

# GEOGRAPHIC INFORMATION SYSTEMS (GIS)

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## **GIS-101** Principles of Geospatial Technology 2 credits, Fall

This course serves as an overview of the concepts and principles of geospatial technology using lab activities to explore maps, geospatial data, and geospatial software. Major themes include: maps and cartography, geodesy, geographic information systems, spatial data privacy, global navigation satellite systems, remote sensing/image interpretation, terrain analysis, web maps, and the geospatial industry.

## **GIS-201** Introduction to Geographic Information Systems 3 credits, Fall

This course explores fundamental concepts of geographic information systems (GIS) utilizing hands-on application through a variety of laboratory exercises with industry-standard ArcGIS software. The class explores basic map principles, cartographic design, geodesy, and geospatial data manipulation while exploring ArcGIS to create, display, query, relate, classify, and analyze spatial data to create maps and answer geographic questions.

## **GIS-202** Intermediate Geographic Information Systems 3 credits, Winter

This class follows the introductory course as a continuation of desktop Geographic Information Systems (GIS) principles using the ArcGIS software platform. Topics explored include working with geodatabases (feature datasets, feature classes, subtypes, domains, etc), topology, vector and raster analysis, creating and editing data, and process automation using ModelBuilder. Students also practice key GIS project management processes, workflows, and best practices through an analysis project.

Prerequisites: GIS-201

## **GIS-205** Cartography and Map Making 3 credits, Winter

Explores basic cartographic design principles and how to apply them to produce high quality maps using GIS software. Introduces cartographic terminology, principles, and map-making tools. Major themes include visual representation and communication; how to turn geographic data into effective maps for print and the web; how to critique maps; map design and elements; and color, fonts, labels, and symbols for maps.

Prerequisites: GIS-201

## **GIS-232** Data Collection & Application 2 credits, Spring

This course introduces data collection techniques and application of those techniques. This course explores different techniques to collect spatial and attribute data. The class focuses on GPS (Global Positioning System) data collection using a combination of recreational/mapping-grade GPS units and common mobile devices (with embedded GPS) used in industry. The class will emphasize the capabilities and strengths of each type of data collection equipment.

Prerequisites: GIS-101

## **GIS-236** Introduction to Programming for GIS 3 credits, Winter

An introduction to computer programming and Object Orientated Programming (OOP) with the Python language. Covers basic computer programming concepts including data types, loops, control structures, functions, classes, and program development. Use Python for problem solving by creating basic scripts all the way to more advanced object-oriented programs.

Recommended: GIS-101

## **GIS-237** Advanced Programming for GIS 3 credits, Not Offered Every Term

This course introduces Python programming in connection with Geographic Information Systems (GIS). It focuses on automating processes, procedures, programming with GIS data types, and building custom functions using ESRI's ArcGIS software platform. It also provides the opportunity to build custom Python script tools that can be used and shared among GIS users.

Prerequisites: GIS-236

## **GIS-238** GIS Web Mapping and Services 2 credits, Not Offered Every Term

This course presents the basic practices involved with GIS Web development. Gain an understanding of web GIS fundamentals. Introduces building GIS web maps, services, and applications. Focuses on developing and publishing on the web using the ESRI suite of web GIS technologies.

Recommended: Familiarity with GIS software and applications

## **GIS-270** GIS Capstone 3 credits, Spring

The Geographic Information Systems (GIS) Capstone course is the culmination of the Geographic Information Systems Technology (GIST) certificate program. Working with the instructor, students begin the course by researching and proposing a project. After developing a project plan and working through the analysis necessary, students will present their findings in an oral and written presentation. Additionally, scenario-based assignments will reinforce the project-based analysis process. Throughout the course, portfolio building strategies are explored with an emphasis on developing a professional portfolio demonstrating their work as preparation for entering the GIS profession.

## **GIS-280** GIS/CWE 2-6 credits, Fall/Winter/Spring/Summer

Cooperative Work Experience. Provides students with on-the-job work experience in the field of geographic information systems. Variable Credit: 2-6 credits. Required: Student Petition.

Prerequisites: GIS-201

Recommended: This class is intended for students that are completing their GIS Certificate at Clackamas Community College

Corequisites: CWE-281

## **GIS-286** Remote Sensing 3 credits, Spring

This course is an introduction to the science of remote sensing. The course explores the techniques used to acquire, interpret, and process remotely sensed data. It provides a historical analysis of the technology, the interpretation of remotely sensed data, and the use of remote sensing data in GIS. Active and passive systems are explored as well as methodologies to transform and rectify remotely sensed raster data. Students explore applications of remote sensing using real-world examples and data.

Prerequisites: GIS-201