Shasta College GIS Certificate Program
Course Descriptions

GEOG 11 - Map Principles
This course will cover essential map principals. A variety of different types of maps and their uses will be explored, along with methods of data collection and representation employed. Students will explore the concept of map scale and its applicability to using maps for measurement. Map projections, coordinate systems, and datums will be explored with respect to their effective use and potential pitfalls. Map abstraction, symbology, and cartographic principals will be covered as well.

GEOG 5 – Digital Planet
This course will explore the technologies and the societal implications of our digital planet. Specific attention is given to geospatial technologies which provide locational services, imagery, mapping and other capabilities. In addition to use in industry, government, and non-profit sectors, these technologies are also common on mobile devices and in Internet applications. Investigation of issues related to society, population, and geo-politics will be undertaken using a variety of Internet-based technologies that are ideally suited to analyzing sociological data and geographic patterns. This course will also consider issues of geographic perception, social justice, equity, privacy, and representational accuracy of our digital planet. This course may be offered in a distance education format.

GIS 1 - Survey of Digital Mapping
This course is a survey of digital mapping technologies, focusing on consumer and commercial applications. Such technologies, also known as geospatial technologies, are increasingly used by average citizens as well as business, government and non-profit organizations. Students will learn underlying concepts that will help to understand the broader utility and potential of digital mapping technologies, including general concepts related geographic information systems (GIS), global positioning systems (GPS), and satellite imagery. Internet applications such as Google Earth and ArcGIS Online will be utilized to explore digital mapping technologies. This course may be offered in a distance learning format.

GIS 10 - Introduction to Geographic Information Systems
Geographic information systems (GIS) are used in a range of fields: urban planning, marketing, public health, natural resource management, and emergency response to name a few. This course will introduce students to fundamental software capabilities of GIS, along with the underlying conceptual framework. Students will learn about the essential qualities of GIS data, including spatial and attribute characteristics. Students will learn procedures for data acquisition from secondary sources, along with data creation and editing. Producing useful, aesthetically pleasing maps will be an integral part of the course. Basic analysis through the use of queries and overlays will also be covered. ArcGIS software will be used for the course.

GIS 20 - Spatial Databases
This course covers database principals, structure and processes as they apply to geographic information systems (GIS). Data management is a critical aspect of GIS. Students will work with various data to learn database fundamentals such as design, indexing, access, and reports. Integration of non-spatial data with GIS data will be a key component of the course. Students will also explore the use of the ArcGIS geodatabase. Microsoft Access and ArcGIS software will be used in the course.
**GIS 21 - GIS-CAD Integration**
This course covers computer-aided drafting (CAD) structure, principles and processes as they apply to geographic information systems (GIS). CAD data management is a critical aspect of GIS. Students will work with various CAD data to learn processing and manipulation techniques for displaying and working with CAD data in a GIS. Preparation and georeferencing of CAD data will be key components of the course. AutoCAD and ArcGIS software will be used in this course.

**GIS 22 – GIS Data Creation**
This course explores essential methods for GIS data creation. Students will implement common procedures to meet GIS data creation objectives. Digitizing and editing will be implemented using a variety of software procedures, tools and techniques. Data creation will also be implemented through geocoding of address and coordinate data. Global positioning systems (GPS) technologies for GIS data creation will be undertaken using both mapping-grade and mobile GIS methods. Students will perform pre-planning, field and post-processing procedures for effective GIS data creation. Measures and methods of quality assurance and quality control will be emphasized. This course will use ArcGIS software, along with Trimble GPS hardware and software. Course may be offered in distance education format.

**GIS 23 - Raster GIS**
This course provides students skills for access, representation and manipulation of raster data in a range of different formats. Students will learn various methods for the display of raster data. Students will perform manipulation and analysis of grid data sets, such as digital elevation models (DEM). Use of imagery as a foundation GIS dataset will be covered.

**GIS 24 - Customizing GIS**
This course introduces students to customizing GIS applications to improve efficiency for specific editing and data manipulation scenarios. Several methods for customizing ArcGIS will be introduced including loading pre-built third party tools, creating custom toolbars, custom buttons, geoprocessing toolboxes, geoprocessing models, along with a brief introduction to writing scripts. The course will briefly introduce the students to programming ArcObjects with VBA and Python for programming scripts.

**GIS 25 - GIS Projects**
This course provides students with skills in GIS project design, implementation and management. Successful GIS projects require a systematic approach to identification of system objectives, required resources and implementation approach. Acquisition and management of data, along with project documentation, will also be covered. Students will apply these skills through the design and implementation of a project. Projects will be presented to other GIS users. ArcGIS, ArcPad, and ArcIMS will be the primary software used for the course.

**GIS 94 - Worksite Learning**
Work experience using geographic information systems to be approved and supervised by a college representative to ensure experience of educational value. Stresses good work habits through actual job performance. A student may enroll in one to four units per semester. One unit of work site learning credit is granted for each 75 hours paid or 60 hours of on-the-job activity. Students must enroll in at least seven units, including worksite learning. NOTE: This course may be repeated three times for a total of four enrollments since course content varies and skills are enhanced by supervised repetition.