

# B.S. IN ARCHITECTURAL ENGINEERING

## Overview

The Architectural Engineering curriculum provides an integrated educational experience in mathematics, basic sciences, humanities, social sciences, engineering sciences, and architectural engineering design. The Architectural Engineering program integrates design applications across the curriculum, beginning with building construction and architectural design in the sophomore year, and continuing with structural, building mechanical and electrical systems design, and construction management in the junior and senior years. The curriculum culminates with a major comprehensive design experience that includes applications from the major specialty areas of architectural engineering.

Graduate study is offered leading to the degree of Master of Science in Architectural Engineering (<http://bulletin.miami.edu/graduate-academic-programs/engineering/civil-architectural-environmental-engineering/>). For detailed information on graduate studies, see the Graduate Studies Bulletin..

## Curriculum Requirements

Code	Title	Credit Hours
<b>Engineering Courses</b>		
CAE 111	Introduction to Engineering I	3
CAE 115	Introduction to Engineering II (Surveying)	1
CAE 210	Mechanics of Solids I	3
CAE 211	Mechanics of Solids II	3
CAE 212	Structural Laboratory	1
CAE 310	Structural Analysis	3
CAE 320	Concrete Structures	3
CAE 321	Steel Structures	3
CAE 330	Fluid Mechanics	3
CAE 361	Building Information Modeling I	3
CAE 370	Geotechnical Engineering I	3
CAE 371	Geotechnical Laboratory	1
CAE 380	Electrical and Illumination Systems for Buildings	3
CAE 381	Building Mechanical Systems I: Hvac Fundamentals	3
CAE 402	Professional Engineering Practice	3
CAE 403	Senior Design Project I - Engineering Design	3
CAE 404	Senior Design Project II - Integrated Engineering Documents	3
CAE 460	Construction Management	3
CAE 470	Foundations and Earth Retaining Systems	3
CAE 480	Plumbing and Life Safety for Buildings	3
CAE 481	Building Mechanical Systems II: HVAC Systems	3
CAE 581	Energy-Efficient Building Design	3
ISE 311	Applied Probability and Statistics	3
MAE 303	Thermodynamics	3
<b>Math and Science Courses</b>		
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
CHM 151	Chemistry for Engineers	3
CHM 153	Chemistry Laboratory for Engineers	1
PHY 221	University Physics I	3
PHY 222	University Physics II	3
PHY 223	University Physics III	3
PHY 224	University Physics II Lab	1
PHY 225	University Physics III Lab	1
<b>Additional Required Courses</b>		

ARC 230	Building Technology I: Materials and Methods	3
ARC 292	Introduction to Architecture Design I	3
ARC 293	Introduction to Architecture Design II	3
ARC 267	History of Architecture I: Ancient, Medieval and Renaissance	3
ARC 268	History of Architecture II: Baroque through Contemporary	3
WRS 105	First-Year Writing I	3
WRS 107	First-Year Writing II: STEM	3
GEG 199	Geographic Information Systems for Engineers	1
People and Society Cognate		9
<b>Total Credit Hours</b>		<b>127</b>

\*Internships, Practical Training, or other types of practicum 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 any CAE degree requirements.

## Plan of Study

Freshman Year		Credit Hours
<b>Fall</b>		
CAE 111	Introduction to Engineering I	3
WRS 105	First-Year Writing I	3
MTH 151	Calculus I for Engineers	5
PHY 221	University Physics I	3
<b>Credit Hours</b>		<b>14</b>
<b>Spring</b>		
CAE 115	Introduction to Engineering II (Surveying)	1
GEG 199	Geographic Information Systems for Engineers	1
CAE 210	Mechanics of Solids I	3
WRS 107	First-Year Writing II: STEM	3
MTH 162	Calculus II	4
PHY 222	University Physics II	3
PHY 224	University Physics II Lab	1
<b>Credit Hours</b>		<b>16</b>
<b>Sophomore Year</b>		
<b>Fall</b>		
CAE 211	Mechanics of Solids II	3
CAE 212	Structural Laboratory	1
ARC 230	Building Technology I: Materials and Methods	3
ARC 267	History of Architecture I: Ancient, Medieval and Renaissance	3
PHY 223	University Physics III	3
PHY 225	University Physics III Lab	1
ISE 311	Applied Probability and Statistics	3
<b>Credit Hours</b>		<b>17</b>
<b>Spring</b>		
CAE 310	Structural Analysis <sup>1</sup>	3
ARC 292	Introduction to Architecture Design I <sup>1</sup>	3
CHM 151	Chemistry for Engineers	3
CHM 153	Chemistry Laboratory for Engineers	1
MTH 211	Calculus III	3
MTH 311	Introduction to Ordinary Differential Equations	3
<b>Credit Hours</b>		<b>16</b>
<b>Junior Year</b>		
<b>Fall</b>		
CAE 320	Concrete Structures <sup>1</sup>	3

CAE 330	Fluid Mechanics	3
CAE 361	Building Information Modeling I	3
MAE 303	Thermodynamics	3
ARC 293	Introduction to Architecture Design II <sup>1</sup>	3
PS Cognate <sup>2</sup>		3
<b>Credit Hours</b>		<b>18</b>
<b>Spring</b>		
CAE 321	Steel Structures <sup>1</sup>	3
CAE 370	Geotechnical Engineering I <sup>1</sup>	3
CAE 371	Geotechnical Laboratory <sup>1</sup>	1
CAE 380	Electrical and Illumination Systems for Buildings <sup>1</sup>	3
CAE 381	Building Mechanical Systems I: Hvac Fundamentals <sup>1</sup>	3
ARC 268	History of Architecture II: Baroque through Contemporary	3
<b>Credit Hours</b>		<b>16</b>
<b>Senior Year</b>		
<b>Fall</b>		
CAE 403	Senior Design Project I - Engineering Design <sup>1</sup>	3
CAE 470	Foundations and Earth Retaining Systems <sup>1</sup>	3
CAE 480	Plumbing and Life Safety for Buildings <sup>1</sup>	3
CAE 481	Building Mechanical Systems II: HVAC Systems <sup>1</sup>	3
PS Cognate <sup>2</sup>		3
<b>Credit Hours</b>		<b>15</b>
<b>Spring</b>		
CAE 402	Professional Engineering Practice	3
CAE 460	Construction Management <sup>1</sup>	3
CAE 404	Senior Design Project II - Integrated Engineering Documents <sup>1</sup>	3
CAE 581	Energy-Efficient Building Design <sup>1</sup>	3
PS Cognate <sup>2</sup>		3
<b>Credit Hours</b>		<b>15</b>
<b>Total Credit Hours</b>		<b>127</b>

<sup>1</sup> Only offered once a year

<sup>2</sup> To be selected from list of approved People and Society (<https://cognates.miami.edu/explore/People%20&%20Society/>) cognates.

## Mission

The mission of the Department of Civil, Architectural, and Environmental Engineering is to:

- Provide high-quality undergraduate and graduate education in civil, architectural, and environmental engineering that will prepare graduates for professional careers and a lifetime of learning;
- Conduct high-quality research that will advance the body of knowledge and improve the quality of human life;
- Serve the engineering profession and society through active involvement in professional organizations and contribution of professional expertise.

## Goals

The educational objectives of the Architectural Engineering Program are to have graduates who within the first several years following graduation are either

1. Working as a professional in an area closely related to architectural engineering, or
2. Pursuing a graduate or professional degree.

## Student Learning Outcomes

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.

3. An ability to communicate effectively with a range of audiences.
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.