

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: GIS4840 **Crosslisted With*:** N/A

Course Title: Remote Sensing

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):

GEG 1220 and GIS 2250 recommended

MTH 1110

Upper-division standing

C or better in prerequisite courses

Or permission of instructor

Corequisite(s): none

Prerequisite(s) or Corequisite(s): none

Catalog Course Description:

This course provides an overview of photogrammetry and remote sensing principals as well as practical experience in the extraction of earth surface information from hardcopy and digital imagery. Topics include electromagnetic radiation principles, aerial cameras, photo interpretation and measurement, satellite collection systems, digital imagery characteristics, and image processing. The application of remote sensing technologies to land management fields and the integration of digital imagery within Geographic Information Systems (GIS) is emphasized.

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

Remote Sensing and Image Interpretation, 5th edition, Thomas Lillesand, Ralph Kiefer, and Jonathan Chipman, John Wiley & Sons, Inc., 2004

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: GIS4840 _____

Additional readings from scientific journals, books, and trade magazines

Specific (Measurable) Student Behavioral Learning Objectives:

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

1. Explain the underlying principles of remote sensing
2. Demonstrate a high-level understanding of the five elements of remote sensing:
 - a. data collection
 - b. data processing
 - c. exploitation
 - d. dissemination, and
 - e. tasking
3. Evaluate types of sensing and recording equipment
4. Set up and use selected equipment such as stereoscopes, etc.
5. Analyze information on aerial photos and other recordings such as physical, cultural, topographic, and other features.
6. Derive positional information from aerial photos using photogrammetric principles.
7. Process digital images (using Image Analysis software or current equivalent) for the purpose of image registration, enhancement, analysis, and classification.

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

1. Fundamentals
 - 1.1 Definitions and background of remote sensing
 - 1.2 The electromagnetic spectrum
 - 1.3 Solar radiation and atmospheric fundamentals
 - 1.4 Spectral reflectance characteristics of earth surface features
2. Photographic Systems, Photogrammetry, and Photo Interpretation
 - 2.1 Cameras and camera systems
 - 2.2 Films and filters
 - 2.3 Principles of photo interpretation
 - 2.4 Measurements from aerial photos
 - 2.5 Interpretation of color infrared photos
 - 2.6 Utilization of aerial photography in resource management
 - 2.7 Planning photographic missions
3. Scanner Systems, Image Interpretation, and Data Analysis
 - 3.1 Multispectral and Thermal scanner systems
 - 3.2 Landsat and other satellite scanner systems
 - 3.3 Interpretation of multispectral and thermal scanner data
 - 3.4 Computer-aided analysis of scanner data
 - 3.5 Utilization of scanner data in resource management
4. Radar Systems and Image Interpretation
 - 4.1 Radar systems and data characteristics
 - 4.2 Interpretation of radar imagery
 - 4.3 Utilization of radar data in resource management

1. Evaluation Of Student Performance:

2. Homework and lab assignments
3. Quizzes and Exams
4. Class Participation