

## **Common Course Outline for:** GEOG 1180 – Cartography and Geographic Information Systems

### **A. Course Description**

1. Number of credits: 3
2. Lecture hours per week: 2  
Lab hours per week: 2
3. Prerequisites: None
4. Co-requisites: None
5. MnTC Goals:

A study of useful computing techniques in geography, with special emphasis on computer generated graphics and maps, and geographic information systems (GIS). Topics include basic principles of communication using maps, including projections, scale, and symbolization, as well as basic use of computer operating systems, spreadsheet, database, and GIS software. Laboratory applications include generating and designing graphics and thematic maps, and basic spatial analytical applications using GIS. This is an applications-oriented course in which students learn to manipulate geographic data using software such as Excel, Surfer, IDRISI, and ArcView GIS, and apply principles of cartographic design using Photoshop.

**B. Date last revised:** February, 2014

### **C. Outline of Major Content Areas**

- a. Maps
- b. Communication of Geographic Data
- c. PC hardware and software basics
- d. Spreadsheets and Graphing
- e. Map projections
- f. Types of variables and types of maps
- g. Mapping discrete interval/ratio data that is true of areas (choropleth maps)
- h. Performing mathematical operations on variables to create new variables for mapping
- i. Map Design
- j. Overview of Geographic Information Systems (GIS)
- k. Data Analysis using GIS

### **D. Course Learning Outcomes** should have 5-8 max

Upon successful completion of the course, the student will be able to:

1. Understand maps as a distinct form of communication, and as efficient and effective tools for the communication of spatial information
2. Discuss advantages of modern mapping techniques.
3. Determine what types of geographic data are appropriate for different types of graphs.

4. Understand the distinction between the main types of maps, with attention to the general characteristics, preparation, and appropriate uses of each.
5. Understand the cartographic processes of generalization and symbolization, and the relationship between mapped data and the "real world."
6. Discuss and apply standardized cartographic principles of map construction and design.
7. Recognize subjective mapping techniques used to advance viewpoints.
8. Determine types of geographic data appropriate for display in choropleth maps.
9. Use data histograms and scatterplots to objectively choose data classes for choropleth maps.
10. Develop an awareness of the role played by maps and cartography in the discipline of geography, and discuss modern uses of maps and geographic information systems in sciences, social sciences and marketing.
11. Perform boolean operations (AND, OR) using IDRISI environmental modeling software and report of results.
12. Perform area and dispersion analysis using ArcView GIS software and report meaningful results.

**E. Methods for Assessing Student Learning**

Instructors may use any or all of the following, but are not limited to:

- a. Minimum of two fifty minute exams
- b. written lab reports and projects
- c. Any other additional work assigned

**F. Special Information**

- a. Students should consult their course syllabus for specific grading policies.