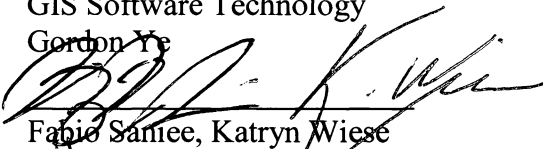



City College of San Francisco
Course Outline of Record

I. GENERAL DESCRIPTION

A. Approval Date	February 2011
B. Department	Engineering and Tech & Earth Sci
C. Course Number	GIS 112, GEOG 112
D. Course Title	GIS Software Technology
E. Course Outline Preparer(s)	Gordon Ye
F. Department Chairperson	 Fabio Samee, Katryn Wiese
G. Dean	 David Yee

II. COURSE SPECIFICS

A. Hours	Lecture: 2.5 weekly (43.75 total) Laboratory: 1.5 weekly (26.25 total)
B. Units	3.0
C. Prerequisites	GIS/GEOG 110
Corequisites	None
Advisories	None
D. Course Justification	Provides students with varying backgrounds and work experiences the opportunity to learn the more sophisticated concepts and practical applications of Geographic Information Systems (GIS) as they apply to various fields.
E. Field Trips	No
F. Method of Grading	Letter
G. Repeatability	0

III. CATALOG DESCRIPTION

Hands-on training in advanced application of GIS technology. Network modeling, linear referencing data model, user interface customization, software customization on ESRI's ArcObjects™ platform, web GIS using Google Map™ and KML™ mash-up technology.

IV. MAJOR LEARNING OUTCOMES

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

- Use Visual Basic scripts to execute mass edits in ArcView™.
- Identify spatial questions that can be answered using network modeling in GIS.
- Identify applications of linear referencing.
- Design simple geo-processing models using Model Builder™.
- Identify uses of stochastic process models.
- Use simple scripts utilizing ArcObjects™ to automate tasks.
- Design a simple user interface on ArcView platform.
- Explain the process of automating cartography using tools like MapBook™.
- Differentiate raster-based from vector-based web GIS.
- Develop a simple Google Map™ mash-up web site with KML™ overlays.

V. CONTENTS

- A. Automating geo-processing using Model Builder™
 - 1. Using variables
 - 2. Using parameters
 - 3. Exporting model to Vbscript
- B. Network Modeling
 - 1. Network data structure and connectivity
 - 2. Network modeling applications
 - a. Routing
 - b. Location-allocation studies
 - 3. Linear referencing
- C. Advanced GIS database design: ESRI's Geodatabase™
 - 1. Topology data model
 - a. Storing topology in attribute tables vs. storing geometry
 - b. Ensuring topological integrity
 - 2. Enforcing business rules in spatial databases
 - a. Geometric Network™
 - b. Production line edit tools - ArcFM™
 - 3. "Smart" annotation
 - 4. Alternative graphical representations of spatial data
 - a. Schematic™ extension
 - b. Representation™ model
- D. GIS software customization
 - 1. Graphical user interface (GUI) customization
 - 2. Creating pop-up labels and hyperlinks from map data
 - 3. Using scripts with ArcView
 - a. Using example scripts
 - b. Using ArcObjects™
 - 4. Scripting help resources
- E. Automating cartography using MapBook™
 - 1. Map grid setup
 - 2. Index map setup
 - 3. Active text
- F. Web GIS
 - 1. Software platforms
 - a. Thick vs. thin client
 - b. raster vs. vector
 - 2. Google Map™ and Google Earth™, compare with ArcGIS Explorer™
 - 3. KML™
 - 4. Google Map mash-up technology

VI. INSTRUCTIONAL METHODOLOGY

- A. Assignments
 - 1. Out-of-class reading assignments from the textbook as well as selected journal articles.

2. In-class lab assignments that produce reports and maps describing results of GIS analysis.
 3. In-class lab assignments that involve independent design and problem-solving.
 4. Out-of-class final project where the student will independently develop a GIS modeling project, locate appropriate data from the internet, develop analysis questions and implementation algorithms.
- B. Evaluation
1. Lab assignments – evaluated on whether the student completed the lab task correctly.
 2. Written reports – evaluated on completeness of lab task, clearness of communication style, and accuracy of the analysis.
 3. Short quizzes – on topics such as fundamental concepts of object-oriented programming, understanding the components of network data structure, current trends in web GIS applications, pros and cons of storing topology in the GIS database, etc.
 4. Final exam – written, in-class exam covering all topics taught in the course.
 5. Final project – evaluated on completeness of model, accuracy of data, correctness of analysis.
- 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, 2006 or latest edition.
 2. Articles from journals and industry newsletters. Journals include Spatial News and GIScience & Remote Sensing.

VII. TITLE 5 CLASSIFICATION

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