SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY

SAULT STE. MARIE, ONTARIO

COURSE OUTLINE

COURSE TITLE:	Geographic Information Systems (GIS)		
CODE NO. :	NET303	**SEMESTER:**	Two
PROGRAM:	Fish & Wildlife Conservation Technician, Forest Conservation Technician, Natural Environment Technician/Technologist		
AUTHORS:	Gerard Lavoie; Marie Alexander; Miranda Harrison		
DATE:	January 2013	**PREVIOUS OUTLINE DATED:**	January 2012

APPROVED:

"Colin Kirkwood" — **Dean**

Jan/2013 — **DATE**

TOTAL CREDITS:	3
PREREQUISITE(S):	N/A
HOURS/WEEK:	4

For additional information, please contact Colin Kirkwood, Dean, Environment Technology & Business
School of Technology and Natural Resources
(705) 759-2554, Ext. 2688

I. COURSE DESCRIPTION:

This course builds introductory GIS skills. Focus is on effective data creation, collection, & management. Topics covered include: efficient data capture methodology; creating & managing geodatabases; performing spatial analysis; performing 3D analysis; image geo-referencing; advanced spatial queries; data manipulation; image processing; metadata & vector editing; & shape topology.

II. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE:

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

1. Apply knowledge of natural environment practices to plan, create & manage GIS data.

Potential Elements of the Performance:

- Effective geodatabase planning & creation.
- Gain experience with GIS toolbars used by OMNR.
- Solve natural environment/management problems using GIS.
- Perform GIS tasks following OMNR data specifications.

2. Use the ESRI ArcMap and ArcCatalog interface effectively

Potential Elements of the Performance:

- Load multiple vector and raster layers.
- Maintain existing ArcMap projects used for data update.
- Perform geoprocessing operations
- Use ArcCatalog to interchange and convert file formats.
- Customize toolbars for efficient usage.
- Understand procedures for metadata file update and use.

3. Manipulate attribute tables and perform tabular operations.

Potential Elements of the Performance:

- Populate attribute tables from existing spreadsheets.
- Add, delete and calculate field records.
- Perform many query types using the Field Calculator

4. Create and print effective layouts and digital presentations.

Potential Elements of the Performance:

- Manipulate layout properties and operations.
- Export layouts to .pdf, or .tif formats for digital storage.
- Cartographic principles exposure.

5. Use ArcToolbox to perform geoprocessing tasks.

Potential Elements of the Performance:

- Analyze spatial data by buffering features, overlaying data and calculating attribute values.
- Merge, dissolve, clip, union, erase, intersect and calculate areas tools to manipulate layers & evaluate results.
- Reproject data for use with GPS units, and also to view within different UTM zones.
- Interpolate vertices to incorporate elevation values within a 3D shapefile.
- Understand the geometry repairing tools.
- Perform smoothing to reduce the number of redundant vertices within a shape.

6. Integrating GPS field collection with GIS Analysis

Potential Elements of the Performance:

- Upload and download waypoints & tracks using DNR Garmin.
- Use GPS points to georectify imagery.
- Perform edit tasks on waypoints and tracks to create new shapefiles.

III. TOPICS:

1. Introduction to ArcGIS desktop
2. Customizing ArcMap toolbars
3. Effective geodatabase planning & creation.
4. Symbolizing features and rasters
5. Classifying features and rasters, labeling features
6. Querying data, joining and relating tables
7. Selecting features by location, preparing data for analysis
8. Analyzing spatial data, projecting data in ArcMap
9. Editing features and attributes
10. Geoprocessing using ArcToolbox
11. Making maps for presentation
12. Integrating GPS with GIS

IV. REQUIRED RESOURCES/TEXTS/MATERIALS:

- Students will receive appropriate handouts covering the course material when necessary.

V. EVALUATION PROCESS/GRADING SYSTEM:

Evaluation will be based on practical tests, a project presentation and assignments.

Practical Tests (2)	**50%**
Exercises/Assignments (10)	**50%**
	100%

PLEASE NOTE:
For a breakdown of individual marks by assignment by week refer to the course syllabus on LMS.

The following semester grades will be assigned to students:

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.

VI. SPECIAL NOTES:

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

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.

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.

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.

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.

VII. COURSE OUTLINE ADDENDUM:

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