

Bachelor of Science in Electrical Engineering Concentration in Environmental Applications

The Michigan Tech Department of Electrical and Computer Engineering is pleased to offer a **Concentration in Environmental Applications**, within the degree Bachelor of Science in Electrical Engineering.

This concentration is intended for those students whose primary interest is in electrical engineering, and who seek to apply their skills in environmental quality assurance and remediation. Examples of such applications include environmental remote sensing, water treatment, and industrial controls for building management systems or energy generation.

Students enrolled in the concentration will take a number of required and elective courses in environmental engineering and remote sensing, and will have the opportunity for capstone design projects in cooperation with the Department of Civil and Environmental Engineering.

The BSEE Concentration in Environmental Applications will open career possibilities for electrical engineering graduates who have a focused passion for our shared environment.



To complete the BSEE with a concentration in Environmental Applications a student must include the following coursework:

ENVE 3501 Environmental Engineering Fundamentals	3
ENVE 3502 Environmental Monitoring and Measurement	3
Remote Sensing Area:	6 or 7
GE 4250 Fundamentals of Remote Sensing + EE 4252 Digital Signal Processing (4 cr.)	
Or EE 3090 Geometrical Wave Optics + EE 3190 Optical Sensing and Imaging	
Environmental Quality Engineering Area: Choose Two	6
ENVE 4502 Wastewater Treatment Principles and Design	
ENVE 4503 Drinking Water Treatment Principles and Design	
ENVE 4504 Air Quality Engineering and Science	
ENVE 4505 Surface Water Quality Engineering	
ENVE 4507 Application of Sustainability Principles	
ENVE 4511 Solid and Hazardous Waste Engineering	
ENVE 4512 Green Engineering Design and Sustainability	
Total credits	18 or 19

Michigan Technological University

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Michigan Tech

Bachelor of Science in Electrical Engineering Environmental Applications concentration (18 cr)

This suggested plan applies to students entering in Academic Year 2016-2017 who are ready for calculus.

Semester 1			Semester 2		
CH1150&1151	Univ. Chemistry I & Lab I	4	PH2100	Univ. Physics I - Mechanics	3
CH1153	Prob. Solv. Chem. I :optional	1	ENG1102	Engineering Modeling & Design	3
ENG1101	Engineering Analysis	3	MA2160	Calculus with Technology 2	4
MA1160 ¹	Calculus with Technology 1	4	PH1200	Univ. Physics II Lab	1
PH1100	Physics Lab 1	1	EE1110	Essential Math for EE's	1
UN1015	Composition	3	EE1111	Intro. to Elec. & Comp. Engg.	1
			UN1025	Global Issues	3
	Total	15/16		Total	16
Semester 3			Semester 4		
MA2321 ²	Linear Algebra	2	EE2112	Electrical Circuits II & Lab	4
MA3521 ²	Differential Equations	2	EE3120	Electric Energy Systems	3
EE 2111	Electrical Circuits I	3	MA3160	Multi-variable Calculus	4
CS1111	Intro to Programming in C/C++	3	EE2174	Digital Logic and Lab	4
PH2200	Univ. Physics 2-Elec&Magnet	3		Critical/Creative Thinking crse ⁶	3
	Soc. Resp./Ethic. Reasoning crse ⁶	3			
	Total	16		Total	18
Semester 5			Semester 6		
EE3131	Electronics	4	EE3901	Design Fundamentals	2
EE3140	Electromagnetics	3	EE3261	Control Systems	3
EE3160	Signals and Systems	3	EE3171	Microcontroller Appls & Lab	4
ENVE3501	Environmental Engineering Fund.	3	ENVE3502	Env. Monitoring & Measurement	3
	HASS HU/FA elective ⁶	3	Sugg. GE2100	HASS elective ⁶	3
	Total	16		Total	15
Semester 7			Semester 8		
EE4901 ⁸	EE Design Project 1 (part 1)	2	EE4910 ⁸	EE Design Project 2 (part 2)	2
EE3180	Probability – Signal Analysis	3	ENVExxxx ⁴	Env. Quality Engg. Elective	3
ENVExxxx ⁴	Env. Quality Engg. Elective	3		Remote sensing choice 1b or 2b ³	3
	Remote sensing choice 1a or 2a ³	3		EE elective ^{5,7}	3
	EE elective ^{5,7}	3		HASS SS/PSY/EC elective ⁶	3
	2 nd Comp/Comm. Course ⁶	3		Free Elective	1
	Total	17		Total	15
			Total	128 Credits	

Students must add 3 units of co-curricular activities (Physical Education), usually taken in six .5 units.

Follow pre-requisites and semester offerings. This is a 'suggested' plan which can vary by individual student. Students who begin in a pre-calculus course will take ENG1001 and ENG1100 in place of ENG1101 in first year.

1. MA1160 may be replaced by MA1161.
2. MA2320 and MA3520 may replace MA2321 and MA3521.
3. Remote sensing sequence: Choose either set: (1a EE4252 and 1b GE4250) or (2a EE3090 and 2b EE3190)
Note: sequence 2 may be taken in junior year.
4. Choose two courses from the Environmental Quality Engineering Areas list.
5. EE Electives: Minimum 6 credits of EE courses not listed here and not EE3805, EE4805, EE4901, EE4910.
EE4252, Digital Signal Processing and It's Applications, Fall of Year 4, is recommended.
6. HASS = Humanities, Arts and Social Sciences. Follow university requirements for general distribution electives.
GE2100, Environmental Geology is a recommended *HASS Restricted List elective* for this program.
7. Up to 6 credits "EE" level 4000+ may be double-counted toward an ECE accelerated master's program.
8. Approved Engineering Design courses or Enterprise courses may replace EE4901, & EE4910. See department advisor.