

METROPOLITAN STATE COLLEGE OF DENVER
Office of Academic Affairs

REGULAR COURSE SYLLABUS

School of Letters, Arts & Sciences

Department: Earth and Atmospheric Science

Semester(s) Offered: __ Fall and Spring__

Prefix & Course Number: GIS3250 **Crosslisted With*:** N/A

Course Title: Cartography

Credit Hours: 3 (2+2)

Contact Hours: Lecture 30 Lab 30 Internship Practicum

Schedule Type(s): B **Grading Mode(s):** L

Repeat* (Variable topics): N/A

*(Pertinent only if the course can be repeated; enter maximum number of hours that can be earned by taking this course.)

Restrictions (Variable Topics Course): N/A

Prerequisite(s):

GIS 2250

MTH 1210

C or better in prerequisite courses

Or permission of instructor

Corequisite(s): none

Prerequisite(s) or Corequisite(s): none

Catalog Course Description:

This course focuses on basic cartographic and visualization concepts and techniques to convey spatial information. Students will critique and design basic cartographic products such as dot, choropleth, contour, and proportional symbol maps using Geographic Information Systems (GIS). They will explore advanced visualization techniques such as integrating data, text, and graphics, developing web maps, and animating maps to show temporal change. Cartographic applications for natural resource management and planning are stressed.

Required Reading and Other Materials will be equivalent to (Title, Author, Publisher, Copyright Date):

Cartography: Thematic Map Design, 5th Edition, Borden D. Dent, McGraw-Hill, 1999

Visual & Statistical Thinking, textbooklet, Edward Tufte, ISBN 0-961-39213-4

APPROVED:

Department Chair/Institute Director

Date

Dean

Date

Associate VP, Academic Affairs

Date

*If crosslisted, attach completed Course Crosslisting Agreement Form

Prefix and Course Number: GIS3250 _____

Specific (Measurable) Student Behavioral Learning Objectives:

Upon completion of this course the student should be able to:

1. Determine cartographic requirements for a project
2. Transform datasets from one map projection to another
3. Select map types based on spatial data distribution and map purpose
4. Design and produce maps that are visually compelling based on color, symbology, and composition
5. Design and produce maps that clearly convey spatial information through appropriate classification schemes.
6. Design and produce maps to represent both discrete and continuous phenomena
7. Design and produce maps that tell a complete story through the use of graphics and text which complement map figure.
8. Acquire data from the internet
9. Convert GIS datasets from one file format to another
10. Design and produce maps for use on the Internet
11. Design and produce cartographic products using GIS software (ArcView GIS or current equivalent)
12. Design and produce web pages using media software (DreamWeaver or current equivalent).

Detailed Outline Of Course Content (Major Topics and Subtopics) or Outline Of Field Experience/Internship (experience, responsibilities and supervision):

1. What is GIS to cartography?
 - 1.1. Cartographic principles
 - 1.2. GIS capabilities
 - 1.3. How are digital maps different from manual map products?
 - 1.4. Advantages and disadvantages of manual and automated map production?
2. Elements of map design
 - 2.1. What information can be included in maps?
 - 2.2. Map design
 - 2.3. Map elements
3. Principles of color
 - 3.1. Color lookup tables.
 - 3.2. Color schemes.
 - 3.3. Color visual impairment.
 - 3.4. Display devices and hard copy.
4. Review of map projections
 - 4.1. Classes
 - 4.2. Conversions between projections
 - 4.3. Ellipsoids and datums
5. Discrete versus continuous phenomena
 - 5.1. Phenomena versus data.
 - 5.2. Data values.

- 5.3. Data standardization
- 5.4. Impact of scale

- 6. Spatial Data Visualization
 - 6.1. Use of tables and graphs
 - 6.2. Spatial statistics
 - 6.3. Correlation versus causation
- 7. Map compilation and generalization
 - 7.1. Classification
 - 7.2. Inclusion of graphics and metadata
- 8. Thematic maps
 - 8.1. Thematic versus general reference maps.
 - 8.2. Types of thematic maps.
- 9. Choropleth maps
- 10. Dot maps
- 11. Proportional symbol maps
- 12. Visualization of 3-D Surfaces
 - 12.1. Contour maps
 - 12.2. Slope, aspect, and relief
- 13. Data Acquisition and Processing
 - 13.1. Internet sources
 - 13.2. Data Conversion
 - 13.3. Data transfer
 - 13.4. Data integration
- 14. New advances in computer cartography
 - 14.1. Electronic Atlases
 - 14.2. Interactive maps
 - 14.3. Map animation
 - 14.4. Virtual reality

Evaluation Of Student Performance:

Cartography Exercises

Lecture Exams, Quizzes, and Assignments

Class Participation