

GEOG 104 (Spring 2009)

Geographic Information Science and Spatial Reasoning

(GE course in the category of FOUNDATION: Mathematics/Quantitative Reasoning)

Class Web site <http://map.sdsu.edu/geog104/>

Blackboard URL: <https://blackboard.sdsu.edu/>

Lectures: Tu/Th 9:30am - 10:45pm

Location: Storm Hall 248

Instructor: Douglas Stow
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Office Hours: Tu 1-2 and Wed 11-12 or appt.

Overview:

This course will introduce fundamental concepts of geographic information science (GIScience), including geographic information systems (GIS), global positioning systems (GPS), cartography, remote sensing, and spatial analysis. Advanced geospatial application tools, such as Google Earth, Google Map, and the National Geographic Map Machine will be used to demonstrate these concepts. Basic principles of mathematics and quantitative reasoning will be covered. Students will learn how to use geospatial technologies and tools in addressing human and environmental problems. Students will be able to organize geospatial data, understand and interpret remotely sensed imagery, visualize spatial patterns, and conduct basic spatial query and map overlay functions.

Prerequisites: Satisfaction of the Entry-Level Mathematics requirement (ELM).

Textbooks:

[Required] Bolstad, Paul, 2008. GIS Fundamentals: A First Text on Geographic Information Systems (Third Edition), Eider Press, White Bear Lake, Minnesota.

[Optional] Longley, P.A., Goodchild, M.F., Maguire, D. J., and Rhind, D. W., 2005. Geographic Information Systems and Science (Second Edition), John Wiley and Sons, Toronto.

Lectures: Lecture sessions emphasize the principles and concepts of GIScience and spatial reasoning, including spatial analysis theory, GIS operations, Cartography, spatial statistics, remote sensing, and computer technology. Lecture graphics will be available through Blackboard.

Web-based Assignments (Homework):

Students will complete six web-based exercises on any campus computers or on their home computers with high speed Internet access. Students may wish to use computers in the Geography Spatial Analysis Laboratory (Storm Hall 338) during times that the lab is not being used for other classes. Web-based assignments are due at the beginning of the lecture (9:30am) on the lab due date. Late submission will be docked 20% per day. Web-based GIS exercises may be accessed at <http://map.sdsu.edu/geog104/lab.htm>

Grading:

A flexible curve based on the point total for all graded work and participation will be used to assign course grades. Proportions of the point total will be as follows (within +/- 3%):

Class participation (lectures): 10%
Midterm exams (2): 40%

Web exercises: 25%
Final exam: 25%

Graded work:

Examinations will include multiple choice, problem solving (computation), and short answer questions. The final exam will include a comprehensive essay question. Web-based exercises will entail several modules containing on-line demonstrations and exercises. Each module consists of multiple choice short answer, and problem solving questions. Class participation will be based on attendance and engaging in lecture and Blackboard discussions.

Additional readings: (Available via the Internet or be distributed in the lecture)

Corvallis Microtechnology, Inc. (1996). Introduction to the Global Positioning System for GIS and TRAVERSE. URL: <http://www.cmtinc.com/gpsbook/index.htm>

Butler, Declan (2006). The web-wide world. *Nature*, 439(16). February 2006, pp. 776-778.

NASA Earth-Sun System Website: <http://science.hq.nasa.gov/earth-sun/>

Trimble, Inc. (2006). GPS Tutorial. URL: <http://www.trimble.com/gps/index.shtml>

Gewin, Virginia (2004), Mapping opportunities. *Nature*, 427(22), pp. 376-377. URL: <http://www.aag.org/nature/nature.htm>