

GEOGRAPHY 4231 - REMOTE SENSING (F18)

Instructor: Dr. Bradley A. Wilson
Office: RC-2006A
Office hours: Mon: 11:30am - 1:20pm and 3pm – 4:15pm
Wed: 11:30am - 1:20pm and 3pm – 4:15pm
Thurs: 10:30am - noon

Text: Jensen, Introductory Digital Image Processing, 4th ed.

Required Readings: (2 assigned readings course website)

Grading:	Term Paper Abstract	5%	(abstract+ 5 ref's due Oct. 3rd)
Grading:	Term Paper	25%	(paper due Dec 5th)
	*Midterm Exam #1	15%	(Oct 24th)
	*Midterm Exam #2	25%	(Nov 19th)
	*Radar Exam	10%	(Dec 3rd)
	Lab Exercises (5)	20%	(% varies, see next page)

Late penalties on all due material: 10% per day.

Understand the theory in this class is more important than the lab experience. *You must obtain a minimum average grade of 50% on the exams. If your exam average is not above 50% on these three exams, the lab and term paper marks will be dropped and your final mark will be based on the exams only.

*If you miss an **exam** for any reason other than those deemed acceptable in Lakehead University calendar, then you will be given the opportunity of a essay-based makeup exam that is significantly longer and more difficult.

Course Description:

This course will introduce the basic concepts of remote sensing, including digital image acquisition, correction, and information extraction. Basics on digital image processing will also be covered. The lab portion of this course includes many commonly used digital image processing tasks and utilization of PCI Geomatica software. A term paper will be written by the student allowing for the opportunity to increase their knowledge on a specific application of remote sensing technology.

Student Responsibilities:

- please attend all classes and arrive on time
- read text or reading before class, make a list of questions and bring them to class, make sure to ask me about them...others will want clarification on these things too!
- please ask questions, all concepts must be clearly understood in order to progress to more advanced topics, please take action if you are confused about any aspect

Week	Topics	Readings
1	Introduction to Remote Sensing	Chap. 1
2	Introduction, Part 2 Digital image acquisition systems	Chap. 2 (sensors: ETM+, MSS, SPOT 5 HRVIR, Hyperion)
3	Digital image acquisition systems (cont.) Contrast enhancements <i>(Lab #1: Image Basics in ArcGIS <u>3%</u>)</i>	Chap. 8 (p. 282-287)
4	The Remote Sensing Project Geometric / radiometric corrections <i>(Lab #2: Geometric Correction and Resampling Methods <u>3%</u>)</i> <u>**Term Paper abstract and ref's due Oct. 3rd</u>	Chapter 3 and 4 Chap. 7
5	Geometric / radiometric corrections (cont.) Image Transformations and Spectral Indices <i>(Lab #3: Image Transforms and Indices <u>5%</u>)</i>	Chap. 8 (pp. 255-274)
Reading Week Oct. 8-12		
6	Image Transformations and Spectral Indices (cont.)	
7	Midterm Review <u>Midterm Exam #1 (Oct. 24th)</u>	
8	Digital image classification Spectral Unmixing <i>(Lab #4 : Classification <u>5%</u>)</i>	Chap. 9 Chap. 11 (p. 460-464)
9	Ancillary/supplemental data for classification <i>(Lab #4 cont.)</i>	website: Hutchinson, 1982
10	Change Detection Midterm Review <i>(Lab #5 Change Detection <u>4%</u>)</i>	Chap. 12
11	<u>Midterm Exam #2 (Nov. 19th)</u> Principles of imaging radars	website: Lillesand and Keifer, 1994
12	Principles of imaging radars (cont.)	
13	<u>Radar Exam #3 (Online test: Dec. 3)</u>	
<u>**Term paper due Dec 5th</u>		