# Master Syllabus Department of Geography

## GEOG 342/542: Introduction to Remote Sensing

## **Course Description**

Lectures will review the physics and various systems of remote sensing, while lab exercises will cover some applications of remote sensing on the environment. Topics include the electromagnetic radiation, aerial photograph interpretation, multispectral-, hyperspectral-, thermal remote sensing, RADAR/LIDAR, and remote sensing applications on vegetation, water, and urban landscape. (3 credit hours).

Prerequisite: No prerequisite

## **Course Objectives**

The goal of this combined undergraduate/graduate course will introduce students the fundamental principles of remote sensing and its applications on physical environment of the earth. The specific objectives of the course are to (1) understand electromagnetic radiation and spectral reflectance properties of the earth surfaces, (2) learn to examine spectral, spatial, and temporal properties of various remote sensing systems, (3) explore the applications of remote sensing on environmental monitoring and natural resources management, and (4) develop basic skills of image processing on remotely sensed data.

## **Course Rationale**

Remote sensing has changed the way people view the earth dramatically and is a key component in the new emerging geospatial technology. This course is essential for geography student's core curriculum in that it introduces the basic concepts of spatial data acquisition from aerial and satellite platforms and map preparation using remotely sensed imagery. This is of particular significance since new satellites and computer resources are revolutionizing this technical field, and students must acquire proper skills in interpreting remotely sensed imagery and its applications on the environment.

# **Course Content and Format**

Students will be presented materials in both a lecture style format that will include multimedia presentations and hand-on exercises in the graphics computer laboratory. The following shows an example of a potential outline of topics for this course, with time allotment for each topic at the discretion of the instructor.

- Topic I Electromagnetic radiation
- Topic II Aerial photograph interpretation

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Topic III	Photogrammetry
Topic IV	Remote sensing data and software
Topic V	Multispectral remote sensing
Topic VI	Thermal infrared remote sensing
Topic VII	Microwave remote sensing (RADAR)
Topic VIII	Remote sensing of vegetation
Topic IX	Remote sensing of water
Topic X	Remote sensing of urban landscapes
Topic XI	Remote sensing of soils, rocks, and minerals

## **Textbook Suggestions**

Jensen, John R. 2007. *Remote Sensing of the Environment: An Earth Resource Perspective*, 2<sup>nd</sup> ed. New Jersey: Prentice Hall. ISBN 0-13-188950-8

Campbell, James. B. 2002. *Introduction to Remote Sensing*, 3<sup>rd</sup> Edition. Guilford Press, 621 pages. ISBN: 1572306408

## Methods for Evaluating Student Performance:

Forms of evaluation might include examinations, quizzes, homework, lab exercises, presentations, and term project. Graduate students enrolled in the course as GEOG542 would be expected to accomplish an additional work load (e.g., term paper, additional problems on homework and exams, etc.).

## **Evaluation of the Course**

Students use university (and departmental) online course evaluation forms to evaluate this course.