

## Minor in Civil & Environmental Engineering

The **Minor in Civil & Environmental Engineering** (CEE) is designed to provide non-CEE majors knowledge of the topics common to a civil engineering degree. Students will have the ability to apply knowledge of one or more technical areas appropriate to civil engineering. Students will be able to apply knowledge in structural, environmental, and/or water resources engineering.

### Admissions

Admission requires approval of the CEE program chair or associate chair. Students will need to complete Calculus I and Calculus II, Chemistry I, and Introductory Mechanics before being considered for acceptance into the minor. A minimum GPA of 3.0 is required for admission into the CEE Minor, but this minimum GPA may be raised as space limitations dictate. Students should be aware that most upper level courses in CEE also require Calculus III, Linear Algebra, and Ordinary Differential Equations (or equivalents) as prerequisites and selection of courses should be done in consultation with a faculty advisor within the CEE department.

### To Apply

Please complete the online form available at the following link:

[https://engineering.rowan.edu/prospective\\_students/requestofminorform.php](https://engineering.rowan.edu/prospective_students/requestofminorform.php)

Applications are due by November 1 for Spring admission, and April 1 for Fall admission.

### Program Curriculum

The curriculum will consist of two tracks of courses within CEE.

#### **Structures Track (18 or 19 Cr)**

ENGR 01271- Statics (2 cr)

ENGR 01291- Dynamics (2 cr)

ENGR 01272- Solid Mechanics (2 cr) or ENGR 01273- Strength of Materials (3 cr)

CEE 08382- Structural Analysis (3 cr)

CEE 08383 -Analysis and Design of Steel Frames (3 cr)

Two (2) Civil Engineering Structures Electives selected with an advisor (6 cr)

#### **Environmental/Water Resources Track (19 cr)**

Engr 01271 Statics (2cr)

CEE 08305 -Civil Engineering Systems (3 cr)

ENGR 01341- Fluid Mechanics (2 cr)

CEE 08311 -Environmental Engineering I (3 cr)

CEE 08342- Water Resources Engineering (3 cr)

Two (2) Civil Engineering Electives selected with an advisor (6 cr)

### Courses

*ENGR 01271: Statics 2 s.h.*

Prerequisites: (MATH 01131 or MATH 01141) and (PHYS 02200 or PHYS 00220)

The course deals with the study of engineering statics which includes the statics of structural systems. The study of structural systems includes equilibrium, structural analysis, and geometric properties of structural members.

*ENGR 01291: Dynamics 2 s.h.*

Prerequisites: (PHYS 02200 or PHYS 00220) and ENGR 01271. Study of kinematics and kinetics of a particle, including work-energy and impulse-momentum methods. Systems of particles are considered. Kinematics and kinetics of plane motion of rigid bodies are introduced with respect to absolute and relative motions in various reference frames. Concept of mass moment of inertia is introduced.

*ENGR 01272: Solid Mechanics 2 s.h.*

Prerequisites: ENGR 01271. The course deals with the study of solid mechanics including stress and strain, mechanical properties of materials, and beam and bar analysis. The study of beam and bars includes axial forces, torsion, bending, shear, combined loading, buckling, and design.

*CEE 08305: Civil Engineering Systems 3 s.h.*

Prerequisites: MATH 01131 or MATH 01140. The course deals with the theories and principles of civil engineering systems as applied to real world analysis and design problems. The course covers four important areas of civil engineering systems: linear programming, project scheduling, probability and statistics, and engineering economics. The course includes appropriate computer applications.

*ENGR 01341: Fluid Mechanics I 2 s.h.*

Prerequisites: MATH 01236 and (PHYS 02200 or PHYS 00220). The course deals with general fluid flow and with fluid flow in pipe systems. Topics covered in the area of general fluid flow include hydrostatics, laws of fluid motion, kinematics, dynamics, energy balance, and dimensionless groups. Topics covered in the area of pipe flow include incompressible flow, compressibility, pumps, viscosity, boundary layers, turbulence, and losses. The course includes appropriate laboratory experiments and computer applications.

*CEE 08311: Environmental Engineering I 3 s.h.*

Prerequisite: CHEM 06105 with a grade of C- or better and (Co-requisite ENGR 01341 or prerequisite ENGR 01342). This course deals with topics in principles of environmental engineering, including ecosystems, water and wastewater treatment and design, and sludge/residuals management.

*CEE 08342: Water Resources Engineering 3 s.h.*

Prerequisite: (ENGR 01341 with a grade of C- or better or ENGR 01342 with a grade of C- or better) and (MATH 01235 with a grade of C- or better or MATH 01231 with a grade of C- or better). This course deals with the analysis and design of basic water flow structures using the principles of hydraulics and hydrology. The topics covered in hydrology include the analysis of rainfall, runoff, groundwater flow, and stream flow. The topics covered in hydraulics include the analysis and design of hydraulic structures such as weirs, open channels, culverts, and storm sewers. The course includes appropriate laboratory experiments and computer applications.

*CEE 08382: Structural Engineering 3 s.h.*

Prerequisite: ENGR 01272 with a grade of C- or better or ENGR 01273 with a grade of C- or better. This course deals with the analysis of simply-supported and continuous structures using classic and matrix analysis methods including integration, moment-area, conjugate beam, virtual work, force, and stiffness methods. Trusses, beams and frames are considered in the course.

*CEE 08383: Analysis and Design of Steel Frames 3 s.h.*

Prerequisites: CEE 08382. This course deals with the analysis and design of structural frames. Analysis using the stiffness method is emphasized. The design of frame members includes the design of steel beams and beam-columns, connections for steel frames, bracing and composite steel/concrete members. Steel joists and decking are also introduced. The course includes appropriate computer applications. Additional electives are selected in consultation with an advisor.