



## GEOGRAPHY FINAL COURSE OUTLINE: FALL 2016

### GEOGRAPHY 603 H(3-3)

#### Remote Sensing: Basics and Beyond

Instructor: Mryka Hall-Beyer	Office: ES 458
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\*GEOG603 is offered in **online format only**. There are no scheduled lecture periods, to allow full participation by remote students. All lecture material is available on the course D2L site. Labs may be carried out individually using student-licensed software. The ES415 lab is reserved for GEOG603 use from 9-11 every Monday, and software is installed and supported in that lab, however attendance is not required in these sessions. Four times during the semester there will be a formal session during this time. Lectures, lab instructions and all supplementary material will be available using the Desire-2-Learn (D2L) online courseware system <http://www.d2l.ucalgary.ca>. Communication is normally handled through email, D2L-based discussion boards and Skype. Students will be automatically enrolled on the course D2L site once they have registered for the course and activated their University of Calgary IT accounts. Students may, as they wish and are able, arrange group study or lab sessions within the constraints of plagiarism guidelines. The professor is available via email and by appointment.

#### Official Course Description

Introduction to the theory and practice of remote sensing. Topics include physics of remote sensing, sensor systems, resolutions, geometric and radiometric correction, image analysis (enhancements, filtering, texture analysis, principal components, classification approaches and algorithms, and accuracy). Specific image acquisition systems and their methodological requirements. Emphasis is on fundamental concepts. Laboratory provides experience with fundamental image processing techniques and project completion and writing.

#### Prerequisite

Consent of the Department.

**Students must have, or have access to, a computer able to install and run the required image processing software** (there is no Mac version and PC partitions on a Mac have not worked well in the past) **and have a connection able to upload and download large files.**

#### Supplementary Fees

N/A

#### Text(s)/Readings

1. Jensen, J.R. Introductory Digital Image Processing 4th ed. (2016) Prentice-Hall.
2. Northey, M., D.B. Knight and D. Draper. 2010. Making Sense in Geography and Environmental Sciences: A Student's Guide to Research and Writing. Oxford University Press: ISBN 978-0-19-544002-7

3. Recommended for students wanting detailed technical information: J.A. Richards and X. Jia, *Remote Sensing Digital Image Analysis: an Introduction*. 4th ed. 2005, Springer. ISBN-10 3-540-25128-6 or ISBN-13 978-3-540-25128-6.

### Software

All students unable to work in the ES415 lab need to purchase and install PCI Geomatica® image processing software. Any enrolled student may acquire this; the complete student license is for 4 months and is free. Detailed information is available on the course D2L site. Students are strongly advised not to use different image processing software, as all lecture demonstrations and labs are adapted to Geomatica, and the Department supports this software. ENVI software is also available in the ES415 lab, but its use is not encouraged for the above reasons. Students electing to use different software will not receive local technical support, and assignments will not be altered to accommodate their choice.

### Grading (Weighting)

Participation in online discussions, quizzes	10%
Formal labs: 4@10%	40%
Lab 1	8%
Lab 2	8%
Lab 3	16%
Lab 4	8%
Term Test:	10%
Essay/literature review	15%
Lab-based final project: Proposal 3% + Report 22%	25%

### There is no final examination for this course

**To pass the course** all components listed above must be *completed*. The average of all grades must be passing, but it is *not necessary to pass* each component in order to pass the course as a whole. Students are reminded that at the graduate level, they must receive a B- or better to count the course towards their program.

### Grading System

Numerical grades and the final course letter grade will be awarded according to the following scheme. Grades awarded on a letter basis (see below) will be converted at the midpoint of the range (e.g. A+ will be averaged as 97, B- as 72.5).

94-100 A+	75-79.99 B	56-60.99 C-
88-93.99 A	70-74.99 B-	52-55.99 D+
84-87.99 A-	66-69.99 C+	50-51.99 D
80-83.99 B+	61-65.99 C	0-49.99 F

For graduate students, a B (GPA 3.0) average over all courses in, program must be maintained. Effectively, a course grade of B- may or may not be cause for withdrawal from program, depending on marks in other courses in program. This only applies to the final course grade, however, not to individual course component marks.

For material graded with letters, the following meaning is applied:

A+	Outstanding performance
A	Excellent: superior performance, showing comprehensive understanding of subject
A-	

B+	Good – solid understanding of the material
B	
B-	Marginally satisfactory performance at the graduate level – basic understanding of the subject. Note that this is the lowest mark that will maintain standing in the graduate Program. A B average over all Program courses must be maintained.
C+	Basic understanding of the subject; inadequate for further work at the graduate level.
C	
C-	
D+	Minimal Pass-marginal performance for undergraduate level
D	
F	Fail - - poor performance

**For additional detailed course information posted by the Instructor see D2L at:**  
<http://D2L.ucalgary.ca/>

### **Writing across the Curriculum**

Writing skills are not exclusive to English courses and should cross all disciplines. Clear concise technical writing is essential to all aspects of a technical graduate level career and related jobs requiring a graduate degree. At the level of this course, students are assumed to be familiar with the structure and conventions of scientific or technical writing; writing helps and specific instructions are provided on the course D2L site. Students are expected to do a substantial amount of writing in this course, and writing is a major factor in the evaluation of student work. The services provided by the Writing Centre in the Effective Writing Office can be used by all students who require further assistance. These Centres help students to edit their work effectively. They do not provide an individual editing service: allow plenty of time when using them. Students whose first language is not English are especially encouraged to make maximum use of these facilities.

### **Principles of Conduct**

The University of Calgary Calendar includes a statement on the Principles of Conduct expected of all members of the University community (including students, faculty, administrators, any category of staff, practicum supervisors and volunteers) whether on or off the University's property. This statement applies in all situations where the members of the University Community are acting in their University capacities. All Members of the University Community have a responsibility to familiarize themselves with this statement which is available at:  
<http://www.ucalgary.ca/pubs/calendar/current/j-2.html>.

### **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 claim to be unaware of what constitutes academic dishonesty or plagiarism. The most common forms are 1) presenting another student's work as your own; 2) presenting an author's work or ideas as your own, either by direct claim or by failing to use proper referencing; 3) using work completed for another course without permission or adaptation; and 4) Using extensive direct

quotes without proper attribution. Plagiarism in any form 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. If a student is in any doubt about what constitutes plagiarism in a particular case, they should consult the professor at the earliest opportunity, before the work is handed in. In this online course, specific questions that arise about permitted collaboration and group study should be discussed on D2L in the appropriate forum.

### **Disability Resource Centre Accommodations**

If you are a student with a documented disability who may require academic accommodation and have not registered with the Disability Resource Centre (DRC), please contact their office at 403-220-8237. 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.

### **Freedom of Information and Protection of Privacy**

All assignment submission will occur online through D2L, which makes individual work available only to students having a password and enrolled in this course.

### **Re: Posting of Grades and Picking-up of Assignments**

- All assignments will be handled through D2L.
- Their own grades will be available to each student on D2L by password access. 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](mailto:suvpaca@ucalgary.ca)
- SU Faculty Rep. Phone: 220-3913 and e-mail: [arts1@ucalgary.ca](mailto:arts1@ucalgary.ca)
- The students ombudsman office information can be found at:  
<http://www.su.ucalgary.ca/page/affordability-accessibility/su-structure/contact-info>

### **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.