GEOG 214 **WINTER 2005**
DIGITAL GEOMATICS

Instructor

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Course Description

The course introduces students to the basics of digital geomatics including geographic information systems and digital remote sensing.

Learning Outcomes

On completion of the course students should be able to:

- demonstrate an understanding of the basic concepts in digital geomatics, including concepts in GIS, digital mapping and database systems, and digital remote sensing;
- demonstrate an ability to handle spatial data through the application of GIS and remote sensing software.

Text

The following two texts are available in the college bookstore.
Ian Heywood, An Introduction to Geographical Information Systems. 2002. Prentice Hall.

Geography 214 Digital Geomatics: Course Manual.

In addition, the Canada Centre for Remote Sensing (CCRS) has an on-line tutorial *Fundamentals of Remote Sensing*
http://www.ccrs.nrcan.gc.ca/ccrs/learn/tutorials/fundam/fundam_e.html
Several chapters from the tutorial form the basis of the remote sensing material discussed in the course.

Text Support

The Heywood text provides a set of multiple choice questions for each chapter at the website www.booksites.net/heywood. Click *An Introduction to Geographical Information Systems second edition,* click *Student Resources*. Students are strongly encouraged to use these questions to test their understanding of the concepts introduced in each chapter. Many of these questions will form part of the in-class tests.

Evaluation

Evaluation is based on a series of tests, lab and class exercises and a project.
Tests. There is a mid-term (20%) and a final test (25%). The format of the two tests will be discussed in class.
Lab and class assignments. All lab and class assignments are due the following week at Thursday's class. These assignments are outlined in the Course Manual.
Project. Students use GIS and remote sensing software in problem solving. The project is due the last class of the semester.

Assignments handed in late will have a **10% penalty** and assignments over one week late will not be accepted.

Evaluation summary

Tests I and II	45%
Lab and class exercises	40%
Project	15%

Topic Outline

Week of	
Jan 10	Introduction to the course:
Week 1	Geomatics and geographic inquiry
	Heywood, Ch. 1
	Notes: Geomatics and geography
	Lab 1: A quick guide to viewing data with ArcView GIS
	Assignment 1: Introduction
Jan 17	Spatial data
Week 2	Heywood, Ch. 2
	Notes: Representing the earth in a GIS
	Lab 2: Exploring World Earthquakes with GIS
	Assignment 2: Spatial Data
Jan 24	Collecting spatial data
Week 3	Heywood, Ch. 2
	Notes: Coordinate systems
	Lab 3: Spatial data
Jan 31	Spatial data modeling: vector and raster data
Week 4	Heywood, Ch. 3
	Notes: Data quality
	Lab 4: Working with vector and raster data
	Analyzing Tornadoes with GIS
	Assignment 3: Spatial data modeling
Feb7	Data input and editing
Week 5	Heywood, Ch. 5
	Notes: Data Input and Output
	Lab 5: Downloading Imagery; Digitizing

Feb 14 **TEST**
Week 6

READING BREAK

Feb 21 Working with remotely sensed data
Week 7 Introduction to remote sensing science, satellites and sensors
Canada Centre for Remote Sensing, Ch. 1 Introduction; Ch. 2 Sensors

Lab 6: *Working with Image Data*

- *Working with remotely sensed data (Exercise 2): Image is everything*
- *Registering and Using Imagery within a GIS*

Assignment 4: Working with remotely sensed data

Feb 28 Introduction to Projects:
Week 8 *Mapping and analyzing land use in the Ottawa region*
Analyzing temperature patterns in BC
Analyzing neighbourhood demographics in Victoria
Analyzing stress in a soybean crop

Assignment 5: Data input

March 7 Attribute data management
Week 9 Heywood, Ch. 4

Lab 7: Mapping a Parking Lot

Projects

March 14 Data analysis
Week 10 Heywood, Ch. 6
Notes: GIS Analysis

Lab 8: Raster Data Analysis

- *San Marcos DEM*
- *Mount St. Helens – Before and After*

Assignment 6: Data analysis

March 21 Guest speaker
Week 11

Lab 9: Vector Data Analysis
Locating a Fire Tower Using GIS

March 28 Image analysis: Image classification; image transformation
Week 12 CCRS, Ch. 4 Image Analysis

Lab 10: Analyzing Images
Working with remotely sensed data:

- *(Exercise 6) Finding and collecting;*
- *(Exercise 7) The grass is greener*

Assignment 7: Image analysis/Working with images

April 4 Output: from new maps to enhanced decisions
Week 13 Heywood, Ch. 8

Lab 11: Canadian Demographics
Lab 12: Geo-demographics

April 11 Review and Projects
Week 14

GRADING SYSTEM

95 -100% A+	
90 - 94% A	Superior levels of achievement
85 - 89% A-	
80 - 84% B+	
75 - 79% B	High levels of achievement
70 - 74% B-	
65 - 69% C+	Satisfactory level of achievement
60 - 64% C	Sufficient level of achievement
50 - 59% D	Minimum level of achievement
0 - 49% F	Minimum level is not achieved