



ANTELOPE VALLEY COLLEGE  
**Academic Affairs**  
**Course Outline of Record**

**Academic Affairs Only**

<input type="checkbox"/>	New Course
<input type="checkbox"/>	Effective Date (for articulation )
X	COR Revision 10/23/2008
<input type="checkbox"/>	Pre Req/Advisories
<input type="checkbox"/>	Other Changes
X	SLOs 4/10/08

**COURSE SUBJECT & NUMBER:** GEOG 220

**COURSE NAME:** \*Data Acquisition and Management in Geographic Information Systems (GIS)

**COURSE UNITS:** 3 **COURSE HOURS:** 3 hours weekly

**COURSE REQUISITES:** *(Follow format of similar courses found in the college catalog.)*

Prerequisite: Completion of GEOG 205

Advisory: Completion of CA 131, MATH 080, and MATH 102, and completion of or concurrent enrollment in MATH 115.

Eligibility for College Level Reading and ENGL 101.

**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 as (R# ).*

This course provides a general survey of basic methods of data acquisition, database design and management for GIS. This course focuses on the specific data requirements of GIS. Students will examine methods of digitizing preexisting data and explore database development and management. Students will use their knowledge to complete GIS projects. Before enrolling students must have the computer skills, knowledge of georeferencing, coordinate systems, processes of data capture, data management and analysis and the skills necessary to produce a GIS map gained in GEOG 205. This course is intended for Geography/GIS majors and persons using GIS in professional settings. (CSU, AVC)

**COURSE OBJECTIVES:** *( Title 5 requires that courses show evidence of critical thinking skills. 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 components of a database and geodatabase system.
2. Digitize data and create databases for it.
3. Design a database and discuss methods for managing the spatial data used in GIS.
4. Apply skills to build databases for both raster and vector formats.
5. Apply and correct projections to acquired data.
6. Import and georeference electronic data.

**Course Subject & Number:** GEOG 220

**Course Name:** \*Data Acquisition and Management in Geographic Information Systems (GIS)

**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. Each instructor must cover all material listed below.)*

- 1. Overview of Data in GIS**
  - a. How Maps Present Information
  - b. Geographic Data Models
  - c. Introduction to databases and GIS
  - d. Designing Databases and Smart Features
  - e. Project Planning
- 2. Managing Data in GIS**
  - a. Introducing Database Concepts
  - b. Project Planning
  - c. Relational Databases and other types of data storage
- 3. Introducing Relational Databases**
  - a. Relational Systems
  - b. Base tables and Views
  - c. Domains and Relations
- 4. Database Languages and Geodatabases**
  - a. SQL
  - b. Access
  - c. Candidate Keys
  - d. Primary and Alternative Keys
  - e. Foreign Key Rules and Nulls
- 5. Acquiring Data in GIS**
  - a. Data Acquisition in GIS: Scanners
  - b. Methods and Limitations
  - c. Georeferencing
  - d. Editing and Database Creation
  - e. Digitizing from Images
- 6. Data Acquisition in GIS: Digitizing**
  - a. Methods and Limitations
  - b. Georeferencing
  - c. Editing and Database Creation
- 7. Data Acquisition in GIS: GPS**
  - a. Methods and Limitations
  - b. Georeferencing
  - c. Importing and Formatting GPS Data
  - d. Editing and Database Creation
- 8. Data Acquisition in GIS: Remote Sensing Data**
  - a. Sources: Aerial Photographs and Satellite Images
  - b. Methods and Limitations
  - c. Georeferencing
- 9. Data Acquisition in GIS: Electronic Media**
  - a. Internet Resources
  - b. Correcting Projection Problems
  - c. Georeferencing

**Course Subject & Number:** GEOG 220

**Course Name:** \*Data Acquisition and Management in Geographic Information Systems (GIS)

**TYPICAL HOMEWORK ASSIGNMENTS: (Do not include in-class work, quizzes, or tests)**

*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 weekly reading assignments that focus both on the fundamentals of data acquisition and management in GIS. Two texts will be used, one will focus more on the academic aspects of management while the other will explain how to perform various functions using ArcView software. (ArcView is one of the most commonly used GIS software packages.)

**2. Describe nature and frequency of typical writing assignments if applicable; note if any are required:**

Students will describe how various methods of data acquisition would be organized in ways that can be used to solve geographic problems. These short writing assignments will be given every 2 - 3 weeks.

Students will also design a computer project focusing on data acquisition and management. Part of the design process includes preparing a written plan and project description. Students are required to create "metadata" files which 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:**

Data management and acquisition requires that students understand and use basic statistical computations throughout the class on a weekly basis. 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 (oral presentations; special projects; visual/performing arts; etc); note if any are required:**

Students will develop projects that apply a variety of methods of data acquisition which will be organized so that they can solve geographic problems. They must consider complex variables when creating their data organization.

*For categories 1-4 above, list the estimated hours per week it would take a student to complete assignments. Title 5 (section 55002) requires that each unit must be shown to require three hours of work per week by the student either in or out of class.*

Homework formula: 3 hours of class work *times* each unit of credit *minus* classroom hours *equals* required homework hours.

**Reading Assignments:** 2 hrs

**Writing Assignments:** 1 hr

**Computational Assignments:** 1 hr

**Other Assignments:** 2 hrs

**Course Subject & Number:** GEOG 220

**Course Name:** \*Data Acquisition and Management in Geographic Information Systems (GIS)

**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, present audio/visual materials; facilitate group work, etc. Do not list specific instructional equipment.)*

Lecture, demonstration and supervision of hands-on use of computers

**METHODS OF EVALUATION:** *(These must be clearly related to course objectives and reflect course content and assignments 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.)*

Students will complete a short research paper in which they will explore applications and issues in data acquisition and management.

Practical application of GIS skills will be evaluated based upon the completion of a project using two or more methods of data acquisition in GIS. The project will include a written component including project goals, description, metadata and evaluation.

#### **Suggested Texts or Other Instructional Materials**

*(List several when possible; include title, author, publisher, date, and latest edition. If older than five years, provide brief rationale.)*

Chang, Kang-tsung. Introduction to Geographic Information Systems. 2008. 4<sup>th</sup> Edition. McGraw Hill.

Shekhar, S. and Cahwla, S. Spatial Databases: A Tour. 2003. Prentice Hall.

Van Sickle, Jan. Basic GIS Coordinates. 2004. CRC Press.

Other appropriate textbooks or reference books may be substituted at the discretion of the instructor.