OTTAWA-CARLETON GEOSCIENCE CENTRE

Campus	CU Code / (CRN)	UO Code	Name	Instructor	Term
Fall 2009 Graduate Course Offering (Jan.7th.)					
UO		GEO 7999	M.Sc.Thesis		F/W
UO		GEO 9999	Ph.D. Thesis		F/W
UO	ERTH 5301	GEO 5131	Siliciclastic Sedimentology (Cross listed with GEO 4366)	W. Arnott	Fall
UO	ERTH 5503	GEO 5153A	Computer Techniques in the Earth Sciences – GIS in Earth Sciences (Cross listed with GEO 4301A	B. Daneshfar	Fall
UO	ERTH 5001	GEO 5301 A	Field Trip to Iceland (Cross listed with GEO 4362 & Earth 4503)	A. Fowler	Fall
UO	ERTH 5001	GEO 5301 B	Solid Earth System (Cross listed with GEO 4301B)	G. Milne/D. Schneider	Fall
UO	ERTH 5001	GEO 5301 F	Glacial Sedimentology (Cross listed with GEO 4301F)	D. Cumming/H. Russell/D. Sharpe	Fall
UO		GEG 5311 F	Environmental Change in Cold Regions	T. Lewkowicz	Fall
UO		GE 6102 F	Advanced Geomatics	M. Sawada	Fall

Campus	CU Code / (CRN)	UO Code	Name	Instructor	Term
Winter 2010 Graduate Course Offering					
UO	ERTH 5204	GEO 5124	Geology and Geochemistry Ore Deposits (Cross listed with GEO 4371)	M. Hannington	Winter
UO	ERTH 5503	GEO 5153 B	Computer Techniques in the Earth Sciences: Quantitative Analysis in Geology (Cross listed with GEO 4354)	B. Daneshfar	Winter
UO	GEOL 5403	GEO 5143	Environmental Isotopes and Groundwater Geochemistry	I. Clark	Winter
UO	ERTH 5600	GEO 5160	Chemistry in Earth Sciences: Subduction Zone Geochemistry	K. Hattori	Winter
UO	ERTH 5002	GEO 5302 C	Earth Sciences and Climate (Cross listed with GEO 4301C) Cancelled	G. Milne	Winter
UO	ERTH 5002	GEO 5302 D	Trace Elemental Analysis in Natural Materials (Cross listed with GEO 4301D)	N. De Silva	Winter
UO	ERTH 5002	GEO 5302 M	Seminar in Earth Sciences II: Short course on Geoenvironmental Modeling of Ore Deposits	M. Hannington	Winter
UO	ERTH 5503	GEO 5153 C	Computer Techniques in the Earth Sciences: Predictive, Risk and Potential Mapping for Scientific and Engineering Project in GIS (Lec.: Wed. 5:30 – 7:00 / Lab.: Wed. 7:00 – 10:00) CUBE 202	B. Daneshfar	Winter

4th Year course Offering 2009-2010					
Campus	**CU Code / (CRN)**	**UO Code**	**Name**	**Instructor**	**Term**
Fall and Winter term					
UO		GEO 4301A	Selected Topics in Earth Sciences: GIS for Science and Engineering	B. Daneshfar	Fall
UO		GEO 4301B	Selected Topics in Earth Sciences: Solid Earth Systems	G. Milne/ D. Schneider	Fall
UO		GEO 4362	Advanced Igneous Petrogenesis (Iceland Field Trip)	B. Cousens	Fall
UO		GEO 4366	Advanced Siliciclastic Sedimentology	B. Arnott	Fall
UO		GEG 4121	Applic GIS in Natural & Soc. Sc.	M. Sawada	Fall
UO		GEG 4129	Global Climate Change	K. Gajewski	Fall
OU		GEO 4301 C	Selected Topics in Earth Sciences: Earth Systems and Climate **(CANCELLED)**	G. Milne	Winter
OU		GEO 4301 D	Selected Topics in Earth Sciences: Trace Elemental Analysis in Geology	N. De Silva	Winter
OU		GEO 4342	Groundwater Geochemistry	I. Clark	Winter
OU		GEO 4354	Quantitative Analysis in Geology	D. Daneshfar	Winter
OU		GEO 4371	Advanced Mineral Deposits	M. Hannington	Winter
OU GEG		GEG 4301	Advanced Geomatics	M. Sawada	Winter
OU GEG		GEG 4726	Séminaire Géographique Physique	T. Lewkowicz	Winter

WINTER 2010

Predictive, Risk and Potential Mapping for Scientific and Engineering Projects in GIS

Graduate 3 credit course
Bahram Daneshfar

Introduction

By integrating spatial information in GIS quantitatively, predictive, risk, potential and suitability maps can be created. These kinds of maps can help scientists and engineers in decision making which can be required in various steps of different kinds of projects (e.g.: minerals and other natural resources potential and favourability mapping, environmental hazard risk mapping, site selection suitability mapping for various engineering projects, landslide risk mapping, ecological habitat favourability mapping, etc.).
This course provides a practical overview of fundamental concepts, procedures and methods that can be applied in GIS to integrate GIS information quantitatively to generate decision making maps.
Following each lecture session, there will be one lab session per week to practice the discussed methods. For each method several practical examples will be demonstrated. Students should also do weekly assignments related to each method to learn the exact required steps and details for practical application of the discussed integration methods in GIS. In addition each student will do a term project to practice all the steps required to generate predictive, risk and potential mapping.

Specific topics of the course

• What is modeling and integration in GIS?
• General steps in quantitative integration in GIS
• Selecting GIS layers for integration
• Processing and preparing GIS layers for integration
• Designing and automating models in Model Builder
• Quantitative integration based on:

1- Non-probabilistic methods
- Process modeling (analytical, experimental)
- Index overlay (multi criteria evaluation)
- Fuzzy logic
- Neural network

2- Probabilistic methods (Data-driven)
- Logistic regression
- Discriminant Analysis
- Weights of evidence

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Required Software

This course should be taught in a computer lab with ArcGIS, Spatial Analyst, a statistical software (MINITAB or Systat), all are available through Faculty of Science teaching computer labs.

Prerequisite

Students need to have some background knowledge/experience in GIS.**Predictive, Risk and Potential Mapping for Scientific and Engineering Projects in GIS**