

# B.S. in Civil & Environmental Engineering

## Academic Program Guide for **New First-Year Students** (Effective Fall 2019)

Department of Civil Engineering ([jahan@rowan.edu](mailto:jahan@rowan.edu))

*Students who entered Rowan University prior to Fall 2018 should follow the guide for their program and start year in consultation with their advisor.*

### Rowan University Graduation Requirements for all Majors / Degrees

- Students must complete at least 120 semester hours (sh) of coursework that apply to their Rowan University degree.
- Students must have a cumulative GPA of at least 2.0 in Rowan University coursework. (Transfer courses/credit do not count toward the RU GPA.)
- A minimum of 30 sh of coursework must be completed at/through Rowan University.
- Only grades of "D-" or above may apply to graduation/degree requirements. (Some programs may set higher minimums.)
- Students must meet the Rowan Core and Rowan Experience Requirements.
  - An individual course can potentially satisfy one Rowan Core literacy and/or multiple Rowan Experience attributes.
  - Rowan Core and Rowan Experience designations are listed in course details in Section Tally ([www.rowan.edu/registrar](http://www.rowan.edu/registrar)) and may also be searched on that site under "Attributes." A list of Rowan Core courses is here: <https://confluence.rowan.edu/display/AS/Rowan+Core+Course+List>.
- Students must apply for graduation and should do so for the term in which they will complete all program requirements.

### Program-Specific Graduation Requirements for this Major / Degree

- None.

### Rowan Core Requirements<sup>1</sup>

*Students must satisfy all six Rowan Core Literacies. A minimum total of 3 sh of coursework is required to satisfy each Literacy.*

*With the exception of the 11 sh counted here for Communicative Literacy, credits attached to the courses in this section will apply elsewhere.*

- ☐ (COML) Communicative Literacy: *Must be met by the following three courses or their official equivalents:*
  - ☐ COMP 01111 College Composition I (3 sh)
  - ☐ ENGR 01201 Sophomore Eng. Clinic I (4 sh)
  - ☐ ENGR 01202 Sophomore Eng. Clinic II (4 sh)
- ☐ (ARTL) Artistic Literacy *Recommendation from major:*
- ☐ (GLBL) Global Literacy *Recommendation from major:*
- ☐ (HUML) Humanistic Literacy *Recommendation from major:*
- ☐ (QNTL) Quantitative Literacy *Recommendation from major:* MATH 01130 (4 sh counted under non-program)
- ☐ (SCIL) Scientific Literacy *Recommendation from major:* CHEM 06100 (4 sh counted under non-program)

Subtotal of credits counted in this section: 11 sh

### Rowan Experience Requirements

*Students must satisfy all three Rowan Experience attributes. Credits attached to the courses in this section will apply elsewhere.*

- ☐ (LIT) Broad-Based Literature Attribute *Recommendation from major:*
- ☐ (WI) Writing Intensive Attribute *Recommendation from major:* ENGR 01403 (2 sh counted under major)
- ☐ (RS) Rowan Seminar Attribute<sup>2</sup> *Recommendation from major:* ENGR 01101 (2 sh counted under major)

### Non-Program Courses (23 sh)

*Courses in this section cannot be in the major department.*

| Course #  | Course Name  | Course Attributes / Notes              | Sem/Yr | Grade | Credits         |
|---|--|--|--------|-------|-----------------|
| CHEM 06100  | Chemistry I  | Satisfies Scientific Literacy          |        |       | 4               |
| CS 01104  | Intro to Scientific Programming  | SM                                     |        |       | 3               |
| MATH 01130  | Calculus I   | Satisfies Quantitative Literacy        |        |       | 4               |
| MATH 01131  | Calculus II  | SM                                     |        |       | 4               |
| PHYS 00220  | Introductory Mechanics   | SM, LAB; Satisfies Scientific Literacy |        |       | 4               |
| BIOL 01112 or<br>BIOL 01113 or<br>BIOL 01210 or<br>BIOL 01212 or<br>GEOG 06130 or<br>GEOL 01101 | Gen. Biology – Envir Focus or<br>Gen Biology – Human Focus or<br>Human Anatomy and Physiology I or<br>Human Anatomy and Physiology II or<br>Earth Science Lab I or<br>Physical Geology | Approved Technical Science<br>Elective |        |       | 4               |
|   |  |  |        |       | Subtotal: 23 sh |

<sup>1</sup> The Rowan Core requirements are waived for transfer students with an earned A.A. or A.S. degree from a NJ community/county college.

<sup>2</sup> The Rowan Seminar requirement is waived for all students transferring 24 or more approved credits into Rowan University at the time of initial entry.

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## Major Requirements (74 sh)

### SUMMARY OF MAJOR REQUIREMENTS

- 25 sh of Foundational Courses
  - 28 sh of Mid-Level Courses
  - 9 sh of Upper-Level Courses
  - 12 sh of Civil Engineering Electives
- 
- 74 sh total

### FOUNDATIONAL COURSES

| Course #   | Course Name                   | Course Attributes / Notes | Sem/Yr | Grade | Credits |
|------------|-------------------------------|---------------------------|--------|-------|---------|
| ENGR 01101 | Freshman Eng. Clinic I        | Rowan Seminar Attribute   |        |       | 2       |
| ENGR 01102 | Freshman Clinic II            |                           |        |       | 2       |
| CEE 08305  | Civil Engineering Systems     |                           |        |       | 3       |
| ENGR 01271 | Statics                       |                           |        |       | 2       |
| MATH 01230 | Calculus III                  |                           |        |       | 4       |
| CEE 08102  | Engineering Graphics          |                           |        |       | 2       |
| ENGR 01291 | Dynamics                      |                           |        |       | 2       |
| ENGR 01272 | Solid Mechanics               |                           |        |       | 2       |
| CEE 08103  | Field Surveying               |                           |        |       | 2       |
| MATH 01235 | Math for Engineering Analysis |                           |        |       | 4       |
| Subtotal:  |                               |                           |        |       | 25 sh   |

### MID-LEVEL COURSES

| Course #   | Course Name                       | Course Attributes / Notes | Sem/Yr | Grade | Credits |
|------------|-----------------------------------|---------------------------|--------|-------|---------|
| ENGR 01303 | Junior Eng. Clinic                | Must be taken twice.      |        |       | 4       |
| ENGR 01341 | Fluid Mechanics                   |                           |        |       | 2       |
| ENGR 01281 | Material Science                  |                           |        |       | 2       |
| CEE 08382  | Structural Analysis               |                           |        |       | 3       |
| CEE 08301  | Civil Engineering Materials       |                           |        |       | 2       |
| CEE 08311  | Environmental Engineering         |                           |        |       | 3       |
| CEE 08383  | Analysis & Design of Steel Frames |                           |        |       | 3       |
| CEE 08342  | Water Resources Engineering       |                           |        |       | 3       |
| CEE 08361  | Transportation Engineering        |                           |        |       | 3       |
| CEE 08351  | Geotechnical Engineering          |                           |        |       | 3       |
| Subtotal:  |                                   |                           |        |       | 28 sh   |

### UPPER-LEVEL COURSES

| Course #   | Course Name                | Course Attributes / Notes                     | Sem/Yr | Grade | Credits |
|------------|----------------------------|---|--------|-------|---------|
| ENGR 01403 | Senior Eng. Clinic         | Must be taken twice, Satisfies WI requirement |        |       | 4       |
| CEE 08491  | CE Design Project I        |   |        |       | 2       |
| CEE 08492  | CE Design Project II       |   |        |       | 2       |
| CEE 08490  | Civil Engineering Practice |   |        |       | 1       |
| Subtotal:  |                            |   |        |       | 9 sh    |

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## CIVIL ENGINEERING ELECTIVES

Students must choose 4 electives based on availability. At least 1 elective must come from 3 of the following areas: Environmental Engineering, Water Resources Engineering, Geotechnical Engineering, Transportation Engineering.

### ENVIRONMENTAL ENGINEERING

|                       | Course #  | Course Name                                     | Course Attributes / Notes | Sem/Yr | Grade | Credits |
|-----------------------|-----------|---|---------------------------|--------|-------|---------|
| <input type="radio"/> | CEE 08312 | Sustainable Civil & Environmental Engineering   |                           |        |       | 3       |
| <input type="radio"/> | CEE 08412 | Environmental Treatment Process Principles      |                           |        |       | 3       |
| <input type="radio"/> | CEE 08413 | Introduction to Environmental Management        |                           |        |       | 3       |
| <input type="radio"/> | CEE 08422 | Site Remediation Engineering Principles         |                           |        |       | 3       |
| <input type="radio"/> | CEE 08431 | Solid and Hazardous Waste Management            |                           |        |       | 3       |
| <input type="radio"/> | CEE 08432 | Pollutant Fate and Transport Principles         |                           |        |       | 3       |
| <input type="radio"/> | CEE 08433 | Principles of Integrated Solid Waste Management |                           |        |       | 3       |

### WATER RESOURCES ENGINEERING

|                       | Course #  | Course Name  | Course Attributes / Notes | Sem/Yr | Grade | Credits |
|-----------------------|-----------|--|---------------------------|--------|-------|---------|
| <input type="radio"/> | CEE 08441 | Surface Hydrology                                  |                           |        |       | 3       |
| <input type="radio"/> | CEE 08442 | Hydrometeorology                                   |                           |        |       | 3       |
| <input type="radio"/> | CEE 08443 | Advanced Water Resources Engineering For Seniors   |                           |        |       | 3       |
| <input type="radio"/> | CEE 08444 | Principles of Hydraulic Design                     |                           |        |       | 3       |
| <input type="radio"/> | CEE 08445 | Principles of Environmental Fluid Mechanics        |                           |        |       | 3       |
| <input type="radio"/> | CEE 08446 | River Engineering Principles                       |                           |        |       | 3       |
| <input type="radio"/> | CEE 08447 | Watershed Engineering Principles                   |                           |        |       | 3       |
| <input type="radio"/> | CEE 08448 | Introduction to Water and Environmental Monitoring |                           |        |       | 3       |

### GEOTECHNICAL ENGINEERING

|                       | Course #  | Course Name                         | Course Attributes / Notes | Sem/Yr | Grade | Credits |
|-----------------------|-----------|-------------------------------------|---------------------------|--------|-------|---------|
| <input type="radio"/> | CEE 08452 | Foundation Engineering for Seniors  |                           |        |       | 3       |
| <input type="radio"/> | CEE 08453 | Earth Retaining Systems for Seniors |                           |        |       | 3       |
| <input type="radio"/> |           |                                     |                           |        |       | 3       |

### TRANSPORTATION ENGINEERING

|                       | Course #   | Course Name  | Course Attributes / Notes | Sem/Yr | Grade | Credits |
|-----------------------|------------|--|---------------------------|--------|-------|---------|
| <input type="radio"/> | CEE 08463  | Transportation Planning, Demand, and Data Analysis |                           |        |       | 3       |
| <input type="radio"/> | CEE 08464  | Elements of Transportation Engineering for Seniors |                           |        |       | 3       |
| <input type="radio"/> | CEE 08465  | Pavement Analysis and Evaluation                   |                           |        |       | 3       |
| <input type="radio"/> | CEE 08466  | Introduction to Transportation Systems Modeling    |                           |        |       | 3       |
| <input type="radio"/> | CEE 08468  | Introduction to Intelligent Transportation Systems |                           |        |       | 3       |
| <input type="radio"/> | ENGR 01480 | Viscoelasticity                                    |                           |        |       | 3       |

### STRUCTURAL ENGINEERING ELECTIVES

|                       | Course #  | Course Name                              | Course Attributes / Notes | Sem/Yr | Grade | Credits |
|-----------------------|-----------|--|---------------------------|--------|-------|---------|
| <input type="radio"/> | CEE 08473 | Advanced Structural Analysis for Seniors |                           |        |       | 3       |
| <input type="radio"/> | CEE 08474 | Structural Mechanics                     |                           |        |       | 3       |
| <input type="radio"/> | CEE 08475 | Fatigue and Fracture                     |                           |        |       | 3       |
| <input type="radio"/> | CEE 08476 | Portland Cement Concrete                 |                           |        |       | 3       |
| <input type="radio"/> | CEE 08481 | Reinforced Concrete Design               |                           |        |       | 3       |
| <input type="radio"/> | CEE 08483 | Advanced Steel Design for Seniors        |                           |        |       | 3       |
| <input type="radio"/> | CEE 08484 | Prestressed Concrete for Seniors         |                           |        |       | 3       |
| <input type="radio"/> | CEE 08485 | Advanced Reinforced Concrete for Seniors |                           |        |       | 3       |
| <input type="radio"/> | CEE 08486 | Bridge Engineering for Seniors           |                           |        |       | 3       |

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|                       |           |                                       |  |  |                 |
|-----------------------|-----------|---------------------------------------|--|--|-----------------|
| <input type="radio"/> | CEE 08487 | Design of Masonry and Wood Structures |  |  | 3               |
|                       |           |                                       |  |  | Subtotal: 12 sh |

Free Electives for this Major/Degree (12 sh)

*Students should choose Free Electives to satisfy any Rowan Core or Rowan Experience requirements that are not fulfilled by Major or Non-Program courses.*

| Course # | Course Name | Course Attributes / Notes | Sem/Yr | Grade | Credits         |
|----------|-------------|---------------------------|--------|-------|-----------------|
|          |             |                           |        |       | 3               |
|          |             |                           |        |       | 3               |
|          |             |                           |        |       | 3               |
|          |             |                           |        |       | 3               |
|          |             |                           |        |       | Subtotal: 12 sh |

Total Program Credits Required for this Major / Degree: 120 SH