**GEOGRAPHIC INFORMATION SYSTEMS**

A geographical information system (GIS) is an information system that is designed to work with data referenced by spatial or geographic coordinates. In other words, a GIS is both a database system with specific capabilities for spatially-referenced data, as well as a set of operations for working with the data. (Star and Estes, 1990)

Simply put, a GIS combines layers of information about a place to give you a better understanding of that place. What layers of information you combine depends on your purpose finding the best location for a new store, analyzing environmental damage, viewing similar crimes in a city to detect a pattern, and so on.

https://www.cocc.edu/programs/gis/ (https://www.cocc.edu/programs/gis/default.aspx)

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**Programs**

**Career and Technical Education**

- Geographic Information Systems - One Year Certificate of Completion (CC1) (https://catalog.cocc.edu/programs/geographic-information-systems/geographic-information-systems-cc1/)

**Courses**

**GEOG 211 Computer Cartography (4 Credits)**
Develops skills needed to produce maps using ArcGIS Desktop software. Outlines cartographic principles and map use. Emphasis on mapping techniques within a GIS. Intended for students enrolled in GIS or UAS programs.

**GEOG 265 Geographic Information Systems (4 Credits)**
Introduces students to principles and practice of GIS, while providing experience using ArcGIS Desktop and Spatial Analyst software. Develops both theoretical understanding of GIS and experience in accessing GIS datasets. Students exposed to raster and vector GIS.

**GEOG 266 Arc GIS (5 Credits)**
**Recommended preparation:** or to be taken with GEOG 265.
Provides working knowledge of ArcGIS Desktop software. In addition, students undertake designing and developing a GIS database, performing spatial analysis, creating maps, and generating a report using the desktop products.

**GEOG 267 Geodatabase Design (5 Credits)**
**Recommended preparation:** GEOG 266.
Covers fundamentals of creating, using, editing, and managing spatial and attribute data stored in a geodatabase in ArcGIS. Topics include data migration; data loading; topology rules; use of subtypes, attribute domains, and relationship classes. Also covered are creation, editing and analysis of geometric networks.

**GEOG 267 Spatial Data Collection (5 Credits)**
Provides the skills to collect location information for the purpose of integration with a Geographic Information System. The focus is on proper utilization of Global Positioning System (GPS) receivers and data collection. Intended for students enrolled in the second year of GIS or UAS programs, or similar academic preparation (see program director for details).

**GEOG 275 GIS Capstone (5 Credits)**
**Recommended preparation:** GEOG 265.
Culmination GIS project. Students are presented with a set of criteria and perform all steps necessary to complete the project including: project planning, designing and developing a GIS database, data collection and editing, performing spatial analysis, creating maps, generating reports and presenting of project output. See instructor for details.

**GEOG 280 Co-op Work Experience GIS (1-3 Credits)**
**Prerequisites:** instructor approval.
Provides opportunity for on-the-job experience in the GIS field. Normally taken summer term, but may occur during any term. See instructor for details.

**GEOG 284 GIS Customization (5 Credits)**
**Recommended preparation:** CIS 122.
Utilizes techniques to customize ArcGIS software through use of a current programming language. Publishing content to the Internet and Servers is also undertaken.

**GEOG 285 Data Conversion and Documentation (5 Credits)**
**Recommended preparation:** GEOG 266.
Covers a variety of techniques to collect and convert data between various formats, projections and coordinate systems, etc. Cultivates student's ability to research and experiment with data and enhance problem-solving skills. Stresses use of metadata which allows the data user to determine whether a particular data set is suitable for its proposed use.

**GEOG 286 Remote Sensing (5 Credits)**
Introduces students to the theory and methods of remote sensing through use of satellite imagery. Practical exercises involve use of SPOT, LANDSAT and Quickbird images with ArcGIS/Imagine Analysis software. Digital analysis is discussed and performed including preprocessing, image classification and image evaluation. Intended for students enrolled in the second year of GIS or UAS programs, or similar academic preparation (see program director for details).

**GEOG 287 Analysis of Spatial Data (5 Credits)**
**Recommended preparation:** GEOG 266.
Leads students through the analytical capabilities of GIS. Course begins with the more elementary but useful techniques involving locating and describing features, then proceeds to more advanced techniques based on higher-level spatial objects. Lab exercises utilize the Spatial Analyst Extension of ArcGIS to perform analysis of raster datasets.