

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, Spring ____

Prefix & Course Number: GIS 4850 **Cross listed with*:** N/A

Course Title: Spatial Modeling in Raster

Credit Hours: 4 (3+2)

Contact Hours: Lecture 45 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 1110

C or better in prerequisite courses

Upper-division standing

Or permission of instructor

Corequisite(s): none

Prerequisite(s) or Corequisite(s): GIS 3250

Catalog Course Description:

This is an upper-division course in Geographic Information Systems (GIS) with an emphasis on spatial analysis and modeling. The underlying foundations of map algebra are discussed along with practical exercises that allow the student to develop familiarity with those procedures. This course offers an opportunity for students with a solid background in the fundamentals of GIS to apply the analytical capabilities of this technology to model real-world situations in support of decision-making. Application of GIS to the fields of Land Use Planning and Natural Resource Management are emphasized.

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

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: ___GIS4850_____

GIS Modeling in Raster, Michael DeMers, John Wiley & Sons, 2002

Extending ArcView GIS - Teach Yourself to Use ArcView extensions, Tim Ormsby and Jonell Alvi, ESRI, Redlands, 1999

Readings from different books, manuals, scientific and trade journals.

Specific (Measurable) Student Behavioral Learning Objectives:

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

1. Build a spatial database from various download sites providing free spatial data
2. Determine raster model and raster analytical capabilities including the use of Map Algebra Local, Focal, and Global Functions
3. Model spatial processes
4. Produce a professional technical report.
5. Process and analyze raster data with ArcView Spatial Analyst software or current equivalent
6. Integrate spatial data from a variety of sources including spatial data datum reprojection
7. Apply raster analyses to simple and complex spatial problems in planning and decision making
8. Track inputs, outputs, and analysis sequences through flowcharting.

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

Course Content:

1. Introduction
2. Maps as Numbers
3. Introduction to Modeling & Flowcharting
4. Calculations in Thematic Attribute Tables
5. Map Algebra - Operators & Operations
6. Map Algebra – Local, Focal, Zonal, & Global Functions
7. Modeling Essentials
8. Conceptualizing Models
9. Model Formulation
10. Prescriptive Modeling
11. Model Verification

Evaluation Of Student Performance:

Quizzes

Exams

Assignments, lab exercises

Class participation