

B.S. IN ENVIRONMENTAL ENGINEERING/M.S. IN PRODUCT DESIGN

Overview

The College of Engineering offers a dual-degree program that culminates with students receiving a Bachelor of Science in Environmental Engineering and a Master of Science in Product Design concurrently. This program is available only to qualified students enrolled in the undergraduate program in Environmental Engineering at the University of Miami. This program is intended to give qualified Environmental Engineering students the opportunity to acquire both a baccalaureate degree and a Master of Science degree in five years rather than the 4 plus 2 years (approximately) that is traditionally expected. The two degrees are awarded simultaneously when the combined requirements have been met for both degrees.

Juniors enrolled in environmental engineering who have maintained at least a 3.0 CGPA have the option to apply for admission to the dual degree program.

Those who are accepted into this accelerated program must maintain at least a 3.0 CGPA and a minimum of a 3.0 GPA for the final 30 credit hours to meet the requirements of the Graduate School.

If space permits, up to 12 credit hours of graduate coursework can be taken during the fourth year can be counted toward the 30 credit hours required for the M.S. degree. Students must be registered for a minimum of 12 undergraduate credit hours per semester in their fourth year to take these additional graduate courses. Students can register for a maximum of 6 graduate credit hours in each semester of their fourth year.

If a student needs to withdraw from the dual degree program, then all the requirements for the B.S. degree must be completed for graduation with the B.S. in environmental engineering degree.

Admission Requirements

The dual B.S. in environmental engineering/M.S. in product design degree is available only to qualified undergraduate students enrolled in the B.S. in environmental engineering within the Department of Chemical, Environmental, and Materials Engineering. Students must have undergraduate student status and a cumulative G.P.A. of at least 3.0 at the time of application. Qualified students are strongly advised to apply to the dual degree program as early as possible in their junior year to facilitate academic advising and course selection in the second semester of their junior year.

Curriculum Requirements

Code	Title	Credit Hours
BS IN ENVIRONMENTAL ENGINEERING REQUIREMENTS (122 CREDIT HOURS)		
Engineering Courses		
EGN 114	Global Challenges Addressed by Engineering and Technology	3
CET 300	Computational Methods for Engineers	3
CET 330	Fluid Mechanics	3
CET 340	Introduction to Environmental Engineering ¹	3
CET 345	Environmental Laboratory and Analysis ^{1,7}	3
CET 403	Senior Design Project I - Engineering Design ¹	3
CET 404	Senior Design Project II – Integrated Engineering Documents ^{1,7}	3
CET 430	Water-Resources Engineering I ¹	3
CET 440	Water Quality Control Systems ¹	3
CET 530	Water Resources Engineering II ¹	3
CET 533	Water-Quality Control in Natural Systems	3
CET 540	Environmental Chemistry	3
CET 541	Environmental Engineering Microbiology	3
CET 543	Air Pollution Control Engineering	3
CAE 115	Introduction to Engineering II: Geospatial Data (Surveying and GIS) ¹	2
CAE 210	Mechanics of Solids I	3
CAE 402	Professional Engineering Practice ⁷	3
ECE 205	Principles of Electrical Engineering–I	3
ISE 311	Applied Probability and Statistics	3
MAE 303	Thermodynamics	3
Technical Elective (any BME, CAE, CET, ECE, ISE, or MAE course at the 200-level or higher) ⁵		3

Marine Science Courses		
MSC 301	Introduction to Physical Oceanography	3
Marine/Atmospheric Science Elective (either (a) a 300-level or higher elective courses required for a minor in Marine Science, or (b) MSC 311, MSC 313, MSC 314, MSC 339, MSC 340, MSC 341, MSC 342, MSC 345, MSC 418, MSC 425) ⁴		
Math and Science Courses		
MTH 151	Calculus I for Engineers	5
MTH 162	Calculus II	4
MTH 211	Calculus III	3
MTH 311	Introduction to Ordinary Differential Equations	3
PHY 221	University Physics I	3
PHY 222	University Physics II	3
PHY 106	Physics Laboratory 1	1
CHM 121	Principles of Chemistry	4
CHM 113	Chemistry Laboratory I	1
Biology Elective ⁶		3
General Education Requirements		
Written Communication Skills:		
WRS 105	First-Year Writing I	3
WRS 107	First-Year Writing II: STEM	3
Quantitative Skills:		
MTH 151	Calculus I for Engineers (fulfilled through the major)	
Areas of Knowledge:		
Arts and Humanities Cognate ²		9
People and Society Cognate ²		9
STEM Cognate (9 credits) (fulfilled through the major)		
M.S. IN PRODUCT DESIGN REQUIREMENTS (30 CREDIT HOURS)		
Technical Core Courses		9
Students will choose 3 from the following:		
CET 670	Soft Matter Colloids	
BME 635	Advanced Biomaterials	
CHM 620	Physical Organic Chemistry	
CHM 624	Supramolecular Chemistry	
CHM 665	Principles of Spectroscopic Techniques	
CHM 681	Advanced Analytical Chemistry	
Innovation Management Core Courses		9
Students will choose 3 from the following:		
ISE 670	Engineering Management	
ISE 671	Engineering Entrepreneurship	
ISE 672	Management of Technological Innovation	
ISE 763	Project Management Techniques	
ISE 772	Strategic Management of Technological Innovation.	
Sector Specific Concentration Courses		9
Students will choose 3 courses from their sector of interest:		
Sector: Cosmetics and Consumer Goods		
BME 695	Current Trends in Regenerative Medicine	
CAE 729	Molecular Simulation of Materials	
ECE 643	BioNanotechnology	
CET 671	Chemical Product Design	
Sector: Pharmaceuticals and Biopharmaceuticals		
BME 665	Principles of Cellular and Tissue Engineering	
BME 685	Immunoengineering	
ECE 677	Data Mining	

CET 671	Chemical Product Design	
Sector: Nanotechnology		
BME 622	Scanning Electron Microscopy for Engineers	
CET 760	Aerosol Instrumentation	
ECE 643	BioNanotechnology	
Master's Project		
CET 605	Master's Project	3
Total Credit Hours		152

¹ Only offered once a year in the semester indicate in the curriculum

² To be selected from the approved lists. Students take a minimum of 3 courses (9 credits) in the AH cognate and 3 courses in the PS cognate (9 credits).

³ CET 533, CET 540, CET 541, and CET 543 are offered on a 3-semester rotation. Students must take all four courses.

⁴ Students must select the Marine/Atmospheric Science Elective from the list of (a) 300-level or higher elective courses required for a minor in Marine Science, or (b) MSC 311, MSC 313, MSC 314, MSC 339, MSC 340, MSC 341, MSC 342, MSC 345, MSC 418, MSC 425. To complete the requirements for the minor in Marine Science, additional courses are required. The requirements for the minor in Marine Science can be found in the University Bulletin.

⁵ Technical Elective is any engineering course (BME, CAE, CET, ECE, ISE, or MAE) 200 level or higher. CET 395 Undergraduate Research can also be used as a Technical Elective.

⁶ BIL 150 or BIL 160. Note that BIL 151 need not be taken with BIL 150, and BIL 150 is a prerequisite of BIL 160.

⁷ Counts towards the Advance Writing & Communication Skills requirement.

Internships, Practical Training, or other types of practicums are neither required nor optional credit-earning components in the established undergraduate curriculum. Credit earned through these experiences via UMI 305 will not count towards the degree requirements.

Plan of Study

Freshman Year		Credit Hours
Fall		
EGN 114	Global Challenges Addressed by Engineering and Technology	3
MTH 151	Calculus I for Engineers	5
PHY 221	University Physics I	3
WRS 105	First-Year Writing I	3
Credit Hours		14
Spring		
CAE 115	Introduction to Engineering II: Geospatial Data (Surveying and GIS) ¹	2
MTH 162	Calculus II	4
PHY 222	University Physics II	3
PHY 106	Physics Laboratory 1	1
WRS 107	First-Year Writing II: STEM	3
PS Cognate ²		3
Credit Hours		16
Sophomore Year		
Fall		
CET 300	Computational Methods for Engineers ¹	3
CAE 210	Mechanics of Solids I	3
MTH 211	Calculus III	3
CHM 121	Principles of Chemistry	4
CHM 113	Chemistry Laboratory I	1
PS Cognate ²		3
Credit Hours		17
Spring		
CET 340	Introduction to Environmental Engineering ¹	3
ECE 205	Principles of Electrical Engineering-I	3
MTH 311	Introduction to Ordinary Differential Equations	3

Biology Elective ⁶		3
AH Cognate ²		3
Credit Hours		15
Junior Year		
Fall		
CET 330	Fluid Mechanics	3
CET 345	Environmental Laboratory and Analysis ^{1,7}	3
MAE 303	Thermodynamics	3
ISE 311	Applied Probability and Statistics	3
MSC 301	Introduction to Physical Oceanography (MSC 111 not required)	3
Credit Hours		15
Spring		
CET 430	Water-Resources Engineering I ¹	3
CET 440	Water Quality Control Systems ¹	3
Environmental Engineering Course ³		3
Marine/Atmospheric Science Elective ⁴		3
Technical Elective ⁵		3
Credit Hours		15
Senior Year		
Fall		
CET 403	Senior Design Project I - Engineering Design ¹	3
CET 530	Water Resources Engineering II ¹	3
Environmental Engineering Course ³		3
Environmental Engineering Course ³		3
AH Cognate ²		3
Graduate Elective		3
Credit Hours		18
Spring		
CET 404	Senior Design Project II – Integrated Engineering Documents ^{1,7}	3
CAE 402	Professional Engineering Practice ⁷	3
Environmental Engineering Course ³		3
AH Cognate ²		3
PS Cognate ²		3
Graduate Elective		3
Credit Hours		18
Year Five		
Fall		
Graduate Course		3
Graduate Course		3
Graduate Course		3
Graduate Course		3
Credit Hours		12
Spring		
CET 605	Master's Project	3
Graduate Course		3
Graduate Course		3
Graduate Course		3
Credit Hours		12
Total Credit Hours		152

¹ Only offered once a year in the semester indicated in the curriculum.

- ² To be selected from approved lists. Students take a minimum of 3 courses (9 credits) in the AH cognate and 3 courses in the PS cognate (9 credits).
- ³ CET 533, CET 540, CET 541, and CET 543 are offered on a 3-semester rotation. Students must take all four courses.
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- ⁷ Counts towards the Advance Writing & Communication Skills requirement.