GEOG 535 – Winter 2017
Remote Sensing and Interpretation

Wed 1:05-3:55PM Burnside Hall 511	**Instructor**: Dr. Margaret Kalacska **Email**: margaret.kalacska@mcgill.ca
	Office: Burnside Hall 622 **Office Hours**: By appointment

Course Overview

This course is a graduate course in remote sensing applications and advanced analytical techniques. The main objective of the seminar component is to foster scientific discussion and critical analysis of remote sensing research. It covers work from ground based, aerial and satellite systems. Emphasis will be placed on applications of remotely sensed data in ecological processes with examples from other fields. Theoretical aspects include techniques from remote sensing as well as other disciplines such as machine learning. This course will also include hands-on experience with spectrometry data collection and analysis using ENVI, Matlab and other software.

Prerequisite: GEOG 308 or permission of instructor

Require Textbook
None

Required Readings
Weekly journal articles and/or book chapters will be assigned as mandatory readings

Evaluation
Lab Assignments: 35% (5 assignments worth 7% each)
Paper presentation: 20% (10% for presentation, 10% for discussion)
Participation: 5%
Final Paper: 20%
Quizzes: 20%

Course Policies

Regular attendance is expected.

Late assignments will be penalized 10% per 24 hr period unless permission to miss the deadline has been received in writing from the instructor prior to the deadline. Lab assignments will only be accepted via MyCourses.

This is not an introductory course in remote sensing. It is expected that students are familiar with the basic concepts. If your general proficiency in remote sensing is limited,

it is expected that you keep yourself up-to-date with the basics, and you may require a significantly higher workload than other students to succeed in this course.

It is the responsibility of each student to back up their laboratory and project work via USB device (i.e. USB key, external hard drive), or online storage.

Mobile computing and communications devices are permitted in class under the following condition:

• Only for the specified use; e.g., note taking, consulting online resources

Theoretical topics to be covered

- Pattern classification (supervised and unsupervised learning)
- Sensors and data quality
- Feature selection and data reduction
- Unmixing
- Thermal applications
- Wavelets
- UAV photography
- Ground spectroscopy

Software

The course work will primarily be completed with ENVI 5.3 and Matlab. For specific applications other software may also be used.

Final Paper

The purpose of this paper is to gain experience writing grant proposals, something you will encounter often in your graduate career as well as in your professional careers. This year you will follow the format of the Natural Sciences and Engineering Research Council (NSERC) granting agency. You may propose any remote sensing research project that interests you. Additional details regarding the formatting will be provided. Your final paper is due April 12, 2017 at 18:00 (EST).

Field trip

Depending on the weather conditions, a field trip to Mer Bleue ON is planned for March or April. The purpose of the field trip is to gain hands on experience with collecting remotely sensed data through a real world setting. However, good weather conditions (i.e. no rain or snow) are needed. In the event of a long winter with continued snowfall or continuous rainy conditions alternate arrangements will be made.

McGill University values academic integrity. Therefore all students must understand the meaning and consequences of cheating, plagiarism and other academic offences under the Code of Student Conduct and Disciplinary Procedures (see www.mcgill.ca/students/srr/honest/ for more information).

L'université McGill attache une haute importance à l'honnêteté académique. Il incombe par conséquent à tous les étudiants de comprendre ce que l'on entend par tricherie, plagiat et autres infractions académiques, ainsi que les conséquences que peuvent avoir de telles actions, selon le Code de conduite de l'étudiant et des procédures disciplinaires (pour de plus amples renseignements, veuillez consulter le site www.mcgill.ca/students/srr/honest/)

In accord with McGill University's Charter of Students' Rights, students in this course have the right to submit in English or in French any written work that is to be graded.

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In the event of extraordinary circumstances beyond the University's control, the content and/or evaluation scheme in this course is subject to change.

If you have a disability please contact the instructor to arrange a time to discuss your situation. It would be helpful if you contact the Office for Students with Disabilities at 514-398-6009 before you do this.

Mobile computing and communications devices (MC2):
The use of MC2 devices must, in all cases, respect policies and regulations of the University, including in particular the following:

1. *The Code of Student Conduct and Disciplinary Procedures;*
2. *The Policy Concerning the Rights of Students with Disabilities;*
3. *The Policy on the Responsible Use of McGill IT Resources.*

No audio or video recording of any kind is allowed in class without the explicit permission of the instructor. MC2 devices are not to be used for voice communication without the explicit permission of the instructor. MC2 devices are permitted in class insofar as their use does not disrupt the teaching and learning process.