



COURSE OUTLINE

GIS430

Prepared: Gerard Lavoie Approved: Corey Meunier

Course Code: Title	GIS430: ECOLOGICAL INVENTORY TECHNIQUES
Program Number: Name	4018: GIS-APPLICATION SPEC
Department:	GEOGRAPHIC INFORMATION SYSTEMS
Semester/Term:	18W
Course Description:	Stereoscopic visualization accompanied by 3Dimensional GIS workflows is fundamental to this course. Students will be exposed to specialized hardware and software used to view and interpret varying ecological land units found within Ontarios diverse landscape. In addition to gaining competence in working with stereoscopic hardware and software, students will also be introduced to a wide variety of landforms, terrestrial ecosystems, tree species, and wetlands. Digitizing and editing vectors in 3Dimensions following ministry specifications will be a constant focus as the landscape is explored. This course aims to prepare our students for GIS support roles in industry that require knowledge of Stereo Analyst and PurVIEW extensions for ArcGIS.
Total Credits:	2
Hours/Week:	2
Total Hours:	2
Prerequisites:	GIS422
Vocational Learning Outcomes (VLO's):	4018 - GIS-APPLICATION SPEC
Please refer to program web page for a complete listing of program outcomes where applicable.	<p>#1. Understand the general concepts of spatial information and the current methodologies used to input, store, manipulate, and retrieve this type of data in a computer based environment;</p> <p>#2. Understand the typical data structures, algorithms, and computational problems that are encountered in various GIS technologies;</p> <p>#3. Be aware of the variety of sources of spatial data, such as surveying and remote sensing, that feed into a GIS, and the methods by which these data are realized in a GIS system;</p> <p>#4. Understand the ways in which GIS technologies can be applied within specific disciplines (see assumption above), and the advantages, changes in method, developmental problems, and restructuring that may result from the adoption of these technologies;</p> <p>#7. Be capable of generating a plan for the design, implementation, and operation of a proposed GIS systems for a typical industrial client or group, and executing this plan as a demonstration project.</p>
Essential Employability Skills (EES):	#2. Respond to written, spoken, or visual messages in a manner that ensures effective communication.

- #4. Apply a systematic approach to solve problems.
- #5. Use a variety of thinking skills to anticipate and solve problems.
- #7. Analyze, evaluate, and apply relevant information from a variety of sources.
- #10. Manage the use of time and other resources to complete projects.
- #11. Take responsibility for ones own actions, decisions, and consequences.

Course Evaluation:

Passing Grade: 50%, D

Other Course Evaluation & Assessment Requirements:

Grade
 Definition Grade Point Equivalent
 A+ 90 - 100% 4.00
 A 80 - 89%
 B 70 - 79% 3.00
 C 60 - 69% 2.00
 D 50 - 59% 1.00
 F (Fail) 49% and below 0.00

CR (Credit) Credit for diploma requirements has been awarded.
 S Satisfactory achievement in field /clinical placement or non-graded subject area.
 U Unsatisfactory achievement in field/clinical placement or non-graded subject area.
 X A temporary grade limited to situations with extenuating circumstances giving a student additional time to complete the requirements for a course.
 NR Grade not reported to Registrar's office.
 W Student has withdrawn from the course without academic penalty.

Evaluation Process and Grading System:

Evaluation Type	Evaluation Weight
Assignments	100%

Course Outcomes and Learning Objectives:

Course Outcome 1.

1. Visualize stereoscopic imagery from within ArcMap using PurVIEW & Stereo Analyst extensions for ArcGIS.

Learning Objectives 1.

- 1.1 Understand the components that make up stereoscopic image models.
- 1.2 Explore the various types of stereoscopic imagery available, both satellite & aerial.
- 1.3 Build/process image sets, and their supporting files.
- 1.4 Understand file organization protocols.
- 1.5 Successfully employ ArcMap's visualization tools while displaying 3Dimensional imagery (i.e.: pan, zoom, and roam).

Course Outcome 2.

2. Create, measure, overlay and display 3D vectors using stereoscopic imagery.

Learning Objectives 2.

- 2.1 Understand x, y, z positional accuracy.
- 2.2 Accurately measure tree and object heights using stereoscopic software tools within ArcGIS extensions.
- 2.3 Digitize 3D features using DEM, and DSM terrain following tools, as well as manually.
- 2.4 Convert 2D feature classes to 3D using Elevation models.

Course Outcome 3.

3. Accurately create, and design field calibration plot locations for ecosite data collection.

Learning Objectives 3.

- 3.1 Establish & record accurate distances, directions and x, y, z locations for field usage.
- 3.2 Successfully identify "tie in points" used for access in the field.
- 3.3 Understand standardized concepts & protocols used for field plot placement.

Course Outcome 4.

4. Compile supplementary data (2D) and geoprocess for usage in a GIS support role.

Learning Objectives 4.

- 4.1 Isolate the boundaries of a working area for Ecological Inventory operations.
- 4.2 Perform geoprocessing tasks on supplementary data as per working areas.
- 4.3 Perform 2D to 3D conversion on supporting data and import into a geodatabase format.
- 4.4 Clean out attribute records and remove erroneous and/or redundant data.

Course Outcome 5.

5. Identify delineation boundaries for non-forested features using OMNR eFRI and ELC specifications.

Learning Objectives 5.

- 5.1 Gain some introductory exposure to Ecosite Land classification parameters .
- 5.2 Understand the automated water classification product and methods used for quality control.
- 5.3 Differentiate between non-forested wetland features. Classify non-forested urban features.
- 5.4 Identify & discuss natural vs. purposed disturbances.

Course Outcome 6.

6. Identify delineation boundaries of forested stands using OMNR eFRI and ELC specifications.

Learning Objectives 6.

- 6.1 Differentiate conifer, hardwood and mixed wood stand types.
- 6.2 Recognize single and multi tiered stands.
- 6.3 Identify plantations and natural regeneration.
- 6.4 Identify wetland species (conifer and deciduous).
- 6.5 Identify upland species (conifer and deciduous).

Course Outcome 7.

7. Perform semi-automated water classification as per OMNR specifications.

Learning Objectives 7.

7.1 Perform image preparation, bitmap operations and vector output operations.

7.2 Smooth and reduce feature class vertices using weed tolerances.

7.3 Convert final water layer for stereoscopic use using 3D Analyst and digital surface models.

7.4 Perform quality control and stereoscopic vector editing using ArcGIS extensions.

Course Outcome 8.

8. Digitize Ecological boundaries stereoscopically.

Learning Objectives 8.

8.1 Demonstrate and complete common editing tasks while following a terrain model.

8.2 Demonstrate the ability to digitize without the support of snapping.

Date:

Friday, January 19, 2018

Please refer to the course outline addendum on the Learning Management System for further information.