



Department of Civil, Architectural, and Environmental Engineering  
 1251 Memorial Drive  
 McArthur Engineering Building, Rm 325  
 Coral Gables, FL 33146

### CIVIL ENGINEERING (CEN) DESIGN ELECTIVES

Effective: AY 2018/19 to present

| Fall Semester |         |                                     | Spring Semester |         |  |
|---------------|---------|-------------------------------------|-----------------|---------|--|
| Course        | Credits | Title                               | Course          | Credits | Title                                  |
| CAE 521       | 3       | Advanced Design of Steel Structures | CAE 520         | 3       | Advanced Design of Concrete Structures |
| CAE 530       | 3       | Water-Resources Engineering II      | CAE 570         | 3       | Advanced Foundation Engineering        |

**Note:** Students must take two design electives. Choose two from CAE 520/521, CAE 530, and CAE 570.

### CIVIL ENGINEERING (CEN): BASIC SCIENCE ELECTIVES

Effective: AY 2010/11 to present

| Course   | Credits | Title   |
|----------|---------|---|
| BIL 150  | 4       | General Biology (Lab not required by CAE)                                       |
| BIL 160  | 4       | Evolution and Biodiversity (Lab not required by CAE; BIL 150 is a prerequisite) |
| ECS 111  | 3       | Introduction to Earth's Ecosystem   |
| GSC 110  | 3       | The Earth System (Note: This course includes a Lab)                             |
| ATM 102* | 3       | Introduction to Weather and Climate   |
| ATM 103* | 3       | Survey of Modern Meteorology  |
| MSC 301  | 3       | Introduction to Physical Oceanography   |

\*Before Spring 2015, these courses were: MSC 102, MSC 103

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## CIVIL ENGINEERING (CEN) TECHNICAL ELECTIVES

Effective: AY 2019/20 to present

| Course   | Credits | Title  |
|----------|---------|--|
| CAE 345  | 3       | Environmental Laboratory and Analysis                      |
| CAE 361  | 3       | Building Information Modeling I                            |
| CAE 380  | 3       | Electrical and Illumination Systems for Buildings          |
| CAE 381  | 3       | Building Mechanical Systems I: HVAC Fundamentals           |
| CAE 460  | 3       | Construction Management                                    |
| CAE 480  | 3       | Plumbing and Life Safety for Buildings                     |
| CAE 481  | 3       | Building Mechanical Systems II: HVAC Systems               |
| CAE 510  | 3       | Structural Mechanics                                       |
| CAE 511  | 3       | Advanced Structural Analysis                               |
| CAE 520* | 3       | Advanced Design of Concrete Structures                     |
| CAE 521* | 3       | Advanced Design of Steel Structures                        |
| CAE 522  | 3       | Design of Prestressed Concrete Structures                  |
| CAE 523  | 3       | Design of Masonry Structures                               |
| CAE 525  | 3       | Timber Structural Systems                                  |
| CAE 531  | 3       | Surface-Water Hydrology                                    |
| CAE 532  | 3       | Ground-Water Hydrology                                     |
| CAE 533  | 3       | Water-Quality Control in Natural Systems                   |
| CAE 540  | 3       | Environmental Chemistry                                    |
| CAE 541  | 3       | Engineering Systems for Disease Control and Bioremediation |
| CAE 542  | 3       | Solid and Hazardous Waste Engineering                      |
| CAE 543  | 3       | Air Pollution Control Engineering                          |
| CAE 553  | 3       | Transportation Systems Planning and Demand Modeling        |
| CAE 560  | 3       | Sustainable Construction                                   |
| CAE 570  | 3       | Advanced Foundation Engineering                            |
| CAE 580  | 3       | Hospital and Health Care Facilities Design                 |
| CAE 581  | 3       | Energy Efficient Building Design                           |
| CAE 590  | 1-3     | Special Topics   |

\*This course can be used as a Technical Elective if not used as a Design Elective

**Notes:**

1. All requisites (including pre- and co-) must be satisfied for each course prior to enrollment.
2. CAE 561 was offered prior to Fall 2020, and can also be used as a CEN Technical Elective

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### ENVIRONMENTAL ENGINEERING (ENV) COURSES

Effective: AY 2011/12 to present

| Course  | Credits | Title                                    |
|---------|---------|--|
| CAE 533 | 3       | Water-Quality Control in Natural Systems |
| CAE 540 | 3       | Environmental Chemistry                  |
| CAE 542 | 3       | Solid and Hazardous Waste Engineering    |

**Note:** All the above courses are required. See rotation for semester offering.

### ENVIRONMENTAL ENGINEERING (ENV): BIOLOGY ELECTIVES

Effective: AY 2010/11 to present

| Course  | Credits | Title   |
|---------|---------|---|
| BIL 150 | 4       | General Biology (Lab not required by CAE)                                       |
| BIL 160 | 4       | Evolution and Biodiversity (Lab not required by CAE, BIL 150 is a prerequisite) |

### TECHNICAL ELECTIVES – ALL CAE DEGREE PROGRAMS

Effective: AY 2011/12 to AY 2015/16

The requirement for the elective course called "Technical Elective" (as opposed to the "CEN Technical Elective") can be fulfilled by taking any regular engineering course offered in the College of Engineering (CoE) at the 200 level or above. Alternatively, the Technical Elective may be selected from the following list:

| Course  | Credits | Title                             |
|---------|---------|-----------------------------------|
| ARC 517 | 3       | Construction Documents            |
| AMP 402 | 3       | Introduction to Ocean Engineering |
| AMP 509 | 3       | Coastal Physics and Engineering   |
| AMP 531 | 3       | Ocean Measurements                |
| AMP 535 | 3       | Introduction Underwater Acoustics |

Effective: AY 2016/17 to present

The requirement for the elective course called "Technical Elective" (as opposed to the "CEN Technical Elective") can be fulfilled by taking any regular engineering course offered in the College of Engineering (CoE) at the 200 level or above. There are no Technical Electives outside of the College of Engineering.

Effective: AY 2019/20 to present

CAE 395 (Undergraduate Research-3 credits) can be counted as a Technical Elective towards graduation. Appropriate documentation and approval needs to be generated by the supervising CAE faculty member.

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### SENIOR DESIGN PROJECT I– ALL CAE PROGRAMS

Effective: AY 2016/17 to present

Each student enrolled in Senior Design Project I (CAE 403) has primary responsibility for at least one discipline. Below are the pre- and co-requisite requirements by discipline. In addition to satisfying the pre-requisites and co-requisites shown below, students must also have Senior Standing and obtain the permission of the instructor.

| Discipline   | Pre-requisite(s)    | Co-requisite(s)   |
|--|---------------------|---|
| Architectural Design   | ARC 292 and ARC 293 | CAE 361   |
| Civil / Stormwater Management /<br>Water Supply/Sewerage/Site<br>Design/Paving and<br>Grading/Transportation | CAE 430 and CAE 450 | CAE 530   |
| Environmental /Water<br>Treatment/Wastewater<br>Treatment/Water-Quality Control                              | CAE 340 and CAE 440 | None  |
| Structural   | CAE 320 and CAE 321 | At least one additional course in structural<br>engineering design, and CAE 470 |
| Mechanical, Electrical, and<br>Plumbing (MEP)  | CAE 380 and CAE 381 | CAE 480 and CAE 481   |

### GENERAL CURRICULUM NOTES

1. Effective AY 2019/20: IEN 311 (Applied Probability and Statistics) can be substituted by MTH 224 (Introduction to Probability and Statistics).