

**GEOG 214
DIGITAL GEOMATICS**

FALL 2004

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	45%
Final project	10%

Topic Outline

Week of

Sept 6 Introduction to the course

Week 1

Introductory Lab: A quick guide to viewing data with ArcView GIS

Assignment 1: Introduction

Sept 13 What is digital geomatics?
Week 2 What is GIS? What is remote sensing?
Geographic inquiry and GIS
Heywood, Ch. 1
Notes: Geomatics and geography

Lab 1: Investigating World Demography using GIS

Sept 20 Spatial data
Week 3 Heywood, Ch. 2
Notes: Representing the earth in a GIS

Lab 2: Exploring World Earthquakes with GIS

Assignment 2: Spatial Data

Sept 27 Collecting spatial data: GPS data; remotely sensed data; census data
Week 4 Heywood, Ch. 2
Notes: Coordinate systems

Lab 3: Spatial data

Oct 4 Spatial data modeling: vector and raster data
Week 5 Heywood, Ch. 3
Notes: Data quality

*Lab 4: Working with Vector and Raster Data
- Analyzing Tornadoes with GIS*

Assignment 3: Spatial data modeling

Introduction to GIS project
Analyzing temperature patterns in BC

Oct 11
Week 6

Thanksgiving (No class Monday Oct 11)

Attribute data management
Heywood, Ch. 4

Lab 5: Mapping a Parking Lot

Oct 18
Week 7

Data input and editing
Heywood, Ch. 5
Notes: Data Input and Output

Lab 6: Downloading Imagery; Digitizing

Assignment 4: Data input

Introduction to GIS project
Analyzing neighbourhood demographics in Victoria

Oct 25
Week 8

Test

Lab 7: Locating Study Sites for Stipa Comata using GIS

Nov 1
Week 9

Working with remotely sensed data
- Introduction to remote sensing science
- Satellites and sensors
Canada Centre for Remote Sensing, Ch. 1 Introduction; Ch. 2 Sensors

Lab 8: Working with Image Data
- *Working with remotely sensed data (Exercise 2): Image is everything*
- *Registering and Using Imagery within a GIS*

Assignment 5: Working with remotely sensed data

Nov 8
Week 10

Output: from new maps to enhanced decisions
Heywood, Ch. 8

Lab 10: Spatial Analysis
-Canadian Demographics

Assignment 7: Output

Remembrance Day (No class Thursday Nov 11)

Nov 15
Week 11

Data analysis
Heywood, Ch. 6
Notes: GIS Analysis

Lab 9: Vector Data Analysis
- Analyzing Watersheds with GIS

Assignment 6: Data analysis

Nov 22
Week 12

Guest Speaker

Lab 9: Raster Data Analysis
- The Raster Data Model
- Mount St. Helens – Before and After

Nov 29
Week 13

Image analysis: Image classification and transformation
CCRS, Ch. 4 Image Analysis

Lab 12: Analyzing Images
- Working with images
- Working with remotely sensed data: (Exercise 6) Finding and collecting; (Exercise 7) The grass is greener; (Exercise 8) In a class of their own

Assignment 8: Image analysis

Remote sensing project
Analyzing ozone damage to milkweed plants
Analyzing stress in a soybean crop

Dec 6
Week 14

Image analysis: Image classification and transformation
Project completion

GRADING SYSTEM

95 - 100% A+	Superior levels of achievement
90 - 94% A	
85 - 89% A-	
80 - 84% B+	High levels of achievement
75 - 79% B	
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

LEARNING SUPPORT AND SERVICES FOR STUDENTS

There are a variety of services available for students to assist them throughout their learning. This information is available in the College Calendar, Registrar's Office or the College web site at <http://www.camosun.bc.ca>

ACADEMIC CONDUCT POLICY

There is an Academic Conduct Policy. It is the student's responsibility to become familiar with the content of this policy. The policy is available in each School Administration Office, Registration, and on the College web site in the Policy Section.

www.camosun.bc.ca/divisions/pres/policy/2-education/2-5.html