FLORIDA ATLANTIC UNIVERSITY

NEW/CHANGE PROGRAM REQUEST
Undergraduate Programs

UUPC Approval 12-2-24
UFS Approval _____
Banner _____
Catalog _____

Department Civil, Environmental and Geomatics Engineering

College Engineering and Computer Science

Program Name
Geomatics Engineering

☐ **New Program***

☑ **Change Program***

Effective Date
(TERM & YEAR)
summer 2025

Please explain the requested change(s) and offer rationale below or on an attachment.

This program changes to serve our students and bring us into compliance with the BOG.

1. Revises IFP language to the new general education language
2. Deletes the requirement for AA Transfers and student with over 60 Cr to take fundamentals of Engineering class (freshman class EGN 1002)
3. Adds Python option for classes
4. Adds RI designation to SUR 4463
5. Adds a construction track to the curriculum
6. Made minor clarifications

*All new programs and changes to existing programs must be accompanied by a catalog entry showing the new or proposed changes.

Faculty Contact/Email/Phone

Frederick Bloetscher, Ph.D., P.E., Professor, Assoc Dean for UG studies fbloetsc@fau.edu 239-250-2423

Consult and list departments that may be affected by the change(s) and attach documentation
n/a

Approved by		***Date***
Department Chair	Evangelos Kaisar	11/18/2024
College Curriculum Chair	Yalan Liu	11/21/2024
College Dean		11/21/24
UUPC Chair	Korey Sorge	12-2-24
Undergraduate Studies Dean	Dan Meeroff	12-2-24
UFS President		
Provost		

Email this form and attachments to mjenning@fau.edu seven business days before the UUPC meeting.

College of Engineering
and Computer Science

~~Geomatics Engineering~~ Geomatics Engineering

Bachelor of Science in ~~geomatics engineering~~ Geomatics Engineering (b.s.g.~~-~~e.)

(Minimum of 120 credits required)

Formatted: Space Before: 0 pt, After: 8 pt, Line spacing: Multiple 1.16 li, Pattern: Clear

Formatted: Font: 12 pt

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 in order to be accepted into the ~~Geomatics Engineering~~ Geomatics Engineering ~~Technology~~ program.

Prerequisite Coursework for Transfer Students

Students transferring to Florida Atlantic University must complete both lower-division requirements (including the requirements of the (General Education 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 Transition *Guides*.

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~~ 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~~ 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~~ Geomatics Engineering for details.

Curriculum

The Bachelor of Science in ~~Geomatics Engineering~~ 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.

1. University General Education Program – Students who have earned a bachelor's degree from a four-year accredited institution of higher education or an A.A. degree from a Florida state college or state university in Florida are deemed to have completed the General Education Requirements. (1)
2. Pre-Engineering Requirements – Students must complete the pre-engineering requirements to declare major.
3. Math requirements

Calculus with Analytic Geometry 1 (4)	MAC 2311	4
Calculus with Analytic Geometry 2 (4)	MAC 2312	4 **or**
Introduction to Calculus with Applications	MAC 2210	4
Probability and Statistics 1	STA 4442	3 **or**
Probability and Statistics for Engineers	STA 4032	3 **or**
Stochastic Models for Computer Science	STA 4442	3 **or**
Probability and Statistics 1	STA 4442	3 **or**
Introductory Statistics	STA 2023	3 **or**
Or equivalent statistic class		3

4. Basic Science requirements

General Chemistry 1	CHM 2045	3 **and**
General Chemistry Lab 1	CHM 2045L	1

Formatted: Highlight
Formatted: Highlight
Formatted: Highlight
Formatted: Highlight
Formatted: Highlight
Formatted: Highlight
Formatted: Highlight
Formatted: Font: Bold
Formatted: Highlight
Formatted: Highlight
Formatted: Highlight
Formatted: Highlight
Formatted: Highlight
Formatted: Highlight
Formatted: Highlight
Formatted: Highlight
Formatted: Highlight
Formatted: Underline, Highlight
Formatted: Highlight
Formatted: Font: Bold
Formatted: Highlight
Formatted: Highlight
Formatted: Highlight
Formatted: Highlight
Formatted: Highlight
Formatted: Highlight

General Physics for Engineers 1	PHY 2048	3 **and**
General Physics 1 Lab	PHY 2048L	1
Physical Geology/Evolution of the Earth	GLY 2010C	4
Physical and Natural Science Restricted Elective 1		3 or 4 cr
Physical and Natural Science Restricted Elective 2		3 or 4 cr

~~**General Education Program - 39 credits**~~

~~**Foundations of Written Communication Courses - 6 credits**~~

~~College Writing 1 (1), (2)~~	~~ENC 1101~~	~~3~~
~~College Writing 2 (1), (2)~~	~~ENC 1102~~	~~3~~

~~**Foundations of Mathematics and Quantitative Reasoning Courses - 6 credits**~~

~~Calculus with Analytic Geometry 1 (1), (4)~~	~~MAC 2311~~	~~4~~
~~Introductory Statistics~~	~~STA 2023~~	~~3~~

~~**Foundations of Science and the Natural World Courses - 6 credits**~~

~~General Physics for Engineers 1 (1), (8)~~	~~PHY 2048 **and**~~	~~3~~
~~General Physics 1 Lab~~	~~PHY 2048L~~	~~1~~

~~**Students must take one additional course from the list below:**~~

~~General Chemistry 1~~	~~CHM 2045 **and**~~	~~3~~
~~General Chemistry 1 Lab~~	~~CHM 2045L~~	~~1~~
~~Physical Geology/Evolution of the Earth~~	~~GLY 2010C~~	~~4~~

~~**Foundations of Society and Human Behavior Courses - 6 credits** (1), (3)~~

~~**Foundations of Global Citizenship Courses - 6 credits** (1), (3)~~

~~**Foundations of Humanities Courses - 6 credits** (1), (3)~~

~~**Total**~~	~~**39**~~

-

Formatted: Highlight
Formatted: Highlight
Formatted: Highlight
Formatted: Highlight
Formatted: Highlight
Formatted: Highlight
Formatted: Highlight
Formatted: Highlight
Formatted: Highlight
Formatted: Strikethrough
Formatted: Strikethrough

~~**Additional Basic Mathematics and Sciences Electives - 15 credits**~~		
~~Introduction to Calculus with Applications~~	~~MAC 2210 or~~	~~4~~
~~Calculus with Analytic Geometry 2~~	~~MAC 2312~~	~~4~~
~~**Or** any mathematics course for which one of the math courses is a direct prerequisite~~		
~~Introduction to Physical Geography~~	~~GEO 2200C~~	~~3~~
~~Select 8 credits from the Foundations of Science and the Natural World Group A or B not already taken for credit~~		~~8~~

Physical and Natural Science Restricted Elective 1: includes but is not limited to Biological Science with Lab, Earth Science, or equivalent.

Physical and Natural Science Restricted Elective 2: includes but is not limited to Physics for Engineers 2 (PHY 2044) with lab (PHY 2049L), General Chemistry 2 (CHM 2046) with lab (CHM 2046L), or other physical or natural science course approved by the department.

Formatted: Highlight

Business Electives - 3 credits (select one course)		
Principles of Accounting 1	ACG 2021	
Entrepreneurship	ENT 4024	3
Entrepreneurial Assistance Project	ENT 4934	3
Introduction to Business	GEB 2011	3
Information Systems Fundamentals	ISM 2000	3
Introduction to Management and Organizational Behavior	MAN 3025	3
Principles of Real Estate	REE 3043	3
Engineering Graphics	EGN 1111C	3

Formatted Table

Engineering Fundamentals ~~–~~ 12 to 15 credits		
Fundamentals of Engineering (9)	EGN 1002	
Introduction to Mapping and GIS (5)	GIS 3015C **or**	3

Formatted: Underline, Highlight

Formatted Table

Formatted: Highlight

GIS for Civil Engineering Applications	CGN 4321	3
Geomatics	SUR 3103 **and**	2
Geomatics Lab	SUR 3103L	1
Computer-Aided Design	CGN 2327 **or**	3
Computer Programming Elective		
Programming 1	COP 2220 **or**	3
Computer Applications in Engineering 1	EGN 2213 **or**	3
C for Engineers	EEL 2161	3
Introduction to Programming in Python (4)	COP 3035C	

Formatted: Strikethrough

Formatted: Strikethrough, Highlight

Formatted: Highlight

Construction Engineering Core - 6 credits		
Engineering and Construction Surveying	SUR 3205	2
Engineering and Construction Surveying Lab	SUR 3205L	1
RI: Construction Project Management	CCE 4031 **or**	3
Civil Engineering Project Management	CCE 5036	3
Introduction to Infrastructure Management	CGN4612	3
Construction Management Assessment	CCE4033	3
Introduction to Transportation Engineering (5)	TTE 3004C	3

Formatted Table

Surveying Engineering Core - 12 credits (labs must be taken concurrently with the course and the same grade)		
Automated Surveying and Mapping	SUR 3141 **and**	2
Automated Surveying and Mapping Lab	SUR 3141L	1
Measurement Theory and Data Analysis	SUR 3520	3
Cadastral Principles and Legal Aspects	SUR 4403	3

Formatted: Highlight

Formatted Table

Geodesy and Geodetic Positioning	SUR 4530 **and**	2
Geodesy and Geodetic Positioning Lab	SUR 4530L	1

Reality Capture Core - 6 credits

Select any combination to total 6 credits.

Introduction to Laser Mapping Technology	CCE 4514C **or**	3
Terrestrial Laser Scanning	CEG 6304C	3
Digital Photogrammetry Principles and Applications	SUR 4331C **or**	3
Digital Photogrammetry and Image Interpretation	SUR 6335C	3
Thermal Infrared Remote Sensing and Applications	SUR 4384 **or**	3
Thermal Infrared Remote Sensing	SUR 6387C	3

Capstone Design - 6 credits

RI: Subdivision Design	SUR 4463 **and**	~~3~~2
~~Land Subdivision and Platting Lab~~	~~SUR 3463L~~	~~1~~

Capstone Elective - Select one (2)

RI: Civil, Environmental and Geomatics Engineering Design 1	CGN 4803C **or**	3
RI: Engineering Technology Capstone	ETG 4951	3

Technical Electives - Select ~~18~~ 23-27 credits from the list below or from the Construction, Rea Capture or Surveying core above

Any approved College of Engineering and Computer Science course 3000-level and above

Remote Sensing of the Environment (5) (6)	GIS 4035C	3
Principles of Geographic Information Systems (5) (6)	GIS 4043C	3
Digital Image Analysis (5) (6)	GIS 4037C	3

Formatted Table

Formatted: Highlight

Formatted: Highlight

Formatted Table

Formatted: Strikethrough, Highlight

Formatted: Highlight

Commented [FB1]: Math error in catalog

Formatted: Strikethrough

Formatted: Highlight

Formatted: Highlight

Formatted: Right: 0.69"

Formatted Table

Engineering Professional Internship	EGN 3971	0-4
Directed Independent Research in Engineering and Computer Science (7)	EGN 4911	0-3
Directed Independent Research in Engineering and Computer Science	EGN 4915	1-3
New Venture Launch	ENT 4015	3
Advanced Business Planning	ENT 4114	3
Entrepreneurship Internship	ENT 4940	1-4
Environmental Issues in Atmospheric and Earth Science	ESC 3704	3
Principles of Financial Management	FIN 3403	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 4760	3
Introduction to Mapping and GIS	GIS 3015C	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	GLY 4750C	3
Hydrogeology	GLY 4822	3

Engineering Geology	GLY 4830	3
Introduction to Hydrogeology Modeling and Aquifer Test (5)	GLY 4832C	3
~~Professional Internship~~	~~IDS 3949~~	~~0-4~~
Leadership, Supervisory Skills and Team Development	MAN 4046	3
Marketing Management	MAR 3023	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

Formatted: Strikethrough

Notes:

1. Contributes to University Core Curriculum requirements.
2. Contributes to Writing Across Curriculum (Gordon Rule) writing requirement.
3. General Education 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. Includes a 1-credit laboratory.
6. Students pursuing the GIS certificate should consider taking these courses.
7. Grading: S/U.

8. PHY 2048, General Physics 1 (4 credits) is an acceptable substitute, but only 3 credits will apply toward the degree.

~~8.~~9. For those students entering with a B.S. degree or over 60 Cr. who have not taken EGN 1002, they may substitute an upper level technical elective to meet this requirement.

Formatted: Highlight

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 by major.

Minors and Certificate Programs Appropriate for Geomatics Engineering

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

Computer Science Minor (Department Electrical Engineering and Computer Science)

Entrepreneurial Management Minor (College of Business)

Surveying and Mapping Certificate Program, highly 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 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.

Internships

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.

Geomatics Engineering
Undergraduate Minor

(Minimum of 18 credits required)

Students minoring in ~~Geomatics Engineering~~ 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.

Required Courses (3 credits)		
Geomatics	SUR 3103	2
Geomatics Lab	SUR 3103L	1

Select additional courses from below for a minimum of 15 credits.		
Digital Photogrammetry Principles and Applications (2)	SUR 4331C	3
Measurement Theory and Data Adjustments (2)	SUR 3520	3
Automated Surveying and Mapping (2)	SUR 3141	2
Automated Surveying and Mapping Lab (2)	SUR 3141L	1
Subdivision Design	SUR 4463	2
Land Subdivision and Platting Lab (2)	SUR 3463L	1
Engineering and Construction Surveying (3)	SUR 3205	2
Engineering and Construction Surveying Lab (3)	SUR 3205L	1
Geodesy and Geodetic Positioning (3)	SUR 4530	2
Geodesy and Geodetic Positioning Lab (3)	SUR 4530L	1
Cadastral Principles and Legal Aspects (2)	SUR 4403	3
Principles of Geographic Information System	GIS 4043C	3
Introduction to Laser Mapping Technology	CCE 4514C	3
Any other Surveying or Mapping Technical Elective as determined by the department		3

Notes:

(1) Requires knowledge of geometry and trigonometry.

(2) Requires SUR 3103/SUR 3103L, Geomatics and Lab, as prerequisites.

(3) Requires SUR 3103/SUR 3103L, Geomatics and Lab and introductory statistics, as prerequisites.

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

Surveying and Mapping
Undergraduate Certificate

(Minimum of 12 credits required)

The Department of Civil, Environmental and ~~Geomatics Engineering~~ Geomatics Engineering offers undergraduates a certificate in Surveying and Mapping. Students are entitled to the certificate by completing a minimum of 12 credits 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.

Required Courses (3 credits)		
Geomatics (1)	SUR 3103	2
Geomatics Lab (1)	SUR 3103L	1

Select additional courses from below for a minimum of 9 credits.		
Digital Photogrammetry Principles and Applications (2)	SUR 4331C	3
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 3520	3
Engineering and Construction Surveying (4)	SUR 3205	2
Engineering and Construction Surveying Lab (4)	SUR 3205L	1
Cadastral Principles and Legal Aspects	SUR 4403	3

Formatted Table

Formatted Table

Thermal Infrared Remote Sensing and Applications	SUR 4384	3
Principles of Geographic Information System	GIS 4043C	3
Introduction to Laser Mapping Technology	CCE 4514C	3

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

(2) Requires SUR 3103/SUR 3103L, Geomatics and Lab, as prerequisites.

(3) Requires SUR 3103/SUR 3103L, Geomatics and Lab and introductory statistics, as prerequisites.

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

Combined Programs

~~geomatics engineering~~ Geomatics Engineering to ~~civil~~ Civil Eengineering bachelor of science in ~~geomatics engineering~~ Geomatics Engineering (B.S.G.E.) to master of science (m.s.)

This program allows Bachelor of Science in ~~Geomatics Engineering~~ Geomatics Engineering (B.S.G.~~C.~~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 12 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 credits, 120 for the undergraduate degree and 30 for the master's degree. Students complete the undergraduate degree first, taking no more than 12 credits of graduate coursework in their senior year, which will then be used to satisfy both degrees.

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.