

# GEOSPATIAL SCIENCE (GSS)

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# Course numbers with the # symbol included (e.g. #400) have not been taught in the last 3 years.

## **GSS 800 - Elements of Geospatial Science**

**Credits: 4**

This on-line course lays the foundation for Geospatial Science (GSS) thinking by exploring the definition, methods, data types, data sources, software, and equipment used within the field of GSS. The importance and structure of the regional GSS industry is discussed with emphasis on how GSS is used across multiple disciplines. Course includes some guest lectures from industry professionals. Lectures and tests are conducted on-line. Students are required to download and install some software and data to complete assignments.

## **GSS 805 - Applied Geographic Information Systems for Research**

**Credits: 4**

This course teaches concepts and applied techniques of Geographic Information System tools and technologies to solve real world Geospatial Science problems across multiple disciplines. Technical topics covered include geospatial data collection, quality, conversion, management, analysis, visualization, and dissemination. Students hands-on-lab and independent exercises use the latest version of ArcGIS software. Development and implementation of a project proposal and an independent project are completed by students to forward individual interests.

## **GSS 807 - GIS for Earth and Environmental Science**

**Credits: 4**

This course teaches concepts and applied techniques of Geographic Information System tools and technologies to solve Geospatial Science problems for Earth Science and Environmental Engineering. Technical topics covered include geospatial data collection, quality, conversion, management, analysis, visualization, and dissemination. Students hands-on-lab and independent exercises use the latest version of ArcGIS and other GIS software. Development and implementation of a project proposal and an independent project are completed by students related to course topics.

## **GSS 809 - GIS for Water Resources**

**Credits: 4**

This course provides students the opportunity for application of emerging technologies with a focus on Geographic Information Systems and remote sensing in water resources engineering and hydrology. Topics may include digital mapping of water resources information, spatial coordinate systems, river and watershed networks, soil and land use mapping, flood/hydrology modeling and flood plain mapping, terrain analysis for hydrologic modeling, and integration of times series and geospatial data. Special fee.

## **GSS 817 - Remote Sensing for Earth and Environmental Science**

**Credits: 4**

Remote sensing provides insight into spatial and temporal aspects of environmental and earth systems. Students will learn digital image processing techniques, understand different sensor and platform technologies, and discuss new trends in remote sensing science. Focus on applied research questions and projects will be addressed. The course will include hyperspectral, lidar analysis, and unmanned aerial systems. Work will be done using ImageJ, Google Earth Engine and python. Programming background is not a requirement. Special fee.

## **GSS 896 - Special Topics**

**Credits: 4**

Special topics in geospatial technologies including by not limited to geographic information system, global positioning system, remote sensing, spatial analysis, statistics, crowdsourcing mapping, geodesy, and surveying.

## **GSS 996 - Geospatial Science Independent Study**

**Credits: 2-4**

May include research project, fieldwork or a relevant internship where students will build or apply GIS, Remote Sensing, GPS, or other Geospatial technologies. To be elected only with permission of program coordinator and with qualified supervision. Special fee.