**Engineering Technology ~~Geomatics Engineering~~**
**Bachelor's Program**

Graduates of the Bachelor of Science in Engineering Technology (B.S.E.T) will have the technical and managerial skills necessary to enter careers in planning, design, construction, operation or maintenance of the built environment and global infrastructure in support of engineering projects.

~~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 program strives to deliver a top class educational experience in engineering technologies throughout the FAUservice area and beyond, and makes a significant contribution to the needs of a growing southeast Florida community. Program faculty focus on student-centered learning methodologies that require students to be active, responsible participants in their own learning. This program values ethical behavior, use of state-of-the-art tools and equipment, problem solving, innovation, individual responsibility, thoughtful risk taking, teamwork and leadership.

~~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**The Bachelor of Science in Engineering Technology program at Florida Atlantic University is dedicated to graduating majors who, within a few years after graduation will:

(A) Practice within engineering technical fields such as planning and preparing documents appropriate for analysis, design, and other engineering related activities in organizations that employ them

(B) Advance their knowledge of engineering practice, both formally and informally, by engaging in lifelong learning experiences, including graduate studies

(C) Serve as effective professionals, based on strong interpersonal and teamwork skills, capable of performing economic analyses and cost estimates to select appropriate engineering materials and practices related to design of engineering systems

(D) Participate as leaders in activities that support the performance of standard analysis and design in engineering fields.

~~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 positioning 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 Engineering Technology program are achieved by ensuring that graduates have the following characteristics or student outcomes:

(a) an ability to select and apply the knowledge, techniques, skills, and modern

tools of the discipline to broadly-defined engineering technology activities including utilizing modern measurement technologies to acquire data;

(b) an ability to select and apply a knowledge of mathematics, science, engineering, and technology to engineering technology problems that require the application of principles and applied procedures or methodologies;

(c) an ability to conduct standard tests and measurements; to conduct, analyze, and interpret experiments; to analyze data for conformance with precision and accuracy requirements; and to apply experimental results to improve processes;

(d) an ability to design systems, components, or processes for engineering technology problems;

(e) an ability to function effectively as a member or leader on a technical team;

(f) an ability to identify, analyze, and solve broadly-defined engineering technology problems including the use of industry-standard software to solve technical problems;

(g) an ability to apply written, oral, and graphical communication in both technical and non-technical environments; and an ability to identify and use appropriate technical literature and to apply technical concepts to the design of measurement systems to meet project requirements;

(h) an understanding of the need for and an ability to engage in self-directed

continuing professional development;

(i) an understanding of and a commitment to address professional and ethical responsibilities including a respect for diversity;

(j) a knowledge of the impact of engineering technology solutions in a societal and global context; and

(k) a commitment to quality, timeliness, and continuous improvement.

~~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 – specifically, graduates will be successful in finding professional employment, attaining professional licensure, and/or pursing further academic studies;;

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.).~~[~~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 Engineering Technology**

**~~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 Technology degree will be awarded to students who:

1. Meet all general degree requirements of the University;

2. Complete the curriculum for the B.S.E.T. ~~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****~~General Studies~~** |
| 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 |
| **~~Total~~** | **~~24~~** |

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| **Foundations of Mathematics and Quantitative Reasoning****~~Basic Mathematics and Sciences~~** |
| Calculus with Analytic Geometry 1 (1), (4) | MAC 2311 | 4 |
| ~~Calculus with Analytic Geometry 2 (1), (4)~~ | ~~MAC 2312~~ | ~~4~~ |
| ~~Engineering Math 1~~ | ~~MAP 3305~~ | ~~3~~ |
| ~~General Chemistry 1 (1)~~ | ~~CHM 2045~~ | ~~3~~ |
| Introductory Statistics | STA 2023 | 3 |
| ~~Probability and Statistics for Engineers~~ | ~~STA 4032~~ | ~~3~~ |
| ~~General Chemistry 1 Lab (1)~~ | ~~CHM 2045L~~ | ~~1~~ |
| ~~General Physics for Engineers 1 (1)~~ | ~~PHY 2048~~ | ~~3~~ |
| ~~General Physics 1 Lab~~ | ~~PHY 2048L~~ | ~~1~~ |
| ~~Physics for Engineers 2 (1), (5)~~ | ~~PHY 2044~~ | ~~3~~ |
| ~~General Physics 2 Lab~~ | ~~PHY 2049L~~ | ~~1~~ |
| ~~Introduction to Physical Geography~~ | ~~GEO 2200C~~ | ~~3~~ |
| ~~Science or Math Elective (10)~~ |  | ~~4~~ |
| **~~Total~~** | **~~33~~** |
| **Foundations of Science and the Natural World** |
| Students must take 2 from the following courses, one of which must be from Group A. The other course may be from Group A or Group B. One of the courses must have a lab. |
| Group A |
| Introduction to Astronomy | AST 2002 | 3 |
| Life Science (lab available) | BSC 1005 | 2 |
| Biological Principles (lab available) | BSC 1010 | 3 |
| Anatomy and Physiology 1 (lab available) | BSC 2085 | 3 |
| General Chemistry 1 (lab available) | CHM 2045 | 3 |
| Environmental Science and Sustainability | EVR 1001 | 3 |
| General Physics 1 (lab available) | PHY 2048 | 4 |
| College Physics 1 | PHY 2053 | 4 |
| or any course in the natural sciences for which one of the above courses is the direct prerequisite |
| Group B |
| Introduction to Biological Anthropology (lab available) | ANT 2511 | 3 |
| Nature: Intersections of Science, Engineering and the Humanities | ETG 2831 | 3 |
| Physical Geology/Evolution of the Earth | GLY 2010C | 4 |
| History of the Earth and Life | GLY 2100 | 3 |
| General Chemistry for the Health Sciences (lab available) | CHM 2032 | 3 |
| Engineering Chemistry (lab available) | EGN 2095 | 3 |
| Biodiversity (lab available) | BSC 1011 | 3 |
| Weather and Climate | MET 2010 | 3 |
| Physical Science | PSC 2121 | 3 |
| **TOTAL** | **37** |

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| **Basic Math and Science Electives** |
|  Introduction to Calculus with Applications OR | 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 |
| Choose any course from Foundations of Science and the Natural World Group A or B | 4 |
| TOTAL | 8 |

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| **Engineering Technology Fundamentals** |
| Fundamentals of Engineering | EGN 1002 | 3 |
| ~~Introduction to Geomatics Engineering~~ | ~~SUR 2034~~ | ~~3~~ |
| **~~Professional Core (6)~~** |  |  |
| Geomatics~~Fundamentals of Surveying~~ | SUR3103~~SUR 2101~~ | 2 |
| Geomatics Lab~~Fundamentals of Surveying Lab~~ | SUR 3103L~~SUR 2101L~~ | 1 |
| Engineering Graphics Elective |  |  |
|  Engineering Graphics OR | EGN1111C | 3 OR |
|  Computer Aided Design ~~Fundamentals of AutoCAD~~ | CGN 2327 | 3 |
| Computer Programming Elective  |  |  |
|  Introduction to Programming in C OR | COP 2220 | 3 OR |
|  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~~ |
| ~~Land Subdivision and Platting Lab~~ | ~~SUR 3463L~~ | ~~1~~ |
| ~~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~~ |
| ~~Total~~ |  | ~~51~~ |
| **Foundations of Business Electives (choose 2 from the following)** |  | **6** |
|  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 |
| **Total** | **18** |

Choose 3 of the following 5 Engineering Technology Core course groupings.

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| **Construction Engineering Technology Core (12 credits)** |
| Construction Project Management | CCE 4031 | 3 |
| Engineering and Construction Surveying | SUR 3205 | 2 |
| Engineering and Construction Surveying Lab | SUR 3205L | 1 |
| Introduction to Transportation Engineering (5) | TTE 3004C | 3 |
| Digital Image Processing Elective |  |  |
|  Introduction to Laser Mapping Technology OR | CCE 4516 | 3 OR |
|  Digital Photogrammetry Principles and Applications/Lab  | SUR 4331/L | 2+1 |

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| **Environmental Engineering Technology Core (12 credits)** |
| Introduction to Pollution Prevention and Sustainability | ENV 4072 | 3 |
| Oceanography | OCE 3008 | 3 |
| Remote Sensing Elective |  |  |
|  Remote Sensing of the Environment (5) OR | GIS 4035C | 3 OR |
|  Thermal Infrared Remote Sensing and Applications | SUR 4384 | 3 |
| Geo-Environmental Elective |  |  |
|  Environmental Issues in Atmospheric and Earth Science OR | EVR 3704 | 3 OR |
|  Water Resources (5) OR | GEO 4280C | 3 OR |
|  Coastal and Marine Science | GLY 3730 | 3 |

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| **Surveying Engineering Technology 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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| **Engineering Mechanics Technology Core (12 credits)** |
| Statics | EGN 3311 | 3 |
| Dynamics | EGN 3321 | 3 |
| Strength of Materials | EGN 3331 | 3 |
| Materials Elective (EGN 3365 OR CGN 3501C OR Equivalent) |  | 3 |

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| **Computing Technology Core (13 credits)\*** |
| Data Mining and Predictive Analytics | ISM 4133 | 3 |
| Introduction to Logic Design (5) | CDA 3201C | 4 |
| Foundations of Computer Science | COP 3014 | 3 |
| Data Structures | COP 3530 | 3 |

\*Computing Technology core is 13 credits, so only 17 credits of technical electives are required.

Two additional upper division computer science courses will grant minor in CS, see your advisor for more information

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| **Engineering Technology Capstone**  |
| Engineering Technology Capstone | ETG 4670 | 3 |
| Total | 3 |

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| **Engineering Technical Electives (select 17-18 credits from the list below) (6)****~~Technical Electives (select two courses from the list below) (9)~~** |
| Approved College of Engineering and Computer Science course 3000 level or above |
| Any Engineering Technology Core course not already taken |
| 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 |
| Programming in GIS (5) | GIS 4102C | 3 |
| Field Methods (5) | GLY 4750C | 3 |
| Hydrogeology | GLY 4822 | 3 |
| Transportation and Spatial Organization | GEO 4700 | 3 |
| Application in GIS (5) | GIS 4048C | 3 |
| Introduction to Hydrogeology Modeling and Aquifer Test (5) | GLY 4832C | 3 |
| Digital Image Analysis (5) | GIS 4037C | 3 |
| Geovisualization and GIS (5) | GIS 4138C | 3 |
| Environmental Issues in Atmospheric and Earth Science | EVR 3704 | 3 |
| Water Resources | GEO 4280C | 3 |
| Coastal and Marine Science | GLY 3730 | 3 |
| Engineering Geology | GLY 4830 | 3 |
| Sea-Level Rise: Impacts and Responses  | GEO 3342 | 3 |
| Quantitative Methods | GEO 4022 | 3 |
| Spatial Data Analysis | GEO 4167C | 3 |
| Biogeography | GEO 4300 | 3 |
| Urban Geography  | GEO 4602 | 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~~ |
| **Total** | **17-18 ~~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 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 Technology, 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 Technology**
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.E.T. ~~B.S.G.E. in~~ ~~Geomatics Engineering~~. Contact the department offering the minor or certificate for more details.

**Internships ~~Cooperative Education~~**
Engineering Technology 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~~**~~credits)~~** |
| ~~Introduction to Geomatics Engineering~~ | ~~SUR 2034~~ | ~~3~~ |
| ~~Fundamentals of Surveying (1)~~ | ~~SUR 2101~~ | ~~2~~ |
| ~~Fundamentals of Surveying Lab (1)~~ | ~~SUR 2101L~~ | ~~1~~ |
| ~~Fundamentals of AutoCAD~~ | ~~CGN 2327~~ | ~~3~~ |

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| **~~Select additional courses from below for a minimum of 9 credits~~** |
| ~~Digital Photogrammetry Principles andApplications (2)~~ | ~~SUR 4331~~ | ~~2~~ |
| ~~Digital Photogrammetry Principles and Applications Lab (2)~~ | ~~SUR 4331L~~ | ~~1~~ |
| ~~Surveying Data Analysis (3)~~ | ~~SUR 3643~~ | ~~3~~ |
| ~~Automated Surveying and Mapping (2)~~ | ~~SUR 3141~~ | ~~2~~ |
| ~~Automated Surveying and Mapping Lab (2)~~ | ~~SUR 3141L~~ | ~~1~~ |
| ~~Land Subdivision and Platting (2)~~ | ~~SUR 3463~~ | ~~2~~ |
| ~~Land Subdivision and Platting Lab (2)~~ | ~~SUR 3463L~~ | ~~1~~ |
| ~~Engineering and Construction Surveying (4)~~ | ~~SUR 3205~~ | ~~2~~ |
| ~~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~~ |
| ~~Principles of Geographic Information System~~ | ~~GIS 4043C~~ | ~~3~~ |
| ~~Introduction to Terrestrial Laser Scanning~~ | ~~SUR 4150C~~ | ~~3~~ |
| ~~Any other Surveying or Mapping Technical 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, as prerequisites.

(3) Requires SUR 2101/SUR 2101L, Fundamentals of Surveying and Lab, and MAC 2312 as prerequisites; and STA 4032 as corequisite.

(4) Requires SUR 3643, Surveying Data Analysis, as a prerequisite.

(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 | SUR 4530 | 2 |
| Geodesy and Geodetic Positioning Lab | SUR 4530L | 1 |
| Measurement Theory and Data Adjustments | 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) | SUR 3205 | 2 |
| Engineering and Construction Surveying Lab (2) | SUR 3205L | 1 |
| Cadastral Principles and Legal Aspects (2)~~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.