F INDICATES COURSE IS OFFERED FALL SEMESTER

ENVIRONMENTAL ENGINEERING FLOWCHART Academic Year 2016-17

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

Updated: 7/29/16

S INDICATES COURSE IS OFFERED SPRING SEMESTER

= General Education Requirement

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

Su INDICATES COURSE IS OFFERED SUMMER SEMESTER

(L) INDICATES A COURSE WHICH INCLUDES A LAB

SEMESTERS (MA2320 & MA3520) MUST BE SCHEDULED IN ADDITION TO THE LECTURE Fall Year 2 Year 3 Year 4 Year 1 Spring Fall Spring Fall Spring Fall Spring SEE BACK JR STDG. FOR PRE-REQS MA2320/2321 CE3620 (L) ENVE4506 UN1015 EC3400 MA1160/1161 MA2160 MA3160 CE4905 MA1160 ENVE3501 LINEAR ALGEBRA WATER RESOURCES SUSTAIN, PRINC UN1025 **EC DECISION** CALCULUS I CALCULUS II CALCULUS III SENIOR DESIGN (2 CREDITS) ENGINEERING TO ENG. PRACTICE **ANALYSIS** (4/5 CREDITS) (4 CREDITS) (4 CREDITS) (3 CREDITS) (4 CREDITS) (3 CREDITS) (3 CREDITS) F. S. Su F, S, Su F, S, Su F, S, Su F, S, Su (TRACK A F, S, Su F, S, Su ENG3200 & ENVE3502 can also be a MA1160/ MA1160/1161 ENG2120 & For other senior design options, please visit the advising 1161 Corea. co-req to CE3620 MA2160 GF2000 PH2100 website: http://www.mtu.edu/cee/undergraduate/capstone/ CE3810 (L) MA3520/3521 PH1100 (L) PHYSICS SOIL MECHANICS Pre-req or PHYSICS LAB ENVE3501 DIFFERENTIAL EQ CE3620 ENVE3501 LECTURE I (4 CREDITS) ENV. ENGRG. (1 CREDIT) Co-req (2 CREDITS) (RECOMMENDED) ENVE4503, (3 CREDITS) ENVE4505 (L) F, S, Su **FUNDAMENTALS** F. S. Su F, S, Su ENVE4502, SURFACE WATER ENVE4509 (L) F. S. Su (3 CREDITS) (TRACK B) ENG3200 GE3850 (L) ENV. PROCESS. & QUALITY ENGRG. MA1160/ GEOHYDROLOGY CH1150/1151 (3 CREDITS) **SIMULATION** MA2160 CH1150/1151 MA1160/1161 1161 Corec (3 CREDITS) (2 CREDITS) CH1150/1151 FW3330 (L) ENG1101 ENG1102 F. S SOIL SCIENCE ENVE3502 (L) MODELING & **FNGINFFRING** (4 CREDITS) F.M.M.A ANALYSIS DESIGN ENVE3501 & (3 CREDITS) ENVE3502 & (3 CREDITS) (3 CREDITS) ENG3200 F, S, Su F, S, Su **HIGHLY RECOMMENDED ENG1002 or BUT NOT REQUIRED ENVE4502 ENVE3501 ENG1100 or ENVE3501 FNVF4503 PROFESSIONAL. ENVE4501 (L) WASTEWATER ENG1101 CHEM PROCESS WATER TREATMENT ELECTIVE **ENG1003 TREATMENT (4 CREDITS) (3 CREDITS) (3 CREDITS) MA2160 (3 CREDITS) AUTOCAD F, S, Su CH1150/1151 (1 CREDIT) CH1150 PH2100 S GE2000 (L) ENG3200 UNIVERSITY ENG1102 **GEOLOGY** THERMO/FLUIDS CHEMISTRY (3 CREDITS) (4 CREDITS) (3 CREDITS) CH1160 JR. STDG. F, S F, S, Su F, S, Su CO-REQS LINIVERSITY SOPH, STDG **CHEMISTRY II** BL3080 ENVE3501 FREE ELECTIVE BL3310 (L) ENVE4504 (3 CREDITS) BIO CONCEPTS FOR CH1151 (L) MICROBIOLOGY AIR QUALITY ANY 1000+ COURSE F, S, Su **ENGINEERS** UNIVERSITY (3 CREDITS) (3 CREDITS) (3 CREDITS) (3 CREDITS) CHEMISTRY LAB F, S, Su S (1 CREDIT) CH1161 (L) HU3120 F, S, Su LINIVERSITY Recommended CHEMISTRY II LAB ANY HASS/HASS COMPOSITION/ ENG2120 PROFESSIONAL. (1 CREDIT) **HU/FA COURSE** SS/EC/PSY COURSE See Back ENVE1501 MA2160 COMMUNICATION STATICS/STRGTH OF **ELECTIVE** RESTRICTED F. S. Su INTRO TO ENV. (SEE HASS LIST) (SEE HASS LIST)) PH2100 -(SEE HASS LIST) MATERIALS SEE BACK COURSE (3 CREDITS) (3 CREDITS) ENGINEERING. ENG1102 (4 CREDITS) (3 CREDITS) (3 CREDITS) (3 CREDITS) (1 CREDIT) F, S, Su F, S, Su F, S F, S, Su *** ONE SEMESTER OF 3000 LEVEL F, S, Su OR HIGHER LANGUAGE COURSE CAN REPLACE UN1025 6 credits must be upper CE3331 IR STDG division 3000-4000 level CRITICAL/CREATIVE SOC RESP/ETHICAL NOTE: SEE REVERSE SIDE FOR **PROFESSIONAL** UN1015 ***UN1025 courses THINKING (GL. 4) **REASONING (GL 8)** PRACTICE Total Academic Credits: 131 EXPLANATION OF PROFESSIONAL COMPOSITION GLOBAL ISSUES UN1015 and UN1025 are (SEE LIST ON BACK) (SEE LIST ON BACK) (2 CREDITS) ELECTIVES, GENERAL EDUCATION Total Co-Curricular Units: 3 (3 CREDITS) (3 CREDITS) prerequisites for all upper (3 CREDITS) (3 CREDITS) F. S AND CO-CURRICULAR COURSES F. S, Su F, S, Su division HASS courses F, S, Su F, S, Su 17 16 18 16 17 16 14 17 GOAL 4 & GOAL 8 COURSES CAN BE TAKEN IN EITHER Co-cur Unit Co-cur Unit Co-cur Unit Co-cur Unit Co-cur Unit Co-cur Unit ORDER IN THE SOPHOMORE (.5 CREDIT) (.5 CREDIT) (.5 CREDIT) (.5 CREDIT) (.5 CREDIT) (.5 CREDIT) YEAR. F, S, Su F, S, Su

PROFESSIONAL ELECTIVES

Specialty Area	Course #	Course Title	<u>Credits</u>	<u>Semester</u>	<u>Prerequisites</u>
Air Quality	ENVE4515	Atmospheric Chemistry	3	Spring	ENVE4504 or ENVE4501, SR
	UN4000	Remote Sensing Seminar	1	Fall, Spring	Sophomore Standing
Surface Water Quality	ENVE5504	Surface Water Quality Modeling	3	Spring	ENVE4505
	FW4220	Wetlands	4	Fall	
<u>Groundwater</u>	GE3040	Fund. of Applied and Environ. Geophysics		Spring	PH2200
	GE4800	Groundwater Engineering	3	On Demand	GE3850
Manufacturing	MEEM4685	Env Resp Design & Manuf	3	Spring – alt yrs	Senior Standing
Water Resources	CE4620	River and Floodplain Hydraulics	3	Fall	CE3620
	CE4640	Stormwater Management and LID	3	Summer (Online)	CE3620
	CE5664	Water Resources Modeling	3	On Demand	CE3620
	ENVE4507	Distribution and Collection	3	Spring	CE3620 and ENVE3501
	FW3540*	Intro to GIS for Natural Resource Mgmt	4	Spring	ENVE3502
	FW4220	Wetlands	4	Fall	
	UN4000	Remote Sensing Seminar	1	Fall, Spring	Sophomore Standing
Math/Physical Science	ENVE4518	Aquatic Biogeochemistry	3	Fall	ENVE4501 (C), ENVE4505 (C)
	ENVE4528	Global Biogeochemistry	3	Fall	ENVE4501 (C)
	MA4630	Numerical Methods	3	Fall	MA3530**
	PH1200/2200	Physics II	4	Fall, S, Su	PH2100, MA2160 (co-req)
Computer Science	CS1121	Intro to Programming I	3	Fall, S, Su	MA1032 (Co-reg)
	CS1122	Intro to Programming II	3	Fall, S, Su	CS1121
Business & Construction	ACC2000	Accounting Principles I	3	Fall, S, Su	
	MKT3000	Principles of Marketing	3	Fall, S, Su	Cannot be a Freshman
	CE3332	Fundamentals of Construction Engineerin	ig 3	Fall, S, Su	Sophomore Standing
	EC3300	Industrial Organization	3	Fall, S, Su	EC2001, UN1015, UN1025
Environmental Policy	SS3520	U.S. Environmental History	3	Spring - alt yrs	UN1015, UN1025
	SS3630	Environmental Policy and Politics	3	Fall	UN1015, UN1025
Other applicable courses	ENVE4511	Solid and Hazardous Waste Engineering	3	Spring	ENVE3501
	CE4820	Foundation Engineering	3	Fall	CE3810
	CE4830	Geosynthetics Engineering	3	Spring	CE3810
	CE4990	Special Topic (Varies by semester)	3	Fall, Spring	Varies
	SU2000	Surveying & GIS Fundamentals	2	Fall, Spring	

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

*FW3540 WILL BE OPEN TO FORESTRY MAJORS ONLY UNTIL THE INITIAL REGISTRATION PERIOD IS OVER

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/

SENIOR DESIGN PREREQUISITES:

EQUIRED

ENVE3501 OR ENVE3503, ENVE3502, AND CE3620

PLUS 4 OF THE FOLLOWING:

CE3810, ENVE4502, ENVE4504, ENVE4506 OR GE3850

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	**GOAL 8 LIST
FA2330	EC2001
FA2520	PSY2000
FA2720	SS2100
FA2820	SS2200
HU2130	SS2400
HU2503	SS2500
HU2538	SS2501
HU2700	SS2502
HU2820	SS2503
HU2910	SS2504
SS2300	SS2505
	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

^{**}MA3520/3521 SHOULD SUBSTITUTE FOR MA3530