

GEOGRAPHY 633 H (3-3) AREA III

RESEARCH AND APPLICATIONS IN REMOTE SENSING

Timetable: Winter Session 2006

Lec 02 TR 08:30 - 09:45 ES 920
Lab 02 W 17:00 – 19 :50 ES 415

Instructor:

Dr Geoffrey Hay
Office: ES 454
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Course Assistant:

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Course Content: This seminar-based course will examine 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 technical aspects of several major topics (see below) using state-of-the-art remote sensing software (IDL/ENVI v4.1 and/or PCI Geomatica v9.1). Application specific software and Web based tutorials and remotely sensed datasets will also be utilized.

Prerequisite: GEOG 699.33 (603) or Consent of the Department

For additional course information posted by the Instructor see Blackboard at:
<http://blackboard.ucalgary.ca/>

Major Topics

- Review of Remote Sensing Fundamentals
- Multiscale, Hyperspectral, and Object-based analysis
- Research Topics and Techniques for Geographic Applications
- Microwave Remote Sensing

Reference Materials: There is no textbook required for this course. Students are expected to get the majority of their reference materials through scientific journals and the Internet. There are several good remote sensing textbooks that provide useful general reference materials, and students would be well-advised to gain access to one or more of the following:

**Jensen, J. R., 2004: Introductory Digital Image Processing: A Remote Sensing Perspective. Prentice Hall.

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

Lillesand, T. M., R. W. Kieffer, and J. W. Chipman, 2003: Remote Sensing and Image Interpretation. Wiley.

Berlin, G. L. and T. E. Avery, 2004: Fundamentals of Remote Sensing and Airphoto Interpretation. Prentice Hall.

Tentative Course Overview *(subject to change)

Wk	Date T/TR	CONTENT	LABS
1	Jan 10 Jan 12	- Introduction, self test, sign-up for group topics. - Review (Hay)	
2	Jan 17 Jan 19	- Review (Hay) - Topic 1 (Hay) – Multiscale Analysis and LiDAR	Lab 1: Jan 18
3	Jan 24 Jan 26	- Lead Group 1 - lecture - Lead Group 1 - review discussion (Secondary Group 6)	Multiscale information extraction.
4	Jan 31 Feb 02	- Topic 2 (Hay) – Hyperspectral Analysis, SMA/Thermal IR - Lead Group 2 - lecture	Hand in Lab1 to CA at start of Lab2
5	Feb 07 Feb 09	- Lead Group 2 - review discussion (Secondary Group 5) - Topic 3 (Hay) - SMA/Thermal IR (cont), Radiance, Reflectance and DNs.	Lab 2: Feb 08
6	Feb 14 Feb 16	- Lead Group 3 - lecture - Lead Group 3 - review discussion (Secondary Group 4)	DNs, Radiance, Reflectance and Atmospheric Corrections.
7	Feb 20-24	- READING WEEK	Hand in Lab2 to CA at start of Lab3
8	Feb 28 Mar 02	- Term Test #1 - Guest lecture - TBA	Lab 3: March 01
9	Mar 07 Mar 09	- Topic 4 (Hay) – Microwave Basics - Lead Group 4 - lecture	Time Series Microwave Remote Sensing Analysis using RADARSAT-1.
10	Mar 14 Mar 16	- Lead Group 4 - review discussion (Secondary Group 3) - Topic 5 (Guest: <i>Torsten Geldsetzer</i>) – Radar Polarimetry/Acoustic RSing	Hand in Lab3 to CA at start of Lab4
11	Mar 21 Mar 23	- Lead Group 5 - lecture - Lead Group 5 - review discussion (Secondary Group 2)	Lab 4:
12	Mar 28 Mar 30	- Topic 6 (Hay) – Pixels, Objects and Issues of Scale - Lead Group 6 - lecture	Pixel versus Object-Based Classification using high-resolution imagery.
13	April 04 April 06	- Lead Group 6 - review discussion (Secondary Group 1) - Guest lecture - TBA	Hand in Lab4 to CA April 12 – lab time
14	April 11 April 13	- Review - Term Test #2	
End Winter Session (April,13), No Final Exam			

Grading (weighted)

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

NOTE: There is no final examination for this course and it is not essential to pass all components in order to pass the course as a whole.

Grading System:

96-100	A+	77-80	B	59-61	C-
90-95	A	71-76	B-	55-58	D+
86-89	A-	65-70	C+	50-54	D
81-85	B+	62-64	C	0-49	F

Plagiarism

Academic dishonesty is not an acceptable activity at the University of Calgary and students are **strongly advised** to read the Student Misconduct section in the University Calendar. 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.

Re: Posting of Grades and Picking-up of Assignments

- Assignments will be handed back only in class or by the Professor at pre-arranged time(s).
- To receive your assignment back via mail, please include an appropriately sized self-addressed, stamped envelope with your assignment when handing in to the professor.
- Posting of grades will be at the discretion of each Professor and, if posted, they will be scrambled. Grades will **not** be available at Geography's main office.

Contact Information for Student and Faculty Representation

- SU VP Academic Phone: 220-3911 and e-mail: suypaca@ucalgary.ca
- SU Faculty Rep. Phone: 220-3913 and e-mail: socialsciirep@su.ucalgary.ca

Campus Safewalk

Campus Security, in partnership with the Students' Union, provides the Safewalk service, 24 hours a day, to any location on Campus including the LRT, parking lots, bus zones and University residences. Contact Campus Security at 220-5333 or use a help phone, and Safewalkers or a Campus Security officer will accompany you to your Campus destination.