GEOG 531 (H3)
Remote Sensing in Forest Ecology

Timetable: Summer Session, July 30 – August 6, 2005

Location: Kananaskis Field Station

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TA:

Course Calendar Description:
This course provides hands-on experience using satellite and airborne remote sensing in forest ecological studies. Students will be exposed to a variety of topics, including field instrumentation, field survey protocols, and advanced image processing techniques used to derive key parameters used in ecological mapping, monitoring, and modeling. Includes field work and computer labs.

Course Content:
Remote sensing is an incredibly useful and versatile information source for natural resource managers and physical scientists. Practitioners of the discipline that are equipped with the proper blend of technical, analytical, and problem-solving skills can make valuable contributions to a wide range of professional and academic settings. This course is designed to train students in field data collection and remote sensing image analysis for forest ecology studies. First, we explore the applications and principles of remote sensing image analysis in a forest environment. Second, we examine the field equipment and data collection protocols necessary for measuring and characterizing forest structural components. Third, we conduct the field work necessary to assemble a data base capable of supporting the analysis of remotely-sensed imagery and the production of regional vegetation maps. Finally, we relate the field measurements to the imagery through algorithms and models and produce an assessment of the biophysical characteristics of the forest surrounding the Kananaskis Field Station.

Students in this course will participate in lectures, tutorials, computer labs, field work, and a group project. Practical skills to be developed include:

1. Field instrumentation
2. Timber cruising and vegetation mensuration
3. Field sample design
4. Advanced mapping and image processing

The following schedule is tentative. Tutorial sessions designed to allow each student team the opportunity to outline their questions and discuss potential solutions will be held each evening.

Course Schedule:

- **Monday July 31**

  11:00AM-12:00PM: Lecture/Discussion

  - Orientation, registration at Kananaskis Field Station, distribution of materials, formation of groups

  1:00-5:00PM: Field Equipment Demonstration

  - Safety and navigation
  - Differential GPS

  7:00-9:00PM: Lecture/Discussion

  - Course goals
  - Characteristics of remote sensing data
  - Extracting information on forest conditions, processes, and change
  - Suggestions for effective project management

- **Tuesday August 1**

  9:00AM-10:00PM: Lecture/Discussion

  - Concepts and practice of forest mensuration
  - Introduction: Lab 1

  10:00AM-12:00PM: Field Equipment Demonstration

  - Positional and safety equipment: GPS, compass, hand-held radios, safety procedures
  - LAI-measuring equipment: ceptometer, hemispherical camera, increment bore
  - Forest inventory field equipment: clinometer, increment bore, dbh tape, densiometer

  1:00-5:00PM: Field Exercise

  - Sample plot measurements
  - Data workup and plot comparisons
  - GPS plot locations

  9:00PM: Lab 1 due

- **Wednesday August 2**

  9:00-10:00AM: Lecture/Discussion

  - Overview of the Alberta Vegetation Inventory
  - Introduction: Lab 2

  10:00AM-5:00PM: Group Field Work

  - Field mensuration of stand structure at plot locations in assigned forest stand

  9:00PM: Assignment 2 due

- **Thursday August 3**

  9:00-10:00AM: Lecture/Discussion

  - Concepts and practice of measuring forest LAI: field, remote sensing, models
  - Introduction: Lab 3

  10:00AM-5:00PM: Group Field Work

  - Sapwood, light, and photographic measurement of LAI at plot locations in assigned forest stand

- **Friday August 4**

  All Day: Group Project Work

  9:00PM: Lab 3 due

- **Saturday August 5**

  All Day: Group Project Work

- **Sunday August 6**

  9:00AM-12:00PM: Group Project Work

  1:00PM-3:00PM: Group Presentations

  3:00PM-4:30PM: Final Written Exam

Required Texts: Franklin, S. E., 2001: Remote Sensing for Sustainable Forest Management, Lewis.

Readings: See http://earthsystems.ucalgary.ca/Kan

Grading (Weighting):

1. Three labs

Lab 1: Forest Mensuration Exercise and Field Map	15%
Lab 2: AVI Label of Field Plots	15%
Lab 3: Field Measurement of LAI for Field Plots	15%

2. Group Project

Project Writeup	25%
Project Presentation	10%

3. Final Examination (short answer, 1.5 hour exam) 20%

Note: it is not necessary to pass each course component in order to pass the course.

Prerequisite: Consent of the instructor

Supplementary Fees: Supplementary fees of $290.00 covering the cost of room and board at the Kananaskis Field Station are non-refundable.

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: suvpaca@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.