

Department of Geography and Environmental Studies

Instructor: Koreen Millard koreenmillard@cunet.carleton.ca

Office: Loeb A301D

Office hours: TBD

Meeting Date: Jan 10, 2022 to Apr 12, 2022

Lab Dates: Tuesdays, 08:35 am - 10:25 am

Lecture Location: Loeb A200

Lab Dates: Wednesdays 12:35 pm - 14:25 pm

Lab Location: Loeb A200

TAs: TBD

Description: Advanced image enhancement; land cover classification for thematic mapping; biophysical modeling; applications in resources, environment, and urban mapping. The focus of this course will be on analyzing environmental conditions and phenomenon using remotely-sensed imagery through spatial and statistical analysis. This course will use Google Earth Engine, a cloud based remote sensing progressing suite. Students will require access to the internet through a modern browser and a google account (i.e. gmail, Google Drive). No coding skills are required but students will be expected to use and develop their own python scripts in the labs.

Evaluation

10 Labs at 4% each = 40%

10 quizzes at 2% each = 20%

1 practical mid-term test = 10%

1 final group project = 30%

Course calendar (tentative: dates and topics subject to change):

Week	Subject
1	Welcome + Review of core RS concepts (EMR, atmosphere and surface interaction, sensor types, rasters)
2	Basic image processing: atmospheric correction, mosaicking, indices (NDVI, NDBI),
3	Basic image processing for SAR: types of SAR datasets/products, backscatter intensity to dB, speckle filter, shadow layover, foreshortening,
4	Arctic Greening (trend analysis)
5	Urban sprawl / degreening (trend analysis)
6	Wildfire (Landsat and MODIS) - pre and post fire dNBR
7	Winter Break
	Flood mapping (SAR thresholding/Otsu)
8	Seasonal snow cover, depth, melt, albedo (SAR and optical)
9	Sea Surface Temperature
10	Ocean chlorophyll
11	Image Classification and Change detection Algorithms
12	Glaciers and/or sea ice and/or Lake Ice (SAR)
13	Final Project Presentation