Geographic Information Systems (GIS)

Instructor:	**Lab Instructor:**
Bradley A. Wilson	Mr. Jason Freeburn
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Student consultation hours as posted on respective office doors.

Course Description and Objectives:

The course is intended to provide you with some experience of how to represent various types of spatial data in the form of visual displays which more readily communicate information than raw data. In addition you will be given grounding in GIS principles and techniques to spatial data analysis that can lead to further study in this useful field. At the end of this course you will be more sensitive to the value of a cartographically sound map and will have been initiated into the world of GIS.

Specific Objectives:

- introduction to raster and vector-based GIS;
- develop a working knowledge of ArcGIS software;
- learn the underlying principles of GIS database construction;
- learn to diagnose and manage errors associated with GIS; and
- learn common spatial data analysis techniques.

Course Grading:

• Lab exercises	30%
• Lab exam (last week of classes during lab time)	10%
• Midterm #1 (Thurs. Jan. 29)	15%
• Midterm #2 (Tues. Mar. 10)	15%
• Final Exam (TBA)	30%
	100%

The lab exercises are to be submitted electronically to Mr. Freeburn and/or the Teaching Assistant (gis2232@lakeheadu.ca) in accordance with the instructions provided at the first lab period. Overdue labs will be penalized by 10% per academic day or part thereof.

Course Organization:

Lectures:	Tuesdays & Thursdays 11:30-12:20 (in RB-2047)
Lab (section L1):	Thursdays 8:30 - 11:20, in AT-3009
Lab (section L2):	Fridays 8:30 - 11:20, in AT-3009
Lab (section L3):	Mondays 8:30 - 11:20, in AT-3009

There will be two 50-minute lectures each week, portions of which will be preparation for the 3-hour laboratory period. Students must be registered in one of the 3 lab sections. Lab sessions will focus on practical exercises to learn specific operations available in GIS software and to clarify lecture concepts. A complete schedule of planned topics is found below. The content from lab sessions will be tested in the four exams (3 exams and lab test).

No formal division of the class into groups will be made for labs or assignments, though it is acknowledged you will likely work together at times. **Individual (and <u>unique</u>) submissions are expected for each lab exercise and assignment. I expect you to read and understand the University's policy on plagiarism.**

Course Resources:

- (***required text***): Chang, K., 2014. *Introduction to Geographic Information Systems*, 7th Edition (New York, NY: McGraw-Hill), 425 pages with companion CD

- (***required***): USB device for data storage and for submission of assignments

These items are available in the bookstore. Readings from the required text are to be assigned throughout the term.

Accessing Lakehead's Computer Labs:

Access to LU's computer labs and course datasets (including those for this course) is gained with your LU-issued e-mail log in ID and password. Be sure to **select "AD" (Active Directory)** for choosing the location to log on to. Data and additional instructions for lab exercises will be located in the Geog 2232 'course folder' that is found in the K:/ sub-directory. When working with datasets and creating new data, **save all files to either a USB device or on the N:/ sub-directory** or as advised by the Lab Instructor. Files saved to the DeskTop will be lost in the event of a computer re-boot or crash. <u>Save files frequently with ArcGIS</u> and similar software.

Instructor Expectations:

You are expected to be present in lectures since much of the material is directly relevant to the lab exercises, assignments and tests. Attendance at labs will be recorded and will be reviewed when assigning final course grades. All lab exercises are to be drafted according to instructions received from the Lab Instructor.

GEOG 2232 COURSE SCHEDULE (*subject to changes*)

Week of:	Lecture Topics	Readings
Jan. 5	Introduction Databases	Chang: chapter 1
Jan. 12	Map Projections	Chang: chapter 2.1-2.3
Jan. 19	Coordinate Systems Data Models in GIS (Intro)	Chang: chapter 2.4-2.5
Jan. 26	Issues with Spatial Data Models **MIDTERM #1 – Jan. 29**	
Feb. 2	Raster Data Models	Chang: chapter 4
Feb. 9	Vector Data Models	Chang: chapter 3
Feb. 16	*READING WEEK*	
Feb. 23	Acquisition of Spatial Data	Chang: chapter 5
Mar. 2	Editing Spatial Data	Chang: chapter 7
Mar. 9	**MIDTERM #2 – Mar. 10** Overlay Analysis	Chang: chapter 11.2
Mar. 16	Vector Analysis Terrain Analysis	Chang: chapter 11 Chang: chapter 13
Mar. 23	Raster Data Analysis	Chang: chapter 12
Mar. 30	Buffer Analysis Cost Pathway Analysis	Chang: chapter 11.1 Chang: chapter 17