



SOUTHWESTERN COLLEGE COURSE OUTLINE

School of: Mathematics, Science, and Engineering

Origination Date: 02/20/2009

Department: Physical Sciences

Discipline: Geography

Course Designator and Number: GEOG 154

Effective Date: 2010 Fall

Title: Introduction to Remote Sensing

Effective Catalog Year: 2010–2011

Units 3 Lec 3 Lab 0

Total Contact Hours: 54

Same as other course(s) designator(s), PHS 154

Grading Basis: Grade or Pass/No Pass option available

Repeatable: 0

Corequisite:

Limitation on Enrollment:

Prerequisite:

Recommended Concurrent Enrollment:

Recommended Preparation:

MATH 60 or equivalent or through the Southwestern College multiple measures placement processes

RDG 158 or equivalent or through the Southwestern College multiple measures placement processes

Course Description & Scope: (50 words or less)

Introduces fundamental concepts of electromagnetic radiation and its interactions with various media. Explores commonly used sensors and techniques of remote sensing. (Same as PHS 154.)
[D; CSU]

Measurable Course Objectives and Minimum Standards, as Determined by Standards set by the instructor, at 70% Proficiency for a Grade of "C":

1. Student will analyze and describe fundamental principles of electromagnetic radiation.
2. Student will analyze and assess interaction of radiation with various media, including surfaces.
3. Student will describe and use principles of radiative transfer.
4. Student will examine and explain principles of electro-optical systems.
5. Student will compare and contrast microwave systems.
6. Student will appraise and evaluate scattering systems.
7. Student will identify and examine a variety of remote sensing platforms.

Core Content to be covered in all sections:

1. Approximately 15% of course
Fundamental principles of electromagnetic radiation
 - Polarization
 - Spectra
 - Angular distributions
2. Approximately 15% of course
Interaction of radiation with various media
 - Propagation and dielectric constants
 - Plane boundaries
 - Scattering
 - Reflection
3. Approximately 15% of course
Interaction of radiation with Earth's atmosphere
 - Atmospheric structure
 - Absorption
 - Scattering
4. Approximately 15% of course
Electro-optical systems
 - Visible, infrared, and thermal
 - Spatial and spectral resolution
5. Approximately 15% of course
Microwave systems
 - Antenna theory
 - Active
 - Passive
6. Approximately 15% of course
Scattering systems
 - Scatterometry
 - Single-aperture
 - Synthetic aperture
7. Approximately 10% of course
Remote sensing platforms
 - Aircraft
 - Satellite

NOTE: For specific details, see instructor's syllabus.

Method of evaluation to determine if objectives have been met by students:

1. Competency-based written and practical tests
2. Computer assignments
3. Objective test
4. Problem solving

Other Methods of evaluation:**Example of Assignments:**Reading

Read the following case study: Estimation of Carbon Stock Using Remote Sensing: A Case Study of Indonesia. Based on your review of the case study, answer the following questions:
1) What primary question is the study seeking to address? How is remote sensing being used to address this? What remote sensing data was used for the study? What are the results of the study?

Writing

In a few sentences, describe the difference between spatial and spectral resolution.

Critical Thinking

If your goal is to map the sea-surface temperature as a function of latitude and longitude, which type of observing platform is most appropriate? Why?

Instructional Methodology:

Requires a minimum of three (3) hours of work per unit, including class time.

1. Audiovisual
2. Distance education
3. Individualized Computer Assistance
4. Lecture

Required and major optional reading(s), including textbook(s) and software: (Author: Last name, First name. Title. 2nd ed. (or higher edition) Location: Publisher, Year)

Required:

- Lillesand, Thomas M., et.al. Remote Sensing and Image Interpretation. 6th ed. Hoboken, NJ: John Wiley & Sons, Inc., 2007. ISBN: 9780470052457

Optional:

- Jensen, J. R. . Remote Sensing of the Environment. 2nd ed. Upper Saddle River: Prentice Hall, 2007. ISBN: 9780131889507

Codes

Is this an approved special class for students with disabilities? No Answer

Is this course a part of a cooperative work experience program? No Answer

Funding Agency Category: Not yet Specified

Is this a basic skills course? No Answer

Course Offered: Variable