DEPARTMENT OF
GEOGRAPHY AND PLANNING

GPHY 342 – Remote Sensing II: Digital Image Processing

Course Instructors	Ilia Parshakov		Email: ip27@queensu.ca
Offices	D114 Mackintosh-Corry Hall		
Contact Time	Two 1.0 hour lectures per week One 2.0 hour laboratory per week		Phone: 613-533-6000 ext. 75050
Format	Lectures and labs		
Class Assessment	Lab Assignments	55%	
	Mid-term Exam	20%	
	Final Exam	25%	

COURSE OVERVIEW

The aim of the course is to examine contemporary image processing and information extraction techniques; and analyze remotely sensed data for environmental and geographical applications and research. This course represents an extension of GPHY 242/3.0, with an in-depth examination of data processing techniques from passive and active remote sensing sources with the purpose of information extraction. Topics include remote sensor technology, image enhancement, image classification, radiometric and geometric correction and sources, change detection, airborne laser scanning, and applications of remote sensing data.

LEARNING OUTCOMES

1. At the end of the course, students should be capable of advising on the best types of remote sensing data, scales and analysis procedures for studying specific geographical/environmental problems or phenomena.
2. The students will be able to explain the similarities and differences between passive and active remote sensing systems operating in the visible, near, middle and far infrared and microwave regions of the spectrum.
3. In addition to learning the characteristics of the sensors, how they record data and how the data are processed, the students will analyze these data using sophisticated digital analysis techniques using industry standard software.
4. The students will examine how these data and data products can be integrated with other spatial data for various types of spatial data analysis.

COURSE TOPICS

Image processing systems and image statistics; Image enhancement; Radiometric and Geometric Correction; Thematic information extraction – Pattern recognition; Active remote sensing – Information extraction; Digital change detection, Thematic map accuracy assessment.

This course is highly recommended for the Certificate in Geographic Information Science.

COURSE READINGS

Jensen, J.R. 2016. Introductory Digital Image Processing: A Remote Sensing Perspective, 4th Edition, Pearson Education Inc., Glenview, IL, 623 pp. **Note**: This text is also used for GPHY 242.