GEOMATICS | GEOSPATIAL ANALYSIS

Geomatics is a Science, Technology, Engineering, and Mathematics (STEM) major that addresses spatial data collection, management, and analysis. Traditionally known for surveying and mapping, Geomatics also has some more well-known applications such as Geographic Information Systems (GIS), Global Positioning Systems (GPS), and even Unmanned Aerial Vehicles (UAVs). Spatial data is collected through many techniques such as ground surveying, photogrammetry, remote sensing, satellite positioning, inertial measurements, echo-sounding, and laser scanning. Spatial information collected may then be integrated into a geographic information system or other graphical form and analyzed to support a broad range of applications. For instance, Geomatics uses this technology to detect how and where things are located, and uses this information for a variety of purposes, including establishing property boundaries, locating and documenting historical buildings, analyzing ecological data including habitat types and species migration patterns, designing new roads and other infrastructure, and much more.

About this Program

- **College:** Agricultural and Life Sciences
- **Degree:** Bachelor of Science in Geomatics
- **Credits for Degree:** 120
- **Specializations:** Geospatial Analysis | Surveying and Mapping
- **Additional Information**
- **Related Geomatics Programs**

To graduate with this major, students must complete all university, college, and major requirements.

Geomatics students learn how land, infrastructure, and natural resources are measured, analyzed, and integrated into useable forms and systems. Students gain hands-on experience working with field equipment and in high-tech classrooms. Present land values, rates of urban development, and environmental concerns require a broad set of expertise to develop, manage, and apply geospatial information. Students majoring in Geomatics complete either the Surveying and Mapping specialization or the Geospatial Analysis specialization.

Both specializations within the Geomatics major are offered at the Fort Lauderdale Research and Education Center in Ft. Lauderdale, FL, the Gulf Coast Research and Education Center in Plant City, FL and at the Mid-Florida Research and Education Center in Apopka, FL.

Related Geomatics Programs

- Geomatics certificate
- Mapping with Small Unmanned Aerial Systems certificate

Geospatial Analysis

The Geospatial Analysis specialization offers a broader set of courses in GIS and 3-D modeling.

Critical Tracking records each student's progress in courses that are required for entry to each major. Please note the critical-tracking requirements below on a per-semester basis.

Equivalent critical-tracking courses as determined by the State of Florida Common Course Prerequisites may be used for transfer students.

### Semester 1

- Complete at least 1 of 7 critical-tracking courses (excluding labs): AEB 2014 or ECO 2023 or ECO 2013, AEC 3030C or SPC 2608, COP 2800 or advisor-approved course in computer programming, MAC 2311, PHY 2053/PHY 2053L, PHY 2054/PHY 2054L and STA 2023
  - 2.5 GPA required for all critical-tracking courses
  - 2.0 UF GPA required

### Semester 2

- Complete at least 2 additional critical-tracking courses, excluding labs
  - 2.5 GPA required for all critical-tracking courses
  - 2.0 UF GPA required

### Semester 3

- Complete at least 2 additional critical-tracking courses, excluding labs
  - 2.5 GPA required for all critical-tracking courses
  - 2.0 UF GPA required

### Semester 4

- Complete at least 2 additional critical-tracking courses, excluding labs
  - 2.5 GPA required for all critical-tracking courses
  - 2.0 UF GPA required

### Semester 5

- Complete all critical-tracking courses including labs
  - 2.5 GPA required for all critical-tracking courses
  - 2.0 UF GPA required

To remain on track, students must complete the appropriate critical-tracking courses, which appear in bold. These courses must be completed by the terms as listed above in the Critical Tracking criteria.

This semester plan represents an example progression through the major. Actual courses and course order may be different depending on the student's academic record and scheduling availability of courses. Prerequisites still apply.

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Semester One</td>
<td>Economic Issues, Food and You <em>(Critical Tracking)</em> (Gen Ed Social and Behavioral Sciences)</td>
<td>3-4</td>
</tr>
<tr>
<td></td>
<td>Principles of Macroeconomics <em>(Critical Tracking)</em> (Gen Ed Social and Behavioral Sciences)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Principles of Microeconomics <em>(Critical Tracking)</em> (Gen Ed Social and Behavioral Sciences)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>What is the Good Life (Gen Ed Humanities)</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Gen Ed Biological or Physical Sciences</td>
<td>3-4</td>
</tr>
</tbody>
</table>
State Core Gen Ed Composition; Writing Requirement 3
Elective 2 3-4
Semester Two
Select one: 3
- COP 2800 Computer Programming Using JAVA (Critical Tracking)
- COP 2271 Computer Programming for Engineers and Computer Programming for Engineers Laboratory (Critical Tracking)
- COP 3275 Computer Programming Using C (Critical Tracking)
- COP 3229 Computer Programming Using C++ (Critical Tracking)
- Approved computer programming course (Critical Tracking)
MAC 2311 Analytic Geometry and Calculus 1 (Critical Tracking: State Core Gen Ed Mathematics) 3
State Core Gen Ed Humanities 3
State Core Gen Ed Social and Behavioral Sciences 3
Elective 2
Semester Three
PHY 2053 Physics 1 5
& 2053L and Laboratory for Physics 1 (Critical Tracking; State Core Gen Ed Biological Sciences and Physical Sciences) 3
STA 2023 Introduction to Statistics 1 (Critical Tracking; Gen Ed Mathematics) 3
Gen Ed Composition; Writing Requirement 3
Elective 4 2-4
Semester Four
Select one: 3
- AEC 3030C Effective Oral Communication (Critical Tracking)
- SPC 2608 Introduction to Public Speaking (Critical Tracking)
- PHY 2054 Physics 2 5
& 2054L and Laboratory for Physics 2 (Critical Tracking; Gen Ed Physical Sciences) 3
Select 6 credits: 6
- Gen Ed Diversity and International
- Gen Ed Diversity or International and/or Social and Behavioral Sciences
Elective 2
Semester Five
Select one: 3
- AEC 3033C Research and Business Writing in Agricultural and Life Sciences (Writing Requirement)
- ENC 2210 Technical Writing (Writing Requirement)
- ENC 3254 Professional Writing in the Discipline (Writing Requirement)
- SUR 3103C Geomatics 5
- SUR 3323 Visualization of Spatial Information 5
- GIS 3072C Geographic Information Systems 5
- SUR 3641 Survey Computations 5
Credits 15
Semester Six
AEB 3133 Principles of Agribusiness Management 3-4
or MAN 3025 or Principles of Management
Credits 15
AEB 4123 Agricultural and Natural Resource Law 3-4
or BUL 4310 or The Legal Environment of Business
SUR 3331C Photogrammetry 5
SUR 4501C Foundations of UAS Mapping 5
SUR 3520 Measurement Science 5
Credits 15-17
Summer After Semester Six
SUR 4949 Co-op Work Experience 1
Credits 1
Semester Seven
Select one: 2-3
- FNR 3131C Dendrology/Forest Plants
- FOR 4934 Topics in Natural Resources (Florida Forest Communities)
SUR 4350C Advanced Photogrammetry 5
SUR 4530 Geodesy and Geodetic Positioning 5
SUR 4911 Supervised Research in Geomatics 3
Select 6 approved credits: 6
- Analysis electives
- Geomatics electives
- Geospatial application electives
Credits 17-18
Semester Eight
SUR 4121 Geospatial Analysis 5
SUR 4380 Remote Sensing 5
SUR 4912 Senior Project 5
Select 3 approved credits: 3
- Analysis electives
- Geomatics electives
- Geospatial application electives
Natural resources elective 3
Credits 13
Total Credits 120

1. FOR 3004 or SWS 3022 and SWS 3022L recommended.
2. GEO 2200 or GLY 2010C recommended.
3. May be used as substitutes:
   - MAC 1114 and MAC 2233 for MAC 2311
   - PHY 2004 and PHY 2004L for PHY 2053 and PHY 2053L
   - PHY 2005 and PHY 2005L for PHY 2054 and PHY 2054L
4. GEO 2200 or GLY 2010C recommended, if not already taken.
5. Minimum grade of C required.

Placement tests and/or prerequisites may be required to access certain courses.

Non-specified general education (GE) courses may be selected from any approved course in the subject area. Selection of courses must consider satisfaction of the writing requirement and international studies and diversity requirements.

Geomatics addresses land information development and management through field survey, photogrammetry, remote sensing, satellite positions and other techniques. The program is nationally accredited and graduates often obtain licensure as professional surveyors and mappers.

A nationally accredited ABET program.

**Before Graduating Students Must**

- Pass the geomatics competency exam, given in five parts. One part will be given in each of these required courses:
Students in the Major Will Learn to

Student Learning Outcomes (SLOs)

Content
1. Knowledge and competency in geometry, statistics, boundary law, surveying and mapping instrument usage and statutes and ordinances pertaining to professional practice.

Critical Thinking
2. Define problems, formulate solutions, assess legal evidence, interpret statistical results, design a system or process, and understand professional and ethical issues.

Communication
3. Create, interpret and analyze written text, oral messages and multimedia presentations.

Curriculum Map
$I = Introduced; R = Reinforced; A = Assessed$

<table>
<thead>
<tr>
<th>Courses</th>
<th>SLO 1</th>
<th>SLO 2</th>
<th>SLO 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>SUR 3103C</td>
<td>I, R, A</td>
<td>I, R, A</td>
<td>I, R, A</td>
</tr>
<tr>
<td>SUR 3520</td>
<td>I, R, A</td>
<td>I, R, A</td>
<td>I, R, A</td>
</tr>
<tr>
<td>SUR 4430</td>
<td>I, R, A</td>
<td>R, A</td>
<td>R, A</td>
</tr>
<tr>
<td>SUR 4463</td>
<td>R, A</td>
<td>R, A</td>
<td>R, A</td>
</tr>
<tr>
<td>SUR 4912</td>
<td>R, A</td>
<td>R, A</td>
<td>R, A</td>
</tr>
</tbody>
</table>

Assessment Types
- Labs
- Projects
- Papers
- Exams
- Presentations