GIS 55 Course Outline as of Spring 2010

CATALOG INFORMATION

Dept and Nbr: GIS 55 Title: GIS FOR EARTH SCI
Full Title: GIS Applications for Earth Sciences
Last Reviewed: 3/2/2009

Units		Course Hours per Week		Nbr of Weeks	Course Hours Total	
Maximum	3.00	Lecture Scheduled	2.00	17.5	Lecture Scheduled	35.00
Minimum	3.00	Lab Scheduled	3.00	17.5	Lab Scheduled	52.50
		Contact DHR	0		Contact DHR	0
		Contact Total	5.00		Contact Total	87.50
		Non-contact DHR	0		Non-contact DHR	0

Total Out of Class Hours: 70.00 Total Student Learning Hours: 157.50

Title 5 Category:	AA Degree Applicable
Grading:	Grade Only
Repeatability:	33 - 3 Enrollments Total
Also Listed As:	
Formerly:	

Catalog Description:
This course provides training in the application of geographic information systems (GIS) principles to observing and analyzing Earth Science phenomena, especially with regard to identifying patterns of geologic hazards. It assists students in preparation for a career within the field of GIS, or to provide GIS training as an analytical tool to Earth Science majors.

Prerequisites/Corequisites:
Course Completion of GIS 51

Recommended Preparation:

Limits on Enrollment:

Schedule of Classes Information:
Description: This course provides training in the application of geographic information systems (GIS) principles to observing and analyzing Earth Science phenomena, especially with regard to identifying patterns of geologic hazards. It assists students in preparation for a career within the field of GIS, or to provide GIS training as an analytical tool to Earth Science majors. Successful completion will enable students to clearly communicate the results of risk assessment through

GIS analysis and cartographic presentation. (Grade Only)
Prerequisites/Corequisites: Course Completion of GIS 51
Recommended:
Limits on Enrollment:
Transfer Credit: CSU;
Repeatability: 3 Enrollments Total

ARTICULATION, MAJOR, and CERTIFICATION INFORMATION:

AS Degree:	**Area**			Effective:	Inactive:
CSU GE:	**Transfer Area**			Effective:	Inactive:
IGETC:	**Transfer Area**			Effective:	Inactive:
CSU Transfer:	Transferable	Effective:	Spring 2010	Inactive:	Fall 2017
UC Transfer:		Effective:		Inactive:	

CID:

Certificate/Major Applicable:
Both Certificate and Major Applicable

COURSE CONTENT

Outcomes and Objectives:
Upon completion of this course, the student will be able to:
1. Identify where geologic hazards do and do not occur
2. Determine why a geologic pattern occurs in certain areas and not others
3. Identify other phenomena such as human created features that are spatially associated with the hazard
4. Manipulate map views and query databases with GIS software to analyze observed spatial patterns
5. Evaluate the risk of particular geologic hazards occurring to human life and property at a specific site or region
6. Create a custom map of geologic risk assessment using professional cartographic presentation
7. Repeating students will gain enhanced skills and proficiencies through learning and applying methodologies and tools from updated and upgraded versions of the software.

Topics and Scope:

1. World-wide distribution of landform features
   a. Patterns in seafloor topography, earthquakes and volcanoes
   b. Plate motion data
   c. Spatial patterns and data to identify and classify plate boundaries

2. Spatial patterns of plate tectonics
   a. Rate of spreading of the Atlantic Ocean
   b. Plate spreading rate change across the globe
   c. Juan de Fuca plate
   d. Hawaiian Islands and rate of motion of the Pacific tectonic plate

e. San Andreas Fault

3. Distribution of earthquakes and seismic risk
   a. Deadly earthquake patterns throughout history
   b. Earthquake destructive potential
   c. Impact of seismic risk on economic and demographic growth

4. Distribution of volcano hazards and explosive risk
   a. Historic volacanic record
   b. Volcanic Explosivity Index (VEI)
   c. Effects of major eruptions on climate
   d. Effects of the most explosive volcanoes in history

5. Tsunami hazards
   a. Major tsunami events
   b. Tsunamis and communities: preparedness and aftermath
   c. Tsunami trigger events and criteria for issuing tsunami warnings

6. Geo-hazards and identifying risk in Sonoma County
   a. Distribution of historic earthquakes for Sonoma County
   b. Seismic shaking maps for Sonoma County
   c. Tsunami risk assessment for Sonoma County
   d. Population at risk and infrastructure

7. With repeat: Updated versions of software - methodologies and tools.

Assignment:

1. Read approximately one chapter of the textbook per week
2. Bi-weekly lab assignments using GIS technology
3. Bi-weekly writing assignments
4. Semester GIS project
5. Midterm exam
6. Final exam
7. Repeating students will gain enhanced skills and proficiencies through learning and applying methodologies and tools from updated and upgraded versions of the software.

Methods of Evaluation/Basis of Grade:

Writing: Assessment tools that demonstrate writing skills and/or require students to select, organize and explain ideas in writing.

Biweekly writing assignments	Writing 20 - 30%

Problem Solving: Assessment tools, other than exams, that demonstrate competence in computational or non-computational problem solving skills.

Semester project and bi-weekly lab assignments	Problem solving 20 - 30%

Skill Demonstrations: All skill-based and physical demonstrations used for assessment purposes including skill performance exams.

Mid-term and final exam	Skill Demonstrations 30 - 40%

Exams: All forms of formal testing, other than skill performance exams.

Multiple choice, completion, true-false, short answer	Exams 20 - 30%

Other: Includes any assessment tools that do not logically fit into the above categories.

None	Other Category 0 - 0%

Representative Textbooks and Materials:
Exploring the Dynamic Earth: GIS Investigations for the Earth Sciences. Hall, Michelle K.; Walker, C. Scott; Huth, Anne K.; Butler, Robert F.; Kendall, Larry P.; and Jenness, Jeff S., ArcGIS Edition, Thomson Brooks/Cole, Belmont, California: 2007

Various readings from Internet sites, including, the United States Geological Survey, University of California Berkeley Seismic Lab, and California Institute of Technology (CalTech).