

# Focus Area in Mechanical Engineering

## Energy and Environment

Revised on January 5, 2023

The Energy and Environment (EAE) focus area (FA) provides advanced education in the increasingly important area of energy production, utilization, and its environmental impact, with particular attention to emerging technologies. The FA also provides a solid foundation in transport process modeling and an introduction to environmental engineering. Engineers working in this area must possess not only the fluid dynamics and heat and mass transport modeling abilities typical of mechanical engineers, but also a level of understanding of sustainability of engineered systems.

Semester	Course	Session	SH	Pre-/Co-Requisites
4 (Spring)	Elective		3	
6 (Spring)	Elective		3	
6 (Spring)	Elective		3	
7 (Fall)	ME:5145 Intermediate Heat Transfer	F	3	ME:3045
	OR ME:5160 Intermediate Mechanics of Fluids	F	3	ENGR:2510
7 (Fall)	Elective		3	
8 (Spring)	Elective		3	
8 (Spring)	Elective		3	

Energy & Environment Electives (minimum of 2 required)	Session	SH	Pre-/Co-Requisites
CEE:4107 Sustainable Systems	S	3	
ME:4111 Scientific Computing and Machine Learning	F, S	3	MATH:2560
ME:4160 Engines and Power Plants	S	3	ENGR:2130
ME:5145 Intermediate Heat Transfer	F	3	ME:3045
ME:5149 Propulsion Engineering	F	3	ENGR:2130
ME:5160 Intermediate Mechanics of Fluids	F	3	ENG:2510
General Electives	Session	SH	Pre-/Co-Requisites
ME:4024 Product Design and Realization	S	3	ME:2200 or ENGR:2760, /ENGR:2750
ME:4125 Biomimetic Fluid Dynamics	S <sup>2</sup>	3	ENGR:2510
ME:4175 Computational Naval Hydrodynamics	S <sup>1</sup>	3	ENGR:2510
ME:4186 Enhanced Design Experience	S	3	ME:4086
ME:5143 Computational Fluid and Thermal Engineering	F	3	ME:3045
ME:5210 Intermediate Thermodynamics	F <sup>2</sup>	3	ENGR:2130
CBE:5405 Green Chemical and Energy Technology	S*	3	CBE:2105
CBE:5415 Satellite Image Processing and Remote Sensing of Atmosphere	S*	3	
CBE:5417 Physical Meteorology and Atmospheric Radiative Transfer	S*	3	
CEE:3371 Principles of Hydraulics and Hydrology	S	3	ENGR:2510
CEE:4102 Groundwater	F	3	
CEE:4159 Air Pollution Control Technology	S	3	

For further information, please contact: Professor A. Ratner (albert-ratner@uiowa.edu), Department of Mechanical Engineering, University of Iowa, Iowa City, IA 52242.

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CEE:5380 Fluid Flows in Environmental Systems	F	3	
ECE:5620 Electric Power Systems	S <sup>2</sup>	3	ENGR:2120, MATH:2560, PHYS:1611
EES:1080 Introduction to Environmental Science OR EES:1290 Energy and the Environment	F, S  F	3  3	
ISE:2500 Engineering Economy	S	3	STAT:2020
Flexible Elective – Choose at most one course from: (i) engineering courses that are required in another (non-ME) program, (ii) engineering courses at an upper level (e.g. ME courses numbered 4100 and above), (iii) mathematics, physics or chemistry courses at a more advanced level than those required in the ME curriculum (note: MATH:3800 is not approved as Flexible Elective if ME:4111 is taken as any of the Energy & Environment Focus Area courses), (iv) independent investigation in a mechanical engineering subject area, or (v) courses that appear on a list of approved courses found at <a href="http://engineering.uiowa.edu/mechanical-engineering-undergraduate-program/focus-areas">engineering.uiowa.edu/mechanical-engineering-undergraduate-program/focus-areas</a>	Any	3	

<sup>1</sup> offered even years only

<sup>2</sup> offered odd years only

\* Irregular offerings, check schedule for specific semesters

Substitutions are discouraged and will only be approved under exceptional circumstances requiring the approval of the advisor, FA coordinator and DEO.

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