Course Title: Geographic Information Systems for Environmental Design
Course Number: EVDS 611
Instructors: Dr. Richard M. Levy, rmlevy@ucalgary.ca
Time: Friday 9-12:50
Location: PF 2170/ PC LAB/ 2165
Office Hours: Tues, Thurs 1:30-3:00, PF 4182
TA: Francesco Petrisano

Introduction

Introduction to the use of GIS in urban planning and environmental management. Discussions on GIS modeling focus on population projection, location theory, land use modeling and environmental and ecological management. Case studies from both the public and private sector provide the basis of assignments. Emphasis given to developing sensitivity to the application appropriate for specific GIS problems.

Objectives

Students in the course will have an opportunity to develop an understanding of the theory and practice of GIS and remote sensing. In addition to class lectures and discussions, guest lectures and lab sessions will introduce students to both raster and vector based GIS applications used by professionals in environmental management and urban planning. Several assignments will be given during the term. A goal of these assignments will be to develop a sensitivity to the application appropriate for solving specific GIS problems. Many of the lectures will be illustrated by actual problems encountered in practice. Topics that will be discussed during the term include:

- GIS and mapping
- Decision support and GIS
- Sources for GIS and remote sensing data
- Data structures and data management
- Interpretation of multi-spectral, radar and other remote sensing data
- Land use classification
- Topographical analysis
- Design and implementation of GIS
- Modeling with GIS
- Spatial Analysis with GIS
- Data visualization

Teaching Approach:

Lectures and labs are an integral component of the course. Lectures will provide students with the background needed to complete the problems in the lab. During the semester you will have an opportunity to work with the two most popular desktop GIS applications in the market place: ArcGIS and MapInfo. In addition to acquiring experience with GIS software, you will learn how to utilize ACCESS as a database management tool. This will be a particularly important skill for those who plan to acquire field data as part of your graduate research. During the course you will also be introduced to EXCEL as a tool for data organization and statistical analysis.

Students should have a basic understanding of EXCEL for this course. If you have any questions about this course please contact the instructor at rmlevy@ucalgary.ca

Content: Topic Areas & Class Schedule:

No	Date	Period 1	Period 2	Period 3
1	16-Jan-15	Introduction: Why GIS	Types of Spatial Data: Raster vs Vector	Looking at Maps, Map Making
2	23-Jan-15	Surveying, Measurement and Projection	Lab in Class	Surveying, Measurement and Projection
3	30-Jan-15	Photo Interpretation and Classification	Lab	Lab
4	6-Feb-15	Urban Modeling	Lab	Lab
5	13-Feb-15	Lab	Lab	Lab
6	20-Feb-15	**Block Week: No Class**	**Block Week: No Class**	**Block Week: No Class**
7	27-Feb-15	Urban Modeling	Lab	Lab
8	6-Mar-15	Remote Sensing	Lab	3D Data and the 3D World
9	13-Mar-15	Regional Modeling	Lab	Lab
10	20-Mar-15	Lab: Regional Modeling	Lab	Lab
11	27-Mar-15	Data Structures	Lab: Access	Lab: Access
12	3-Apr-15	Good Friday: No Class	Good Friday: No Class	Good Friday: No Class
13	10-Apr-15	**Exam**	**Exam**	**Exam**

Means of Evaluation:
The course evaluation will be based on the assignments completed during the term, which includes written assignments, and a final exams.

1) Assignment 1: Urban Planning – 22%
2) Assignment 2: Urban Modeling – 22%
3) Assignment 3: Regional Planning – 22%
4) Final Exam - 34%

Grading Scale

Grade	Grade Point Value	4-Point Range	Percent	Description
A+	4.00	4.00	95-100	Outstanding - evaluated by instructor
A	4.00	3.85-4.00	90-94.99	Excellent - superior performance showing comprehensive understanding of the subject matter
A-	3.70	3.50-3.84	85-89.99	Very good performance
B+	3.30	3.15-3.49	80-84.99	Good performance
B	3.00	2.85-3.14	75-79.99	Satisfactory performance
B-	2.70	2.50-2.84	70-74.99	Minimum pass for students in the Faculty of Graduate Studies
C+	2.30	2.15-2.49	65-69.99	All final grades below B- are indicative of failure at the graduate level and cannot be counted toward Faculty of Graduate Studies course requirements.
C	2.00	1.85-2.14	60-64.99	
C-	1.70	1.50-1.84	55-59.99	
D+	1.30	1.15-1.49	50-54.99	
D	1.00	0.50-1.14	45-49.99	
F	0.00	0-0.49	0-44.99	

Notes:

- A student who receives a "C+" or lower in any one course will be required to withdraw regardless of their grade point average (GPA) unless the program recommends otherwise. If the program permits the student to retake a failed course, the second grade will replace the initial grade in the calculation of the GPA, and both grades will appear on the transcript.

All late assignments will be subject to a grade reduction. For each two days late, your grade will be reduced by .33/ 4.00.

Readings:

Links to articles will be available from D2L.

General References:

Antennucci,J.C., Geographic Information Systems, A Guide to the Technology, New York, New York: Van Nostrand Reinhold, 1991.
Berry, J. Beyond Mapping: Concepts: Algorithms and Issues in GIS, N.Y.: John Wiley & Sons.
Huxhold, William E., An Introduction to Urban Geographic Information Systems, New York, New York: Oxford University Press, 1991.
Lillesand, Thomas and Ralph W. Kiefer, Remote Sensing and Image Interpretation, New York, New York: John Wile & Sons, Inc., 1994.

WebSources:

www.GIS.Com (ESRI supported website)
www.esri.com (ESRI home page)
http://www.gislounge.com/ (GIS portal)
http://www.csiss.org/ (GIS portal sponsored by a grant from NSF)
http://www.urisa.org/ (The Assoiciation for GIS Professionals http://www.freegis.org/
(Portal to free GIS software, documents and other
http://www.innovativegis.com/basis/ (Corporate website for Berry &Associates)

Software: MapInfo, ArcGIS, Google Earth, ACCESS, EXCEL