

Civil, Environmental and Geomatics Engineering

Faculty:

~~Searlatos, P. D., Chair;~~ Yong, Y., ~~Associate Chair;~~ [Meeroff, D. E.](#), ~~Associate Chair;~~ ~~Leone, D. J., Interim Director of Geomatics;~~ Arockiasamy, M.; Berber, M.; Bloetscher, F.; Bober, W.; De Groff, D.; Gibson, L.; Kaisar, E.; ~~Meeroff, D. E.;~~ [Nagarajan, S.](#); Reddy, D. V.; ~~Rodriguez-Seda, J. D.;~~ Rosson, B.; [Scarlatos, P. D.](#); Sobhan K.; Stevanovic, A.; Teegavarapu, R.

Affiliated Faculty:

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

Adjunct Faculty:

[George, K. P.](#); [Leone, D. J.](#); [Muniz, A.](#); [Munuswamy, S.](#); [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 [by completing the Intellectual Foundations Program.](#)

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 [changinggrowing](#) 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 ~~vigorous~~ 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.

Educational Objectives and 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).

For undergraduate Civil Engineering students, the department has established the following additional educational ~~objectives at the program level:~~ ~~outcomes. Graduates will have:~~

1. ~~A proficiency~~Be proficient in the following ~~major areas of~~ civil engineering disciplines: structural engineering, transportation engineering, geotechnical engineering and water resources/environmental engineering;
2. ~~An~~Have an appreciation for the role of civil engineering in infrastructure planning, protection and sustainability;
3. ~~Succeed~~Achieve success in finding professional employment and/or pursuing further academic studies.

The Civil Engineering program outcomes are:

- 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 multi-disciplinary teams.

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- 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 life-long learning.
- j) A knowledge of contemporary issues.
- k) An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

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

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

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

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

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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 pre-professional requirements listed [above in order](#) to be accepted into 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* (see www.fau.edu/registrar/tsm.php).

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

~~In order~~ 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)
Public Speaking	3	(one 3-credit course)
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)
Engineering 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)

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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, ~~except for humanities and social science courses not applied toward Writing Across Curriculum (Gordon Rule) writing requirements~~. 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
<u>Intellectual Foundations Program: Society and Human Behavior Courses (1), (3)</u>		<u>6</u>
<u>Intellectual Foundations Program: Global Citizenship Courses Social Sciences (1),(3),(4)</u>		<u>9</u> 6
<u>Intellectual Foundations Program: Creative Expressions Courses Humanities (1),(3),(4)</u>		<u>9</u> 6
Total		24

Basic Mathematics and Sciences		
Calculus for Engineers 1 (1),(5)	MAC 2281	4
Calculus for Engineers 2 (1),(5)	MAC 2282	4

Calculus with Analytic Geometry 3	MAC 2313	4
Engineering Mathematics 1	MAP 3305	3
Probability and Statistics for Engineers	STA 4032	3
Engineering Chemistry (1)	EGN 2095	3
Engineering Chemistry Lab (1)	EGN 2095L	1
Physics for Engineers 1 (1),(6)	PHY 2043	3
General Physics 1 Lab	PHY 2048L	1
Physics for Engineers 2 (1),(6)	PHY 2044	3
General Physics 2 Lab	PHY 2049L	1
Fundamentals of Surveying	SUR 2104C	3
Total		33

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Engineering Fundamentals		
Fundamentals of AutoCAD	CGN 2327	3
Fundamentals of Engineering	EGN 1002	3
Computer Applications in Engineering 1 Programming Elective (7)	EGS2231	3
Statics	EGN 3311	3
Dynamics	EGN 3321M 3400 or EOC 3113	3
Strength of Materials	EGN 3331M 3524 or EOC 3150	3
Engineering Thermodynamics-Science Elective (8)	EGN 3343	3
Total		21

Professional Core (69)		
Soil Mechanics (740)	CEG 3011C	3
Foundation Engineering	CEG 4012	3
Analysis of Structures (740)	CES 3102C	3
Structural Steel Design	CES 4605	3

Reinforced Concrete Design	CES 4702	3
Civil Engineering Materials (7+0)	CGN 3501C	3
<u>Undergraduate Research in Civil Engineering 1</u>	<u>CGN 3910</u>	<u>1</u>
<u>Undergraduate Research in Civil Engineering 2</u>	<u>CGN 4910</u>	<u>1</u>
Civil Engineering Design 1 (2), (7) (+0)	CGN 4803C	3
Civil Engineering Design 2 (2), (7) (+0)	CGN 4804C	3 2
Applied Hydraulics (7+0)	CWR 3201C	3
Hydrologic Engineering	CWR 4202	3
Environmental Science and Engineering (7+0)	ENV 3001	3
Water and Wastewater Treatment Systems	ENV 4514	3
Introduction to Transportation Engineering (7+0)	TTE 3004C	3
Transportation Planning and Logistics (7+0)	TTE 4005C	3
Total		41

Technical Electives, <u>9.6</u> credits (8+)		
Students select <u>6.9</u> credits from a list of approved technical electives.		
Construction Project Management	CCE 4031	3
Pavement Design	CEG 4126	3
Seminar in Transportation Planning and Management	TTE 4105	3
<u>Engineering Economics</u>	<u>EGN 4613</u>	<u>3</u>
GIS Application in Civil Engineering	CGN 4321	3
Stormwater Modeling and Management	CWR 4307	3
Total		9

Notes:

(1) Contributes to University Core Curriculum requirements.

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- (2) Contributes to Writing Across Curriculum (Gordon Rule) writing requirement.
- (3) ~~Intellectual Foundations Program courses, Social Sciences/Humanities courses~~, totaling 6 ~~or more credits~~, must be selected to satisfy Writing Across Curriculum (Gordon Rule) writing requirements.
- (4) ~~Two or more of the selections must have a global perspective (contact the department for a list of acceptable courses).~~
- (45) Contributes to Gordon Rule mathematics requirement.
- (56) PHY 2048 and PHY 2049 (4 credits each) are acceptable substitutes, but only 6 credits will apply toward the degree.
- (7) ~~See department for the list of approved computer programming electives.~~
- (8) ~~See department for the list of approved engineering science electives.~~
- (69) All professional core courses contain a communications component (writing or speaking).
- (740) Includes a 1-credit laboratory.
- (814) ~~63~~ credits may be taken from a [Civil Department of Civil, Environmental & 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
Engineering General-Chemistry +	EGN 2095CHM 2045	3
Engineering General-Chemistry + Lab	ENG 2095LCHM 2045L	1
Calculus for Engineers 1	MAC 2281	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 for Engineers 2	MAC 2282	4
Fundamentals of AutoCAD	CGN 2327	3
Social Science/Humanities		3

Second Year, Fall (14 credits)		
Physics for Engineers 2	PHY 2044	3
General Physics 2 Lab	PHY 2049L	1

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Calculus with Analytic Geometry 3	MAC 2313	4
Fundamentals of Surveying C for Engineers	SUR 2104 CEEL 2161	3
Intellectual Foundations Course Science/Humanities		3

Second Year, Spring (15 credits)		
Engineering Mathematics 1	MAP 3305	3
Statics	EGN 3311M 3510 or EOC 3105	3
Computer Applications in Engineering [Surveying Elective	EGS 2231-	3
Intellectual Foundations Courses Science/Humanities		6

Second Year, Summer (9 credits)		
Strength of Materials	EGN 3331 EGM 3524 or EOC 3150	3
Engineering Thermodynamics Science Elective	EGN 3343	3
Intellectual Foundation Course Science/Humanities		3

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

Engineering		
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Third Year, Spring (165 credits)		
Soil Mechanics	CEG 3011C	3
Environmental Science and Engineering Hydrologic Engineering	ENV 3001C CWR 4202	3
Dynamics Analysis of Structures	EGN 3321CES 3102C	3
Undergraduate Research in Civil Engineering 1 Fundamentals of AutoCAD	CGN 39102327	13
Intellectual Foundations Courses Transportation Planning and Logistics	TTE 4005C	63

Fourth Year, Fall (165 credits)		
Foundation Engineering	CEG 4012	3
Structural Steel Design	CES 4605	3
Reinforced Concrete Design	CES 4702	3
Civil Engineering Design 1	CGN 4803C	3
Undergraduate Research in Civil Engineering 2 Dynamics	CGN 4910 EGM 3400 or EOC 3113	13
Civil Engineering Technical Elective Social Science/Humanities		3

Fourth Year, Spring (15+ credits)		
Civil Engineering Design 2	CGN 4804C	32
Transportation Planning and Logistics	TTE 4005C	3
Water and Wastewater Treatment Systems	ENV 4514	3
Hydrologic Engineering Reinforced Concrete Design	CWR 4202CES 4702	3
Civil Engineering Technical Elective		3

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: ~~Areas especially appropriate for civil engineering include:~~

[Business Administration \(College of Business\)](#)

[Economics \(Department of Economics\)](#)

[French, German, Japanese, Italian or Spanish \(Department of Languages, Linguistics, and Comparative Literature\)](#)

[International Economics \(Department of Economics\)](#)

[Geomatics Engineering certificate program \(Department of Civil, Environmental and Geomatics Engineering\) \(highly recommended\)](#)

[Geomatics Engineering Minor \(Department of Civil, Environmental and Geomatics Engineering\) \(highly recommended\)](#)

[Geographic Information Systems \(Department of Geosciences\) certificate program \(highly recommended\)](#)

[Geography \(Department of Geosciences\)](#)

[Geology \(Department of Geosciences\)](#)

[Mathematics \(Department of Mathematical Sciences\)](#)

[Public Management \(School of Public Administration\)](#)

[Statistics \(Department of Mathematical Sciences\)](#)

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, Co-operative Education does not substitute for the civil engineering technical elective. For information, contact the department co-op advisor or the Office of Engineering Career Development at 561-297-2694.

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Combined degree Program

B.S.C.V. to M.S. Degree Program

With an approximate duration of five years, the combined Bachelor of Science in Civil Engineering to Master of Science program provides an attractive way for students to continue their graduate work. Students may count 96 credits of approved undergraduate coursework toward both their B.S.C.V. and M.S. degrees. One of the three courses must be at the graduate

level.

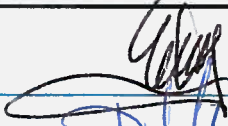




Prerequisite Coursework for Transfer Students

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* (see www.fau.edu/registrar/tsm.php).

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.

To be eligible for the joint B.S.C.V./M.S. program, students must:

1. Have a cumulative GPA of 3.25 or higher (FAU and transfer courses);
2. Have a total institution GPA of 3.25 or higher (FAU courses); and
3. Formally apply to the joint program, completing the admissions process at least one semester prior to beginning the M.S. portion of the program.

<u>Approved by:</u>	<u>Date:</u>
Department Chair: 	10/30/13
College Curriculum Chair: 	10/30/13
College Dean: 	10/31/2013
UUPC Chair: 	11/7/13
Undergraduate Studies Dean: 	11/4/13