GEOGRAPHY 4231 - REMOTE SENSING (W17)

Instructor: Dr. Bradley A. Wilson
Email: bwilson@lakeheadu.ca
Office: RC-2006A

Office hours: Monday and Wednesday: 11:30am - 1:20pm
Tuesday and Thursday: noon - 2:30pm

Text: Jensen, 2005, Introductory Digital Image Processing

Required Readings: (2 assigned readings in Main Library on 2-hour reserve)

Grading:	Term Paper Abstract	5%	(abstract+ 5 ref's due **Feb. 1**)
Grading:	Term Paper	25%	(paper due **April 10 at noon**)
	*Midterm Exam #1	17.5%	(**March 1**)
	*Midterm Exam #2	22.5%	(**Mar 22**)
	*Radar Exam	10%	(**Apr 5)**
	Lab Exercises (5)	20%	(% varies, see next page)

Late penalties on all due material: 10% per day.
***You must obtain a minimum average grade of 50% on the 3 exams.** If your exam average is not above 50% on these 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	Digital image acquisition systems Term Paper Discussion	Chap. 2 (sensors: ETM+, MSS, SPOT 5 HRVIR, Hyperion)
3	The Remote Sensing Project *(Lab #1: Image Recognition **3%**)* Geometric / radiometric corrections	Chapter 6 (pp. 191-222) Chap. 7
4	Geometric / radiometric corrections (cont.) *(Lab #2: Image to Image Registration **3%**)* Contrast enhancements ****Term Paper abstract and ref's due Feb. 1**	Chap. 7 Chap. 4
5	Contrast enhancements (cont.) *(Lab #3: Image to Map Registration **5%**)* Image transformations	Chap. 4 Chap. 8 (pp. 255-274)
6	Image transformations (cont.) *(Lab #3 cont.)*	Chap. 8 (pp. 255-274)
	WINTER STUDY BREAK (Feb. 20-24)	
7	Midterm Review *(Lab #4: Transforms and Image processing **4%**)* **Midterm Exam #1 (March 1)**	
8	Digital image classification	Chap. 9 (pp. 337-399) & Chap. 13
9	Ancillary/supplemental data for classification *(Lab #5 : Classification **5%**)*	Chap. 9 (pp. 399-401) & library: **Hutchinson, 1982**
10	Change Detection *(Lab #5 cont.)* **Midterm Exam #2 (March 22)**	Chap. 12
11	Principles of imaging radars	library: **Lillesand and Keifer, 1994**
12	Principles of imaging radars (cont.) **Radar Exam (April 5)** ****Term paper due April 10 at noon**	