

**SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY
SAULT STE. MARIE, ONTARIO**



**SAULT
COLLEGE**

COURSE OUTLINE

COURSE TITLE: Ecological Inventory Techniques

CODE NO. : GIS430

SEMESTER: 2

PROGRAM: Geographic Information Systems Applications Specialist

AUTHOR: Gerard Lavoie

DATE: January, 2015

PREVIOUS OUTLINE DATED: Jan., 2014

APPROVED: Colin Kirkwood

Jan., 2015

Dean

Date

TOTAL CREDITS: 2

PREREQUISITE(S): N/A

HOURS/WEEK: 2

Copyright ©2013 Sault College of Applied Arts & Technology *Reproduction of this document by any means, in whole or in part, without prior written permission of Sault College of Applied Arts & Technology is prohibited.*

***For additional information, please contact Colin Kirkwood,
Dean, Environment Technology & Business
(705) 759-2554, Ext. 2688***

I. 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 Ontario's 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.

II. LEARNING OUTCOMES AND ELEMENTS OF PERFORMANCE:

Upon successful completion of this course, the student will demonstrate the ability to:

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

Potential Elements of the Performance:

- Understand the components that make up stereoscopic image models.
 - Explore the various types of stereoscopic imagery available, both satellite & aerial.
 - Build/process image sets, and their supporting files.
 - Understand file organization protocols.
 - Successfully employ ArcMap's visualization tools while displaying 3Dimensional imagery (i.e.: pan, zoom, and roam).
2. **Create, measure, overlay and display 3D vectors using stereoscopic imagery.**

Potential Elements of the Performance:

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

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

Potential Elements of the Performance:

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

4. Compile supplementary data (2D) and geoprocess for usage in a GIS support role.Potential Elements of the Performance:

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

5. Identify delineation boundaries for non-forested features using OMNR eFRI and ELC specifications.Potential Elements of the Performance:

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

6. Identify delineation boundaries of forested stands using OMNR eFRI and ELC specifications.Potential Elements of the Performance:

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

7. Perform semi-automated water classification as per OMNR specifications.Potential Elements of the Performance:

- Perform image preparation, bitmap operations and vector output operations.
- Smooth and reduce feature class vertices using weed tolerances.
- Convert final water layer for stereoscopic use using 3D Analyst and digital surface models.
- Perform quality control and stereoscopic vector editing using ArcGIS extensions.

8. Digitize Ecological boundaries stereoscopically.Potential Elements of the Performance:

- Demonstrate and complete common editing tasks while following a terrain model.
- Demonstrate the ability to digitize without the support of snapping.

III. TOPICS:

1. ArcGIS Stereoscopic Interface
2. Water Classification
3. Measuring distances and directions
4. Supplementary data processing
5. Measuring Heights
6. Earth feature recognition

IV. REQUIRED RESOURCES/TEXTS/MATERIALS:

1. Passive polarized 3D glasses (provided).
2. Active 3D shutter glasses (provided).

V. EVALUATION PROCESS/GRADING SYSTEM:

The entire grade will be calculated from the outcome on 5 Assignments and 2 exercises, totaling 100%

One of the following semester grades will be assigned to each student:

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

| | |
|-------------|--|
| 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. |

VI. SPECIAL NOTES:

Course Outline Amendments:

The professor reserves the right to change the information contained in this course outline depending on the needs of the learner and the availability of resources.

Retention of Course Outlines:

It is the responsibility of the student to retain all course outlines for possible future use in acquiring advanced standing at other postsecondary institutions.

Prior Learning Assessment:

Students who wish to apply for advance credit transfer (advanced standing) should obtain an Application for Advance Credit from the program coordinator (or the course coordinator regarding a general education transfer request) or academic assistant. Students will be required to provide an unofficial transcript and course outline related to the course in question. Please refer to the Student Academic Calendar of Events for the deadline date by which application must be made for advance standing.

Credit for prior learning will also be given upon successful completion of a challenge exam or portfolio.

Substitute course information is available in the Registrar's office.

Disability Services:

If you are a student with a disability (e.g. physical limitations, visual impairments, hearing impairments, or learning disabilities), you are encouraged to discuss required accommodations with your professor and/or the Disability Services office. Visit Room E1101 or call Extension 2703 so that support services can be arranged for you.

Plagiarism:

Students should refer to the definition of "academic dishonesty" in *Student Code of Conduct*. A professor/instructor may assign a sanction as defined below, or make recommendations to the Academic Chair for disposition of the matter. The professor/instructor may (i) issue a verbal reprimand, (ii) make an assignment of a lower grade with explanation, (iii) require additional academic assignments and issue a lower grade upon completion to the maximum grade "C", (iv) make an automatic assignment of a failing grade, (v) recommend to the Chair dismissal from the course with the assignment of a failing grade. In order to protect students from inadvertent plagiarism, to protect the copyright of the material referenced, and to credit the author of the material, it is the policy of the department to employ a documentation format for referencing source material.

Student Portal:

The Sault College portal allows you to view all your student information in one place. **mysaultcollege** gives you personalized access to online resources seven days a week from your home or school computer. Single log-in access allows you to see your personal and financial information, timetable, grades, and records of achievement, unofficial transcript, and outstanding obligations. Announcements, news, the academic calendar of events, class cancellations, your learning management system (LMS), and much more are also accessible through the student portal. Go to <https://my.saultcollege.ca>.

Electronic Devices in the Classroom:

Students who wish to use electronic devices in the classroom will seek permission of the faculty member before proceeding to record instruction. With the exception of issues related to accommodations of disability, the decision to approve or refuse the request is the responsibility of the faculty member. Recorded classroom instruction will be used only for personal use and will not be used for any other purpose. Recorded classroom instruction will be destroyed at the end of the course. To ensure this, the student is required to return all copies of recorded material to the faculty member by the last day of class in the semester. Where the use of an electronic device has been approved, the student agrees that materials recorded are for his/her use only, are not for distribution, and are the sole property of the College.

Attendance:

Sault College is committed to student success. There is a direct correlation between academic performance and class attendance; therefore, for the benefit of all its constituents, all students are encouraged to attend all of their scheduled learning and evaluation sessions. This implies arriving on time and remaining for the duration of the scheduled session. *<Optional: It is the departmental policy that once the classroom door has been enclosed, the learning process has begun. Late arrivers may not be granted admission to the room.>*

Tuition Default:

Students who have defaulted on the payment of tuition (tuition has not been paid in full, payments were not deferred or payment plan not honoured) as of the first week of *<choose November, March, or June>* will be removed from placement and clinical activities. This may result in loss of mandatory hours or incomplete course work. Sault College will not be responsible for incomplete hours or outcomes that are not achieved or any other academic requirement not met as of the result of tuition default. Students are encouraged to communicate with Financial Services with regard to the status of their tuition prior to this deadline to ensure that their financial status does not interfere with academic progress.

VII. COURSE OUTLINE ADDENDUM:

The provisions contained in the addendum are located on the portal form part of this course outline.