Michigan Technological University
Interdisciplinary Minor in Alternative Energy Technology
Program Code IMAE, Academic Year 2024-25
Department of Chemical Engineering
Total Credits Required: 18

The interdisciplinary minor in alternative energy technology prepares students for careers in energy and related fields by providing students with relevant technical expertise in alternative energy technologies, and a knowledge of how energy intersects with society and/or the environment.

Required THERMODYNAMICS course: select one course, 2 to 4 credits
- CEE 3200 Thermodynamics/Fluid Mechanics (4) Prereqs: CH1112 or (CH1150 and CH1151) and PH2100 and ENG1102 and MA2160
- CM 3230 Thermodynamics for Chemical Engineers (4) Prereqs: CM2110 and MA2160 and PH2100
- MEEM 2201 Introductory Thermodynamics (3) Prereqs: MA2160 and CH1150 and CH1151
- MET 3700 Applied Thermodynamics (3) Prereqs: MET3400
- MSE 3100 Materials Processing I (4) Prereqs: (MY2100 or MSE2100 or BE2800) and MA2160
- PH 2300 University Physics III – Fluid and Thermodynamics (2) Prereqs: PH1160 or PH2100

Required CIRCUITS course: select one course, 3 credits
- EE 2111 Electric Circuits I (3) Prereqs: MA2160
- EE 3010 Circuits and Instrumentation for Cyber Physical Systems (3) Prereqs: none
- EET 1121 Circuits I (3) Prereqs: MA1031 or MA1032 or MA1120 or MA1121 or MA1135 or MA1160 or MA1161
- EET 1411 Basic Electronics (3) Prereqs: MA1031 or MA1032 or MA1120 or MA1121 or MA1135 or MA1160 or MA1161

Required ENERGY TECHNOLOGY course: select 3 or more credits
- CM/ENT 3979 Alternative Energy Tech and Processes (1) Prereqs: CH1112 or (CH1150 and CH1151) and (MA1121 or 1160 or MA1161)
- EE 3120 Electric Energy Systems (3) Prereqs: EE2110 or EE3010 or (EE2111 and EE2112(C))
- EE/MEEM 4295 Introduction to Propulsion Systems for Hybrid Electric Vehicles (3) Prereqs: MEEM2200 or CEE3200 or MEEM2201
- EE/MEEM 4296 Experimental Studies in Hybrid Electric Vehicles (3) Prereqs: none
- MEEM 4200 Principles of Energy Conversion (3) Prereqs: MEEM4201 or MEEM3230 or CM3230 or CEE3200 or MY3100 or MSEE3100
- MEEM 4235 Wind Energy (3) Prereqs: MEEM3201
- MEEM 4260 Fuel Cell Technology (3) Prereqs: MEEM3201 or CM3110

Required ENERGY & SOCIETY course: select 3 or more credits
- CM 3980 Sustainable Chemical Engineering (1) Prereqs: CM2110 and (MA3520 or MA3521 or MA3530 or MA3560)
- EC 4620 Energy Economics (3) Prereqs: EC2001 and UN1015 and UN1025
- ENG 4515 Introduction to Sustainability and Resilience (3) Prereqs: none
- ENG 4525 System Analysis for Sustainability and Resilience (3) Prereqs: none
- MEEM 4240 Combustion and Air Pollution (3) Prereqs: MEEM2200 or MEEM2201 or CEE3200
- MEEM 4685 Env Resp Design & Manufacturing (3) Prereqs: none
- SS 3800 Energy Technology and Policy (3) Prereqs: UN1015 and UN1025
- SS 3811 Energy Security and Justice (3) Prereqs: UN1015 and UN1025
- SS 3815 Energy and Society (3) Prereqs: UN1015 and UN1025
Interdisciplinary Minor in Alternative Energy Technology, continued

Select remaining credits from the Energy Technology and Energy & Society on page 1, or the optional elective courses below. Credits to total 18.

Optional ELECTIVE courses:

- CM 4080 Undergraduate Research in Biofuels Engineering (1 to 6) Prereqs: none
- EE 4219 Introduction to Electric Machinery and Drives (3) Prereqs: (EE2112 or EE3010) and EE3120
- EE 4226 Power Engineering Laboratory (1) Prereqs: EE4221 and EE4222
- EE 4227 Power Electronics (3) Prereqs: EE3120 and (EE3130 and EE3131)
- ENT 29xx/39xx/49xx Enterprise Project Work (AEE or by approval)
- MEEM 4220 Internal Combustion Engines I (3) Prereqs: MEEM4201
- MEEM 4250 Heating/Ventilation/Air Conditioning (3) Prereqs: MEEM3201
- MEEM 4820 Introduction to Aerospace Propulsion (3) Prereqs: MEEM4230
- MET 4390 Internal Combustion Engines (3) Prereqs: MET4300 or (MET3700 and MET4360)
- MSE 4410 Science of Ceramic Materials (3) Prereqs: MY2100 or MSE2100 or BE2800
- Undergraduate Research by approval (1 to 6) Prereqs: none