ENGG*3340 GIS IN ENVIRONMENTAL ENGINEERING

SCHOOL OF ENGINEERING, UNIVERSITY OF GUELPH

FALL 2007

COURSE DESCRIPTION

This course provides basic-level knowledge of Geographic Information System (GIS) principles, techniques and practice in Environmental Engineering and Natural Resources Management. In this course students will learn about data sources, visualization, query, analysis, and integration using "ESRI ArcGIS 9.1", a popular desktop GIS and mapping software.

INSTRUCTOR

Dr. Bahram Gharabaghi, THRN 2386, ext. 58451, bgharaba@uoguelph.ca
Homepage: http://www.soe.uoguelph.ca/faculty_pages/bahram_g.html

OFFICE HOURS

You are welcome to visit at your convenience and/or send me an email to book an appointment.

COURSE RESOURCES

Lectures: Tuesday and Thursday, 10:00AM - 11:20AM, THRN 1135

REQUIRED TEXTBOOKS

Mastering ArcGIS, Maribeth Price, McGraw Hill, ISBN: 978-0-07-305152-9

LEARNING OUTCOMES

- Knowledge of the basic GIS structure and functions;
- Understanding data structuring and application program development;
- Familiarity with data input, display and analysis;
- Learning about various applications of GIS in environmental engineering and natural resource management projects; and
- Developing expertise for effective use of a GIS software package to build geographical information systems.

TOPICS OF STUDY

- Chapter 1: Introducing ArcGIS
- Chapter 2: Working with ArcMap
- Chapter 3: Coordinate Systems and Map Projections
- Chapter 4: Drawing and Symbolizing Features
- Chapter 5: Working with Tables
- Chapter 6: Queries
- Chapter 7: Spatial Joins
- Chapter 8: Map Overlay
- Chapter 9: Presenting Data
- Chapter 10: Geocoding
- Chapter 11: Basic Editing in ArcMap
- Chapter 12: More Editing Techniques
- Chapter 13: Working with Geodatabases
- Chapter 14: Analyzing Networks
- Chapter 15: Raster Analysis

EVALUATION

The final grade will be determined from the results of the final examination, term project, and in-class presentations weighted as follows:

- In-Class Presentations   40%
- Term Project   40%
- Final Exam   20%

IN-CALSS PRESENTATION

Each student will review and discuss four examples (10 marks each) of application of ArcGIS with their classmates. These four presentations will be scheduled every two weeks and the duration of each presentation will be 10 min plus 5 min for question period. The content of the oral presentations will be evaluated based on evidence of knowledge of the subject and terminology, mastery of using ArcGIS and its tools, knowledge of available GIS data and its quality, and the level of effort dedicated for the example. The oral presentations will also be evaluated based on non-verbal behaviors such as eye contact and voice control, the ability to effectively respond to the questions from the audience and control of the time for the presentation.

TERM PROJECT REPORT

Each students will assume the identity of a consulting firm providing services to a client and submit a proposal by Thursday September 27th, 10:00 am that should include a description of the project as well as a detailed workplan. Proposals will be reviewed and general feedback will be provided. The main tasks will include project definition and objectives, background literature review, data collection, analysis, reporting, and presentation. Evaluation of the term project reports will be based on:

- ➢ Cover material (cover letter, title page, table of contents, executive summary)
- ➢ The idea and topic (novel, genuine, applied, essential, clear objectives)
- ➢ Introduction (purpose, background, scope of work, available data)
- ➢ Content (provides specific, accurate, precise information)
- ➢ Organization (individual paragraphs integrate smoothly into the overall report)
- ➢ Writing (ideas and organization lead to clear understandable writing)
- ➢ Professional appearance (high quality of text, figures and tables presented)
- ➢ Data (use of a variety of sources appropriate to the project)
- ➢ Analysis (use of a variety of ArcView GIS functions and extensions)
- ➢ Results (clarity and accuracy of interpretation and discussion of the results)
- ➢ Conclusion (clarity of expression and understanding of concepts)
- ➢ Recommendations
- ➢ References (complete and properly formatted)
- ➢ Format (typed, line spacing, margins, page numbers, grammar, spelling, professionally written, organized, readable, completeness, clarity, conciseness, and consistency)

The term project reports are due on Thursday Nov. 29th, 2007.

BLACKBOARD

Some of the lecture notes and course material will be made available on Courselink: http://courselink.uoguelph.ca/ce6courselink/index.html

POLICY FOR MISSED EXAMINATION

If the Final Examination is not written, the procedures in the current University of Guelph Undergraduate Calendar must be followed.

PLEASE NOTE

The Regulations concerning Academic Misconduct as outlined in the University of Guelph, Undergraduate Calendar for 2007 will be strictly enforced.