

# ENGINEERING FOR ENERGY SUSTAINABILITY, CERTIFICATE

## REQUIREMENTS

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#### TOTAL CREDITS REQUIRED FOR CERTIFICATE COMPLETION: MINIMUM OF 16

- Minimum of 6 credits required in Liberal Studies and Science category (including one foundational course option)
- Minimum of 6 credits required in Engineering category (including one foundational course option)
- Additional 3 credits from either category above, or students may substitute an applied course such as senior capstone or independent study (with approval). See note under the Capstone heading below.
- 1 credit required in Seminar category
- Grade point average of 2.5 or above for all coursework that counts for the certificate

#### Liberal Studies and Science (Minimum of 6 credits)

Code	Title	Credits
<b>Liberal Studies and Science Foundational Courses</b>		<b>3</b>
A A E 246	Climate Change Economics and Policy	
A A E/ECON 371	Energy, Resources and Economics	
ENVIR ST 349	Climate Change Governance	
ENVIR ST/ GEOSCI 411	Energy Resources	
ENVIR ST/ A A E/ECON/ URB R PL 671	Energy Economics	
PHYSICS 115	Energy and Climate	

#### Any Liberal Studies and Science Foundational course from above or

#### Electives:

ENVIR ST 112	Environmental Studies: Social Science Perspectives	
ENVIR ST 113	Environmental Studies: Environmental Humanities	
ENVIR ST/ILS 126	Principles of Environmental Science	
ENVIR ST/ GEOG 139	Global Environmental Issues	
ENVIR ST/ A A E 244	The Environment and the Global Economy	
ENVIR ST/ GEOG 339	Environmental Conservation	
ENVIR ST/A A E/ ECON 343	Environmental Economics	

ENVIR ST/  
ATM OCN 355

Introduction to Air Quality

ENVIR ST/GEOG/  
HISTORY 460

American Environmental History

#### Engineering (Minimum of 6 credits)

Code	Title	Credits
<b>Engineering Foundational Courses</b>		<b>3</b>
BSE/ ENVIR ST 367	Renewable Energy Systems	
CBE 512	Energy Technologies and Sustainability	
E C E 356	Electric Power Processing for Alternative Energy Systems	
M E/N E 565	Power Plant Technology	
<b>Any Engineering Foundational course from above or</b>		<b>3</b>

#### Electives:

BSE 460	Biorefining: Energy and Products from Renewable Resources	
CBE/M E 567	Solar Energy Technology	
CIV ENGR/ G L E 421	Environmental Sustainability Engineering	
CIV ENGR/ G L E 535	Wind Energy Balance-of-Plant Design	
E C E 427	Electric Power Systems	
M E 461	Thermal Systems Modeling	
M E 466	Air Pollution Effects, Measurements and Control	
or CIV ENGR 42 Air Pollution Effects, Measurement and Control		
N E 571	Economic and Environmental Aspects of Nuclear Energy	

#### Seminar (1 credit)

Code	Title	Credits
E P 418	Sustainable Energy Challenges and Solutions	1
CBE 555	Seminar-Chemical Engineering Connections	1

#### Capstone (optional 3 credits)

Students may request to count no more than 3 credits of applied coursework toward the 16-credit total through an optional Capstone course. This course must be approved by the certificate's faculty chair in consultation with the certificate's oversight committee. Students must submit a description of their course project, demonstrating application of at least one of the certificate's learning outcomes. Details of the project will be verified with the course instructor. Courses that may qualify include:

- Senior Design Project or Capstone
- Independent Study
- Honors Thesis

To submit a Capstone course request, complete this online course substitution form ([https://uwmadison.co1.qualtrics.com/jfe/form/SV\\_9tYyECXdgTwBAs5/](https://uwmadison.co1.qualtrics.com/jfe/form/SV_9tYyECXdgTwBAs5/)). Course substitution requests may be submitted any time, but should be submitted as early as

possible once there are sufficient details (such as a course syllabus or a project description) that demonstrate how the course or project aligns with the certificate's learning outcomes.

- COURSE SUBSTITUTION FORM ([HTTPS://UWMADISON.CO1.QUALTRICS.COM/JFE/Form/SV\\_9TYyecxdgtwbAS5/](https://uwmadison.co1.qualtrics.com/JFE/Form/SV_9TYyecxdgtwbAS5/))

## **CERTIFICATE COMPLETION REQUIREMENT**

This undergraduate certificate must be completed concurrently with the student's undergraduate degree. Students cannot delay degree completion to complete the certificate.