

GGGS447 Spring 2020

Remote Sensing of Natural Hazards



Course Information:

Title: Remote Sensing of Natural Hazards

CRN: 17269

Time: 04:30 pm-7:10 pm, Mondays, 01/21-05/13/2020

Location: Exploratory Hall 2312

Instructor: [Prof. John Qu \(jqu@gmu.edu\)](mailto:jqu@gmu.edu)

Teaching Assistant (TA) Ms. Chenyang Xu (cxu8@gmu.edu)

Telephone: (703) 993-3958

Office: Room 2412, Building: Exploratory Hall

Office Hour: Stop by 2:00-4:00PM Mondays and Wednesdays or make appointment

Course Description:

This course will introduce the students to the fundamental principles of satellite-based applications on natural hazards. One of the main goals of this course is not only to provide the basic knowledge of fundamentals of monitoring natural hazards with satellite remote sensing technology, but also concentrating on observing, tracking and forecasting these events by combining satellite based and in situ observations and model simulations. We will focus on wildfire, drought, flood, cyclonic storms, volcanic eruptions and dust storms, et al. in Spring 2020.

Prerequisites

College Math (such as MATH 214) and physics (such as PHYS 262), or permission of instructor.

Class final project and term paper:

Each student will select one of natural hazards at beginning of the semester and will prepare a literature-reviewing essay to demonstrate of understanding of selected major natural hazards based on the literature reviewing during the semester and will be able to join in-class discussions.

Remote sensing application on natural hazards related final presentations and final term papers are encouraged. Final term paper will focus on literature-reviewing, critical thinking and future direction (due May 11).

Grading:

Grades will be based upon your performance on the homework exercises, midterm, class attendance and final term paper and presentation. The weighted contribution of each of these items to your final grade is given below:

Homework 30%

Midterm 30%

Final Project 30%

Class attendance 10%

(A=90-100, B=80-89, C=70-79, D=60-69, F=<60)

Textbook:

No Required Textbook.

Recommended references books, selected “Algorithm Theoretical Basis Document (ATBD)” and selected scientific journal papers will be used during the lectures, which will be posted on Blackboard.

Honor code:

Students must follow the GMU Scholastic Honor Code. Please show respects to everyone in the classroom. Copying homework (or quiz) is considered cheating.

Detailed Schedule

Week one 01/27	Introduction to remote sensing of natural hazards
Week two 02/03	Physical principles of remote sensing applications of nature hazards
Week three 02/10	Remote sensing data sources for monitoring natural hazards
Week four 02/17	Remote sensing of wildfire (1) Homework one due
Week five 02/24	Remote sensing of wildfire (2)
Week six 03/02	Remote sensing of drought (1)
Week seven 03/09	Remote sensing of drought (2) Mid-term
Week eight 03/16	Spring break
Week nine 03/23	Remote sensing of dust storms
Week ten 03/30	Remote sensing of tropical storms and hurricane
Week eleven 04/06	Remote sensing of flood
Week twelve 04/13	Invited guest speaker (TBD) Homework two due
Week thirteen 04/20	Open discussions (issues, challenges and future direction of natural hazard monitoring from space) or independent study
Week fourteen 04/27	Class summary and final project presentations (GGS777, Group 1)
Week fifteen 05/04	Final project presentations (GGS777 Group 2)
Week sixteen 05/11	Final term paper due