Remote Sensing of the Physical Environment (GR 4333/6333)
Distance Learning Fall 2012

Instructors:
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Prerequisites: Consent of Instructor

Information:
- Please <u>email</u> the instructors through <u>MyCourses.</u> Please <u>refrain</u> from <u>making phone calls</u>, this method is a last resort, and will only be used at the instructor's request.
- For all technical issues email <u>Help@distance.msstate.edu</u> or call 662-325-0276
- For general inquiries about MSU, the program or the Geospatial Certificate email Joy Bailey at <u>jbailey@distance.msstate.edu</u>
- MSU Bookstore phone: (662) 325-1576 or (662) 325-2249
- Geosciences fax: (662) 325-9423
- Textbook: Introduction to Remote Sensing, 2011, 5th Edition, James B. Campbell ISBN 978-1-60918-176-5
- Software: Erdas Imagine 11. You will need to download the software and then obtain a license. Instructions of how to do this are located on the course home page. Please email Kate if you have any questions.

Purpose and Goals of the Course:
Remote Sensing (RS) and Geographic Information Systems (GIS) have become prevalent in natural resource management, in applications of earth science, geology, meteorology, transportation, and in many other disciplines. **Remote Sensing is the art and science of extracting information from an object, area, or phenomenon through the analysis of data acquired by a device that is not in contact with the object, area, or phenomenon under investigation.** This course exposes students to the properties of light, patterns and processes, and automated processing of remotely sensed data. Students will learn to use software that is designed to **help** derive information from remotely sensed data. Use of RS software and RS/GIS analysis techniques will be taught.

Course Objectives:
1. Develop a basic understanding of how remotely sensed and geographic data can be represented;
2. Learn about the basic nature of light;
3. Review sensors and platforms;
4. Teach concepts of analyzing RS data to produce thematic maps;
5. Learn concepts of landscape patterns and underlying processes;
6. Provide hands-on opportunities to use remote sensing software to derive information from remotely sensed data. This will be accomplished through laboratory exercises and individual projects.

General Course Outline:

- General Concepts
  - Definition
  - Mapping the Earth
  - Scale
  - Resolution
  - Light
  - Sensors
- Methods and Techniques
  - Enhancement
  - Feature Space
  - Classifications
  - Accuracy Assessment
- Applications
  - Vegetation
  - Water
  - Urban

Method of Instruction:
The course will be administered through the **MyCourses** website which can be accessed at http://mycourses.msstate.edu. The lectures, quizzes, grades, course information, contact with the instructors, etc. will be conducted through MyCourses. Please, check the MyCourses course page daily for updates. The **lectures** will be available through web-streaming (Quicktime format) and these video files can be accessed through the "Learning Modules" course tools (left menu bar). The streaming requires Quicktime®, which you can download for free at www.apple.com/quicktime/download/. If there are technical problems watching the videos on-line, please email the instructors. The PowerPoint presentations of each lecture are also available on MyCourses in the "Learning Modules" link. To assist with the labs, there are a few video files to get you started. These are also available via video streaming from MyCourses. The lab documents (instructions and lab data) are available on the course home page in a folder titled Labs. You will need a software program, such as WinZip or 7-Zip, to extract the files from a zipped folder. It is likely that your computer already has such a program. If not, you can download 7-zip for free from the internet at http://www.7-zip.org/. Please contact the instructors immediately if you have questions or need assistance downloading the lab files.

Office Hours:
You may contact **Kate Grala**, the main contact for the course at any time Monday through Friday from 9 am to 4 pm via the Mycourses Mail tool. A timely response will be given during this timeframe. Questions are always welcome at any time, but may take a little longer to answer outside of office hours and during school holidays.

Student Responsibilities:

Preparation: Students should feel free to ask questions during the course of each lecture and lab, as this is the best time to clarify anything that is confusing. Please, prepare for each lecture by reading assigned material and by reviewing your notes.

Extra Credit: No extra credit will be provided for students.

Lecture Topics and Readings (Tentative):

Lecture #	Dates Available	Date Due for Quizzes	Book Reading
1	08/20/2012	08/29/2012	Ch. 1, 3, & 5
2	08/20/2012	09/05/2012	Ch. 10
3	08/20/2012	09/12/2012	Ch. 2 & 6
4	08/29/2012	09/19/2012	Ch. 4
5	09/05/2012	09/26/2012	Ch. 11
6	09/12/2012	10/03/2012	Ch. 13 & handout
7	09/26/2012	10/17/2012	Ch. 12
8	10/03/2012	10/24/2012	Ch. 14
9	10/17/2012	10/31/2012	Ch. 16
10	10/24/2012	11/07/2012	Course Review, None

GIS Laboratory Schedule (Tentative):

Lab #	Start Date	Lab	Due Date
1	08/24/2012	Gaining Familiarity with ERDAS Imagine	09/07/2012
2	08/31/2012	Image Enhancements – Visual	09/14/2012
3	09/07/2012	Image Enhancement Spatial Filters	09/21/2012
4	09/14/2012	Spectral Image Enhancement	09/28/2012
5	09/21/2012	Image Rectification and Resampling	10/19/2012
6	10/12/2012	Unsupervised Classification	10/26/2012
7	10/19/2012	Supervised Classification	11/02/2012
Project	11/05/2012	Final Project	11/28/2012

*All Times and Dates are based on the Central Time Zone

Other Important Dates:
Timed Midterm Exam will be available from 10/08/2012 to 10/12/2012
Fall Break is scheduled during 10/04/2012 to 10/07/2012
Final Project will be available from 11/05/2012 to 11/28/2012
School Holidays are scheduled on 09/03/2012 and 11/21/2012 to 11/25/2012
Timed Comprehensive Final Exam will be available from 11/29/2012 to 12/04/2012

Grading:
Undergraduate student grades will be based on a timed midterm and comprehensive final exams (50%), labs and a final project (40%), and quizzes from the video lectures and assigned reading (10%). Lab deliverables are digital products and need to be submitted within MyCourses, under the assignment tool as PDF documents by specified due dates. Labs are counted off 10 % each day they are late. Graduate student grades will be based on the timed midterm and comprehensive final exams (50%), labs and a final project (35%), quizzes (10%), and one extra assignment (5%). After two days late labs can only be made up with a documented excuse. Students can not make up missed exams without emergency medical documentation or a letter from a dean.

Quizzes:
Weekly quizzes **will not be** timed and will cover the material in the **reading and lecture** for that Module. They cannot be submitted late without a documented excuse.

Exams:
All exams will be a combination of question types, but the majority of questions will be objective-based. **Exams will be timed.** You will not be able to answer questions once time has expired. **Make sure that during an exam you save your each individual answer as you proceed**. Also, when you sit down to take an exam; please make sure that you are in a position free from distractions. Remember that once you start the test, it has to be finished in the specified time period unless there is a documented emergency. Please, prepare for all exams like you would in a regular classroom setting. Exams are **closed-book** and you will not have enough time to look up each item. If there are any problems taking the exam (loose power, internet crashes, etc.), please contact the instructors immediately and indicate what type of problem is occurring. **If your computer or internet crashes during an exam**, you must email the instructor **immediately**. The decision to allow a retake will be based on a comparison of the time that the exam was interrupted with the time when the student emailed the instructor and verification of what happened.

Lab Exercises:
General: Each lab is worth 10 points. Labs should be submitted by the due date. Late labs will not be accepted (unless an extension is granted by the instructor, you must have a documented reason). Students must have downloaded a copy of ERDAS imagine 11, (earlier versions may suffice, contact instructor for details).

Lab Reports: After completing each lab, students will submit a lab report. The lab reports should be uploaded to the assignment drop box in the myCourses website, as a **PDF** file attachment. The drop box is available in each learning module as well as under the assignment tool on the left hand course menu. Many free PDF file converters are available for download from the internet. It is the student's responsibility to make sure the file opens on the instructor's computer. In other words, once you have converted your document to PDF format, it is a good idea to open the file and ensure that everything is displayed how you want it. The total length of the written part of the lab report should be about a page or two. If students would like to have additional information, such as screen captures, or other data they would like to keep for their personal use later, they should be kept in a separate

document and should not be submitted it with your lab report. Lab reports should not exceed 5 pages, and should not include large amounts of extra material. The format for the lab report should include:

1) Purpose/Goal of lab: In your own words explain the purpose of completing the lab. Why are these tasks important to know?

2) Methods Synopsis: About a paragraph in length that describes the general procedures. Keep in mind that this is an overview of the methodology.

3) Results Interpretation: This section should, in your own words, explain the results. Explanations may be responses to the following questions: What does the map show? What are the salient features or results? What does this table describe/show, and why is it important? This section should be at least a paragraph in length.

4) Figures: May include maps, screen captures, tables and graphs. Make sure that these figures have good resolution and are large enough to clearly show the lab objectives. If not, they will not be graded.

5) Questions: Include both the question and the answer that are required in a specific lab. To make answering the questions easier make sure you read all the questions first before starting the lab. Most labs have the questions imbedded within the body of the lab text at the correct place, but some may not.

Lab Bulletin Post: If you have a comment/problem/solution to a problem for a particular lab, please post it on the Discussion Board under the topic "Lab x". Other students who might have a similar problem can read this post, and that may help them resolve it. Also, if you have a problem with a lab and the instructor is not available (say it's 2 am), perhaps a classmate will be reading the post and might be able to provide some assistance at that immediate time.

Do not wait until the last minute to do labs or projects. There will be no sympathy due to computer or network failures that are beyond your control. Many times problems you have with your software may take an email exchange between the student and instructor to get corrected, and this takes time. If you wait till the last minute, there might not be enough time to resolve it. When asking instructor questions, it may be helpful to include basic information about the operating system you are using, version of the software, and a screen capture of the error message or problem you are having.

<u>Civility Policy</u>
All class members deserve to be treated with dignity and respect. Instructors reserve the right to remove inflammatory or prejudicial comments without prior notification, and take disciplinary action as needed.

Student Support Services:

If you have a disability that requires special accommodation, please contact the instructors as well as the Office of Student Support Services within the first two weeks of class online at http://www.sss.msstate.edu or via phone at (662) 325-3335.

Student Honor Code:

Mississippi State University has an approved Honor Code that applies to all students. The Honor code covers plagiarism, or the using of material, ideas, information, languages or writings from other sources without proper acknowledgement of the original source, this includes copying a source even if the source is cited, or copying of someone else's work and submitting it as the students own work, on papers, exams, or any other assignment. Cheating will not be tolerated and punitive measures will be enforced according to MSU policy. Author citations must be included for all written reports and assignments and plagiarism is considered to be cheating and will result in failure of the course, cheating on an exam will also result in failure of the course.

The Honor code is as follows:

> **"As a Mississippi State University student I will conduct myself with honor and integrity at all times. I will not lie, cheat, or steal, nor will I accept the actions of those who do."**

Upon accepting admission to Mississippi State University, a student immediately assumes a commitment to uphold the Honor Code, to accept responsibility for learning, and to follow the philosophy and rules of the Honor Code. Students will be required to state their commitment on examinations, research papers, and other academic work. Ignorance of the rules does not exclude any member of the MSU community from the requirements or the processes of the Honor Code. For additional information please visit:http://www.msstate.edu/dept/audit/1207A.html

Here are some basic rules for online communication:

1. Remember that you're exchanging ideas not with a computer but with other people.

2. Do not shout (type in all caps). It is usually not received well.

3. Do not flame (send angry or confrontational emails). Discussions and debates should remain calm and respectful. Do not say anything that you would not say to someone's face.

4. Respect others' privacy. Do not forward a personal messages sent to you. Remember that you do not have the benefit of facial expressions or gestures etc.

5. Read through your posts as if you were the recipient.

6. Be sure that humor or sarcasm is obvious

7. Be considerate of others' time.

8. Be forgiving of others' mistakes. Some individuals may be less experienced than you are.

9. No personal postings (i.e. My band is playing at Rick's Friday night. Hope you'll come).

10. No internet acronyms (LOL). Everything should be communicated in standard English.