**Geomatics Engineering**

**Bachelor's Program**

The program of study leading to the Bachelor of Science in Geomatics Engineering (B.S.G.E.) deals with designing solutions to measure, map, model, analyze and graphically display the real world. Graduates will explore cutting edge technology in image processing, digital photogrammetry, remote sensing, satellite-based global positioning, geographic information systems, laser scanning and digital mapping.

The B.S.G.E. program is accredited by the Engineering Accreditation Commission of ABET, [http://www.abet.org](http://www.abet.org/).

Students complete coursework in basic science and mathematics, engineering sciences and the main disciplines in geomatics engineering. Because of the major impact geomatics engineers have on society, the curriculum also requires students to complete the [Intellectual Foundations Program.](http://www.fau.edu/academic/registrar/PREcatalog/degreerequirements.php#intellectual)This area of study also offers a minor in Geomatics Engineering and a certificate in Surveying and Mapping.

**~~Geomatics Engineering Vision and Mission~~** ~~The Geomatics Engineering program strives to deliver a quality educational experience in surveying, mapping and emerging geomatics technologies throughout the FAU service area and beyond, and makes a significant contribution to the needs of a growing southeast Florida community. Program faculty focuses on student-centered learning methodologies that require students to be active, responsible participants in their own learning.

This program values ethical behavior, critical thinking, innovation, individual responsibility, thoughtful risk taking, teamwork and leadership.

The Program’s mission and values statements clearly support the missions of the College and the University. In addition, the Geomatics Engineering Program felt it important to clearly state the values it wants to impart to its students – directly and indirectly – as evidenced by its interactions within the program, the geomatics profession, and the community.~~

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

The Geomatics Engineering Program at Florida Atlantic University is dedicated to graduating geomatics engineers who, within a few years after graduation will:

A. **Practice geomatics engineering** within the general areas of boundary and land surveying, geographic information systems (GIS), photogrammetry, remote sensing, mapping, geodesy, and global navigation satellite systems in the organizations that employ them;

B. **Advance their knowledge of geomatics 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 community, the region, the state and the nation.

**Geomatics Engineering Student Outcomes**
The educational objectives of the Bachelor of Science in Geomatics 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 – specifically, graduates will have an advanced understanding of the following areas of geomatics engineering: 1) Surveying, including but not limited to, boundary and land surveying, subdivision and plat creation, control surveys, construction surveys; 2) Geographic Information Systems (GIS); 3) Photogrammetry and Remote Sensing; 4) Mapping, to include but no limited to topographic maps, cadastral maps and land use maps; 5) Geodesy; and 6) Global Navigation Satellite Positioning Systems (GPS, GLONASS, etc.).~~

(1) an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics

(2) an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors

(3) an ability to communicate effectively with a range of audiences

(4) an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts

(5) an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives

(6) an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions

(7) an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

[Link to Geomatics Engineering Minor](http://www.fau.edu/academic/registrar/PREcatalog/engineering.php#geominor)

[Link to Surveying and Mapping](http://www.fau.edu/academic/registrar/PREcatalog/engineering.php#geocert) [Certificate](http://www.fau.edu/academic/registrar/PREcatalog/engineering.php#geocert)

[Link to Combined Program](http://www.fau.edu/academic/registrar/PREcatalog/engineering.php#bsge)



**Bachelor of Science in Geomatics Engineering** (Changes effective fall 2017.)
*(Requires 120 credits.)*

**Admission Requirements**
All students must meet the minimum admission requirements of the University. Please refer to the [Admissions section](http://www.fau.edu/academic/registrar/PREcatalog/admissions.php) of this catalog.

All students must meet the preprofessional requirements listed [above](http://www.fau.edu/academic/registrar/PREcatalog/engineering.php#preprof) in order to be accepted into the Geomatics 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*.](http://www.fau.edu/registrar/registration/transfer.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.
 **Degree Requirements**
The Bachelor of Science in Geomatics 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.G.E. in Geomatics Engineering degree (see below);

3. Take the National Council of Examiners for Engineering and Surveying (NCEES) Fundamentals of Surveying Examination (the first of two exams necessary for the professional surveyors and mappers license). Contact Geomatics Engineering for details.

**Curriculum**
The Bachelor of Science in Geomatics Engineering degree requires 120 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.

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| **Intellectual Foundations Program (39 credits)****~~General Studies~~** |
| [Intellectual Foundations Program:](http://www.fau.edu/academic/registrar/PREcatalog/degreerequirements.php#intellectual) Written Communication Courses |
|  College Writing 1 (1), (2) | ENC 1101 | 3 |
|  College Writing 2 (1), (2) | ENC 1102 | 3 |
| [Intellectual Foundations Program:](http://www.fau.edu/academic/registrar/PREcatalog/degreerequirements.php#intellectual) Society and Human Behavior Courses (1), (3) |   | 6 |
| [Intellectual Foundations Program:](http://www.fau.edu/academic/registrar/PREcatalog/degreerequirements.php#intellectual) Global Citizenship Courses (1), (3) |   | 6 |
| [Intellectual Foundations Program:](http://www.fau.edu/academic/registrar/PREcatalog/degreerequirements.php#intellectual) Humanities Courses (1), (3) |   | 6 |
| [Intellectual Foundations Program:](http://www.fau.edu/academic/registrar/PREcatalog/degreerequirements.php#intellectual) Mathematics and Quantitative Reasoning Courses**~~Basic Mathematics and Sciences~~** |
|  Calculus with Analytic Geometry 1 (1), (4) | MAC 2311 | 4 |
|  Introductory Statistics | STA 2023 | 3 |
| [Intellectual Foundations Program:](http://www.fau.edu/academic/registrar/PREcatalog/degreerequirements.php#intellectual) Science and the Natural World Courses |
|  General Physics for Engineers 1 (1) | PHY 2048 | 3 **and** |
|  General Physics 1 Lab | PHY 2048L | 1 |
| Students must take one additional course from the list below |
|  Physical Geology/Evolution of the Earth | GLY 2010C | 4 |
|  General Chemistry 1~~or Engineering Chemistry~~ | CHM 2045~~Or EGN2095~~  | 3 **and** |
|  General Chemistry 1 Lab | CHM 2045L | 1 |

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| **Additional Basic Math and Science Selected Electives (15 credits)** |
|  Introduction to Calculus with Applications | MAC 2262  | 4 **or** |
|  Calculus with Analytical Geometry 2 | MAC 2312 | 4 |
| **Or** Any mathematics course for which one of the math courses taken is a direct prerequisite |
| Introduction to Physical Geography | GEO 2200C | 3 |
| Choose any 2 courses from Foundations of Science and the Natural World Group A or B not already taken for credit | 8 |

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| **Business Electives (choose 2 from the following) (6 credits)** |
|  Introduction to Business | GEB 2011 | 3 |
|  Principles of Accounting 1 | ACG 2021 | 3 |
|  Introduction to Management and Organizational Behavior | MAN 3025 | 3 |
|  Principles of Real Estate | REE 3043 | 3 |
|  Information Systems Fundamentals | ISM 2000 | 3 |
|  Entrepreneurship | ENT 4024 | 3 |
|  Entrepreneurial Assistance Project | ENT 4934 | 3 |

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| **Engineering Fundamentals (12 credits)** |
| Fundamentals of Engineering | EGN 1002 | 3 |
| ~~Introduction to Geomatics Engineering~~ | ~~SUR 2034~~ | ~~3~~ |
| Geomatics  | SUR3103 | 2 **AND** |
| Geomatics Lab | SUR 3103L | 1 |
| Engineering Graphics Elective |  |  |
|  Engineering Graphics  | EGN1111C | 3 **OR** |
|  Computer Aided Design | CGN 2327 | 3 |
| Computer Programming Elective  |  |  |
|  Introduction to Programming in C OR | COP 2220 | 3 **OR** |
|  Computer Applications in Engineering 1 | EGN 2213 | 3 |

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| **Construction Engineering Core (12 credits)** |
| Construction Project Management | CCE 4031 | 3 |
| Introduction to Laser Mapping Technology | CCE 4516 | 3 |
| Engineering and Construction Surveying | SUR 3205 | 2 |
| Engineering and Construction Surveying Lab | SUR 3205L | 1 |
| Introduction to Transportation Engineering (5) | TTE 3004C | 3 **or** |
| Thermal Infrared Remote Sensing and Applications | SUR 4384 | 3 |

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| **Surveying Engineering Core (12 credits)** |
| Automated Surveying and Mapping/Lab | SUR 3141/L | 2+1 |
| Geodesy and Geodetic Positioning/Lab | SUR 4530/L | 2+1 |
| Measurement Theory and Data Adjustments | SUR 3643 | 3 |
| Cadastral Principles and Legal Aspects | SUR 4403 | 3 |

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| **~~Professional Core (6)~~ Capstone Design (6 credits)** |
| ~~Fundamentals of Surveying~~ | ~~SUR 2101~~ | ~~2~~ |
| ~~Fundamentals of Surveying Lab~~ | ~~SUR 2101L~~ | ~~1~~ |
| ~~Fundamentals of AutoCAD~~ | ~~CGN 2327~~ | ~~3~~ |
| ~~Computer Applications in Engineering 1~~ | ~~EGN 2213~~ | ~~3~~ |
| ~~Introduction to Mapping and GIS (7)~~ | ~~GIS 3015C~~ | ~~3~~ |
| ~~Surveying Data Analysis~~ | ~~SUR 3643~~ | ~~3~~ |
| ~~Digital Photogrammetry Principles andApplications (8)~~ | ~~SUR 4331~~ | ~~2~~ |
| ~~Digital Photogrammetry Principles and Applications Lab (8)~~ | ~~SUR 4331L~~ | ~~1~~ |
| ~~Automated Surveying and Mapping~~ | ~~SUR 3141~~ | ~~2~~ |
| ~~Automated Surveying and Mapping Lab~~ | ~~SUR 3141L~~ | ~~1~~ |
| ~~Principles of Geographic Information Systems (7)~~ | ~~GIS 4043C~~ | ~~3~~ |
| ~~Introduction to Geodesy~~ | ~~SUR 3530~~ | ~~3~~ |
| ~~Engineering and Construction Surveying~~ | ~~SUR 3205~~ | ~~2~~ |
| ~~Engineering and Construction Surveying Lab~~ | ~~SUR 3205L~~ | ~~1~~ |
| ~~Land Subdivision and Platting~~ | ~~SUR 3463~~ | ~~2~~ |
| Subdivision Design AND | SUR 3463 | 2 **AND** |
| Land Subdivision and Platting Lab | SUR 3463L | 1 |
| Capstone Selected Elective  |  |  |
|  Engineering Technology Capstone  | ETG 4951  | 3 **OR** |
|  Civil, Environmental and Geomatics Engineering Design 1 | CGN 4803C | 3 |
| ~~Remote Sensing of the Environment (7)~~ | ~~GIS 4035C~~ | ~~3~~ |
| ~~Legal Aspects of Surveying~~ | ~~SUR 4403~~ | ~~3~~ |
| ~~Satellite Positioning~~ | ~~SUR 4531~~ | ~~2~~ |
| ~~Satellite Positioning Lab~~ | ~~SUR 4531L~~ | ~~1~~ |
| ~~Civil, Environmental and Geomatics Engineering Design 2~~ | ~~CGN 4804C~~ | ~~3~~ |
| ~~Introduction to Terrestrial Laser Scanning~~ | ~~SUR 4150C~~ | ~~3~~ |

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| **Technical Electives (select 18 credits from the list below)** |
| Any approved College of Engineering and Computer Science course 3000 level or above |
| **GIS Technology Core Option (12 credits)** |
| Introduction to Mapping and GIS (7) | GIS 3015C | 3 |
| Principles of Geographic Information Systems (7) | GIS 4043C | 3 |
| Remote Sensing of the Environment (7) | GIS 4035C | 3 |
| Digital Image Processing Elective |
|  Digital Image Analysis (5) | GIS 4037C or | 3 |
|  Digital Photogrammetry Principles and Applications/Lab  | SUR 4331/L | 2+1 |
| Any course from the following list |
| ~~Transportation Operations and LogisticsManagement~~ | ~~TTE 4105~~ | ~~3~~ |
| ~~Construction Project Management~~ | ~~CCE 4031~~ | ~~3~~ |
| ~~GIS for Civil Engineering Applications~~ | ~~CGN 4321~~ | ~~3~~ |
| ~~Programming in GIS~~ | ~~GIS 4102C~~ | ~~3~~ |
| ~~Field Methods~~ | ~~GLY 4750C~~ | ~~3~~ |
| ~~Hydrogeology~~ | ~~GLY 4822~~ | ~~3~~ |
| ~~Transportation and Spatial Organization~~ | ~~GEO 4700~~ | ~~3~~ |
| ~~Application in GIS~~ | ~~GIS 4048C~~ | ~~3~~ |
| ~~Introduction to Hydrogeology Modeling andAquifer Test~~ | ~~GLY 4832C~~ | ~~3~~ |
| ~~Digital Image Analysis~~ | ~~GIS 4037C~~ | ~~3~~ |
| ~~Geovisualization and GIS~~ | ~~GIS 4138C~~ | ~~3~~ |
| ~~Engineering Geology~~ | ~~GLY 4830~~ | ~~3~~ |
| ~~Entrepreneurship~~ | ~~ENT 4024~~ | ~~3~~ |
| ~~Business Law 1~~ | ~~BUL 4421~~ | ~~3~~ |
| ~~Engineering Economics~~ | ~~EGN 4613~~ | ~~3~~ |
| ~~Hydrographic Surveying (7)~~ | ~~SUR 4302~~ | ~~3~~ |
| ~~Hydrographic Surveying Lab (7)~~ | ~~SUR 4302L~~ | ~~1~~ |
| ~~Thermal Infrared Remote Sensing andApplications~~ | ~~SUR 4384~~ | ~~3~~ |
| **~~Total~~** | **~~6~~** |
| Engineering Professional Internship | EGN 3941 | 0-4 |
| Professional Internship | IDS 3949 | 0-1 |
| ~~Transportation Operations and Logistics Management~~ | ~~TTE 4105~~ | ~~3~~ |
| ~~Construction Project Management~~ | ~~CCE 4031~~ | ~~3~~ |
| ~~GIS for Civil Engineering Applications~~ | ~~CGN 4321~~ | ~~3~~ |
| Introduction to Mapping and GIS  | GIS 3015C | 3 |
| Environmental Issues in Atmospheric and Earth Science | EVR 3704 | 3 |
| Sea-Level Rise: Impacts and Responses  | GEO 3342 | 3 |
| Quantitative Methods | GEO 4022 | 3 |
| Spatial Data Analysis | GEO 4167C | 3 |
| Water Resources | GEO 4280C | 3 |
| Biogeography | GEO 4300 | 3 |
| Urban Geography  | GEO 4602 | 3 |
| Transportation and Spatial Organization | GEO 4700 | 3 |
| Digital Image Analysis (5) | GIS 4037C | 3 |
| Applications of GIS (5) | GIS 4048C | 3 |
| Programming in GIS (5) | GIS 4102C | 3 |
| Geovisualization and GIS (5) | GIS 4138C | 3 |
| Coastal and Marine Science | GLY 3730 | 3 |
| Field Methods (5) | GLY 4750C | 3 |
| Hydrogeology | GLY 4822 | 3 |
| Engineering Geology | GLY 4830 | 3 |
| Introduction to Hydrogeology Modeling and Aquifer Test (5) | GLY 4832C | 3 |
| Planning Methods  | URP 4011 | 3 |
| City Structure and Change  | URP 4055 | 3 |
| Planning Implementation Strategies  | URP 4120 | 3 |
| Introduction to Visual Planning Technology  | URP 4254 | 3 |
| Plan Making and Design  | URP 4343 | 3 |
| Sustainable Cities  | URP 4403 | 3 |
| Environmental Planning Methods  | URP 4420 | 3 |
| Urban Development Planning Methods  | URP 4546 | 3 |
| Capital Facilities Planning  | URP 4730 | 3 |
| Site Planning  | URP 4870 | 3 |
| Marketing Management | MAR 3023 | 3 |
| Principles of Financial Management | FIN 3403 | 3 |
| Advanced Business Planning  | ENT 4114  | 3 |
| New Venture Launch | ENT 4015 | 3 |
| Entrepreneurship Internship  | ENT 4940 | 1-4 |
| Leadership, Supervisory Skills, and Team Development | MAN 4046 | 3 |
| ~~Entrepreneurship~~ | ~~ENT 4024~~ | ~~3~~ |
| ~~Business Law 1~~ | ~~BUL 4421~~ | ~~3~~ |
| ~~Engineering Economics~~ | ~~EGN 4613~~ | ~~3~~ |
| ~~Hydrographic Surveying (7)~~ | ~~SUR 4302~~ | ~~3~~ |
| ~~Hydrographic Surveying Lab (7)~~ | ~~SUR 4302L~~ | ~~1~~ |
| ~~Thermal Infrared Remote Sensing andApplications~~ | ~~SUR 4384~~ | ~~3~~ |

**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 credits, must be selected to satisfy Writing Across Curriculum (Gordon Rule) writing requirements.

(4) Contributes to Gordon Rule mathematics requirement.

~~(5) PHY 2049 (4 credits) is an acceptable substitute, but only 3 credits will apply toward the degree.~~
~~(6) All professional core courses contain a communications component (writing or speaking).~~
(5 ~~7~~) Includes a 1-credit laboratory.

~~(8) GIS 4023 is an acceptable substitute.~~

~~(9) Up to 6 credits may be taken from the Department of Civil, Environmental and Geomatics Engineering graduate courses. This is highly recommended for students planning to pursue the B.S./M.S.~~

~~(6 10) Consult an engineering advisor for a list of appropriate courses.~~

**Sample Four-Year Program of Study**For the sample four-year program of study for the Bachelor of Science in Geomatics Engineering, refer to the [Curriculum Sheets and Flight Plans](http://www.fau.edu/uas/curriculum.php) by major.

**Minors and Certificate Programs Appropriate for Geomatics Engineering**
~~Geomatics engineering encompasses many disciplines. Various departments offer minors and certificate programs that augment a student's geomatics engineering education. Students are encouraged to pursue a minor or certificate, such as:~~***~~Business Administration~~***~~(College of Business)~~***~~Geographic Information Systems~~******~~certificate program,~~***~~highly recommended (Department of Geosciences)~~***~~Geography~~***~~(Department of Geosciences)~~***~~Geology~~***~~(Department of Geosciences)~~***~~Mathematics~~***~~(Department of Mathematical Sciences)~~***~~Statistics~~***~~(Department of Mathematical Sciences)~~

Various departments offer minors and certificate programs that augment a student's engineering education. The faculty encourages students to pursue a minor or certificate, such as:

~~Geomatics engineering encompasses many disciplines. Various departments offer minors and certificate programs that augment a student's geomatics engineering education. Students are encouraged to pursue a minor or certificate, such as~~:

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

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

***Computer Science Minor*** (Department of Computer Engineering, Electrical Engineering, and Computer Science)

***Entrepreneurial Management Minor*** (College of Business)

***~~Geography~~***~~(Department of Geosciences)~~***~~Geology~~***~~(Department of Geosciences)~~***~~Mathematics~~***~~(Department of Mathematical Sciences)~~***~~Statistics~~***~~(Department of Mathematical Sciences)~~

Obtaining a minor or certificate will require completing credits beyond the 120 required for the B.S.G.E. in Geomatics Engineering. Contact the department offering the minor or certificate for more details.

**~~Cooperative Education~~** ~~Geomatics Engineering majors are strongly encouraged to gain practical experience through participation in Cooperative Education. For information, contact the FAU Career Center, 561-297-3533 or visit its website at~~[~~www.fau.edu/cdc.~~](http://www.fau.edu/cdc/)

**Internships ~~Cooperative Education~~**
Students are strongly encouraged to gain practical experience through participation in internship opportunities. However, internships may only substitute for one technical elective with prior approval from the department chair and only if taken for a grade (IDS 3949, Professional Internship or EGN 3941, Engineering Professional Internship). ~~Geomatics Engineering majors are strongly encouraged to gain practical experience through participation in Cooperative Education. For information, contact the FAU Career Center, 561-297-3533 or visit its website at~~[~~www.fau.edu/cdc.~~](http://www.fau.edu/cdc/)

**Geomatics Engineering Minor**

Students minoring in Geomatics Engineering will complete a minimum of 18 credits with a grade of "C" or better in each course. Of the18 credits, a minimum of 15 must be earned at FAU. Selected courses must be checked for the proper requirements. The minor is available to all full-time FAU students pursuing a declared major.

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| **Required Courses (**~~9~~ **3 credits)** |
| ~~Introduction to Geomatics Engineering~~ | ~~SUR 2034~~ | ~~3~~ |
| Geomatics ~~Fundamentals of Surveying (1)~~ | SUR 3103~~SUR 2101~~ | 2 |
| Geomatics~~Fundamentals of Surveying Lab (1)~~ | SUR 3103L~~SUR 2101L~~ | 1 |
| ~~Fundamentals of AutoCAD~~ | ~~CGN 2327~~ | ~~3~~ |

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| **Select additional courses from below for a minimum of ~~9~~ 15 credits** |
| Digital Photogrammetry Principles andApplications (2) with lab | SUR 4331 ANDSUR 4331L | 2+1 |
| ~~Digital Photogrammetry Principles and Applications Lab (2)~~ | ~~SUR 4331L~~ | ~~1~~ |
| Measurement Theory and Data Adjustments (3) | SUR 3643 | 3 |
| ~~Surveying Data Analysis (3)~~ | ~~SUR 3643~~ | ~~3~~ |
| Automated Surveying and Mapping (2) with Lab | SUR 3141 ANDSUR 3141L | 2+1 |
| ~~Automated Surveying and Mapping Lab (2)~~ | ~~SUR 3141L~~ | ~~1~~ |
| Subdivision Design withLand Subdivision and Platting Lab (2) | SUR 3463ANDSUR 3463L | 2+1 |
| ~~Land Subdivision and Platting (2)~~ | ~~SUR 3463~~ | ~~2~~ |
| ~~Land Subdivision and Platting Lab (2)~~ | ~~SUR 3463L~~ | ~~1~~ |
| Engineering and Construction Surveying (2 ~~4~~) with Lab | SUR 3205ANDSUR 3205L | 2+1 |
| ~~Engineering and Construction Surveying Lab (4)~~ | ~~SUR 3205L~~ | ~~1~~ |
| ~~Introduction to Geodesy (5)~~ | ~~SUR 3530~~ | ~~3~~ |
| ~~Satellite Positioning (6)~~ | ~~SUR 4531~~ | ~~2~~ |
| ~~Satellite Positioning Lab (6)~~ | ~~SUR 4531L~~ | ~~1~~ |
| ~~Legal Aspects of Surveying (2)~~ | ~~SUR 4403~~ | ~~3~~ |
| Geodesy and Geodetic Positioning with Lab (4) | SUR 4530AND SUR 4530L | 2+1 |
| Cadastral Principles and Legal Aspects (4) | SUR 4403 | 3 |
| Principles of Geographic Information System | GIS 4043C | 3 |
| ~~Introduction to Terrestrial Laser Scanning~~ | ~~SUR 4150C~~ | ~~3~~ |
| Any other Surveying or Mapping Technical Course as determined by the department | 3 |

 **Notes:**
(1) Requires knowledge of geometry and trigonometry.

(2) Requires ~~SUR 2101/SUR 2101L, Fundamentals of Surveying and Lab~~ SUR3103/SUR3103L, Geomatics and Lab, as prerequisites.

(3) ~~Requires SUR 2101/SUR 2101L, Fundamentals of Surveying and Lab, and MAC 2312 as prerequisites; and STA 4032 as corequisite.~~ Requires SUR3103/SUR3103L, Geomatics and Lab and introductory statistics, as prerequisites.

(4) ~~Requires SUR 3643, Surveying Data Analysis, as a prerequisite.~~ Requires SUR3141/SUR 3141L, Automated Surveying and Mapping with Lab, as prerequisites.

~~(5) Requires MAC 2312 or MAC 2282, as a prerequisite.

(6) Requires SUR 3530, Introduction to Geodesy, as a prerequisite.~~**Surveying and Mapping** **Certificate**
The Department of Civil, Environmental & Geomatics Engineering ~~program~~ offers undergraduates a certificate in Surveying and Mapping. Students are entitled to the certificate by completing a minimum of 12credits of coursework with a grade of "C" or better. Selected courses must be checked for the proper prerequisites. The certificate is open to both degree-seeking and non-degree-seeking students.

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| **Required Courses (3 ~~6~~ credits)** |
| ~~Introduction to Geomatics Engineering~~ | ~~SUR 2034~~ | ~~3~~ |
| Geomatics (1)~~Fundamentals of Surveying (1)~~ | SUR3103~~SUR 2101~~ | 2 |
| Geomatics Lab (1)~~Fundamentals of Surveying Lab (1)~~ | SUR3103L~~SUR 2101L~~ | 1 |

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| **Select additional courses from below for a minimum of 9 ~~6~~ credits** |
| Digital Photogrammetry Principles andApplications (2) | SUR 4331 | 2 |
| Digital Photogrammetry Principles and Applications Lab (2) | SUR 4331L | 1 |
| Automated Surveying and Mapping (2) | SUR 3141 | 2 |
| Automated Surveying and Mapping Lab (2) | SUR 3141L | 1 |
| Geodesy and Geodetic Positioning (4) | SUR 4530 | 2 |
| Geodesy and Geodetic Positioning Lab (4) | SUR 4530L | 1 |
| Measurement Theory and Data Adjustments (3) | SUR 3643 | 3 |
| ~~Land Subdivision and Platting (2)~~ | ~~SUR 3463~~ | ~~2~~ |
| ~~Land Subdivision and Platting Lab (2)~~ | ~~SUR 3463L~~ | ~~1~~ |
| Engineering and Construction Surveying (~~2~~ 4) | SUR 3205 | 2 |
| Engineering and Construction Surveying Lab (~~2~~ 4) | SUR 3205L | 1 |
| Cadastral Principles and Legal Aspects (~~2~~ 4)~~Legal Aspects of Surveying (2)~~ | SUR 4403 | 3 |
| Thermal Infrared Remote Sensing and Applications | SUR 4384 | 3 |
| Principles of Geographic Information System | GIS 4043C | 3 |
| Introduction to Laser Mapping Technology~~Introduction to Terrestrial Laser Scanning~~ | CCE 4516~~SUR 4150C~~ | 3 |

**Notes:**
(1) Requires knowledge of geometry and trigonometry.

(2) Requires SUR3103/SUR3103L – Geomatics and Lab, ~~SUR 2101/SUR 2101L, Fundamentals of Surveying and Lab~~, as prerequisites.

(3) Requires SUR3103/SUR3103L, Geomatics and Lab and introductory statistics, as prerequisites.

(4) Requires SUR3141/SUR 3141L, Automated Surveying and Mapping with Lab, as prerequisites.

**Combined Program**
 **B.S.G.E. to M.S. Degree Program**

This program allows FAU Bachelor of Science in Geomatics Engineering (B.S.G.E.) students the opportunity to complete the Master of Science (M.S.) with Major in Civil Engineering in less time than the traditional M.S. program. This combined degree program is intended for academically talented students and high achievers. After application and admittance to the M.S. graduate program at the beginning of the senior year, up to 9 credits of approved graduate-level courses may be taken and counted toward both the B.S.G.E. and the M.S. with Major in Civil Engineering degrees as long as the following criteria are met:

1. The student has met the minimum of 120 credits for the B.S.G.E. degree, and

2. The student has taken a minimum of 30 credits (5000 level or higher) for the M.S. with Major in Civil Engineering.

The combined degree program is 150~~-153~~ credits, 120 for the undergraduate degree and 30~~-33~~ for the master's degree. ~~The M.S. thesis option is 30 credits and the M.S. project is 33 credits.~~ Students complete the undergraduate degree first, taking no more than 9 credits of graduate coursework in their senior year, which will then be used to satisfy both degrees.

**~~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~~*~~.~~](http://www.fau.edu/registrar/registration/transfer.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.G.E./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.

Preprofessional Program (Changes effective fall 2018.)

Entering freshmen and all transfer students will be admitted directly to the College's preprofessional program as pre-engineering students. The following are required for students to be admitted to their major of choice in the College of Engineering and Computer Science:

1. Students must meet University admission requirements.

2. In each core course listed below, students must obtain a minimum grade of “C.” Advanced placement scores of 4 or above will be given credit for the appropriate course(s). A score of 5 is equivalent to an "A," and a score of "4" is equivalent to a "B."

 3. A maximum of two attempts will be allowed for any of the listed courses. Failure to receive a passing grade in the second attempt is grounds for denial of admission to an engineering or computer science program.

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| Electrical and Computer Engineering |
| Calculus with Analytic Geometry 1 (1) | MAC 2311 | 4 |
| Calculus with Analytic Geometry 2 (2) | MAC 2312 | 4 |
| General Physics for Engineers 1 | PHY 2048 | 3 |

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| Civil, Environmental, Mechanical and Ocean Engineering |
| Calculus with Analytic Geometry 1 (1) | MAC 2311 | 4 |
| General Physics for Engineers 1 | PHY 2048 | 3 |

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| Computer Science |
| Precalculus Algebra and Trigonometry (3) | MAC 1147 | 5 |
| Introduction to Programming in C | COP 2220 | 3 |

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| Geomatics Engineering |
| ~~Precalculus Algebra and Trigonometry (3)~~ | ~~MAC 1147~~ | ~~5~~ |
| ~~Geomatics~~ | ~~SUR 3103~~ | ~~2~~ |
| Calculus with Analytic Geometry 1 (1) | MAC 2311 | 4 |

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| ~~Environmental Engineering~~ |
| ~~Precalculus Algebra and Trigonometry (3)~~ | ~~MAC 1147~~ | ~~5~~ |
| ~~General Chemistry 1~~ | ~~CHM 2045~~ | ~~3~~ |

Notes:
(1) MAC 2311 and MAC 2253 are substitutes.

(2) MAC 2312 and MAC 2254 are substitutes.

(3) MAC 1140 and MAC 1114 are substitutes.