-STRENGTH MAT'LS
F,S

CH1150
CH1151
MA2160

CEE3503 or CEE3501 (3) ESEM
ENVIRON ENG
F,S

_____ (3)
**CRITICAL & CREATIVE THINKING CORE

_____ (3)
**SOCIAL RES. & ETHICAL REASONING CORE

** 2ND-YEAR CORE MAY BE TAKEN IN EITHER ORDER

16

Co-cur Unit
F, S, Su

15

Co-cur Unit
F, S, Su

Spring

MA1160/1

MA2320 (2)
LINEAR ALGEBRA
F,S,Su

ENG2505

ENG4505 (3) ESEM
SYSTEMS ANALYSIS MODELING & DESIGN
F

ENG1102
MA2160
PH2100
CH1150

ENG3200 (4)
THERMO/FLUIDS
F,S

Not Fresh or Soph

ENG4515 (3) ESEM
INTRO TO SUSTAINABILITY & RESILIANCE
F

_____ (3)
HU/FA
*** HASS

16

Co-cur Unit
F, S, Su

Year 3

Fall

MA2160

CEE3710 or MA3710 (3)
UNCERTAINTY ALANLYSIS or ENG STATISTICS
F

_____ (3)
DIRECTED ELECTIVE

UN 1015
UN 1025
Jr Stand.

EC3400 (3) BUSM
ECONOMIC DECISION ANALYSIS
F,S,Su

CEE3332 (3) M
FUND OF CONSTRUCTION
F, S

Not Fresh Or Soph

ENG4525 (3) ESEM
SYS ANALYSIS/ SUSTAINABILITY RESILIANCE
S

_____ (3)
EC/PSY/SS
*** HASS BUSM

18

Co-cur Unit
F, S, Su

Spring

_____ (3)
DIRECTED ELECTIVE

MA1160/1
MA3710
or CEE3710

OSM3000 (3) BUSM
OPERATIONS MANAGEMENT
F,S,Su

ENG1505
ENG2505

ENG3505 (1) ESEM
PRACTICUM IN SYSTEMS THINKING & SYSTEMS MODELING
F

CEE3710
or
MA3710

ENG4300 (3) ESEM
PROJECT MANAGEMENT
F, S, Su (on-line)

_____ (3)
COMMUNICATION/ COMPOSITON
*** HASS BUSM

16

Co-cur Unit
F, S, Su

Year 4

Fall

_____ (3)
DIRECTED ELECTIVE

FW4260 (3) or FW3410 (3)
POPULATION ECO OR CONCERVATION BIO
F,S

EE3010
ENG2120
ENG3200
ENG2505
ENG3505
ENG4505

ENG4905 (3)
SR DESIGN
S

Jr or Sr Standing

MET4510 (3)
LEAN MANUFACT & PRODUCTION PLAN
or MEEM/OSM4650
S or F, S

_____ (3)
ANY LIST
*** HASS BUSM

15

Co-cur Unit
F, S, Su

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

BSE Systems Emphasis 2022-23
(minimum of 125 credits)

Academic questions: E-mail **efadvise@mtu.edu**

1 Senior Design **Prerequisite courses:**
ENG1101, ENG1102, ENG2120, ENG2505, ENG3200, ENG3505 (C), ENG4505 (C), 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)*
_X_ ENG1505 (1) _X_ ENG2505 (3) _X_ ENG3505 (1)
_X_ ENG4300 (3) _X_ ENG4505 (3) _X_ ENG4515 (3)
_X_ (CEE3501 OR CEE3503) _X_CEE4525 (3)

4 Systems (*Focus*) Directed Electives (12 credits):

Select 9 credits from one of the following groups.

Enterprise *(9 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

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:
_X_ ACC2000 _X_ EC3400 _X_ MKT3000 _X_ OSM3000
ADD 3 credits from Block III on Business Minor _____
ENG/OSM4300 can not count for both Systems and Business minor
ADD 3 credits from any Block (*many HASS classes*) _____