ANTELOPE VALLEY COLLEGE

Academic Affairs
Course Outline of Record

Academic Affairs Only
☐ New Course
X COR Revision 3/27/2008
☐ COR Update
☐ Pre Req/Advisories
☐ Other Changes
☐ Effective Date

COURSE SUBJECT & NUMBER: GEOG 298C

COURSE NAME: *Special Studies in Geographic Information Systems (GIS)

COURSE UNITS: 3 **COURSE HOURS:** 7.0 hours per week

COURSE REQUISITES: ***(Follow format of similar courses found in the college catalog.)***
Prerequisite: Completion of GEOG 205
Advisory: Completion of MATH 080 (Plane Geometry) and eligibility for Math 115 (Statistics), ENGL 101, and College Level Reading.

COURSE DESCRIPTION: ***(Write a short paragraph providing an overview of topics covered. Be sure to identify target audience--transfer, major, GE, degree/certificate, etc. If repeatable, state the number of times at end of description.)***
This course provides students with the opportunity to work independently on a GIS project. Students will use GIS skills to collect data, model, and analyze complex spatial relationships. BEFORE ENROLLING students must have computer skills, knowledge of georeferencing, coordinate systems, process of data capture, data management and analysis, and the skills necessary to produce a GIS map. This course is intended for Geography/GIS majors and persons interested in using GIS in professional settings. This course may be repeated once. (CSU, AVC) (R1)

COURSE OBJECTIVES: ***(Use Bloom's taxonomy to formulate concise, performance-based measurable objectives common to all students. Objectives must be closely aligned with course content, assignments, and methods of evaluation.)***

Upon completion of course, the successful student will be able to:

1. Describe the nature and types of spatial data needed for the project
2. Collect spatial data and construct a working database
3. Identify appropriate applications for various statistical measures when analyzing spatial data
4. Design methods for solving geographic problems and analyzing spatial data using GIS
5. Apply analytical skills and the use of statistical methods to resolve spatial questions using GIS
6. Create appropriate metadata information
7. Create a final GIS project

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COURSE CONTENT: ***(Enter course content in terms of specific topics or a specific body of knowledge that each instructor must cover. Put topics in outline form with major and minor headings. Title 5 requires that each instructor must cover all material listed below.)***

Weekly discussion of current topics in GIS. Topics will vary widely semester to semester and include investigation of GIS theory and application issues considered in professional journals (available online) and texts.

Design Project

a. Identify project goals and objectives
b. Define and locate the nature and types of spatial data required
c. Build a metadata file
d. Capture the data required
e. Collect spatial data
f. Construct a working database

Identify appropriate applications for the statistical measures used to analyze this spatial data

a. Design methods for solving geographic problems and analyzing spatial data using GIS
b. Apply analytical skills and the use of statistical methods to resolve spatial questions using GIS

Create a final GIS project

a. Present a final graphic product
b. Evaluate the project

A 3 unit GIS project will be extensive in scope. It will require considerable sources of input data and the construction of 3 or more working databases. It will require that students use 3 methods of spatial analysis to analyze geographic problems. Students will complete at least 3 final graphic presentations of maps of their spatial analysis. Actual course content will vary significantly as student projects will cover different topics.

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TYPICAL HOMEWORK ASSIGNMENTS: READING, WRITING, COMPUTATIONAL, OTHER
This information is necessary for all credit courses. Assignments should be closely related to course objectives, content, and methods of evaluation. (See sample of a "Model Outline" in the AP&P Standards & Practices handbook.) Include a range of assignments (minimum of three) from which faculty may choose when designing their syllabus.

1. ***Describe nature and frequency of typical reading assignments if applicable; note if any are required:***
Students will have reading assignments that focus on advanced knowledge of GIS. Students will review texts used in previous courses.

2. ***Describe nature and frequency of typical writing assignments if applicable; note if any are required:***
Students will design and evaluate a GIS project. Part of design process includes preparing a written plan and project description. Students will keep extensive notes describing how they performed complex computer based operations. Students will describe how and why various analytical methods should be used to solve geographic problems. Students will create metadata files. These are technical descriptions concerning the specifics of how data was collected and what methods of analysis were performed (This is an industry standard).

3. ***Describe nature and frequency of typical computational assignments if applicable; note if any are required:***
GIS requires that students understand and use basic statistical computations throughout the class. GIS is able to perform most of the actual math but students will need to understand what calculations are being performed and why these calculations are important to the analytical processes.

4. ***Describe other types of homework assignments that students may be asked to complete; note if any are required:***
Students will search for databases (online) for appropriate mapable data or spatially referenced data.
Students will use ArcGIS and other GIS software to solve a variety of geographic problems.

5. Describe those critical thinking skills that are derived from assignments listed above; be sure that they reflect course objectives.

Students will identify appropriate data sources. Students will develop projects that apply a variety of methods of spatial analysis to solve geographic problems. They must consider complicated variables when performing spatial analysis. They will use a variety of analytic tools available in GIS software to identify patterns.

6. ***For categories 1-4, describe the estimated time per week it would take a student to complete homework assignments.***
Title 5 uses the Carnegie formula for establishing units using a 2:1 ratio as follows: 1 hr. lecture = 2 hrs .homework; 2 hrs. lecture = 4 hrs .homework; etc. For example: reading textbook—2 hours; writing reports—3 hours.

Reading: 3 hours reading supplemental materials online

Writing: 3 hours documenting project progress

Computational: 3 hours evaluating GIS related computations and analytical models.

Other: 1 hour on the Internet researching GIS materials and databases.

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METHODS OF INSTRUCTION: ***(Methods must be consistent with content and appropriate to objectives; state in terms of what instructor will be doing in order to present course content to students: for example, lecture, demonstration, facilitate group work, etc. Do not list specific instructional equipment.)***

Demonstration, instructor led discussion, and hands on use of computers.

METHODS OF EVALUATION: ***(These must be clearly related to course content, assignments, and objectives in order to comply with Title 5 requirements. Describe what instructor will be looking for when evaluating various assignments and tests in order to determine whether students have met course objectives. Grades must be based on demonstrated proficiency in subject matter and determined, where appropriate, by essays, objective and essay tests, research papers or projects, problem solving exercises, or skills' demonstrations.)***

Practical application of GIS skills will be evaluated based on the completion of a final project using two or more methods of spatial analysis in GIS. The project will include a written component including project goals, description, metadata and evaluation as well as at least one map.

Suggested Texts or other Instructional Materials ***(list several when possible; include title, author, publisher, date, and latest edition.)***
Theobald, David, GIS Concepts and ArcGIS Methods, 2nd Edition, 2005: Conservation Planning Technologies
Wiley & Sons, John, Introducing Geographic Information Systems with ArcGIS, 2006: 624 pp.
Lee, Jay and Wong, David W. S., Statistical Analysis with ArcView GIS (r) (Hardcover), 2001: Wiley & Sons
O'Looney, John, Beyond Maps, 2000: ESRI Press: 240 pp.
Bolstad, Paul, GIS Fundamentals, 2002: Eider Press: 424 pp.