



Course: Spatial Technology and Remote Sensing

PEIMS Code: N1302807*

Abbreviation: SPATECRS

Number of credits that may be earned: ½ - 1

Brief description of the course (150 words or less):

The purpose of this class is to provide students with instruction in Geographic Information Systems (GIS) and Remote Sensing (RS) technology. Students will receive instruction and guidance from in-class lecture with the instructor acting in a facilitator capacity on topics including skill building in industry standard geospatial extension software and geospatial tools including global positioning systems (GPS), and continued training in GIS project management and problem solving. Each student will participate in applied learning activities with emphasis placed on planning, conducting and presenting three (3) special projects dealing with the use of GIS/RS tools and data in various career cluster groups that deal with the immediate school environment.

Essential Knowledge and Skills of the course:

- (1) The student applies basic GIS software concept and skills. The student is expected to:
 - (A) explore the use of various geographic projections in GIS software;
 - (B) identify the purpose of Arc View GIS extension software.
- (2) The student applies the application of global positioning system (GPS) technology. The student is expected to:
 - (A) identify data terminology dealing with GPS;
 - (B) identify GPS receiver components;
 - (C) build a data dictionary;
 - (D) perform campus applications in GPS.
- (3) The student demonstrates skills related to problem solving and decision making. The student is expected to:
 - (A) utilize GIS data and applying critical thinking skills;
 - (B) model real-life traffic flow, including one way streets, closed streets, and overpasses;
 - (C) create, query, map, and analyze cell-based raster data;
 - (D) analyze density, distance and proximity of various data using Spatial Analyst tools.
- (4) The student will explore a proposed project in the context of the components of the Project Management Model. The student is expected to:
 - (A) create 3D themes;
 - (B) convert 2D themes to 3D.



- (5) The student will comprise a list of all possible “Mapable” facility categories on the campus. The student is expected to:
- (A) create a map of the high school campus to include all buildings and facilities;
 - (B) develop categories for restrooms, core instruction classrooms, electives classrooms, special use rooms, emergency equipment and excavation routes;
 - (C) place adjacent streets and transportation sites in the map.
- (6) The student will present a project to an appropriate audience. The student is expected to:
- (A) include demographics in the project;
 - (B) place Social-Economic information in the project;
 - (C) use the appropriate business information as a part of the project information.
- (7) The student develops meta data from original data collected from school based applications following FGDC standards. The student is expected to:
- (A) post data on an online data clearing house;
 - (B) integrate data into presentation form.

Description of the specific student needs this course is designed to meet:

This is a new emerging technology under which many career pathways, such as engineering, transportation systems, city planning, community development, environmental sciences, technology, space sciences, marketing, natural resources planning, law enforcement, cartography, real estate development, geology, and architecture are now using GIS to better serve their industry. It also builds job skills in advanced concepts in Remote Sensing, Global Positioning and Geospatial Networks & Routing and Geographical Information Systems through hands on community work.

Major resources and materials to be used in the course:

This is a project based learning class that will be used to enhance on previous work that has been learned in other GIS classes. Students will get to use industry standard tools and equipment to complete projects. Students will also pull data from public and private databases to complete their projects. The following is a list of resources and equipment could prove beneficial to this program:

- (1) PC computer with an 80 gig hard drive and XP operating system
- (2) Spatial Analyst software
- (3) Image Analyst software
- (4) 3-D Analyst software
- (5) GPS equipment
- (6) Internet Access



(7) IP registration to NASA

Required activities and sample optional activities to be used:

- (1) The student will acquire knowledge of careers related to GIS.
- (2) The student will create a GIS map to address a community situation or problem.
- (3) The student will create a GIS map involving their school campus.
- (4) The student will give a presentation on a project that they have created.
- (5) The student will do Geo-Caching on campus to locate landmarks using GPS equipment.
- (6) The student will gather remote sensing images from NASA.

Methods for evaluating student outcomes:

- (1) Student will be given oral test by the instructor.
- (2) Student will be evaluated on developmentally appropriate projects.
- (3) Student will be evaluated on presentations.
- (4) Student will be evaluated by written exams.
- (5) Student will demonstrate the principles of group participation.
- (6) Student will demonstrate effective oral and written communication skills.
- (7) Student will demonstrate the use of GIS/RS tools and data to produce solutions for various technology careers.
- (8) Student will be evaluated on a project based on real-world community problems.
- (9) Student will acquire knowledge of possible careers in GIS.

Required qualifications of teachers:

The teacher shall be certified in Technology Education, Trade and Industrial Education or Social Studies Composite and be familiar with the appropriate technology required to teach the course content.

Additional information (optional):