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DEPARTMENT OF
GEOGRAPHY AND PLANNING

GPHY 342 – Remote Sensing II: Digital Image Processing

Course Instructor	**Mohammad Hossain**	**Email**: mdh9@queensu.ca
Office	Macintosh-Corry Hall, Room D114	
Contact Time	Two-hour lecture and two-hour lab per week	
Format	Lectures and Labs	
Class Assessment	Lab assignment 45% In class presentation 10% 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, change detection, lidar data processing, and applications of remote sensing data.

LEARNING OUTCOMES

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. Special emphasis will be placed on passive satellite and airborne sensors operating in the visible and near-infrared regions of the spectrum, as well as active sensor systems. 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. Emphasis will be placed on how these data and data products can be integrated with other spatial data for various types of spatial data analysis.

COURSE TOPICS

Image processing 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.

COURSE READINGS

Required Text:

Jensen, J.R., 2016 (4th edition). Introductory Digital Image Processing: A Remote Sensing Perspective, Pearson Education Inc., Glenview, IL, 623 p.

Recommended Text:

Jensen, J.R., 2007. Remote Sensing of Environment: An Earth Resource Perspective, Second Edition, Prentice Hall, Upper Saddle River, New Jersey, 592 p. (from GPHY 242/3.0)

Gao, J., 2009. Digital Analysis of Remotely Sensed Imagery [electronic resource], McGraw Hill, New York, 645 p. (https://qcat.library.queensu.ca/vwebv/holdingsInfo?bibId=3523143)