CIVIL ENGINEERING

Civil engineering is the oldest and most diverse branch of engineering. In its broadest sense, the civil engineer adapts the physical features of the earth to the needs of society. Approximately one out of four engineers is engaged in civil engineering.

About this Program

- **College:** Herbert Wertheim College of Engineering
- **Degree:** Bachelor of Science in Civil Engineering
- **Credits for Degree:** 128
- **Additional Information**
- **Related Civil Engineering Programs**

To graduate with this major, students must complete all university, college, and major requirements.

Critical Tracking records each student’s progress in courses that are required for entry to each major. Please note the critical-tracking requirements below on a per-semester basis.

Equivalent critical-tracking courses as determined by the State of Florida Common Course Prerequisites may be used for transfer students.

Semester 1

- Complete 1 of 7 critical-tracking courses with a minimum grade of C within two attempts: CHM 2045 or CHM 2095, MAC 2311, MAC 2312, MAC 2313, MAP 2302, PHY 2048, PHY 2049
- 2.5 GPA required for all critical-tracking courses
- 2.0 UF GPA required

Semester 2

- Complete 1 additional critical-tracking course with a minimum grade of C within two attempts
- 2.5 GPA required for all critical-tracking courses
- 2.0 UF GPA required

Semester 3

- Complete 2 additional critical-tracking courses with minimum grades of C within two attempts
- 2.5 GPA required for all critical-tracking courses
- 2.0 UF GPA required

Semester 4

- Complete 2 additional critical-tracking courses with minimum grades of C within two attempts
- 2.5 GPA required for all critical-tracking courses
- 2.0 UF GPA required

Semester 5

- Complete all 7 critical-tracking courses with minimum grades of C in each course within two attempts
- 2.5 GPA required for all critical-tracking courses
- 2.0 UF GPA required

To remain on track, students must complete the appropriate critical-tracking courses, which appear in bold. These courses must be completed by the terms as listed above in the Critical Tracking criteria.

This semester plan represents an example progression through the major. Actual courses and course order may be different depending on the student’s academic record and scheduling availability of courses. Prerequisites still apply.

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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<tr>
<td>CGN 2002</td>
<td>Introduction to Civil Engineering</td>
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<td>Select one:</td>
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<tr>
<td>CHM 2045</td>
<td>General Chemistry 1 (Critical Tracking; Gen Ed Physical Sciences)</td>
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<tr>
<td>CHM 2095</td>
<td>Chemistry for Engineers 1 (Critical Tracking; Gen Ed Physical Sciences)</td>
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<td>CHM 2045L</td>
<td>General Chemistry 1 Laboratory (Gen Ed Physical Sciences)</td>
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<td>ENC 1101</td>
<td>Expository and Argumentative Writing (State Core Gen Ed Composition; Writing Requirement: 6,000 words)</td>
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<td>IUF 1000</td>
<td>What is the Good Life (Gen Ed Humanities) (Critical Tracking; Gen Ed Mathematics)</td>
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<td>MAC 2311</td>
<td>Analytic Geometry and Calculus 1 (Critical Tracking; Gen Ed Mathematics)</td>
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<td>Professional Communication for Engineers (Gen Ed Mathematics)</td>
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<td>MAC 2312</td>
<td>Analytic Geometry and Calculus 2 (Critical Tracking; Gen Ed Mathematics)</td>
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<td>PHY 2048</td>
<td>Physics with Calculus 1 (Critical Tracking; Gen Ed Physical Sciences)</td>
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<td>PHY 2048L</td>
<td>Laboratory for Physics with Calculus 1 (Gen Ed Physical Sciences)</td>
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<td>State Core Gen Ed Humanities</td>
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<td>State Core Gen Ed Social and Behavioral Sciences</td>
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<td>COP 2271</td>
<td>Computer Programming for Engineers</td>
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<tr>
<td>MAC 2313</td>
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<td>Physics with Calculus 2 (Critical Tracking; Gen Ed Physical Sciences)</td>
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<td>STA 3032</td>
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<tr>
<td>Gen Ed Social and Behavioral Sciences with International, Writing Requirement: 6,000 words</td>
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<tr>
<th>Course</th>
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<th>Credits</th>
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<tbody>
<tr>
<td>CGN 2328</td>
<td>Technical Drawing and Visualization</td>
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<tr>
<td>CGN 3710</td>
<td>Experimentation and Instrumentation in Civil Engineering</td>
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<tr>
<td>EGM 2511</td>
<td>Engineering Mechanics: Statics</td>
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<td>MAP 2302</td>
<td>Elementary Differential Equations (Critical Tracking; Gen Ed Mathematics)</td>
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<tr>
<td>Science elective</td>
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<td>CGN 3421</td>
<td>Computer Methods in Civil Engineering</td>
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<tr>
<td>CGN 4160</td>
<td>Civil Engineering Practice</td>
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</table>
CGN 3510 Introduction to Sustainable Engineering 3
EGM 3400 Elements of Dynamics 2
EGM 3520 Mechanics of Materials 3
Select one:
  GIS 3072C Geographic Information Systems
  SUR 3103C Geomatics
  SWS 4720C GIS in Soil and Water Science
  URP 4273 Survey of Planning Information Systems
  Credits 17

Semester Six
CES 4111 Mechanics of Engineering Structures 4
CGN 3501C Civil Engineering Materials 4
CWR 3201 Hydrodynamics 4
TTE 4004C Transportation Engineering 4
  Credits 16

Semester Seven
CWR 4114 Surface Hydrology 3
CWR 4120 Groundwater 3
CWR 4306 Urban Stormwater Systems Design 3
CWR 4542 Water Resources Engineering 3
ENV 4514C Water and Wastewater Treatment 3
SUR 4463 Subdivision Design 3
TTE 4106 Urban Transportation Planning 3
TTE 4201 Traffic Engineering 3
TTE 4300 Transportation Systems Analysis 3
  One technical class at 3000/4000 level from outside CE department in geology, environmental engineering, building construction/architecture or urban and regional planning (or other as approved by advisor)

Design Electives
Code Title Credits
CCE 4811 Construction Engineering Design 3
CCE 4104 Retaining Wall and Embankment Design 3
CES 4111 Foundation Engineering Design 3
CES 4605 Analysis and Design in Steel 3
CES 4704 Advanced Reinforced Concrete Design 3
CES 4608 Advanced Steel Design 3
CGN 4600 Public Works Engineering and Management Practices 3
CGN 4905 Special Problems in Civil Engineering (Building Codes and Professional Practice) 3
CWR 4114 Surface Hydrology 3
CWR 4120 Groundwater 3
CWR 4306 Urban Stormwater Systems Design 3
CWR 4542 Water Resources Engineering 3
ENV 4514C Water and Wastewater Treatment 3
SUR 4463 Subdivision Design 3
TTE 4106 Urban Transportation Planning 3
TTE 4201 Traffic Engineering 3
TTE 4300 Transportation Systems Analysis 3
  One technical class at 3000/4000 level from outside CE department in geology, environmental engineering, building construction/architecture or urban and regional planning (or other as approved by advisor)

Science Electives
Code Title Credits
BSC 2010 Integrated Principles of Biology 1 3
EES 4103 Applied Ecology 3
EES 4102L Environmental Biology Laboratory 3
GEO 2242 Extreme Weather 3
GEO 3250 Climatology 3
GLY 2030 Environmental and Engineering Geology 3
MET 3503 Weather and Forecasting 3
  Minimum grade of C required.

Second-Level Core Classes
Code Title Credits
CEG 4012 Geotechnical Engineering 3
CES 4702 Analysis and Design in Reinforced Concrete 3
CGN 4503 Pavement Design 3
CWR 4202 Hydraulics 3
EIN 4354 Engineering Economy 3
  Minimum grade of C required.

Technical Electives
Code Title Credits
CCE 4015 Civil Engineering Estimating 3
CCE 4204 Construction Equipment, Methods and Management 3
CCE 4811 Construction Engineering Design 3
CES 4811 Construction Engineering Design 3
CES 4111 Foundation Engineering Design 3
CES 4141 Matrix Structural Analysis 3

Civil engineering is the oldest and most diverse branch of engineering and includes the design and construction of bridges, buildings, dams, waterways, coastal protection works, airports, pipelines, space launching facilities, railroads, highways, sanitary systems, ocean structures and facilities, foundations, harbors, waterworks and many other systems and structures upon which modern civilization depends. In its broadest sense, the civil engineer adapts the physical features of the earth to the needs of society. Approximately one out of four engineers is engaged in civil engineering.

Accredited by the Engineering Accreditation Commission of ABET.

Before Graduating Students Must
- Pass an assessment by two or more faculty and/or industry practitioners of performance on a major design experience.
- Pass an assessment in two courses of individual assignments targeted to each learning outcome. Assessment will be provided by the instructor of the course according to department standards.
- Complete the Fundamentals of Engineering examination.
- Complete an exit interview in your final semester.
- Complete requirements for the baccalaureate degree, as determined by faculty.
Students in the Major Will Learn to
Student Learning Outcomes (SLOs)

Content
1. Apply knowledge of mathematics, science and engineering principles to civil engineering problems.
2. Conduct civil engineering experiments, analyzing and interpreting the data.

Critical Thinking
3. Design a civil engineering system, component or process to meet desired needs within realistic economic, environmental, social, political, ethical, health and safety, manufacturability and sustainability constraints.

Communication
4. Communicate technical data and design information effectively in writing and in speech to other civil engineers.

Curriculum Map

<table>
<thead>
<tr>
<th>Courses</th>
<th>SLO 1</th>
<th>SLO 2</th>
<th>SLO 3</th>
<th>SLO 4</th>
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<tr>
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<td>FE Exam</td>
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Assessment Types
- Laboratory reports
- Exams
- Design projects
- Presentations
- Additional assessments include:
  - The Fundamentals of Engineering (FE) exam
  - The exit and employer surveys