CIVIL ENGINEERING FLOWCHART

General

Academic Year 2016-17

NOTE: LINEAR ALGEBRA & DIFFERENTIAL EQUATIONS CAN BE TAKEN DURING THE SAME SEMESTER (MA2321 & MA3521) OR SEPARATE SEMESTERS (MA2320 & MA3520)

Goal 4 & Goal 8 Courses can be taken in either order in the sophomore year.

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

*6 credits must be upper division 3000-4000 level courses
*UN1015 and UN1025 are prerequisites for all upper division HASS courses

Total Academic Credits: 131
Total Co-Curricular Units: 3

Updated 7/29/16
**Engineering Science Elective List (3 credits)**

<table>
<thead>
<tr>
<th>Course</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BE2700</td>
<td>BIOMEDICAL SIGNALS &amp; SYSTEMS</td>
</tr>
<tr>
<td>CM2110</td>
<td>FUND. OF CHEM ENGRG 1</td>
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<td>CM2200</td>
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<td>MEEM2201</td>
<td>THERMODYNAMICS</td>
</tr>
<tr>
<td>MEEM2700</td>
<td>DYNAMICS</td>
</tr>
<tr>
<td>SSE3730</td>
<td>SYSTEMS DYNAMICS AND DESIGN</td>
</tr>
</tbody>
</table>

**Senior Design (SD) Pre-reqs**

(Complete 7 of the following)

- CE3101, CE3202, CE3331, CE3332, CE3401, CE3620, CE3810
- ENVE3503, CE4213 or CE4223

**UNDERGRADUATE CATALOG**: http://www.mtu.edu/catalog/undergraduate/course-descriptions/

**GENERAL EDUCATION**: http://www.mtu.edu/provost/academic-policies/general-education/programs/

**CO-CURRICULAR LIST**: http://www.mtu.edu/registrar/faculty-staff/advisors/gen-ed/

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**Professional Electives**

(UNDERGRADUATE CATALOG: http://www.mtu.edu/catalog/undergraduate/course-descriptions/)

- ANY 3000, 4000, OR 5000 LEVEL COURSE IN CIVIL AND ENVIRONMENTAL ENGINEERING OR IN ANY OTHER ENGINEERING DEPARTMENT.
  - * AN OVERALL GPA OF 3.00 IS REQUIRED TO TAKE GRADUATE LEVEL COURSES (5000 LEVEL)
  - * A MAXIMUM OF TWO (2) GRADUATE LEVEL COURSES MAY BE USED TOWARD YOUR BSCE DEGREE
- ANY 3000 OR HIGHER LEVEL COURSE IN BIOLOGY, CHEMISTRY, COMPUTER SCIENCE, GEOLOGY, OR PHYSICS.
- ANY 3000 OR HIGHER LEVEL COURSE ANY 4000 OR HIGHER LEVEL COURSE IN MATHEMATICS.
- ANY 3000 OR HIGHER LEVEL COURSE IN BUSINESS OR ECONOMICS. (ACC, BUS, EC, FIN, MGT, MIS, MKT)
- ANY 2000 OR HIGHER LEVEL COURSE IN SURVEYING
- HU3120 – TECHNICAL AND PROFESSIONAL COMMUNICATION

**NOTE**: OTHER COURSES MAY BE USED TO SATISFY THE PROFESSIONAL ELECTIVES REQUIREMENT IF APPROVED BY THE DEPARTMENT OF CIVIL AND ENVIRONMENTAL ENGINEERING ACADEMIC ADVISOR.

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**GENERAL EDUCATION REQUIREMENTS**

**A. CORE COURSES (12 CREDITS)**

1. **UN1015** (COMPOSITION)
2. **UN1025** (GLOBAL ISSUES)
3. CRITICAL AND CREATIVE THINKING (Goal 4)*
4. SOCIAL RESPONSIBILITY AND ETHICAL REASONING (Goal 8) **

*GOAL 4 LIST
  - FA2330
  - FA2520
  - FA2720
  - FA2820
  - HU2130
  - HU2503
  - HU2538
  - HU2700
  - HU2820
  - HU2910
  - SS2300

**GOAL 8 LIST
  - SS2600
  - SS2610
  - SS2700

**B. HASS COURSES (12 CREDITS)** (General Ed Website, left)

1. SECOND COURSE IN COMMUNICATION/COMP
2. HU OR FA COURSE (HASS LIST)
3. SS OR EC OR PSY COURSE (HASS LIST)
4. ANY HASS OR HASS RESTRICTED COURSE (HASS LIST)

- 6 credits must be upper division 3000-4000 level courses
- No more than 3 credits from the HASS Restricted list can be used to satisfy HASS requirements.
- Each course can satisfy only one requirement.

**C. CO-CURRICULAR ACTIVITIES (3 UNITS)**

PE/FA/AR/AF____ PE/FA/AR/AF____
PE/FA/AR/AF____ PE/FA/AR/AF____
PE/FA/AR/AF____ PE/FA/AR/AF____
This is not an official list of degree requirements. Adjustments may be required due to curriculum changes.

CIVIL ENGINEERING FLOWCHART

Water Resources
Academic Year 2016-17

NOTE: LINEAR ALGEBRA & DIFFERENTIAL EQUATIONS CAN BE TAKEN DURING THE SAME SEMESTER (MA2321 & MA3521) OR SEPARATE SEMESTERS (MA2320 & MA3520)

Fall Year 1 Spring

MA1160/1161 CALCULUS I (4 CREDITS) F, S, Su
MA2160 CALCULUS II (4 CREDITS) F, S, Su
PH1100 PHYSICS LAB I (1 CREDIT) F, S, Su
PH2100 PHYSICS LECTURE I (3 CREDITS) F, S, Su
ENG1002 ENGLISH 1A (3 CREDITS) F, S, Su
ENG1102 MODELING & DESIGN (3 CREDITS) F, S, Su
CH1150 UNIVERSITY CHEMISTRY (3 CREDITS) F, S, Su
**ENG1003 AUTOCAD (1 CREDIT) F, S

Fall Year 2 Spring

MA3160 CALCULUS III (4 CREDITS) F, S, Su
MA3220/2321 DIFFERENTIAL EQUATIONS (2 CREDITS) F, S, Su
PH2200 PHYSICS LAB II (1 CREDIT) F, S, Su
PH2200 PHYSICS LECTURE II (3 CREDITS) F, S, Su
SU2000 SURVEYING (2 CREDITS) F, S, Su
ENG2200 THERMO/FLUIDS (3 CREDITS) F, S, Su
MEEM2110 MECHANICS OF MATERIALS (3 CREDITS) F, S, Su
**ENVE3503 ENVIRONMENTAL ENGINEERING (3 CREDITS) F, S, Su

Fall Year 3 Spring

MA3230/3521 STATISTICS (3 CREDITS) F, S, Su
CE3620 (L) WATER RESOURCES (4 CREDITS) F, S, Su
MA3270A OR CE3710 UNCERTAINTY ANALYSIS IN ENG. (3 CREDITS) F, S, Su
MA2160

Fall Year 4 Spring

MA3710 (Co-req or Pre-req)
CE3810 (L) SOIL MECHANICS (3 CREDITS) F, S, Su
CE3905 SENIOR DESIGN (3 CREDITS) F, S, Su
EC3400 ECON. DECISION ANALYSIS (3 CREDITS) F, S, Su

FREE ELECTIVE (3 CREDITS) F, S, Su

GOAL 4 & GOAL 8 COURSES CAN BE TAKEN IN EITHER ORDER IN THE SOPHOMORE YEAR.

**ONE SEMESTER OF 3000 LEVEL OR HIGHER LANGUAGE COURSE CAN REPLACE UN1025

6 CREDITS MUST BE UPPER DIVISION 3000-4000 LEVEL COURSES. UN1015 AND UN1025 ARE PREREQUISITES FOR ALL UPPER DIVISION HASS COURSES

NOTE: SEE REVERSE SIDE FOR EXPLANATION OF PROFESSIONAL ELECTIVES, WATER RESOURCES ELECTIVES, GENERAL EDUCATION AND CO-CURRICULAR COURSES

Total Academic Credits: 131
Total Co-Curricular Units: 3

Updated 7/29/16
**Water Resources Requirements**

Choose 1 course from the following

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Offered</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CE3202</td>
<td>STRUCTURAL ANALYSIS</td>
<td>F, Sp</td>
<td>3</td>
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<td>CE3332</td>
<td>FUND. OF CONSTRUCTION</td>
<td>F, Sp</td>
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<td>CE3401</td>
<td>TRANSPORTATION ENGRG</td>
<td>F, Sp</td>
<td>3</td>
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**WATER RESOURCES DESIGN COURSE** (select 1)

<table>
<thead>
<tr>
<th>Course Code</th>
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<tbody>
<tr>
<td>CE4620</td>
<td>RIVER/FLOODPLAIN HYDRAULICS</td>
<td>Fall</td>
<td>3</td>
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<tr>
<td>CE4640</td>
<td>STORMWATER MANAGE. &amp; LID</td>
<td>Su</td>
<td>3</td>
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<tr>
<td>CE4665</td>
<td>STREAM RESTORATION</td>
<td>Spring</td>
<td>3</td>
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**WATER RESOURCES ELECTIVES** (select 4)

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<tr>
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<td>STREAM RESTORATION</td>
<td>Spring</td>
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<tr>
<td>CE5620</td>
<td>STOCHASTIC HYDROLOGY</td>
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<td>CE5666</td>
<td>WR PLANNING &amp; MANAGEMENT</td>
<td>Var.</td>
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<td>ENVE4502</td>
<td>WASTE TREATMENT</td>
<td>Fall</td>
<td>3</td>
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<tr>
<td>ENVE4503</td>
<td>WATER TREATMENT</td>
<td>Spring</td>
<td>3</td>
</tr>
<tr>
<td>ENVE4505</td>
<td>SURFACE WATER QUALITY</td>
<td>Fall</td>
<td>3</td>
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<tr>
<td>ENVE4507</td>
<td>WATER DISTRIBUTION/COLLECT.</td>
<td>Spring</td>
<td>3</td>
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<tr>
<td>GE3850</td>
<td>GEOHYDROLOGY</td>
<td>F, Sp</td>
<td>3</td>
</tr>
<tr>
<td>GE4800</td>
<td>GROUNDWATER ENGRG</td>
<td>Var.</td>
<td>3</td>
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</tbody>
</table>

**Senior Design (SD) Pre-reqs (complete 7 of the following)**

CE3101, CE3331, (CE3202 or CE3332 or CE3401), CE3620, CE3810, ENVE3503, WATER RESOURCES DESIGN COURSE, & 2 WATER RESOURCES ELECTIVES

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**ENGINEERING SCIENCE ELECTIVE LIST (3 credits)**

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**GENERAL EDUCATION REQUIREMENTS**

**A. CORE COURSES (12 CREDITS)**

1. **UN1015** (COMPOSITION)
2. **UN1025** (GLOBAL ISSUES)
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4. SOCIAL RESPONSIBILITY AND ETHICAL REASONING (Goal 8) **

**B. HASS COURSES (12 CREDITS) (General Ed Website, left)**

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3. SS OR EC OR PSY COURSE (HASS LIST)
4. ANY HASS OR HASS RESTRICTED COURSE (HASS LIST)

**C. CO-CURRICULAR ACTIVITIES (3 UNITS)**

PE/FA/AR/AF______ PE/FA/AR/AF______

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**Professional Electives**

(UNDERGRADUATE CATALOG: http://www.mtu.edu/catalog/undergraduate/course-descriptions/)

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- HU3120 – TECHNICAL AND PROFESSIONAL COMMUNICATION

**Note:** OTHER COURSES MAY BE USED TO SATISFY THE PROFESSIONAL ELECTIVES REQUIREMENT IF APPROVED BY THE DEPARTMENT OF CIVIL AND ENVIRONMENTAL ENGINEERING ACADEMIC ADVISOR.
### Transportation Requirements

**TRANSPORTATION DESIGN COURSE (Select 1)**
- CE4401 PAVEMENT DESIGN Fall 3 cr.
- CE4407 TRANSPORTATION DESIGN Spring 3 cr.

**TRANSPORTATION ELECTIVES (select 4)**
- CE4401 PAVEMENT DESIGN Fall 3 cr.
- CE4402 TRAFFIC ENGINEERING Fall 3 cr.
- CE4404 RAILROAD ENGINEERING Fall 3 cr.
- CE4406 AIRPORT PLANNING Spring 3 cr.
- CE4407 TRANSPORTATION DESIGN Spring 3 cr.
- CE4410 TRANSPORTATION PLANNING Fall 3 cr.

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### Senior Design (SD) Pre-reqs

**complete 7 of the following**

CE3101, CE3202, CE3331, CE3332, CE3401, CE3810 TRANSPORTATION DESIGN COURSE, & 2 TRANSPORTATION ELECTIVES

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### Engineering Science Elective List (3 credits)

- BE2700 BIOMEDICAL SIGNALS & SYSTEMS
- CM2110 FUND. OF CHEM ENGRG 1
- CM2200 INTRO TO MINERALS & MATERIALS
- EE3010 CIRCUITS AND INSTRUMENTATION
- MY2100 INTRO TO MATERIALS SCI & ENGRG
- MEEM2201 THERMODYNAMICS
- MEEM2700 DYNAMICS
- SSE3730 SYSTEMS DYNAMICS AND DESIGN

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### GENERAL EDUCATION REQUIREMENTS

**A. CORE COURSES (12 CREDITS)**

1. **UN1015** (COMPOSITION)
2. **UN1025** (GLOBAL ISSUES)
3. **CRITICAL AND CREATIVE THINKING (Goal 4)** *
4. **SOCIAL RESPONSIBILITY AND ETHICAL REASONING (Goal 8)** *

**B. HASS COURSES (12 CREDITS)** (General Ed Website, left)

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2. **HU OR FA COURSE (HASS LIST)**
3. **SS OR EC OR PSY COURSE (HASS LIST)**
4. **ANY HASS OR HASS RESTRICTED COURSE (HASS LIST)**

**C. CO-CURRICULAR ACTIVITIES (3 UNITS)**

PE/FA/AR/AF

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### Professional Electives

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- HU3120 – TECHNICAL AND PROFESSIONAL COMMUNICATION

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CIVIL ENGINEERING FLOWCHART

Built Infrastructure

Academic Year 2016-17

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

**Note:** Linear algebra & differential equations can be taken during the same semester (MA2321 & MA3521) or separate semesters (MA2320 & MA3320).

**Built Infrastructure Path Requirements**

<table>
<thead>
<tr>
<th>Co-cur Unit (0.5 Unit)</th>
<th>F, S, Su</th>
</tr>
</thead>
<tbody>
<tr>
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<td></td>
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</table>

**General Education Requirements**

**Total Academic Credits:** 131

**Total Co-Curricular Units:** 3

**Updated 7/29/16**
BUILT INFRASTRUCTURE DESIGN COURSE (select 1)
- CE4213 STRUCTURAL CONCRETE DESIGN Spring 4 cr.
- CE4223 STEEL DESIGN 1 Fall 4 cr.
- CE4820 FOUNDATION ENGINEERING Fall 3 cr.

BUILT INFRASTRUCTURE ELECTIVES (select 4)
- CE4020 COMPUTER APPLICATIONS Fall 3 cr.
- CE4201 MATRIX STRUCTURAL ANALYSIS Spring 3 cr.
- CE4213 STRUCTURAL CONCRETE DESIGN Spring 4 cr.
- CE4223 STEEL DESIGN 1 Fall 4 cr.
- CE4233 STRUCTURAL TIMBER DESIGN Spring 3 cr.
- CE4244 LOADS FOR CIVIL STRUCTURES Spring 3 cr.
- CE4333 ESTIMATING, PLANNING, CONST. Fall 3 cr.
- CE4344 CONSTRUCTION SCHEDULING Spring 3 cr.
- CE4820 FOUNDATION ENGINEERING Fall 3 cr.
- CE4830 GEOSYNTHETICS Spring 3 cr.
- CE4850 ROCK ENGINEERING Spring 3 cr.
- CE5212 PRESTRESSED CONCRETE DESIGN Fall 3 cr.
- CE5213 CONCRETE/MASONRY BLDG SYS Fall 3 cr.

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