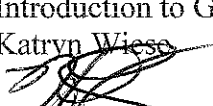



City College of San Francisco
Course Outline of Record

I. GENERAL DESCRIPTION

A. Approval Date	March 2015
B. Department	Engineering and Tech & Earth Sci
C. Course Number	GIS 110, GEOG 110
D. Course Title	Introduction to GIS
E. Course Outline Preparer(s)	Katryn Wiese
F. Department Chairperson	 Litesh Sonjei, Chris Lewis
G. Dean	 David Yee

II. COURSE SPECIFICS

A. Hours	Lecture: 2.5 weekly (44 total) Laboratory: 1.5 weekly (26total)
B. Units	3.0
C. Prerequisites	None
Corequisites	None
Advisories	CNIT 100
D. Course Justification	Introductory course to Geographic Information Systems (GIS) technology and its applications in various fields. Provides students with varying backgrounds and work experiences the opportunity to learn the basic concepts and practical applications of GIS as they apply to various fields.
E. Field Trips	No
F. Method of Grading	Letter
G. Repeatability	0

III. CATALOG DESCRIPTION

A primer course for GIS technology. History, structure, uses, and current trends of GIS, related fundamental concepts, basic query and cartography operations using industry standard ESRI ArcGIS™.

IV. MAJOR LEARNING OUTCOMES

Upon completion of this course a student will be able to:

- Describe the types of applications which lend themselves to a GIS.
- Identify commonly used GIS data formats.
- Formulate basic spatial query and analysis using GIS.
- Design maps using GIS to communicate effectively.
- Obtain, evaluate, and utilize GIS data from the internet.
- Perform basic GIS tasks such as digitizing, geocoding, and georeferencing.
- Construct a simple decision-support model in GIS.

V. CONTENTS

- Overview of what GIS is

1. Earth-based information
 2. Graphic (spatial) data
 3. Database
- B. Structure of GIS
1. Graphical data models
 - a. Vector data model
 - b. Raster data model
 2. GIS file formats
 - a. Shapefiles
 - b. Personal geodatabase/file geodatabase
 - c. Raster/image/GRID formats
 3. Organized into layers by theme
 4. Topology
 5. Earth-based coordinate systems
 - a. Latitude and longitude
 - b. Map projections
- C. Graphical output basics
1. Kinds of data
 - a. Nominal, ordinal, interval/ratio
 2. Kinds of maps
 - a. Reference
 - b. Thematic
 - c. Qualitative
 - d. Quantitative
 3. Map scale
 4. Data scale and resolution
 - a. Precision
 - b. Accuracy
 5. Visual hierarchy
 - a. Color
 - b. Symbol
 - c. Text
 6. Principles of good cartographic design
- D. Basic GIS Query and Analysis
1. Select by attributes: Using SQL expressions
 2. Select by location
 3. Overlay analysis: dissolve, buffer, union, intersect
 4. Raster analysis basics
- E. Basic GIS data creation
1. Georeferencing
 2. Digitizing
 3. Plotting x,y data
 4. Tabular join
 5. Geocoding addresses
- F. Obtaining and evaluating GIS data
1. Metadata

2. Imagery – aerial and satellite
3. Public GIS data sources online
- G. Quantitative methods in cartography and GIS
 1. Representing unique values, numerical ranking, quantities
 2. The choropleth map
 3. Using the database to filter, symbolize, and label
 4. Site suitability modeling
- H. Major GIS application fields
 1. Natural resources management
 2. Land-use planning
 3. Infrastructure operations and planning
 4. Marketing
 5. Natural sciences
 6. Social and economic research

VI. INSTRUCTIONAL METHODOLOGY

- A. Assignments
 1. In-class Assignments: Lab assignments that produce reports and maps describing results of GIS analysis and involving independent design and problem-solving. Examples include choropleth maps and site suitability modeling.
 2. Out-of-class Assignments
 - a. Reading assignments from the textbook as well as selected journal articles.
 - b. Review of past lecture material in preparation for quizzes
 - c. Review of and interaction with online GIS resources to practice lab skills
- B. Evaluation
 1. Lab assignments as described above
 2. Short quizzes on reading and review covering topics such as uses of cartographic elements; how to construct simple SQL queries; how to understand maps and grasp quantitative information from them, etc.
 3. Midterm exam on topics such as raster vs. vector images, map projections, and scale
 4. Final exam covering a review of all course topics
- C. Textbooks and other instructional materials
 1. An Introduction to Geographical Information Systems by Ian Heywood, Sarah Cornelius, Steve Carver, published by Prentice-Hall Upper Saddle River, NJ, 2012 or latest edition.
 2. ESRI hands-on learning lab online resources:
<http://www.esri.com/training/main/hands-on-learning-lab>
 3. Articles from journals and industry newsletters.

VII. TITLE 5 CLASSIFICATION

CREDIT/DEGREE APPLICABLE (meets all standards of Title 5. Section 55002(a)).