

## CIVIL ENGINEERING B.S.CE.

All students must meet the University Requirements. (<http://catalogue.uvm.edu/undergraduate/academicinfo/degreerequirements/>)

The curriculum in civil engineering provides and builds upon a strong foundation in mathematics, and physical, natural and engineering sciences. Instruction in civil engineering disciplines includes structural, geotechnical, environmental, water resources, materials, and transportation engineering. The B.S. in Civil Engineering curriculum is embedded with several courses that meet the University's Sustainability (SU) requirement. The degree as a whole also meets the Sustainability requirement, as approved by the University's Sustainability Curriculum Review Committee.

A Civil Engineering degree is excellent preparation for immediate employment in consulting firms, government agencies, non-profits, and industry. Additionally, many graduates continue their education at the graduate- level.

A systems approach to engineering problem solving is central to the curriculum and involves integrating the short and long-term social, environmental and economic aspects and impacts into sustainable engineering solutions. Hands-on laboratories and/or project-based learning are incorporated into each year of the Civil Engineering curriculum. As part of this approach, service-learning projects with local communities and non-profit groups are featured in some courses. Real-world engineering design culminates in a required major design experience in the senior year, which draws upon prior course work and focuses on technical and non-technical issues and expectations of professional practice. Other aspects of the program include opportunities for laboratory and research experience, development of communication and professional skills, and participation in a community of students and the faculty in the program.

Students are encouraged to pursue minors or focus areas in other disciplines that complement their engineering experience. International education, work experiences and participation in student clubs are also encouraged. Students should consult their advisors early in their program in order to plan accordingly.

## CIVIL ENGINEERING PROGRAM EDUCATIONAL OBJECTIVES

The educational objectives of the civil engineering program are to provide our graduates with disciplinary breadth and depth to fulfill complex professional and societal expectations by:

1. Pursuing careers as practicing engineers or using their program knowledge in a wide range of other professional, educational and service activities.
2. Assuming leadership roles and seeking continuous professional development.
3. Contributing to their profession and society while appreciating the importance of ethical and sustainable practices, diversity, and inclusion.

## REQUIREMENTS

### THE CURRICULUM FOR THE B.S. IN CIVIL ENGINEERING

Students must meet University requirements. Note that the University's Sustainability (SU) and Quantitative Reasoning (QR) requirements are built into the Civil Engineering curriculum. Minimum of 128 credits required.

UNIVERSITY & CEE GENERAL EDUCATION REQUIREMENTS (18 credits) <sup>1</sup>		
Univ FWIL: Foundational Writing & Information Literacy		3
Univ D1: Diversity 1		3
Univ D1/D2: Diversity 1 or Diversity 2		3
CEE General Education Electives		9
MATHEMATICS & STATISTICS REQUIREMENTS (21 credits)		
MATH 021	QR: Calculus I	4
MATH 022	QR: Calculus II	4
MATH 121	QR: Calculus III	4
MATH 122	QR: Applied Linear Algebra	3
MATH 271	QR: Adv Engineering Mathematics	3
STAT 143	QR: Statistics for Engineering	3
COMPUTING & SCIENCE REQUIREMENTS (15-16 credits)		
CS 021	QR: Computer Programming I	3
CHEM 031	General Chemistry 1	4
GEOL 001	Earth System Science	4
or BIOL 001	Principles of Biology	
or BIOL 002	Principles of Biology	
PHYS 030	Physics Problem Solving I (Optional)	1
PHYS 031	Physics for Engineers I	4
CIVIL & ENVIRONMENTAL ENGINEERING COURSE REQUIREMENTS (61 credits)		
CE 001	Statics	3
CE 003	SU: Intro to Civil & Envir Engr <sup>2</sup>	2
CE 010	Geomatics	4
CE 100	Mechanics of Materials	3
CE 101	Materials and Structures Lab	3

CE 132	SU: Environmental Systems	3
CE 133	Transportation Systems	3
CE 134	SU: System Focused Design Engr	3
CE 151	SU: Water & Wastewater Engr	3
CE 160	Hydraulics	3
CE 162	Hydraulics Lab	2
CE 170	Structural Analysis	3
CE 175	SU: Capstone Design	3
CE 180	Geotechnical Principles	3
CE 182	Geotechnical Principles Lab	2
Design Electives <sup>3</sup>		9
CE Electives <sup>4</sup>		9
ADDITIONAL ENGINEERING COURSE REQUIREMENTS (13 credits)		
EE 075	Electrical Circuits & Sensors	4
ENGR 002	Graphical Communication	2
CEMS 050	CEMS First Year Seminar <sup>2</sup>	1
ME 012	Dynamics	3
Technical Elective <sup>5</sup>		3

<sup>1</sup> University & CEE General Education Requirements include: (1) 3 credits of Foundational Writing & Information Literacy (FWIL). Students must take ENGS 001 or HCOL 085 (only for students enrolled in the Honors College). Students transferring from the College of Arts and Sciences can use a TAP class to fulfill this requirement; (2) Students must complete 15 credits of approved General Education Electives, including one 3-credit D1 course, a second 3-credit D1 or D2 course, and 3 credits each of Arts and Humanities (AH) and Social Sciences (SS). A single course can satisfy multiple requirements in this category; the student will still need a total of 15 credits.

<sup>2</sup> CEMS 050 & CE 003 are degree requirements designed for first-year students. Internal and external transfer students may substitute with any engineering (BME, CE, EE, EMGT, ENGR and ME credits except ENGR 010) credits not used to satisfy other requirements.

<sup>3</sup> Design Electives: CE 172, CE 173, CE 201, CE 241, CE 247, CE 253, CE 255, CE 256, CE 262, CE 263, CE 265, CE 273, CE 281 CE 285, CE 286, CE 288 and some CE 295 (Special Topics) courses (consult advisor). At least one design elective must be from CE 172, CE 173, CE 241, CE 281, CE 285 and CE 286.

<sup>4</sup> CE Electives: Any 200-level CE course, CE 172, CE 173, and EMGT 201.

<sup>5</sup> Technical Elective: All 100 level or above courses in engineering (BME, CE, EE, EMGT, ENGR, ME).