University of Alberta
EAS 451 Digital Remote Sensing
Revised Syllabus - Fall 2020

Instructor: John A. Gamon
Office: CCIS 2-277
Phone: 780-492-0345
Email: gamon@ualberta.ca
Web pages: e-Class and gamonlab.org
Office hours: by appointment.

Teaching Assistant: J. Antonio Guzmán Q.
Email: guzmnque@ualberta.ca
Office hours: by appointment

Class Schedule:
Lecture time (Mon-Wed-Fri, 9:00-9:50 am)
Lab time (Thurs 2-4:50 pm)
See Schedule (posted on eClass) for detailed topics and assignments

Calendar Course Description: This course introduces the interactions of electromagnetic radiation with terrestrial materials (rocks, soils, water, snow). These notions are fundamental for the interpretation of optical, thermal, and radar remote sensing imagery. Labs focus on image processing with emphasis on radiometric and geometric enhancements and image classification. The course covers existing and upcoming sensors and applications of the data to earth sciences including geologic and land use mapping and resource exploration.

Additional Course Description: This course introduces remote sensing principles and applications. The first part of the course emphasizes basic principles of electromagnetic (EM) radiation, interaction of EM radiation with matter (e.g. earth surface materials such as minerals, ice, water, and vegetation), and the fundamentals of passive and active remote sensing systems. The second part of the course considers current applications of remote sensing in a variety of Earth System Science disciplines. The final part of the course involves individual student presentations on remote sensing applications. The laboratory introduces students to ENVI (a widely-used commercial image processing software package), and a variety of aircraft and satellite sensor data types and applications. Other software (e.g. R) will likely be used for certain labs.

Online Course Format: this course will be taught entirely online. Students will be expected to have access to a computer, a campus email address, and internet service capable of connecting to the course and lab sessions via Zoom and a Virtual Machine. Students are expected to participate regularly in both online lectures and labs during the scheduled class time, primarily using Zoom sessions. Each lab will have an exercise designed to highlight important concepts and test your understanding of the material covered in the course. Lab exercises require access

to a personal Windows, Mac, or Linux computer capable of running "virtual machine" software (VMware Horizons Client). Students will be expected to install this software during the first week of class, and to report any problems encountered with the software as soon as possible. To install the VM Horizons software, you will need to install/configure the Vmware Horizons client on your personal computer to access the system. Here are the instructions: https://uofaprod.service-now.com/kb_view.do?sysparm_article=KB0012945

Horizons client for Windows – System Requirements
Horizons client for Mac OS – System Requirements
Horizons client for Linux – System Requirements

For general advice on expectations and technology, please visit: https://www.ualberta.ca/information-services-and-technology/services/software-hardware-vendors/technology-requirements.html

For assistance with technology for online learning, please contact your instructor, your lab TA, or UAlberta Information Services & Technology (IST) at 780-492-9400 (web page: https://www.ualberta.ca/information-services-and-technology/index.html). For assistance with eClass, call 780-492-9372 (email: eclass@ualberta.ca). Please refer to Technology for Remote Learning - For Students for further details. If you encounter difficulty meeting the technology recommendations, please email the Dean of Students Office (dosdean@ualberta.ca) directly to explore options and support.

Prerequisite: EAS221

Expected Learning Outcomes: By the end of the semester, the diligent student should have a broad overview of remote sensing methods and applications, and enough familiarity with the principles, tools, and applications to be able to apply remote sensing in a variety of research settings.

LEARNING RESOURCES

Required Textbook and/or Other Major Course Materials: there is no textbook for this course. Instead, readings will be a posted and announced via the course web pages.

Academic Success Centre: The Academic Success Centre provides professional academic support to help students strengthen their academic skills and achieve their academic goals. Individual advising, appointments, and group workshops are available year-round in the areas of Accessibility, Communication, Learning, and Writing Resources. Modest fees apply for some services.

Academic Standards: The University of Alberta is committed to the highest standards of academic integrity and honesty. Students are expected to be familiar with these standards

requiring academic honesty and to uphold the policies of the University in this respect. Students are particularly urged to familiarize themselves with the provisions of the Code of Student Behaviour (https://www.ualberta.ca/governance/resources/policies-standards-and-codes-of-conduct/code-of-student-behaviour.html) and avoid any behaviour which could potentially result in suspicions of cheating, plagiarism, misrepresentation of facts and/or participation in an offence. Academic dishonesty is a serious offence and can result in suspension or expulsion from the University. Note that during the laboratory for this class, you may discuss your assignments with your TA or with other students. However, any written work submitted for a grade must be completed independently.

Grade Evaluation: Grades will be derived from the total points accrued from exams, presentations, and lab exercises and presentations as follows:

Point distributions	Grade assignments
Midterm – 25 points	>90 % A
Final – 35 points	>80 % B
Presentation Proposal – 5 points	>70 % C
Presentations – 10 points	>60 % D
Presentation reviews – 5 points	<60 % F
Lab exercises (10) – 20 points	
Total 100 points	

Grades will be assigned at the end of the semester based on the percentage of total possible points obtained. The "grade assignment" table (above) provides an approximate grading guide, and plus/minus grades will be assigned to borderline cases (within 2-3 points of a cutoff). Final grades will be determined from a review of the class point distribution and performance compared to earlier years.

Exams: There will be one midterm (tentatively scheduled for Friday, Oct 9), requiring a full class period. The final (tentatively scheduled for 14 December, 2020) will be comprehensive, but with a heavier emphasis on the material since the midterm. Exams will include a variety of question types, and will cover material from the lecture, lab, and required reading.

Presentations: Students are expected to present to the class on a topic of their choice, using a peer-reviewed paper from the remote sensing literature. Students must submit a short presentation proposal near Reading Week (see Schedule) for approval and preliminary grading. Presentations will be scheduled during the final lecture and lab sessions and will be evaluated both by the instructor and by fellow students (your peers). Students will also be graded on their reviews of other students' presentations (via completion of a peer review form).

Lab Exercises: Each lab will have a lab exercise designed to highlight important concepts and test your understanding of the material covered in lab. Lab exercises will be due at the beginning of the next week's lab section and will be part of the course grade.

Late Policies & Missed Assignments: A student who cannot complete an exam, presentation, or lab assignment due to incapacitating illness, severe domestic affliction or other compelling reasons can apply for an excused absence. To apply for an excused absence, you must contact the instructor within two working days of missing the assessment or as soon as possible. If an excused absence is granted, then arrangements will be made with the instructor. An excused absence is a privilege and not a right. There is no guarantee that an absence will be excused. Misrepresentation of facts to gain an excused absence is a serious breach of the Code of Student Behaviour. In all cases, instructors may request adequate documentation to substantiate the reason for the absence at their discretion.

Missed Assessments Where the Cause is Religious Belief: For an excused absence where the cause is religious belief, a student must contact the instructor within two weeks of the start of Fall or Winter classes to request accommodation for the term (including the final exam, where relevant). Instructors may request adequate documentation to substantiate the student request. Students who failed at the start of term to request exam accommodations for religious beliefs are expected to follow the deferred final examination process outlined below.

Deferred Final Examination: A student who cannot write the final examination due to incapacitating illness, severe domestic affliction or other compelling reasons can apply for a deferred final examination. Such an application must be made to the student's Faculty office within two working days of the missed examination and must be supported by appropriate documentation or a Statutory Declaration (https://calendar.ualberta.ca/content.php?catoid=29&navoid=7238#Attendance). Deferred examinations are a privilege and not a right; there is no guarantee that a deferred examination will be granted. Misrepresentation of facts to gain a deferred examination is a serious breach of the Code of Student Behaviour.

Disclaimer: This syllabus and schedule is a draft until approved, and may be changed. Any changes will be announced via eClass.

Recording: Recording of class sessions is permitted only with the prior written consent of the instructor, or if recording is part of an approved accommodation plan.