I. **OVERVIEW**
The following information will appear in the 2009 - 2010 catalog

**GEOG 109 Introduction to Geographic Information** 3 Units

*Also offered as: ENSCI - 109: Introduction to Geographic Information*

Introduction to Geographic Information Systems (GIS). GIS centers upon mapping as a tool for identifying and assessing the locations of human activity. Applications to business, economics, weather, geology, real estate, agriculture, etc. Students will create and evaluate databases which generate maps using ArcView.

Field trips are not required.  (A-F Only) Lecture /Lab

Transfer: (CSU, UC)

II. **LEARNING CONTEXT**

Given the following learning context, the student who satisfactorily completes this course should be able to achieve the goals specified in Section III, Desired Learning:

A. **COURSE CONTENT**

1. **Required Content:**

   A. What is GIS?
      1. Geographical Approach
      2. Analysis of Spatial Patterns
      3. Layers of data

   B. Geographical Representations
      1. Map projections
      2. Areal Photography
      3. Remote Sensing
      4. Digital Representation
      5. Rasters and Vectors

   C. The Nature of Geographic Data
      1. Scale and Distortion
      2. Spatial Autocorrelation
      3. Distance Decay

   D. Georeferencing
      1. Placenames
      2. Postal codes
      3. Linear systems
      4. Survey systems
      5. Latitude and Longitude

   E. Cartography and map production
      1. Principles of map design
      2. Map series
      3. Applications
      4. Users and Audience
      5. Legal constraints

   F. GIS in specialized disciplines
      1. Geography
      2. Production agriculture
2. Required Lab Content:

A. Introducing ArcGIS desktop
   1. Arc Map
   2. Arc Catalog

B. Displaying Data
   1. Symbolizing, Classifying and Labeling Features
   2. Layer files
   3. Rasters

C. Querying Data

D. Joining and Relating Tables

E. Analyzing Feature Relationships
   1. Location Queries
   2. Creating graphs, layers
   3. Buffering features
   4. Overlaying data
   5. Projecting data
   6. Defining a projection

F. Building Geodatabases
   1. Creating feature classes
   2. Adding fields and domains
   3. Creating features
   4. Editing feature attribute values

G. Making Maps from Templates

H. Making Maps for Presentations

B. HOURS AND UNITS

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<tr>
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3 Units

C. METHODS OF INSTRUCTION (TYPICAL)

Instructors of the course might conduct the course using the following method:

1. Class lectures and discussion.
2. Videos and internet examples.
3. Guest speakers.
4. Classroom or small group analysis of map projections, computer applications, and database manipulations.
5. Data collection, interpretation and analysis.
6. Individual presentation of projects.
7. Demonstration of computer software and GIS applications.

D. ASSIGNMENTS (TYPICAL)

1. EVIDENCE OF APPROPRIATE WORKLOAD FOR COURSE UNITS
   Time spent on coursework in addition to hours of instruction (lecture hours)
   - weekly reading assignments
   - weekly practice with ArcView software
   - weekly online research for maps and databases

2. EVIDENCE OF CRITICAL THINKING
   Assignments require the appropriate level of critical thinking
   - List and describe three map projections and give one example of how each projection can best be utilized, and one example of how each projection should not be employed.
   - Using the map provided, identify five problems within this illustration. Describe how you could alter this map to conform to USGS mapping standards.

E. TEXTS AND OTHER READINGS (TYPICAL)


III. DESIRED LEARNING

A. COURSE GOAL
   As a result of satisfactory completion of this course, the student should be prepared to:
   create, analyze, and evaluate maps generated using ArcView GIS software. Assess and manipulate databases used to generate maps using ArcView software.

B. STUDENT LEARNING GOALS
   Mastery of the following learning goals will enable the student to achieve the overall course goal.

   1. Required Learning Goals
      Upon satisfactory completion of this course, the student will be able to:
      a. Define geographic information systems (GIS) and describe the value of illustrating locational traits with maps.
      b. Identify and evaluate the capabilities of various GIS applications.
      c. Explain how to manipulate data from one spatial matrix to another.
      d. Identify the principles of cartography and evaluate maps based upon these principles.
      e. Demonstrate the value of GIS application to agriculture, business, environmental, natural resources, and government areas.
      f. Evaluate appropriateness of GIS applications.
      g. Evaluate map patterns based upon database information.
h. Identify and assess the degree of accuracy reflected in map illustrations based upon data set information.

i. Identify, describe, and assess map projections based upon accuracy and intended use.

2. Lab Learning Goals
   Upon satisfactory completion of the lab portion of this course, the student will be able to:
   a. Create new GIS databases.
   b. Analyze data used in GIS applications.
   c. Create and evaluate maps using GIS applications.
   d. Collect, filter, and integrate data for GIS layers using traditional data sources and online data sources.
   e. Identify and apply appropriate map projections for GIS layers.

IV. METHODS OF ASSESSMENT (TYPICAL)

A. FORMATIVE ASSESSMENT
   1. Creation of databases and maps
   2. Essays, multiple choice and matching questions
   3. Individual and group problem-solving activities or presentations
   4. Evaluation of maps based upon data set collection.

B. SUMMATIVE ASSESSMENT
   1. Individual and group problem-solving activities/presentations.
   2. Evaluation of maps based upon of data set collection.
   3. Essays, multiple choice and matching questions
   4. Creation of database and maps