# GEOG 535 – Winter 2014
# Remote Sensing and Interpretation

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| Thu 10:35-12:25<br>Burnside Hall 511 | **Instructor**: Dr. Margaret Kalacska<br>**Email**: margaret.kalacska@mcgill.ca |
| **Laboratory**<br>Thu 14:35-17:25<br>Burnside Hall 511 | **Office**: Burnside Hall 622<br>**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 a similar introductory remote sensing course.

**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 and in-class Quiz: 5%
Final Paper: 20% (5% Proposal, 15% Final paper)
Spectroscopy project: 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 to remote sensing. It is expected that you 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 (e.g. Dropbox, GoogleDrive, etc.).

*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)
• Feature selection and data reduction
• Unmixing
• Thermal applications
• Wavelets
• LiDAR
• GPU computing

**Software**

The course work will primarily be completed with ENVI 5.0 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 Fonds de Recherche du Québec - Nature et Technologies (FQRNT) granting agency. You may propose any remote sensing research project that interests you. Additional details regarding the formatting will be provided. A 250 word summary of your topic is due Feb 28, 2014. Your final paper is due April 11, 2014 at 18:00 (EST).

**Spectroscopy Project**

In groups of 2-3 people you will undertake the collection of data with a spectroradiometer in February. You will be provided with a list of topics to choose from for your project. During the remainder of the term you will analyze your results and present them to the class at the end of term. A one page summary or your project (one per group) is due April 11, 2013 at 18:00 (EST).

*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. 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 398-6009 (online at http://www.mcgill.ca/osd) before you do this.*