

GEOGRAPHY 633 COURSE OUTLINE H (3-3) (AREA III)

RESEARCH AND APPLICATIONS IN REMOTE SENSING

Timetable: FALL SESSION 2005

Lec01	TR	09:30-10:45	ES 920
Lab01	R	13:00-15:50	ES 415

Instructor:

Dr. John Yackel
Office: ES 408
Office hours: TR 10:45-11:45 or by appointment via email
Phone: 220-4892
Email: yackel@ucalgary.ca

Course Assistant:

Steve Howell
Office: ES430
Office Hours: Appointment/email
Phone: 210-8449
Email: selhowel@ucalgary.ca

Course Content:

This seminar-based course examines the breadth of current research topics and techniques in remote sensing for Geographic applications. The topics and techniques will be examined in part through instructor and student led topic-of-interest lectures, lab assignments, and student led remote sensing journal article presentations. Lab exercises, to be held in ES 415, will explore the technical aspects of some of the major topics (see below) using state-of-the-art remote sensing software (PCI Geomatica v9.1 and IDL/ENVI v4.1). Application specific software and Web based tutorials and remotely sensed datasets will also be utilized.

Prerequisite: GEOG 699.33 (603) or consent of the Instructor

Major Topics

- Review of Remote Sensing Fundamentals
- Remote Sensing Systems, Platforms and Sensors (Past, Present and Future)
- Research Topics and Geographic Applications in Optical, Thermal, Multispectral and Hyperspectral Remote Sensing
- Microwave Remote Sensing
- Spatial Analysis and GIS Integration of Remotely Sensed Imagery

Grading:

- *2 term tests @ 10% each* = 20%
- *Presentation of RS topic of interest (TOI)* = 15%
- *Critical Review Presentation of a RS Journal Article* = 15%
- *4 Lab Assignments (10% each)* = 40%
- *Participation during TOI and Journal Article Presentations* = 10%

There is **no** final examination for this course

Reference Material:

No one textbook is required for this course. Numerous textbooks are available for overnight sign out from the Instructor. The Internet will serve as an invaluable resource for information in this course. There are, however, several textbooks that make for good general reference material. As such, it would be advantageous for students to own or gain access to one or more of the following texts:

Lillesand, T.M. and R.W. Kiefer. 2000 (4th Edition). Remote Sensing and Image Interpretation. Wiley.

Jensen, J.R. 2000. Remote Sensing of the Environment: An Earth Resource Perspective. Prentice-Hall.

Lunetta, R.S. and C.D. Elvidge. 1998. Remote Sensing Change Detection: Environmental Monitoring Methods and Applications. Ann Arbor Press.

Plagiarism:

Academic dishonesty is not an acceptable activity at the University of Calgary and students are strongly advised to read the appropriate section in their Calendars (beginning on page 63). Quite often, students are unaware of what constitutes academic dishonesty or plagiarism. The most common are 1) presenting another student's work as your own 2) presenting an author's work or ideas as your own without proper referencing and 3) using work completed for another course. This activity will not be tolerated in this course and students conducting themselves in this manner will be dealt with according to the procedures outlined in the calendar.

Late Policy:

The term project is designed to be worked on individually (see attached handout for guidelines). There are no exceptions for late assignments and those handed in late will be subject to an immediate 10% penalty followed by a 10% reduction in grade for each day thereafter (weekend and holidays included). Medical related circumstances will require a note from a physician.

Re: Posting of Grades and Picking-up of Assignments

- Assignments will be handed back only in class or by the Professor or Teaching Assistant at pre-arranged time(s)
- If you would like to receive your assignment through the mail, please include an appropriately sized self-addressed, stamped envelope with your assignment when you hand it in to the Professor or Teaching Assistant.
- Posting of grades will be at the discretion of each Professor and, if posted, they will be scrambled. Please note, grades will not be available in the Geography office.

Date	Topic	Description
September 13	Introduction	<ul style="list-style-type: none"> • Introduction of course outline and content, grading, and class schedule. • Discussion of journal paper review presentation guidelines • Discussion of student led RS topic of interest (TOI) presentations • Discussion of lab assignments • Instructor-led lecture topic list
September 15	Review of Remote Sensing Fundamentals	<ul style="list-style-type: none"> • Review of basic RS theory, concepts and terminology
September 15	Lab in ES 415 @ 1:00pm Lab #1 – Multi-Scale Information Extraction	<ul style="list-style-type: none"> • Introduction to GIS/RS Lab (TBA), lab policies, hardware, software, etc. • Discussion of Lab #1
September 20	RS Systems, Platforms and Sensors	<ul style="list-style-type: none"> • Past, Present and Future Ground, Airborne and Satellite based Systems, Platforms and Sensors
September 22	RS Systems, Platforms and Sensors cont ... Selection of Topic of Interest presentations due	<ul style="list-style-type: none"> • Past, Present and Future Ground, Airborne and Satellite based Systems, Platforms and Sensors
September 22	Lab time in ES 415 @ 1:00pm for Lab #1	<ul style="list-style-type: none"> • Lab time
September 27	Selected Research Topics and Applications in Optical, Thermal, Multispectral and Hyperspectral Remote Sensing	<ul style="list-style-type: none"> • Instructor led lecture on student selected research topic
September 29	Selected Research Topics and Applications in Optical, Thermal, Multispectral and Hyperspectral Remote Sensing cont ...	<ul style="list-style-type: none"> • Instructor led lecture on student selected research topic
September 29	Lab #1 due@1:00pm	
October 4	Selected Research Topics and Applications in Optical, Thermal, Multispectral and Hyperspectral Remote Sensing cont ...	<ul style="list-style-type: none"> • Instructor led lecture on student selected research topic
October 6	Selected Research Topics and Applications in Optical, Thermal, Multispectral and Hyperspectral Remote Sensing cont ...	<ul style="list-style-type: none"> • Instructor led lecture on student selected research topic
October 6	Lab #2 - DN_s, Radiance, Reflectance, and Atmospheric Correction	<ul style="list-style-type: none"> • Discussion of Lab#2
October 11	Test #1 in class (90 minutes)	<ul style="list-style-type: none"> • Test on all course material presented to date
October 13	Topic of Interest Presentations start (3 per class)	<ul style="list-style-type: none"> • Student-led lecture on selected research topic

October 13	Lab time in ES 415 @ 1:00pm for Lab #2	<ul style="list-style-type: none"> • Lab time
October 18	Topic of Interest Presentations cont ...	<ul style="list-style-type: none"> • Student-led lecture on selected research topic
October 20	Topic of Interest Presentations cont ...	<ul style="list-style-type: none"> • Student-led lecture on selected research topic
October 20	<p>Lab in ES 415 @ 1:00pm</p> <p>Lab # 2 due@1:00pm</p> <p>Lab # 3 - Time Series Microwave Remote Sensing Analysis using RADARSAT-1</p>	<ul style="list-style-type: none"> • Discussion of Lab #3
October 25	Topic of Interest Presentations cont ...	<ul style="list-style-type: none"> • Student-led lecture on selected research topic
October 27	Microwave Remote Sensing for Geographic Applications	<ul style="list-style-type: none"> • Introduction to MRS and applications
October 27	<p>Lab time in ES 415 @ 1:00pm for Lab #3</p> <p>All TOI presentations must be on Blackboard site by 4:30pm</p>	<ul style="list-style-type: none"> • Lab time
November 1	Microwave Remote Sensing for Geographic Applications cont ...	<ul style="list-style-type: none"> • Topics in MRS and applications
November 3	Microwave Remote Sensing for Geographic Applications cont ...	<ul style="list-style-type: none"> • Instructor led lecture on student selected research topic
November 3	<p>Lab #3 due@1:00pm</p> <p>Lab #4 – Pixel versus Object Based Classification using QuikBIRD</p>	<ul style="list-style-type: none"> • Discussion of Lab 4
November 8	Microwave Remote Sensing for Geographic Applications cont ...	<ul style="list-style-type: none"> • Instructor led lecture on student selected research topic
November 10	Reading Days – No Class	
November 15	Guest Lecture – Torsten Geldsetzer, <i>Ph.D. Candidate</i> ‘Polarimetric Microwave Remote Sensing’	<ul style="list-style-type: none"> • Instructor led lecture on student selected research topic
November 17	Test #2 in class (90 minutes)	<ul style="list-style-type: none"> • Test material on TOI’s and MRS
November 17	<p>Lab time in ES 415 @ 1:00pm for Lab #4</p> <p>All Journal Articles in PDF format must be on Blackboard site by 4:30pm</p>	<ul style="list-style-type: none"> • Lab time
November 22	Journal Article Presentations Start ... (3 per class)	<ul style="list-style-type: none"> • Student-led critical review presentations on a journal article of their choice

November 24	Journal Article Presentations cont ...	<ul style="list-style-type: none"> • Student-led critical review presentations on a journal article of their choice
November 24	Lab #4 due@1:00pm	
November 29	Journal Article Presentations cont ...	<ul style="list-style-type: none"> • Student-led critical review presentations on a journal article of their choice
December 1	Journal Article Presentations cont ...	<ul style="list-style-type: none"> • Student-led critical review presentations on a journal article of their choice
December 6	Course summary and evaluation	<ul style="list-style-type: none"> • Instructor led lecture on student selected research topic