

## Geospatial Science (GSS)

### Minor in Geospatial Science

#### Sustainability Studies

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## Geospatial Science

Geospatial analysis is used in a wide range of disciplines as a research tool, a decision-making tool, data analysis tool, and/or as a planning tool. The Minor in Geospatial Analysis is a flexible undergraduate minor that allows students drawn from a broad spectrum of backgrounds to acquire the necessary training in geospatial analysis to complement their area of study. Students will receive training in the use of Geographical Information Systems and may choose from several electives to broaden their experience in geospatial analysis.

## Requirements for the minor in Geospatial Science

Completion of the minor requires 19-20 credits.

### Core courses:

- GSS 105 Introduction to Maps and Mapping
- GSS 313 GIS Design and Applications I
- GSS 314 GIS Laboratory (for students enrolling in GSS 313 Spring 2013 or later)

Select a course in Remote Sensing or GIS:

- Remote Sensing: GEO 440 or MAR 334
- GIS: GSS 325 Design and Applications II

### Elective courses (select 9 or more credits from the following):

- GEO 440 Geological Applications of Remote Sensing
- MAR 334 Remote Sensing of the Environment
- GSS 323 GIS Database and Design
- GSS 325 GIS Design and Applications II (if not taken above)
- GSS 326 GIS Project Management
- GSS 487 Geospatial Science Research (see Note)
- GSS 488 Geospatial Science Internship (see Note)
- ANT 420/GEO 420 Environmental Analysis Using Remote Sensing and Geographic Information Systems
- BIO 319 Landscape Ecology Laboratory

Note: A maximum of three credits of GSS 487 Geospatial Science Research and/or GSS 488 Geospatial Science Internship may be applied to the minor.

## GSS Faculty

Faculty information for this program can be found at [http://www.stonybrook.edu/commcms/sustainability/faculty\\_profiles.html](http://www.stonybrook.edu/commcms/sustainability/faculty_profiles.html)

# GSS

## Geospatial Science

### GSS 105 - F: Introduction to Maps and Mapping

An introduction to the study and design of map formats, symbology, coordinate systems, and how maps record the historical patterns of human behavior. The course will also examine maps as a tool to analyze human activity and societal development, and include important aspects of map data collection, processing, the Global Positioning System (GPS), quantitative mapping, and GIS-based mapmaking techniques.

3 credits

### GSS 209: GIS and Cartography

Cartography is the knowledge associated with the art, science, and technology of maps. Digital computer cartography still follows the same fundamental principles and still requires a broad understanding of graphicacy as a language (as well as numeracy and literacy). This course will provide an introduction to cartographic principles, concepts, software and hardware necessary to produce good maps, especially in the context (and limitations) of geographic information systems (GIS).

*Prerequisite: SBC 113*

3 credits

### GSS 313: GIS Design and Application I

Provides the basic concepts underlying modern geographic information science and technology. Emphasis is placed on the principles of GIS for characterizing environmental systems and computer-based techniques for processing and analyzing spatial data. The course is three credit hours of lecture. The associated one credit laboratory course GSS 314 is required by some majors and minors.

*Prerequisite: MAT 125 or MAT 131*

3 credits

### GSS 314: GIS Laboratory

Practice using the GIS techniques and tools learned in the lecture (GSS 313), work on exercises, and process and analyze the spatial data for the course project. This laboratory course must be taken in the same semester as GSS 313.

*Corequisite: GSS 313*

1 credit

### GSS 323: GIS Database and Design

Concepts of geodatabase design and management in geographic information systems (GIS), SQL statements, geographic data types and functions, data entry, techniques of geographic information structure applications. This is a Windows based computer class with the majority of students work involving GIS computer software.

*Prerequisite: GSS 313*

3 credits

### GSS 325: GIS Design & Applications II

The course builds upon the topics covered in GIS Design and Application I. It emphasizes the applications of GIS in solving real-world problems. Students are expected to gain an understanding of GIS theory, methodology and most importantly application. Students are also expected to demonstrate abilities of spatial thinking, spatial analysis, and be able to solve practical spatial problems utilizing a GIS. Because GIS is both a tool for analysis and the visual communication of these data, students will be required to develop a GIS presentation, much as would be expected in a professional setting. This independent project will constitute a substantial portion of the final grade. This is a Windows based computer class with the majority of students work involving GIS computer software.

*Prerequisite: GSS 313 or equivalent*

3 credits

### GSS 326: GIS Project Management

The course addresses issues unique to a GIS operation such as implementation issues, decision making procedures, strategies for success, legal issues, involvement of management, marketing within an organization, strategic planning, and industry outlook.

*Prerequisite: GSS 313*

3 credits

### GSS 487: Geospatial Science Research

Qualified advanced undergraduates may carry out individual research projects under the direct supervision of a faculty member. Repeatable to a maximum of 3 credits.

*Prerequisite: Permission of instructor*

0-3 credits, S/U grading

### GSS 488: Geospatial Science Internship

The GSS Internship is designed to provide students experience in the real workplace. Interns are expected to function as a GIS/Remote Sensing professional and work within the existing host facility structure or on a free standing project. Interns will complete assigned tasks by hosting facility such as GIS data entry, data retrieval, remote sensing

analysis, GPS field work, documentation, or general GIS facility duties. These activities will be monitored by both a representative of the host facility and the instructor. May be repeated to a limit of 12 credits.

*Prerequisites: GSS 313 and GSS 325, or instructor consent*

0-12 credits, S/U grading