COURSE SYLLABUS: GSC 312-01 : Introduction to Remote Sensing

Instructor: Dr. Haluk Cetin
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Office Hours: 9:30-10:30AM T-Th or by appointment
Lecture and Laboratory: T-Th 11:00AM-12:15PM and T 2:00-3:50PM

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Lecture: BL-312 and **Lab:** BL-425

DEPARTMENT: GEOSCIENCES

COURSE PREFIX: GSC **COURSE NUMBER: 312-01** **CREDIT HOURS:** 4

I. TITLE:

Introduction to Remote Sensing

II. COURSE DESCRIPTION AND PREREQUISITE(S):

The purpose of this course is to introduce students to the fundamental concepts and techniques in the manual interpretation and digital processing of imagery. The focus of the course is on applications in such fields as agriculture, environmental studies, archaeology, minerals exploration, and planning. Laboratory required. The objectives of this course are to acquaint the student with the principles underlying remote sensing, introduce the student to methods of interpreting and analyzing remotely sensed imagery, familiarize the student with the various types of and the manner in which aerial photography and other remotely sensed imagery are obtained , acquaint the student with the technical issues in remote sensing, provide some insight concerning the applications of remote sensing in various discipline areas, and provide hands-on experience in remote sensing using IMAGINE and ArcGIS software.

Prerequisite(s): None

III. COURSE OBJECTIVES:

The student will be able to

A. acquaint the student with the principles underlying remote sensing,
B. introduce the student to methods of interpreting and analyzing remotely sensed imagery,
C. familiarize the student with the various types of and the manner in which aerial photography and other remotely sensed imagery are obtained,
D. acquaint the student with the technical issues in remote sensing,
E. provide some insight concerning the applications of remote sensing in various discipline areas, and
F. provide hands-on experience in remote sensing using IMAGINE and ArcGIS software.

IV. CONTENT OUTLINE:

A. Orientation/Overview: Introduction to Remote Sensing
B. History of aerial photography and other remotely sensed imagery
C. Study of aerial photographs
D. Data acquisition, flight planning
E. Photographic scale. Interpretation clues.
F. Photography, films, filters
G. Remote sensing systems, Digital Image Processing
H. Technical issues in remote sensing: Coordinate systems, data structures and formats, error modeling & data uncertainty and visualization
I. Application issues in remote sensing: Remote sensing application areas, decision-making in remote sensing, system planning and other issues

NOTE: Any changes to the schedule will be announced at the Canvas website

V. INSTRUCTIONAL ACTIVITIES:

A. Lectures and laboratories
B. Powerpoint slides
C. Examinations and use of literature
D. Assigned readings
E. Computer activities/exercises

F. Homework assignments

VI. FIELD, CLINICAL, AND/OR LABORATORY EXPERIENCES:

The laboratory is meant to be an integral part of this course. All students must have a computer account. Laboratory computer exercises are coordinated with classroom lecture material.

VII. TEXT(S) AND RESOURCES:

Required Text: Introduction to Remote Sensing, 5th Edition, James B. Campbell and Randolph H. Wynne,
ISBN-10: 160918176X | ISBN-13: 978-1609181765 | Publication Date: June 21, 2011 | Edition: Fifth Edition

Resources:

A. Printed Material
B. Videos
C. Computer and lab facilities at MARC and the Department of Geosciences
D. Web resources
E. Powerpoint Slides

VIII. EVALUATION AND GRADING PROCEDURES:

Reading assignments, exercises, homework assignments, class projects, term project, quizzes, three examinations will be given. Unless changed by the instructor, it is assumed that the student will have completed the assignment prior to coming to lecture on the due date. Several relatively brief homework exercises will be assigned during the semester to ensure that the pertinent procedures and concepts discussed in lecture are understood. Students are expected to work on the assignment individually and not collectively. **Assignments turned in after the due date but before the next class will receive 80 percent of the grade**. **Assignment will not be accepted that is more than one week late.** The students will be encouraged to bring some problems and/or solutions relevant to the course before the class.

Web/Literature Review: To become better acquainted with remote sensing, one article of your choice is to be reviewed and synopsized during each of the first five weeks of the semester. These reviews should be geared to helping you choose and explore your term project topic. The synopsis of the article to be turned in should include:

1) a correct bibliographic citation (i.e. Cetin, H., and Levandowski, D. W., 1991. Interactive classification and mapping of multi-dimensional remotely sensed data using nPDF. *Photogrammetric Engineering and Remote Sensing* 57(12): 1579-1587.).
2) a brief paragraph describing the article and any key points of importance or interest, and
3) your evaluation of the article.

A template will be available on Blackboard. Web/literature reviews will be graded on accuracy of the citation, characteristics of the article, quality of the review, effectiveness of communication, and neatness (I suggest you use a word processor).

Term Project: Each student will independently do a term project on an aspect of remote sensing. I would like you to turn in a statement describing the topic of interest before (or on) **February 27.** If you cannot think of a topic, please see me, and I will help you choose one. The report (in the form of a Web page and a poster to be presented at the MSU Sigma Xi poster competition) of the project should be approximately 2,000 words in length excluding reference list. Include a title page, abstract, introduction, methods used/detailed description of the project, discussions/conclusions and a list of references. The report will be graded based on content, presentation, and neatness. You should therefore present a logical, coherent discussion. If your report is not legible, it will be given a failing grade. During the 13th week of class each student will give a short presentation on the project to the rest of the class.

Quizzes: Three quizzes will be given during the semester. Each quiz will be given during the last 10 or 15 minutes of the class period. Each quiz will emphasize the material covered since the previous exam, including the material discussed in the previous lecture period. Question format may include multiple-choice, fill-in, matching, true and false, problems, essay, and identification type questions.

Examinations: Three examinations will be given. Each exam will include all materials assigned or presented through the previous week. The question format for the exams will be similar to that on the quizzes.

Any changes to the grading procedure will be announced at the Canvas website.

Grading:

Three Quizzes	15%	A= 90 - 100% of total points
Three Exams	30%	B= 80 - 89% of total points
Laboratory exercises	30%	C= 70 - 79% of total points
Web/paper reviews (5)	5%	D= 60 - 69% of total points
Term project	20%	E= less than 60% of total points
Total	**100%**	

IX. ATTENDANCE POLICY:

Students are expected to adhere to the MSU Attendance Policy outlined in the current MSU Bulletins.

X. ACADEMIC HONESTY POLICY:

Cheating, plagiarism (submitting another person's material as one's own), or doing work for another person which will receive academic credit are all impermissible. This includes the use of unauthorized books, notebooks, or other sources in order to secure or give help during an examination, the unauthorized copying of examinations, assignments, reports, or term papers, or the presentation of unacknowledged material as if it were the student's own work. Disciplinary action may be taken beyond the academic discipline administered by the faculty member who teaches the course in which the cheating took place.
Note: Faculty reserve the right to invalidate any examination or other evaluative measures if substantial evidence exists that the integrity of the examination has been compromised.

XI. NON-DISCRIMINATION POLICY STATEMENT:

Murray State University endorses the intent of all federal and state laws created to prohibit discrimination. Murray State University does not discriminate on the basis of race, color, national origin, gender, sexual orientation, religion, age, veteran status, or disability in employment, admissions, or the provision of services and provides, upon request, reasonable accommodation including auxiliary aids and services necessary to afford individuals with disabilities equal access to participate in all programs and activities. For more information, contact the Executive Director of Institutional Diversity, Equity and Access, 103 Wells Hall, (270) 809-3155 (voice), (270) 809-3361 (TDD).

XII. Other required departmental or collegiate committee information

NOTE: This syllabus is subject to revision if deemed necessary by the instructor. Any changes to the syllabus will be announced in advance.