

GEOGRAPHY 633 H (3-3) AREA III

RESEARCH AND APPLICATIONS IN REMOTE SENSING

Timetable: Winter Session 2007

Lec 02 TR 08:30 - 09:45 ES 920
Lab 02 W 17:00 – 20:00 ES 415

Instructor:

Dr Geoffrey Hay
Office: ES 454
Office Hours: By appointment
Phone: 220-4768
Email: gjhay@ucalgary.ca

Course Assistant(s):

Randy Scharien
Office:
Office Hours: Appointment/email
Email: rkschari@ucalgary.ca

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 (TOI) lectures, lab assignments, and student led remote sensing journal article presentations. Lab exercises, will explore technical aspects of several major topics (see below) using state-of-the-art remote sensing software (IDL/ENVI, eCognition, and/or PCI Geomatica).

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 GEO-Object-Based Image Analysis (GEOBIA)
- Research Topics and Techniques for Geographic Applications
- Microwave Remote Sensing

Reference Materials: There is no textbook required for this course. Students are expected to obtain 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.

*** If you have to purchase a text, this is the one the instructor would most highly recommend.*

Tentative Course Overview *(subject to change)

Wk	Date T/TR	CONTENT	LABS
1	Jan 9 Jan 11	- Introduction, self test, sign-up for group topics. - Review – Part 1: (Hay)	
2	Jan 16 Jan 18	- Review – Part 2: (Hay) - Topic 1 (Hay) – Multiscale Analysis and LiDAR	Lab 1: Jan 17
3	Jan 23 Jan 25	- Lead Group 1 - lecture - Lead Group 1 - review discussion (Secondary Group 6)	Multiscale information extraction.
4	Jan 30 Feb 01	- Topic 2 (Hay) – Hyperspectral Analysis, SMA/Thermal IR - Lead Group 2 - lecture	Hand in Lab1 to CA at start of Lab2
5	Feb 06 Feb 08	- Lead Group 2 - review discussion (Secondary Group 5) - Topic 3 (Hay) - SMA/Thermal IR (cont), Radiance, Reflectance and DNs.	Lab 2: Feb 07
6	Feb 13 Feb 15	- Lead Group 3 - lecture - Lead Group 3 - review discussion (Secondary Group 4)	DNs, Radiance, Reflectance and Atmospheric Corrections.
7	Feb 18-25	- READING WEEK	Hand in Lab2 to CA at start of Lab3
8	Feb 27 Mar 01	- Term Test #1 - Topic 4 (Hay) – Microwave Basics	Lab 3: Feb 28
9	Mar 06 Mar 08	- <u>Guest lecture</u> – Mr Stephen Howell (PhD Candidate) - Lead Group 4 - lecture	Time Series Microwave Remote Sensing Analysis using RADARSAT-1.
10	Mar 13 Mar 15	- Lead Group 4 - review discussion (Secondary Group 3) - Topic 5 (Hay) – Remote Sensing Policy	Hand in Lab3 to CA at start of Lab4
11	Mar 20 Mar 22	- Lead Group 5 - lecture - Lead Group 5 - review discussion (Secondary Group 2)	Lab 4: March 21
12	Mar 27 Mar 29	- Topic 6 (Hay) – Pixels, Objects and Issues of Scale - Lead Group 6 - lecture	Pixel versus Object-Based Classification using high-resolution imagery.
13	April 03 April 05	- Lead Group 6 - review discussion (Secondary Group 1) - <u>Guest lecture</u> - TBA	Hand in Lab4 to CA April 11 – lab time
14	April 10 April 12	- Review - Term Test #2	
End Winter Session (April,13), No Registrar-Scheduled Final Exam			

Grading (weighted)

1. Two Term Tests @ 10% each	=	20%
2. Presentation of group researched RS topic of interest (TOI)	=	15%
3. Critical Review Discussion and Letter to the Editor	=	5%
4. TOI group essay (~ 20 pgs)	=	15%
5. Four Lab Assignments (10% each)	=	40%
6. Participation including in-class, Review Discussions	=	5%

NOTE: There is no registrar-scheduled 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: socialscirep@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.

"It is the student's responsibility to request academic accommodations. If you are a student with a documented disability who may require academic accommodation and have not registered with the Disability Resource Centre, please contact their office at 220-8237. Students who have not registered with the Disability Resource Centre are not eligible for formal academic accommodation. You are also required to discuss your needs with your instructor no later than fourteen (14) days after the start of this course."