

Civil, Environmental and Geomatics Engineering [\(changes eff. spring 2015.\)](#)

Faculty:

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Affiliated Faculty:

Gammack-Clark, J.; Roberts, C.; Root, T.; Xie, Z.

Adjunct Faculty:

George, K. P.; Muniz, A.; Munuswamy, S.; Nettleman, C.; Zheng, X.

The Department of Civil, Environmental and Geomatics Engineering offers programs of study leading to the Bachelor of Science in Civil Engineering (B.S.C.V.), Master of Science (M.S.) with major in Civil Engineering and Bachelor of Science in Geomatics Engineering (B.S.G.E.). To encourage undergraduates to pursue a graduate education, the Department also offers a combined B.S.C.V. to M.S. degree program that permits a student to complete both a bachelor's and a master's degree in Civil Engineering within five years.

[Link to Geomatics Engineering Program](#)

Civil Engineering

Civil engineers design the constructed environment that supports our society. From highways and buildings to bridges and water systems, the profession of civil engineering is responsible for much of the world in which we live.

The program of study leading to the Bachelor of Science in Civil Engineering (B.S.C.V.) reflects the breadth of the profession. Students complete coursework in basic science and mathematics, engineering sciences, civil engineering systems and materials, and the major disciplines in civil engineering. Because of the tremendous impact civil engineers have on society, the curriculum also requires students to pursue studies in the social sciences and the humanities.

The B.S.C.V. program is accredited by the Engineering Accreditation Commission of ABET, <http://www.abet.org>.

The program of study leading to the Master of Science (M.S.) with major in Civil Engineering is designed to meet the advanced civil engineering educational needs of recent graduates of undergraduate engineering programs, practicing engineers and those non-engineering professionals wishing to redirect their career paths.

Civil Engineering Vision and Mission

The Civil Engineering program delivers the highest quality educational and research opportunities throughout the FAU service area and beyond and makes a significant contribution to the needs of a changing South Florida community.

Civil Engineering serves the technological needs of society, especially with regard to the constructed environment in South Florida. It produces a diverse population of engineers, each possessing a superior technical foundation and a rigorous liberal education. It creates new opportunities for the communities and industries of South Florida and beyond.

The faculty focuses on learning and research—the core competencies. Civil Engineering students are active learners motivated to serve society. Administrators and staff are stewards of the Department's self-governance, its role within the University and its support processes.

Through individual dedication, the faculty, administrators and staff contribute to the Department's group success. They value ethical behavior, critical thinking, innovation, individual responsibility, thoughtful risk taking, teamwork and leadership. They also value a balanced, holistic approach to life, in which the well-being of each member of the community has primacy. In this way, their actions educate at least as well as their words.

Civil Engineering Educational Objectives and Student Outcomes

The Civil Engineering program strongly supports the educational objectives and learning outcomes of the College of Engineering and Computer Science (see the Educational Objectives and Expected Student Learning Outcomes subsections previously listed in this section).

Program Educational Objectives are broad statements that describe the expected accomplishments and professional status of Civil Engineering graduates a few years beyond the baccalaureate degree.

The Civil Engineering program at Florida Atlantic University is dedicated to graduating civil engineers who, within a few years after graduation will:

- A. **Practice civil engineering** within the general areas of structural engineering, transportation engineering, geotechnical engineering and water resources/environmental engineering in the organizations that employ them;
- B. **Advance their knowledge of civil engineering**, both formally and informally, by engaging in lifelong learning experiences including attainment of professional licensure and/or graduate studies;
- C. **Serve as effective professionals** based on strong interpersonal and teamwork skills, an understanding of professional and ethical responsibility and a willingness to take the initiative and seek progressive responsibilities;
- D. **Participate as leaders** in activities that support service to, and/or economic development of, the region, the state and the nation.

The educational objectives of the Bachelor of Science in Civil Engineering program are achieved by ensuring that graduates have the following characteristics or student outcomes:

- a. An ability to apply knowledge of mathematics, science and engineering;
- b. An ability to design and conduct experiments, as well as to analyze and interpret data;
- c. An ability to design a system, component or process to meet desired needs within realistic constraints, such as economic, environmental, social, political, ethical, health and safety, manufacturability and sustainability;
- d. An ability to function on multidisciplinary teams;
- e. An ability to identify, formulate and solve engineering problems;
- f. An understanding of professional and ethical responsibility;
- g. An ability to communicate effectively;
- h. The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental and societal context;
- i. A recognition of the need for and an ability to engage in lifelong learning;
- j. A knowledge of contemporary issues;
- k. An ability to use the techniques, skills and modern engineering tools necessary for engineering practice.

For graduate Civil Engineering students, the following additional educational outcomes are established. Graduates will have:

- a. Knowledge in civil engineering and related subjects significantly beyond the baccalaureate level;
- b. The ability to independently conduct research or a significant practice-oriented project in civil engineering;
- c. The ability to communicate ideas and results in written, oral and graphical forms.

These educational outcomes result from successful completion of a well-planned, rigorous set of courses and a major capstone experience (either a thesis or practice-oriented project).

Students wishing to continue their education but not pursue a formal academic degree are welcome to take graduate courses with the appropriate technical preparation.



BACHELOR'S PROGRAM

[Link to Combined Program](#)

[Link to Master's Program](#)

Bachelor of Science in Civil Engineering

Admission Requirements

All students must meet the minimum admission requirements of the University. Please refer to the [Admissions section](#) of this catalog.

All students must meet the preprofessional requirements listed [above](#) to be accepted in the Civil Engineering program.

Prerequisite Coursework for Transfer Students

Students transferring to Florida Atlantic University must complete both lower-division requirements (including the requirements of the Intellectual Foundations Program) and requirements for the college and major. Lower-division requirements may be completed through the A.A. degree from any Florida public college, university or community college or through equivalent coursework at another regionally accredited institution. Before transferring and to ensure timely progress toward the baccalaureate degree, students must also complete the prerequisite courses for their major as outlined in the [Transfer Student Manual](#) and below.

All courses not approved by the Florida Statewide Course Numbering System that will be used to satisfy requirements will be evaluated individually on the basis of content and will require a catalog course description and a copy of the syllabus for assessment.

Coursework for Transfer Students

To minimize the time necessary to complete the Civil Engineering degree, transfer students entering the University with an A.A. degree should structure their programs to include the following:

Topics	Credits (1)	
English Composition	6	(two 3-credit courses)
Social Science	6	(two 3-credit courses)
Humanities	6	(two 3-credit courses)
Complete Calculus Sequence	12	(three 4-credit courses)
Ordinary Differential Equations	3	(one 3-credit course)
General Chemistry, with Lab	4	(one 4-credit course, including lab)
Calculus-based Physics, with Labs	8	(two 4-credit courses, including labs)
Computer Programming (2)	3	(one 3-credit course)
Fundamentals of/Introduction to Engineering (3)	3	(one 3-credit course)
Additional Electives (4)	6	(two 3-credit courses)

Notes:

(1) The number of credits may vary by institution.

(2) Software applications courses are **not** computer programming courses.

(3) An introductory course in engineering is preferred. However, substitutions may be allowed, provided they are part of a cohesive pre-engineering A.A. degree program.

(4) Some institutions offer engineering fundamentals courses that may fulfill degree requirements. See degree requirements below.

Degree Requirements

The Bachelor of Science in Civil Engineering degree will be awarded to students who:

1. Meet all general degree requirements of the University;
2. Complete the curriculum for the B.S. in Civil Engineering degree (see below);
3. Take the Fundamentals of Engineering examination (the first of two exams necessary for professional licensure; contact the Department for details).

Curriculum

The Bachelor of Science in Civil Engineering degree requires 128 credits. For credit toward the degree, a grade of "C" or better must be received in each course listed. In addition, all prerequisites for each mathematics, science or engineering course must be completed with a grade of "C" or better before enrollment is permitted. The degree components are listed below.

General Studies		
College Writing 1 (1), (2)	ENC 1101	3
College Writing 2 (1), (2)	ENC 1102	3
Intellectual Foundations Program: Society and Human Behavior Courses (1), (3)		6
Intellectual Foundations Program: Global Citizenship Courses (1), (3)		6
Intellectual Foundations Program: Creative Expressions Courses (1), (3)		6
Total		24

Basic Mathematics and Sciences		
Calculus with Analytic Geometry 1 (1), (4)	MAC 2311	4
Calculus with Analytic Geometry 2 (1), (4)	MAC 2312	4
Calculus with Analytic Geometry 3	MAC 2313	4
Engineering Mathematics 1	MAP 3305	3
Probability and Statistics for Engineers	STA 4032	3
General Chemistry 1 (1)	CHM 2045	3
General Chemistry Lab 1 (1)	CHM 2045L	1
Physics for Engineers 1 (1), (5)	PHY 2043	3
General Physics 1 Lab	PHY 2048L	1
Physics for Engineers 2 (1), (5)	PHY 2044	3
General Physics 2 Lab	PHY 2049L	1
Basic Science Elective (1)		4

Physical Geology/Evolution of the Earth (GLY 2010C) 4 credits OR Biological Principles (BSC 1010) 3 credits and Biological Principles Lab (BSC 1010L) 1 credit		
Fundamentals of Surveying	SUR 2104C	3
Total		34

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Engineering Fundamentals		
Fundamentals of AutoCAD	CGN 2327	3
Fundamentals of Engineering	EGN 1002	3
Computer Applications in Engineering 1	EGN 2213	3
Statics	EGN 3311	3
Dynamics	EGN 3321	3
Strength of Materials	EGN 3331	3
Engineering Thermodynamics	EGN 3343	3
Fundamentals of Surveying	SUR 2104C	3
Total		21

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Professional Core (6)		
Soil Mechanics (7)	CEG 3011C	3
Foundation Engineering	CEG 4012	3
Analysis of Structures (7)	CES 3102C	3
Structural Steel Design	CES 4605	3
Reinforced Concrete Design	CES 4702	3
Civil Engineering Materials (7)	CGN 3501C	3
Undergraduate Research in Civil Engineering 1	CGN 3910	1
Civil Engineering Design 1 (2), (7)	CGN 4803C	3
Civil Engineering Design 2 (2), (7)	CGN 4804C	3
Undergraduate Research in Civil Engineering 2	CGN 4811	1
Applied Hydraulics (7)	CWR 3201C	3
Hydrologic Engineering	CWR 4202	3
Environmental Science and Engineering (7)	ENV 3001C	3
Water and Wastewater Treatment Systems	ENV 4514	3
Introduction to Transportation Engineering (7)	TTE 3004C	3
Transportation Planning and Logistics (7)	TTE 4005C	3
Total		43

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Technical Electives, 6 credits from the list below (8)		
Construction Project Management	CCE 4031	3

Pavement Design	CEG 4126	3
GIS Application in Civil Engineering	CGN 4321	3
Advanced Hydraulic Systems	CWR 4223	3
Stormwater Modeling and Management	CWR 4307	3
Introduction to Terrestrial Laser Scanning	SUR 4150C	3
Transportation Operations and Logistics Management	TTE 4105	3
Total		6

Notes:

- (1) Contributes to University Core Curriculum requirements.
- (2) Contributes to Writing Across Curriculum (Gordon Rule) writing requirement.
- (3) Intellectual Foundations Program courses, totaling 6,-must be selected to satisfy Writing Across Curriculum (Gordon Rule) writing requirements.
- (4) Contributes to Gordon Rule mathematics requirement.
- (5) PHY 2048 and PHY 2049 (4 credits each) are acceptable substitutes, but only 6 credits will apply toward the degree.
- (6) All professional core courses contain a communications component (writing or speaking).
- (7) Includes a 1-credit laboratory.
- (8) 6 credits may be taken from [Department](#) of Civil, Environmental and Geomatics Engineering graduate courses—this is highly recommended for students planning to pursue the B.S./M.S.

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Sample Four-Year Program of Study for Bachelor of Science in Civil Engineering

First Year, Fall (14 credits)		
College Writing 1	ENC 1101	3
General Chemistry 1 (eff. spring 2015)	CHM 2045	3
General Chemistry Lab 1 (eff. spring 2015)	CHM 2045L	1
Calculus with Analytic Geometry 1	MAC 2311	4
Fundamentals of Engineering	EGN 1002	3

First Year, Spring (14 credits)		
College Writing 2	ENC 1102	3
Physics for Engineers 1	PHY 2043	3
General Physics 1 Lab	PHY 2048L	1
Calculus with Analytic Geometry 2	MAC 2312	4
Fundamentals of AutoCAD	CGN 2327	3

First Year, Summer (6 credits)		
Fundamentals of Surveying	SUR 2104C	3

Intellectual Foundations Course		3
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Second Year, Fall (14 credits)		
Physics for Engineers 2	PHY 2044	3
General Physics 2 Lab	PHY 2049L	1
Calculus with Analytic Geometry 3	MAC 2313	4
Statics	EGN 3311	3
Intellectual Foundations Course		3

Second Year, Spring (15-16 credits)		
Strength of Materials	EGN 3331	3
Engineering Mathematics 1	MAP 3305	3
Computer Applications in Engineering 1	EGN 2213	3
Basic Science Elective Physical Geology/Evolution of the Earth (GLY 2010C) 4 credits OR Biological Principles (BSC 1010) 3 credits and Biological Principles Lab (BSC 1010L) 1 credit		4

Second Year, Summer (6 credits)		
Analysis of Structures	CES 3102C	3
Engineering Thermodynamics	EGN 3343	3
Intellectual Foundations Course		3

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Third Year, Fall (15-12 credits)		
Civil Engineering Materials	CGN 3501C	3
Applied Hydraulics	CWR 3201C	3
Analysis of Structures CES 3102C Intellectual Foundations Course		3
Probability and Statistics for Engineers	STA 4032	3
Environmental Science and Engineering	ENV 3001C	3
Introduction to Transportation Engineering	TTE 3004C	3

Third Year, Spring (16-13 credits)		
Soil Mechanics	CEG 3011C	3
Introduction to Transportation Engineering Environmental Science and Engineering	TTE 3004C ENV 3001C	3
Dynamics	EGN 3321	3
Undergraduate Research in Civil Engineering 1	CGN 3910	1
Intellectual Foundations Courses		3

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Third Year, Summer (3 credits)		
<u>Intellectual Foundations Courses</u>		<u>6</u>
<u>Probability and Statistics for Engineers</u>	<u>STA 4032</u>	<u>3</u>

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Fourth Year, Fall (16-15 credits)		
Foundation Engineering	CEG 4012	3
Structural Steel Design	CES 4605	3
Reinforced Concrete Design	CES 4702	3
Civil <u>Environmental & Geomatics</u> Engineering Design 1	CGN 4803C	3
<u>Undergraduate Research in Civil Engineering 2</u>	<u>CGN 4911</u>	<u>4</u>
Civil Engineering Technical Elective		3

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Fourth Year, Spring (15 credits)		
Civil <u>Environmental & Geomatics</u> Engineering Design 2	CGN 4804C	3
Transportation Planning and Logistics	TTE 4005C	3
Water and Wastewater Treatment Systems	ENV 4514	3
Hydrologic Engineering	CWR 4202	3
Civil Engineering Technical Elective		3

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Minors and Certificate Programs Appropriate for Civil Engineering

Civil engineering is a uniquely wide-ranging profession. Various departments offer minors and certificate programs that augment a student's civil engineering education. The faculty encourages students to pursue a minor or certificate, such as:

~~Geomatics Engineering certificate~~ **Surveying and Mapping certificate program**, highly recommended (Department of Civil, Environmental and Geomatics Engineering)



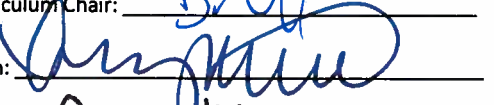
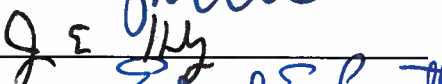

Geomatics Engineering minor, highly ~~recommended~~ recommended (Department of Civil, Environmental and Geomatics Engineering)

Geographic Information Systems certificate program, highly recommended (Department of Geosciences)

Obtaining a minor or certificate will require the completion of credits beyond the 128 required for the B.S. in Civil Engineering. Contact the department offering the minor or certificate for more details.

Cooperative Education

Civil Engineering students are strongly encouraged to gain practical experience through participation in Cooperative Education. However, Cooperative Education does not substitute for the civil engineering technical elective. For information, contact the FAU Career Development Center (CDC) at 561-297-3536 or visit www.fau.edu/cdc.

Approved by:	Date:
Department Chair: 	10/17/2014
College Curriculum Chair: 	10/22/2014
College Dean: 	10/22/14
UUPC Chair: 	11/10/14
Undergraduate Studies Dean: 	11/12/14
UFS President: _____	_____
Provost: _____	_____