

# GEOMATICS

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Not all courses are offered every semester. Refer to the schedule of courses for each term's specific offerings.

More Info (<https://one.ufl.edu/soc/>)

*Unless otherwise indicated in the course description, all courses at the University of Florida are taught in English, with the exception of specific foreign language courses.*

## School Information

The School of Forest, Fisheries, and Geomatics Sciences is a unit within the Institute of Food and Agricultural Sciences (IFAS) and the College of Agricultural and Life Sciences (CALs). The school is home to three distinct yet integrated program areas: Fisheries and Aquatic Sciences (<http://sfrc.ufl.edu/fish/>), Forest Resources and Conservation (<http://sfrc.ufl.edu/forest/>), and Geomatics (<http://sfrc.ufl.edu/geomatics/>). The school's faculty, staff, and students conduct research, teaching, and extension that cuts across a wide range of environments and disciplines.

**Website** (<http://sfrc.ufl.edu/>)

## CONTACT

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## Curriculum

- /UGRD/colleges-schools/UGAGL/IS\_BS07/
- Combination Degrees
- Environmental Policy, Law, and Regulation Certificate
- Fire Ecology and Management Certificate
- Fisheries and Aquatic Sciences Minor
- Forest Health Management Certificate
- Forest Resources and Conservation
- Forest Resources and Conservation Minor
- Geomatics
- Geomatics Certificate
- Mapping with Small Unmanned Aerial Systems Certificate
- Natural Resource Conservation
- Recreation Resources Management Certificate
- Urban Forestry Certificate

## Courses

### GIS 3072C Geographic Information Systems 3 Credits

**Grading Scheme:** Letter Grade

Addresses GIS concepts, data sources, spatial references: GIS data modeling, management, and editing; surface modeling; and vector and raster analysis. Provides practical examples, tutorials, and projects serving the geomatics, natural resource management, and planning fields.

**Prerequisite:** Junior standing or higher.

### GIS 4121 Geospatial Analysis 3 Credits

**Grading Scheme:** Letter Grade

Process of identifying and analyzing patterns in geographic data and describing relationships between spatial features. Introduces techniques aimed at the analysis of spatial data. Topics include characterization of spatial data, geographic distributions, pattern identification (point and area objects), field data analysis, spatial modeling and interpolation, regression methods and cluster analysis.

**Prerequisite:** GIS 3072C and STA 2023 and Geomatics major of junior standing or higher.

### SUR 3103C Geomatics 3 Credits

**Grading Scheme:** Letter Grade

Introduces angle, distance and elevation measurement, as applied to engineering, boundary location, topography, forest management and construction. Covers error theory as well as horizontal and vertical curves.

**Prerequisite:** MAC 1147 and MAC 2311 placement or equivalent.

**SUR 3323 Visualization of Spatial Information 3 Credits**

**Grading Scheme:** Letter Grade

Methods of mapping, modeling, communicating, and visualizing spatial features. Includes boundary and topographical features, attributes, site modeling, site development, and mapping using computer-aided mapping and design features.

**Prerequisite:** MAC 1105 or MAC 1140.

**SUR 3331C Photogrammetry 3 Credits**

**Grading Scheme:** Letter Grade

Relates to use of aerial photographs to determine spatial information. Covers elementary techniques of photogrammetry to establish the foundation for SUR 4350 Advanced Photogrammetry.

**Prerequisite:** SUR 3103C or equivalent.

**SUR 3520 Measurement Science 3 Credits**

**Grading Scheme:** Letter Grade

Theory of measurement errors, error propagation, variance and covariance, polynomial curve fitting, regression analysis, correlation and least squares adjustment.

**Prerequisite:** MAC 2233 and STA 2023 and SUR 3641 or the equivalents.

**SUR 3641 Survey Computations 3 Credits**

**Grading Scheme:** Letter Grade

Principles of geometry applied to surveying computations. Computer methods in surveying.

**Corequisite:** SUR 3103C or equivalent.

**SUR 4201 Route Geometrics and Design 3 Credits**

**Grading Scheme:** Letter Grade

Geometric design of transportation systems, computer applications, and a comprehensive design project. Covers spiral curves, superelevation theory, and earthwork analysis.

**Prerequisite:** SUR 3103C or equivalent and Geomatics or Civil Engineering major.

**SUR 4345 Marine Geomatics 3 Credits**

**Grading Scheme:** Letter Grade

Six-week course on the technologies, concepts, and methods required to acquire, analyze, and manage geographic data used in seafloor mapping and imaging. Provides background on the capabilities and limitations of different data collection systems, as well as for the other types of sensors necessary to collect accurate information. Topics include marine positioning, underwater acoustics, sonars, hydrographic standards, multibeam echosounder systems, and hydrographic survey design.

**Prerequisite:** Junior or senior standing.

**SUR 4350C Advanced Photogrammetry 3 Credits**

**Grading Scheme:** Letter Grade

Precise photogrammetric measurements, camera calibration, object space coordinate systems, analytical control extension, stereoplotter mapping, digital mapping and softcopy stereoplotters.

**Prerequisite:** SUR 3331C and SUR 3520, or the equivalents.

**SUR 4376 Geospatial Applications of UASs 3 Credits**

**Grading Scheme:** Letter Grade

Covers contemporary issues and common applications associated with small UASs (Unmanned Aerial Systems).

**Prerequisite:** Junior or senior standing.

**SUR 4380 Remote Sensing 3 Credits**

**Grading Scheme:** Letter Grade

Remote sensing systems, ground truthing, image classification systems, mapping applications, applications in plant and animal science, urban planning, engineering, geology, and integration into geographic information systems.

**Prerequisite:** Geomatics major of senior standing.

**Attributes:** Artificial Intelligence

**SUR 4403 Cadastral Principles 3 Credits**

**Grading Scheme:** Letter Grade

Cadastral systems, land boundaries, corners and areas; writing land descriptions and identification of land parcels; legal principles of boundary survey, office and business practices; professional standing.

**Prerequisite:** SUR 3103C or equivalent.

**SUR 4430 Surveying and Mapping Practice 3 Credits**

**Grading Scheme:** Letter Grade

Studies land survey practice: the lot survey, the sectional survey and the water boundary survey. Also includes office and business practices and professional standing.

**Prerequisite:** SUR 3520 and SUR 4403, or the equivalents.

**SUR 4463 Subdivision Design 3 Credits****Grading Scheme:** Letter Grade

Design a medium-sized subdivision, including the master plan development, physical development considerations, legal requirements, comprehensive project, mock presentation and platting.

**Prerequisite:** SUR 3323 or equivalent;**Corequisite:** SUR 4201.**SUR 4501C Foundations of UAS Mapping 3 Credits****Grading Scheme:** Letter Grade

Covers the fundamental components of small unmanned aerial systems (UASs) and how they are used to produce high resolution, spatially accurate, planimetric maps and 3-D models of the terrain.

**Prerequisite:** SUR 3103C or equivalent.**SUR 4530 Geodesy and Geodetic Positioning 3 Credits****Grading Scheme:** Letter Grade

Introduces geometric and physical geodesy, ellipsoids, geodetic lines, computation of position, gravity and coordinate systems.

**Prerequisite:** SUR 3103C or equivalent.**SUR 4905 Special Problems in Geomatics 1-3 Credits****Grading Scheme:** Letter Grade

Special problems or projects in geomatics.

**Prerequisite:** Instructor permission.**SUR 4911 Supervised Research in Geomatics 0-3 Credits****Grading Scheme:** S/U

Firsthand, authentic research in geomatics under the supervision of a faculty member. Projects may involve inquiry, design, investigation, scholarship, discovery, or application.

**Prerequisite:** Instructor permission.**SUR 4912 Senior Project 1 Credit****Grading Scheme:** Letter Grade

Laboratory, equipment, or literature investigations of surveying and mapping problems and concepts of current interest resulting in a written work.

This foundational course is the second of a two-course sequence for senior Geomatics students to develop an experiential learning project focused on a self-selected surveying and mapping problem.

**Prerequisite:** SUR4911**SUR 4915 Honors Thesis Research in Geomatics 0-3 Credits****Grading Scheme:** S/U

Independent research in geomatics leading to an honors thesis; mentored by a faculty member. Projects may involve inquiry, design, investigation, scholarship, discovery or application.

**Prerequisite:** junior standing, upper division GPA of 3.75 or higher and completed honors thesis proposal on file.**SUR 4934 Topics in Geomatics 1-4 Credits****Grading Scheme:** Letter Grade

Selected topics in geomatics, including special issues and in-depth study of topics not discussed in other courses.

**Prerequisite:** Instructor permission.**SUR 4940C Practicum in UAS Mapping 3 Credits****Grading Scheme:** Letter Grade

Provides hands-on experience with flight planning and safe deployment of small UASs (Unmanned Aerial Systems) and the subsequent processing of the imagery acquired on these flights.

**Prerequisite:** SUR 4501C.**SUR 4949 Co-op Work Experience 2 Credits****Grading Scheme:** S/U

Practical field experience of sufficient academic rigor.

**Prerequisite:** Geomatics major.