EXPANDED COURSE DESCRIPTION
EARTH, SPACE SCIENCE AND ENGINEERING
Lassonde School of Engineering
Earth and Space Science and Engineering
LE / ESSE 4600 3.0 SECTION M
GIS AND DATA INTEGRATION
FALL 2017 / WINTER 2018

Last Modified Date: 08/18/2017

COURSE CALENDAR DESCRIPTION

Project-oriented geomatics course using GIS systems (Arc/Info and S-PLus or SPSS for UNIX) and various techniques (map algebraic, statistical, fuzzy logic, AI, neural network and fractal/multifractal) for integrating diverse dataset (geological, geophysical, geochemical, remote sensing and GPS). Two lecture hours, two laboratory hours. One term. Three credits. Prerequisite: One of LE/ESSE 3600 3.00, AP/SC/GEOG 3180 3.00, AP/SC/GEOG 4340 3.00, ES/ENVS 3520 3.00, ES/ENVS 4520 3.00, or permission of the instructor. Prior to Fall 2014: Prerequisite: One of LE/EATS 3300 3.00, AP/SC/GEOG 3180 3.00, AP/SC/GEOG 4340 3.00, ES/ENVS 3520 3.00, ES/ENVS 4520 3.00, or permission of the instructor. Prior to Summer 2013: Prerequisite: One of SC/EATS 3300 3.00, AP/SC/GEOG 3180 3.00, AP/SC/GEOG 4340 3.00, ES/ENVS 3520 3.00, ES/ENVS 4520 3.00, or permission of the instructor.

INSTRUCTOR(S)

<table>
<thead>
<tr>
<th>Name</th>
<th>Section / Format / Term</th>
<th>Contact Email</th>
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<tbody>
<tr>
<td>Jadidi Mardkheh, Amaneh</td>
<td>Sec. M / LECT / W</td>
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TOPICS AND CONCEPTS

Course Topics Include
1. Introduction to GIS and data integration
2. GIS Models and Modeling
3. Challenge in Geospatial data integration
4. Data integration methods
5. Spatial Multicriteria Decision Analysis
6. Decision Alternatives and Constraints
7. Criterion Weighting (AHP)
8. Decision Rules
9. Fuzzy Logic Method for SDSS
10. Database integration
11. Geospatial Web Visualization

LIST OF LEARNING OUTCOMES AND EXAMPLES OF

Course Objectives
- To understand the concepts and principles of GIS data structure, data integration and modeling for Geomatics applications.
- To understand advanced spatial analysis method and operator design using multi-layered geospatial maps and data.
- To discuss advanced topics in Geocomputational methods and Geospatial Web technologies.
- To practice GIS through hands-on labs and group projects with GIS software and applications.
**Course Learning Outcomes (CLO)**

- Describe and explain the main steps and processes involved in data integration in GIS
- Critically evaluate the results obtained by various data integration techniques
- Perform various spatial decision support modeling processes using ArcGIS ModelBuilder and other extensions
- Develop basic skills for conducting spatial decision projects with real world data
- Understand various potential improvements of data analysis technologies available in the current GIS

**GRADED ASSESSMENT**

**Assessment**

- Lab Assignment 20%
- Midterm 20%
- Project Term 20%
- Final Exam 40%

**Grade System**

- ≥ 90% A+
- 80-89% A
- 75-79% B+
- 70-74% B
- 65-69% C+
- 60-64% C
- 55-59% D+
- 50-54% D
- 40-49% E
- < 40% F

**ADDITIONAL INFORMATION**

**Textbooks**

- Malczewski, Jacek (1999), *GIS and Multicriteria Decision Analysis*, John Wiley and Sons, Canada.

**Websites**

- The NCGIA Core Curriculum in GIScience (http://www.ncgia.ucsb.edu/giscc/)
- The Geographer’s Craft (http://www.colorado.edu/geography/gcraft/notes/notes.html)
- The GIS Primer: An introduction to GIS (http://www.innovativegis.com/basis/primer/primer.html)
- Canadian Geospatial Data Infrastructure (CGDI) (geoconnections.ca)
• GeoBase (http://www.geobase.ca/)
• GeoGratis (http://www.geogratis.org/)
• GIS Café (giscafe.com)
• Geomatica

Journals
• International Journal of Geographic Information Science
• Journal of Geographical Systems
• Photogrammetric Engineering and Remote Sensing
• ISPRS Journal of Photogrammetry and Remote Sensing
• Geocarto International
• GIM International
• GeoConnexion
• GEO Informatics

ACADEMIC INTEGRITY LINKS
• Senate Policy on Academic Honesty
• Academic Integrity

STUDENT LINKS
• Student Rights and Responsibilities
• Religious Observance
• Academic Accommodation for Students with Disabilities
• Counselling and Disability Services

Many courses utilize Moodle, York University’s course website system. If your course is using Moodle, click here to access it.
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