

Civil Engineering Advising Packet



Engineering School of Sustainable Infrastructure & Environment

Updated Feb. 2024

Civil Engineering Curriculum (Fall 2024)—128 Hours

This list applies only to those whose first semester was before Fall 2023.

BSCE degree requires 60 credits of lower division and engineering fundamentals, 3 credits of additional basic science, 50 credits of required civil engineering course work and 15 credits of advanced electives, for a total of 128 credits.

Lower Division and Engineering Fundamentals (60 credits)

Semester 1

| | | |
|-----------------|-----|--------------------------------------|
| MAC 2311 | (4) | Calculus I |
| CHM 2045 | (3) | Chemistry I |
| CHM 2045L | (1) | Chemistry Lab |
| IDS 2935 | (3) | Quest 1 Course |
| ENC 1101 | (3) | Expository and Argumentative Writing |

Semester 2

| | | |
|-----------------|-----|---|
| MAC 2312 | (4) | Calculus II (MAC 2311) |
| PHY 2048 | (3) | Physics with Calculus I (MAC 2311) |
| PHY 2048L | (1) | Physics I Lab |
| ENC 3246 | (3) | Prof. Comm. for Eng. (ENC 1101) |
| EGN2020C | (2) | Eng. Design & Society |

Semester 3

| | | |
|-----------------|-----|---|
| MAC 2313 | (4) | Calculus III (MAC 2312) |
| PHY 2049 | (3) | Physics with Calculus II (PHY 2048) |
| PHY 2049L | (1) | Physics II Lab (No longer required for students beginning Fall 2020 or later) |
| HUM | (3) | Humanities – State Core (Diversity) |
| SOC | (3) | Social Science – (International) |

Semester 4

| | | |
|-----------------|-----|---|
| MAP 2302 | (3) | Differential Equations (MAC 2312) |
| EGM 2511 | (3) | Statics (PHY 2048, Co: MAC 2313) |
| STA 3032 | (3) | Engineering Statistics (MAC 2311) (Can substitute STA2023 for STA3032) |
| SOC | (3) | Social Science – State Core |
| EML 3007: | (3) | CGN 3510 Sustainable Engineering <i>Not Offered; Manual Degree Audit Update Required.</i> |

Semester 5

| | | |
|-----------------|-----|--|
| EGM 3400 | (2) | Dynamics (EGM 2511) |
| EGM 3520 | (3) | Mechanics of Materials (EGM 2511) |

-All courses in **bold print** require a grade of C or better
 -Courses in **bold italic** are 7 Critical Tracking classes - must average a 2.5 GPA based on best of two attempts (including withdrawals)
 -Underlined courses must be completed with a C grade or higher in two attempts (including withdrawals). Any requests for a third attempt at these courses must be submitted via a departmental petition.
 -Course pre- (or co-) requisites are listed in SMALL TYPE after each course.

Additional Basic Science or Quest 2 (as appropriate) (3 credits)

Additional Basic Science—Students select one course from:

BSC2005, BSC2010, BSC2862, GEO2242, GEO3520, GLY2030C, GLY2038, OCE1001, SWS2007, WIS2552

(Or equivalent course subject to advisor approval)

Quest 2—Students select one course from:

IDS2935: Climate Change Science and Solutions (P, N)
 IDS2935: Energy and Society (P)
 IDS2935: Communities and Climate Change (B)
 IDS2935: Unintended Consequences in the Environment (P,N)
 IDS2935: Water for the Future (B)
 IDS2935: Water for People and Nature (B)
 IDS2935: Living with Rising Seas (P,D)
 IDS2935: Can big data save the earth? (B, 2000 WR)

Required Civil Engineering Courses (50 credits)

General (16 credits):

| | | |
|---|-----|---|
| COP 2271** | (2) | Computer Prog. for Eng. (MatLab) (MAC 2312) |
| **We recommend COP 2273 Computer Prog. For Eng. (Python) <i>Manual Degree Audit Update Required</i> | | |
| CGN 3421 | (3) | Computer Methods in CE (COP2271, COP2273) |
| EEL 3003 | (3) | Elements of Electrical Engineering: CGN 3710 Experiment. & Instrument. Not Offered. |
| CGN 2328 | (3) | Technical Drawing (AutoCAD) (≥2EG) |
| CGN 3501C | (4) | CE Materials (Co: EGM 3520) |
| EGS 4034 | (1) | Professional Ethics (≥3EG) |

Additional Spatial Information/Technology Course (3 credits)

Choose One:

| | | |
|------------|-----|--|
| SUR 3103C* | (3) | Geomatics (F); or |
| URP 4273 | (3) | Survey of Planning Info. Systems (F); or |
| SWS 4720C | (3) | GIS in Soil & Water Science (F, S); or |
| GIS 3072C | (3) | Geographic Information Systems (F); or |
| ARC 4310C* | (3) | Building Information Modeling (S); or |
| ARC 4511* | (3) | Structural Modeling (F) |

*Please let us know at your Advanced Registration Appointment so that we can put you on the list.

Primary Tier Courses – Core Areas (19 credits):

| | | |
|------------------|-----|---|
| CGN 4160 | (3) | Civil Engineering Practice (≥Third Year) |
| CEG 4011 | (4) | Soil Mechanics (EGM 3520) |
| CWR 3201 | (4) | Hydrodynamics (EGM 2511, MAP 2302) |
| CES 3102 | (4) | Structural Analysis (EGM 3520) |
| TTE 4004C | (4) | Transportation Engineering (≥Third Year) |

Secondary Tier Courses – Additional Depth (12 Credits)

Choose 4 of 5:

| | | |
|-----------------|-----|--|
| EIN 3354 | (3) | Engineering Economy (MAC 2312) |
| CEG 4012 | (3) | Geotechnical Engineering (CEG 4011) |
| CWR 4202 | (3) | Hydraulics (CWR 3201) |
| CES 4702 | (3) | Reinforced Concrete (CGN 3501C, CES 3102) |
| TTE4106/TTE4824 | (3) | Urban Transportation Planning (F); or Transportation Facility Design (S) (TTE4004C) |

Advanced Courses (15 credits)

- All advanced courses are 3 credits, and all students must take 15 credits of these courses (5 courses).
- Most advanced courses will only be offered once a year (F=Fall; S=Spring)

- **Capstone design courses in bold (taken in final semester).**

- **Choose 4 courses from (at least one must be a design class*):**

- CCE 4015 Construction Estimating (S) (CGN4160) **Not offered Spring 2024*
 - * CCE 4811 Construction Engineering Design (S) (CGN4160 and EIN3354)
 - * CEG 4104 Retaining Wall/Embankment Design (S) (CEG 4012)
 - * CEG 4111 Foundation Engineering Design (F) (CEG 4012)
 - * CES 4605 Analysis and Design in Steel (F) (CES 3102, CGN 3501C)
 - CGN 4304 Machine Learning Applications in CE (S) (CGN3421)
 - CGN 4404 Applied Data Science in Civil and Environmental Engineering (F) (CGN 3421 or ENV 3040C)
 - CGN 4503 Pavement Design (CGN3501C)
 - * CGN 4905 Design and Construction in Timber (F) (CES 3102)
 - CGN 4905 Freeway Operations and Simulation (S) (TTE 4004C)
 - * CGN 4905 Concrete Mixture Design (S) (CGN3501C)
 - CGN 4905 Seepage in Soils (F) (CEG4011)
 - CGN 4905 Ground Modification Design (F) (CEG4011)
 - CGN 4905 Construction Project Management (S) (CGN4160)
 - CGN 4905 Construction Modeling & Simulation (F)
 - CGN 4905 Construction Planning & Scheduling (F)
 - CGN 4905 Advanced Traffic Simulation (F)
 - CGN 4905 Transportation Data Analytics (F) (TTE 4004C, CGN3421)
 - CGN 4905 Sustainable Transportation and Public Transit (F) (TTE 4004C)
 - CGN 4600 Public Works Engineering (F,S)
 - * CWR 4306 Urban Stormwater Design (F) (CWR 4202)
 - * CWR 4542 Water Resources Engineering (S) (CWR 4202)
 - TTE 4106 Urban Transportation Planning (F) (TTE 4004C)
 - * TTE 4201 Traffic Engineering (F) (TTE 4004C)
 - TTE 4300 Transportation Systems Analysis (F) (TTE 4004C)
 - TTE 4824 Transportation Facility Design (S) (TTE 4004C)
 - * SUR 4463 Subdivision Design (S)
 - EGS 4625 Fundamentals of Engineering Project Management (F, Su, Sp)
 - BCN4423C Temporary Structures (F, S) (May not be offered; Check Schedule of Courses)

Or One advanced out-of-department elective class from:

- Environmental Engineering, Geology, Urban and Regional Planning,
- Construction Management, Architecture, Soil and Water Science
- Mechanical Engineering or Geography. (see complete list of courses on blue sheet)

Choose 1 of capstone design from:

CGN 4806 Water-Transportation Design (F, S) (TTE 4004C)

CGN 4910 Structures-Geotechnical-Construction Design (F, S) (CES 4702)

Example Advanced Courses for a Structures Emphasis:

- CES 4605 Analysis and Design in Steel (F) (CES 3102, CGN 3501C)
- CGN 4905 Design and Construction in Timber (F) (CES 3102)
- CGN 4905 Prestressed Concrete (S) (CES 4702)
- CEG 4104 Retaining Wall/Embank (S) or CEG 4111 Foundation Engineering Design (F)
- CGN 4910 Structures-Geotech-Construction Design (F,S) (CES 4702)**

All students are required to take the *Fundamentals of Engineering (FE) Examination* prior to graduation.

This exam is administered by the National Council of Examiners for Engineering and Surveying (NCEES):

<https://ncees.org/engineering/fe/>

Civil Engineering Curriculum Advanced Elective Courses

Choices for Out-of-Department Elective Courses

Engineering (General):

EGS 4038 Engineering Leadership

Environmental Engineering Sciences:

ENV 4300 Solid Waste Containment Design

ENV 4411 Stormwater Control Systems

ENV 4432 Potable Water Design

ENV 4532 Wastewater System Design

Geology:

GLY 2030C Environmental and Engineering Geology

GLY 3882C Hydrology and Human Affairs

GLY 4155C Geology of Florida

GLY 4700 Geomorphology

GLY 4734 Coastal Morphology and Processes

Architecture:

ARC 4310C Building Information Modeling

ARC 4511 Structural Modeling

Construction Management:

BCN 1582 International Sustainable Development

BCN 3240C Equipment and Methods for Heavy/Highway Construction

BCN 4723 Design-Build Delivery Methods

BCN 4880 Management of Heavy/Highway Construction

Urban and Regional Planning:

URP 4000 Preview of Urban and Regional Planning

URP 4273 Survey of Planning Information Systems (GIS)

Soil and Water Science:

SWS 4244 Wetlands

SWS 4245 Water Resource Sustainability

SWS 4720C GIS in Soil and Water Science

Mechanical Engineering:

EML 3005 Mechanical Design

EML 4312 Control of Mechanical Engineering Systems

Geography:

GEO 2242 Extreme Weather

GEO 3250 Climatology

MET 3503 Weather and Forecasting

Combined Bachelors and Masters Degree “4-1 Program” for Civil Engineering

Acceptable Course Substitutions for 4-1 Credit

If interested in pursuing the combined degree program, please schedule a meeting with your academic advisor to discuss program requirements and course options. You can find a list of master’s program requirements, including required coursework for each specialization area, here: <https://www.essie.ufl.edu/resources/academic-advising/>.

The list below is a sample of possible combined degree program courses. It is your responsibility to consult with your academic advisor and the webpage above for confirmation of master’s program specialization course requirements. Other course substitutions may be possible – check with graduate faculty in area of interest.

Undergraduate Course

CEG 4111 Foundation Design*
 CEG 4104 Retaining Wall Design*
 CGN 4503 Pavement Design*
 EGS 4625 Fund. of Eng. Project Mgmt.*
 BCN 3240C Equip/Meth Highway Const.*
 BCN 4723 Design-Build Delivery Methods*

CEG 4111 Foundation Design*
 CEG 4104 Retaining Wall Design*
 CGN 4503 Pavement Design*
 CGN 4905 Ground Modification Design*
 CGN 4905 Seepage in Soils*

Hydrology and Water Resources

CWR 4306 Urban Stormwater Design*
 CWR 4542 Water Resources Engineering*

CE Elective
 CE Elective

CE Elective
 CE Elective
 CE Elective
 Design Elective
 CGN 4905 Prestressed Concrete*
 CGN 4905 Design and Const. in Timber*

TTE 4106 Urban Transp. Planning*
 TTE 4300 Transp. Systems Analysis*
 TTE 4201 Traffic Engineering*
 TTE 4824 Transportation Facility Design*
 CGN 4905 Freeway Operations & Simulation*
 CGN 4503 Pavement Design*
 CE Elective
 CE Elective

Graduate Course Substitution

Construction

CEG 5115 Foundation Design* (F)⁺
 CEG 6515 Earth Retaining Walls* (S)⁺
 CGN 6905 Pavement Design* (F)
 EGS 6626 Fund. Of Eng. Project Mgmt.* (F,S)
 BCN 5784 Equip/Meth Heavy Const.* (S)
 BCN 5729 Design-Build Delivery Meth.* (F)

Geotechnical

CEG 5115 Foundation Design* (F)⁺
 CEG 6515 Earth Retaining Walls* (S)⁺
 CGN 6905 Pavement Design* (F,S)
 CGN 6905 Ground Modification Design* (F)
 CGN 6905 Seepage in Soils (F)

CGN 6905 Advanced Urban Stormwater *(F)⁺
 CGN 6905 Adv. Water Resources Eng.*(S)⁺
 ENV 6441 Water Resources Planning & Mgmt.
 EES 6051 Adv. Env. Planning & Design (F)
 CWR 5235 Open Channel Hydraulics (F)

Structures

CES 6106 Advanced Structural Analysis (F)
 CES 5607 Behavior of Steel Structures (S)
 CES 6585 Wind Engineering (S)
 CES 5325 Design of Highway Bridges (F)
 CES 5715 Prestressed Concrete* (S)
 CES 5801 Design and Const. in Timber* (F)

Transportation

TTE 5006 Adv. Urban Transport Plan.* (F)
 TTE 5305 Adv. Transp. Systems* (F)
 TTE 5256 Traffic Engineering* (S)⁺
 TTE 5805 Geo. Design Transp. Facilities* (S)
 TTE 6205 Freeway Operat. & Simulation* (S)
 CGN 6905 Pavement Design* (F)
 CGN 5606 Public Works Management (F)⁺
 CGN 5605 Public Works Planning (S)⁺

* These courses are “dual-listed”: parallel undergraduate and graduate sections are dual-taught in the same lecture room.

+ These courses are also offered online through the EDGE program.

Undergraduate Civil Engineering

Policy Statement: Maximum Course Attempts

The Department of Civil & Coastal Engineering requires students to complete certain core courses as part of the Bachelor of Science in Civil Engineering degree program. These core courses serve as prerequisite courses for upper division civil engineering course work and are critical courses in the educational preparation of civil engineers.

Students must complete the following core courses with a C grade or higher. A maximum of two attempts will be granted by the department for these courses. Withdrawals and course drops count as course attempts.

If a student does not complete a core course listed below in two attempts, they must change majors out of civil engineering.

Engineering Fundamentals

| | |
|----------|--------------------------------|
| EGM 2511 | Engineering Mechanics: Statics |
| EGM 3400 | Elements of Dynamics |
| EGM 3520 | Mechanics of Materials |


Primary Tier Courses—Core Areas

| | |
|-----------|-------------------------------------|
| CGN 4160 | Civil Engineering Practice |
| CEG 4011 | Soil Mechanics |
| CWR 3201 | Hydrodynamics |
| CES 3102 | Mechanics of Engineering Structures |
| TTE 4004C | Transportation Engineering |

Any request for a third attempt at one of the above courses must be submitted via a departmental petition after meeting with an academic advisor. Third attempt petitions must provide a student personal statement and include a documentable extenuating circumstance. Student personal statements must include student name and UFID, request for a third attempt at a specific course, complete explanation of extenuating circumstance, and explanation of measures in place for continued success if a third attempt is granted. Supporting documentation must be provided along with the student personal statement.

Generally, a third attempt request must meet the threshold of an approved Dean of Students Medical petition. Students should be aware that the DSO medical petition process takes time to complete, undergo review, and receive a decision. Students will not be approved to continue to take civil engineering major course work if a third attempt petition is not approved.

Approved:

 10/10/2022

Robert Thieke, PhD Date
Undergraduate Coordinator

 10/10/2022

Kirk Hatfield, PhD Date
School Director