

# **GEOGRAPHY 4412 – DIGITAL REMOTE SENSING SOUTHWEST TEXAS STATE UNIVERSITY, SPRING 2002**

**Instructor:** Mark A. Fonstad

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**Office Hours:** 8:30 AM – 9:30 AM Tuesdays and Thursdays or by appointment

**Class Time:** 9:30 AM – 10:45 AM Tuesdays and Thursdays

**Classroom:** Evans Liberal Arts (ELA) Building, Room 312

**Course Line Number:** 231612

## **COURSE DESCRIPTION**

This course is an introduction to digital image processing of satellite scenes including restoration, enhancement, classification, change detection, and mapping for environmental monitoring and inventorying. The course objective is to introduce students to digital image processing of spaceborne and airborne remote sensing data.

## **COURSE PREREQUISITES**

GEO 3416 (Air Photo)

## **COURSE MATERIALS**

Readings for this class will be from the textbook, *Introductory Digital Image Processing: A Remote Sensing Perspective* (1996) by John R. Jensen. Supplemental readings and images will be given as class handouts.

## **SOFTWARE**

In the laboratory, students will use ERDAS Imagine, a professional yet off-the-shelf software package for raster data processing and visualization including images, digital elevation models, and some vector data.

## **EVALUATION AND GRADING POLICIES**

I will evaluate your performance and assign grades based on two major areas of work in this course. First, I will assess your knowledge of the lecture material with three examinations (two midterms and a final). Second, your performance in required laboratory exercises is also used to evaluate your final grade.

All students are expected to take exams at the scheduled time. In the event this is impossible you must contact the instructor as far in advance as possible to determine if other arrangements will be permitted. Make up exams may or may not be permitted at the discretion of the instructor and, if permitted: 1) the format of the exam may be changed, and 2) the possible points earned may be significantly reduced. If exams are not taken at the scheduled time, the following policies apply.

***Situation 1, Anticipated Absence During a Scheduled Exam.*** Personally notify the instructor as far in advance as possible to determine if the reason is acceptable and a make up exam will be permitted. Failure to notify the instructor in advance will result in forfeiture of make up privilege. Examples of acceptable excuses include documented illness and doctor appointments that cannot be scheduled at any other time. Examples of

unacceptable excuses include attending social functions and early departures for holidays. ***Situation 2, An Extreme, Unavoidable Catastrophe Occurs Immediately Preceding the Scheduled Exam Which Makes it Impossible to Take the Exam.*** In such cases, notify the instructor as soon as possible and bring in documentation of the incident so that the instructor may make arrangements for a make up as soon as possible. ***Situation 3, No Acceptable Excuse Exists – No Shows = No Make Up.***

There is a maximum of 500 points for all of the lecture exams and laboratory exercises. The basis for grading will be as follows: 100 points for each of two midterm examinations, 100 points for the final examination, and 200 points for the laboratory section. The final grades will be determined based on the following rules:

|   |                                  |
|---|----------------------------------|
| A | ≥90% (≥450 points)               |
| B | ≥80% and <90% (400 – 449 points) |
| C | ≥70% and <80% (350 – 399 points) |
| D | ≥60% and <70% (300 – 349 points) |
| F | <60% (< 300 points)              |

### **ATTENDANCE POLICY**

Good attendance in lecture is key to your success in this course. First, the exams will be based on lecture material. Second, the laboratory exercise schedule is fairly rigorous, and you will quickly fall behind if you repeatedly miss lectures or labs.

If you must miss class or an exam because of an illness, a personal emergency, or some other extenuating circumstance, please contact me as soon as possible so I can make alternative arrangements for you (this is key). Of course, good attendance means more than just showing up for class. Please read and adhere to the policy on classroom etiquette that appears below. These codes of conduct will allow everyone to participate equally as learners. Thank you for your cooperation.

### **CODE OF CONDUCT**

In the Department of Geography, instructors strive to create an atmosphere of mutual trust and respect in which learning, debate, and intellectual growth can thrive. Creating this atmosphere, however, requires that instructors and students work to achieve a classroom in which learning is not disrupted. At the most basic level, this means that everyone should attend class, be prepared with readings and assignments completed, and that students pay attention. This means no conversations with friends, reading the newspaper, coming late, or leaving early. Such behavior is disruptive to the instructor and to your fellow classmates.

### **STUDENTS WITH DISABILITIES**

Students having special needs/disabilities that require accommodations for successful completion of this course must notify both SWT's Office of Disability Services and the course instructor by no later than the end of the first week of classes. Failure of the student to do so may result in the necessary accommodations not being made.

## SWT ACADEMIC HONESTY POLICY

Learning and teaching take place best in an atmosphere of intellectual fair-minded openness. All members of the academic community are responsible for supporting freedom and openness through rigorous personal standards of honesty and fairness. Plagiarism and other forms of academic dishonesty undermine the very purpose of the university and diminish the value of an education. Specific sanctions for academic dishonesty are outlined in *SWTexan*.

| <b>Schedule</b> | <b>Topics</b>  | <b>Readings</b> |
|-----------------|--|-----------------|
| January 15,17   | Overview, History of Remote Sensing  |                 |
| January 22,24   | The Electromagnetic Spectrum   |                 |
| January 29,31   | Atmospheric & Earth Interactions with Light                                      |                 |
| February 5,7    | Images and Image Description   | Chapter 3,4     |
| February 12,14  | Scanning Systems   | Chapter 2       |
| February 19,21  | Scanning Systems, Resolution   | Chapter 2       |
| February 26,28  | <b>Exam 1 (Tuesday, February 26)</b><br>Introduction to Digital Image Processing |                 |
| March 5,7       | Image Rectification & Restoration  | Chapter 6       |
| March 12,14     | <i>SPRING BREAK</i>  |                 |
| March 19,21     | Image Enhancement, <i>No lecture Thursday</i>                                    | Chapter 7       |
| March 26,28     | Image Enhancement, Cont.   | Chapter 7       |
| April 2,4       | <b>Exam 2 (Tuesday, April 2)</b><br>Supervised Classification                    | Chapter 8       |
| April 9,11      | Unsupervised Classification, Accuracy  | Chapter 8       |
| April 16,18     | Change Detection   | Chapter 9       |
| April 23,25     | Introduction to Hyperspectral & Radar  |                 |
| April 30, May 2 | <b>Final Exam, May 2, 8:00 am – 10:30 am</b>                                     |                 |

