

SYLLABUS
GEOG 330: Introduction to Remote Sensing
2013 Summer Session I

Lecture/Lab Hours:
M, T, W, R, F 3:00 - 4:45 pm
June 3 - July 3, 2013

Instructor: Lily House-Peters
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Office: Harvill 416

Class location: Harvill 401
Office Hours: Tues: 2-3pm
Wed: 2-3pm
&, By Appointment

COURSE OBJECTIVES:

Remote sensing is the art and science of obtaining information about an object without being in direct physical contact. Aerial photographs and satellite imagery constitute a significant output of remote sensing methods. Remote sensing can be used to measure and monitor important biophysical characteristics and human activities on Earth, and remote sensing is increasingly utilized and relied upon to solve the complex physical, biological and social issues affecting our interconnected world. The principles, techniques, and applications of remote sensing cannot be covered in one semester; however this course will provide a detailed overview and give students the background and training needed to understand and utilize aerial photography and satellite image data across a variety of terrestrial applications, and to be prepared for more advanced work in image analysis and digital image processing.

COURSE MATERIALS:

Lecture slides, problem sets, laboratory instructions, and additional materials shall be posted to the course D2L website (www.d2l.arizona.edu). You can access this site using your UA Net ID and Password.

COURSE ASSIGNMENTS, ACTIVITIES & GRADING

Course Assignments & Weighting

- | | |
|--|--------------|
| • Attendance/Daily Questions/In-Class Assignments | (100 points) |
| • 10 Problem Sets (<i>10 points per Problem Set</i>) | (100 points) |
| • 8 Lab Exercises (<i>50 points per Lab</i>) | (400 points) |
| • 4 Quizzes (<i>100 points per Quiz</i>) | (400 points) |

Total possible points: 1000

COURSE REQUIREMENTS:

Ten problem sets, eight lab exercises, and four quizzes are required for the course. ***The course schedule including lecture topics, quiz dates and due dates for problem sets and lab exercises is included on PAGE 8 of this syllabus.***

Final grades will be assigned using the following grading scale:

<i>Letter Grade</i>	<i>Course Points Earned</i>
A	900 – 1,000
B	800 – 899
C	700– 799
D	600 – 699
E	< 600

PARTICIPATION & ATTENDANCE:

Attendance is required and will be checked daily. This course is very short and every single class meeting is necessary for success in the class. *Students should miss no more than 2 class meetings.* Absences will detrimentally impact the student's grade. Participation is highly encouraged and will improve your grade!

Make-ups for the Quizzes will be given ONLY if approved in advance by the instructor, or, in the case of a legitimate unforeseen emergency; documentation is required in this case.

RECOMMENDED TEXTBOOKS:

There is no required textbook for this class. However, I highly recommend the textbook *Remote Sensing of the Environment* for anyone who is interested in pursuing a career or research in remote sensing.

I highly recommend the following textbooks:

1. Jensen, John R., (2007). *Remote Sensing of the Environment: An Earth Resource Perspective*, New Jersey: Prentice-Hall, Inc., 592 pp.
2. Jensen, John R., (2007). *Introductory Digital Image Processing*, New Jersey: Prentice-Hall, Inc., 544 pp.

LABORATORIES:

The laboratory component will provide direct experience in the analysis of aerial photography and satellite imagery through manual interpretation and the use of image processing software. The first labs emphasize the exploration of features found on aerial photographs and satellite images. Later, you will have a hands-on opportunity to process, enhance, and interpret digital satellite images using ERDAS 10 image processing software. The lectures and labs are coordinated: lectures contain important theoretical background essential for success in the labs. For students wishing a more in-depth treatment of applications and greater time utilizing image-processing software, the follow-on course is Geography 483/583, Geographic Applications of Remote Sensing. Both active participation and successful completion of the exercises for each lab will determine your lab grade.

LAB REPORTS:

For each lab you will generate a **digital** report using the templates provided. These reports should contain the answers and figures requested in the lab handouts. Answers must be distinguished with **bold** and/or *italics*. Figures must include captions with a short explanatory text at the bottom of the figure. Figures should not be larger than 4 inches. ONLY labs that meet these requirements will be accepted.

Lab reports must be uploaded to your S:Drive folder by the end of class (5pm) on the due date. Lab reports must be titled ***LastName_FirstName_Lab#.doc***

Late labs will lose 5 points per day late, unless prior arrangements are made with the lab instructor. If you are unable to complete a lab during regular lab hours, there are extended computer access hours and there is an overflow lab (Harvill 454). Check the Open Lab schedule outside the SAL.

Labs are worth 400 total points (or 40%) of your final grade in the course.

<i>Course Component</i>	<i>Point Value</i>	<i>Due Date</i>
Lab#1	50	06 June 2013 (Th)
Lab#2	50	10 June 2013 (M)
Lab#3	50	13 June 2013 (Th)
Lab#4	50	17 June 2013 (M)
Lab#5	50	20 June 2013 (Th)
Lab#6	50	24 June 2013 (M)
Lab#7	50	27 June 2013 (Th)
Lab#8	50	01 July 2013 (M)

QUIZZES:

Four quizzes will test your understanding of remote sensing theory and concepts covered in lectures, in-class assignments, labs, and problem sets.

Each quiz is worth 100 points (or 10%) toward your final grade in the course.

<i>Course Component</i>	<i>Point Value</i>	<i>Exam Date</i>
Quiz 1	100	12 June 2013 (Wed)
Quiz 2	100	19 June 2013 (Wed)
Quiz 3	100	26 June 2013 (Wed)
Quiz 4	100	03 July 2013 (Wed)

PROBLEM SETS:

Ten problems sets will be assigned. They are designed to practice and stretch your understanding of remote sensing principles, and they will require use of lectures notes, labs materials, and in-class assignments.

Problem Sets will be handed out in hardcopy on Tuesdays and Thursdays each week. The Problem Set will be due the following day (Wednesday, or Friday). The Problem Set must be turned in at 3pm (start of class) on the due date to receive credit. *No late Problem Sets will be accepted.*

<i>Course Component</i>	<i>Point Value</i>	<i>Due Date</i>
Problem Set #1	10	05 June 2013 (Wed)
Problem Set #2	10	07 June 2013 (Fri)
Problem Set #3	10	12 June 2013 (Wed)
Problem Set #4	10	14 June 2013 (Fri)
Problem Set #5	10	19 June 2013 (Wed)
Problem Set #6	10	21 June 2013 (Fri)
Problem Set #7	10	26 June 2013 (Wed)
Problem Set #8	10	28 June 2013 (Fri)
Problem Set #9	10	03 July 2013 (Wed)
Problem Set #10	10	03 July 2013 (Wed)

PROFESSIONALISM:

Professionalism is expected from all students. Students demonstrating a professional work ethic, focused work habits and contributions to the course will be rewarded. Failure to behave professionally will result in a grade penalization at the instructor's discretion. Examples of unprofessional behavior include, but are not limited to, non-punctuality, disturbing others in class with cell phones, loud music, or other distractions, plagiarism, abusive, threatening behavior, and unacceptable conduct. **During lectures, workstation computers are not to be used.**

LAB HOURS:

Our lecture and lab meet in Harvill 401, which we call the Spatial Analysis Lab (SAL). The SAL is to be used to work on course related content. Generally, the last half of the daily scheduled course time is reserved for your lab work. The SAL may be available during business hours before the class for additional time if needed, as long as another class is not in session. If the SAL door is closed, show your CatCard to the Geography office staff across the hall, and they should be able to let you in to work. Please remember, the SAL is for class use, not personal use.

The SAL is used by another class starting at 6pm, M-F. You will need to have saved your work and logged off your workstation by this time each day.

INFORMATION MANAGEMENT:

You are responsible for saving and backing up your work. Working with computers in a professional environment requires that you implement a reliable backup strategy for your data. If you don't backup your work, and you experience a file loss or storage problem, no allowance will be made for missed or incomplete assignments.

HELP:

There are several places to seek help. Your fellow students in the course can be a valuable resource. Don't be shy about conversing with each other! Work together to problem-solve; but do not copy. Your submittals and lab work will need to be an individual product. **Credit will not be given to non-unique work products.** All submittals will be scrutinized for compliance with this policy. Also, you need to become familiar with using the ERDAS on-line Help resources. Please try this first before asking for help. Specifically, exhaust your intellectual resources before asking for help. **Please don't hesitate to ask questions and take advantage of my office hours.**

COURSE POLICIES

ACADEMIC MISCONDUCT:

Academic misconduct is treated very seriously in this class. Academic misconduct is defined as any activity that is deemed as compromising the academic integrity of the institution, or otherwise subverts the educational process. Academic misconduct includes:

- (1) Violation of course rules as outlined by the course syllabus;
- (2) Providing or receiving of information during exams;
- (3) Submitting plagiarized work for an academic requirement; and/or,
- (4) Serving as, or enlisting the assistance of, a 'ringer' or substitute for a student in the taking of exams.

The perpetrator of any of action deemed as academic misconduct will be placed in front of the Dean of Student with the possibility of suspension or, even more likely, expulsion. For further information, students should refer to the [University of Arizona's Code of Academic Integrity](#).

ACCESS TO GRADES:

University of Arizona policy mandates that the *instructor is not permitted to provide students' grades over the phone or via email.* You will have regular access to your grades on the D2L course website.

CLASSROOM BEHAVIOR

Please, turn cell phones, smart phones, and pagers off *before* lab time. Emailing, chatting, facebooking or surfing the web will not be tolerated during lab time. Disrespectful or threatening behavior by students toward other students or instructor is unacceptable and is governed by University policies on such behavior. (<http://policy.web.arizona.edu/~policy/threaten.shtml>).

It is our shared goal is to maintain a safe learning environment in which ideas are exchanged freely and without undue criticism.

STUDENT HONESTY

Plagiarism is reprehensible and punishable. According to the University of Arizona, “plagiarism is using others’ ideas and words without clearly acknowledging the source of that information.” In fact, the mere presence of any directly quoted or paraphrased text in your writing that is not properly referenced is considered plagiarism. This includes turning in any lab exercises downloaded from the internet, submitting lab exercises completed by another student in a previous semester, getting someone else to write your lab answers, or writing someone else’s lab for them. All components of this course are to be completed with integrity. Each student is also expected to refrain from any other form of cheating. Cheating during exams— including taking online exams with another student and/or sharing questions & answers with other students enrolled in this online class—is considered a serious offence and will thus be treated as such.

Any case of possible plagiarism or cheating will result in a failing grade on that particular course component. In addition, the instructor reserves the right to file an official complaint with the Dean of Students against the student(s) involved. If you need further clarification, you can consult [the University of Arizona’s Code of Academic Integrity](#) for more information.

THREATENING BEHAVIOR

Threatening behavior in the classroom is prohibited.

Threatening behavior is defined by the University of Arizona as:

Any statement, communication, conduct or gesture, including those in written form, directed toward any member of the University community that causes a reasonable apprehension of physical harm to a person or property. A student can be guilty of threatening behavior even if the person who is the object of the threat does not observe or receive it, so long as a reasonable person would interpret the maker’s statement, communication, conduct or gesture as a serious expression of intent to physically harm.

Any display of such behavior will be handled as stipulated by the [University of Arizona’s Policy on Threatening Behavior by Students.](#)

SPECIAL PROVISIONS

OBSERVED ABSENCES

All holidays or special events observed by organized religions will be honored for those students who show affiliation with that particular religion. A list of religious holidays recognized by the University of Arizona is included in the [Calendar of Religious Holidays.](#) In addition to the holidays described above, absences pre-approved by the University of Arizona’s Dean of Students (or Dean’s designee) will be honored in this course. In either situation, all evidence for such absences needs to be arranged in advance of (not after) the date that an absence is anticipated.

STUDENTS WITH DISABILITIES:

In compliance with Title III of the Americans with Disabilities Act (1990), students who require special assistance will be suitably accommodated. If you anticipate the need for reasonable accommodations to meet the requirements of this course, you must register with the Disability Resource Center and request that the DRC send me official notification of your accommodation needs as soon as possible. If you would like to discuss how the course's requirements and activities might impact your ability to fully engage with the material, please arrange for a virtual "appointment" by the end of the first week. The syllabus and other course materials, as they are distributed, are available in alternative formats upon request.

SUBJECT TO CHANGE STATEMENT

Finally, information contained in the course syllabus, other than the grading policy, may be subject to change with advanced notice, as deemed appropriate by the instructor. Any changes the instructor makes to this syllabus will be posted to the announcements section of the course website.

Table: GEOG 330 Summer 2013 Course Schedule*

No.	Date	Lecture Topic	Problem Set**	Lab***
1	3-Jun (Mon)	Course Overview		
2	4-Jun (Tues)	Introduction to Remote Sensing		
3	5-Jun (Wed)	Visual Image Interpretation	1	
4	6-Jun (Thurs)	Electromagnetic Radiation		1
5	7-Jun (Fri)	Energy-Matter Interactions	2	
6	10-Jun (Mon)	History of Aerial Photography		2
7	11-Jun (Tues)	Introduction to ERDAS 10		
8	12-Jun (Wed)	Quiz 1	3	
9	13-Jun (Thurs)	Cameras, Filters, and Film		3
10	14-Jun (Fri)	Image Interpretation	4	
11	17-Jun (Mon)	Photogrammetry		4
12	18-Jun (Tues)	Remote Sensing Systems		
13	19-Jun (Wed)	Quiz 2	5	
14	20-Jun (Thurs)	Remote Sensing in the Visible-NIR		5
15	21-Jun (Fri)	Remote Sensing in the Thermal Infrared	6	
16	24-Jun (Mon)	Microwave Remote Sensing		6
17	25-Jun (Tues)	Digital Image Processing		
18	26-Jun (Wed)	Quiz 3	7	
19	27-Jun (Thurs)	Remote Sensing of Vegetation		7
20	28-Jun (Fri)	Water and Environmental Applications	8	
21	1-Jul (Mon)	Remote Sensing of the Urban Landscape		8
22	2-Jul (Tues)	Remote Sensing of Soils and Minerals		
23	3-Jul (Wed)	Quiz 4	9, 10	

* The class schedule is subject to change

** Problem Sets are due at the beginning of class (3pm) on the date indicated on the syllabus.

*** Labs are due at the end of class session (i.e. 5pm) on the date indicated on the syllabus.