

SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY

SAULT STE. MARIE, ONTARIO



Sault College

COURSE OUTLINE

COURSE TITLE: Geographic Information Systems (GIS)

CODE NO. : NRT 208 **SEMESTER:** Four

PROGRAM: Fish & Wildlife Conservation Technician, Forest
Conservation Technician, Natural Environment
Technician/Technologist

AUTHOR: Erwin Goertz

DATE: May 2009 **PREVIOUS OUTLINE DATED:** Dec '08

APPROVED: _____
"B. Punch"

	CHAIR	DATE
TOTAL CREDITS:	3	
PREREQUISITE(S):	none	
LENGTH OF COURSE:	4 hours/week	64
	TOTAL CREDIT HOURS:	

Copyright ©2009 The 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 Brian Punch, Chair
School of the Natural Environment/Outdoor Studies & Technology Programs
(705) 759-2554, Ext.2681

I. COURSE DESCRIPTION:

The aim of this course is to introduce students to the use of Geographic Information Systems (GIS) as a source of immediate information and as an analytic tool for solving natural resource management problems. Students will be using ESRI's ArcGIS software.

II. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE:

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

1. Be able to identify the usefulness of GIS applications in natural resource management.

Potential Elements of the Performance:

- define what a GIS is and does
- identify GIS software used by various agencies and the strength and weaknesses of each
- investigate solutions to real world natural resource management problems using GIS

2. Be able to use the ArcMap and ArcCatalog interface effectively

Potential Elements of the Performance:

- access and start the ArcMap software
- open and close projects and exit from the software correctly
- read the project window and understand it's graphical user interface
- use ArcCatalog to browse and access files in various directories
- re-boot the computer if the system locks up
- use Windows XP

3. Open a Map Document and use the user interface to create data frames and manipulate layers..

Potential Elements of the Performance:

- view and manipulate project properties
- manipulate view properties and operations
- manipulate layer (theme) properties and operations
- add layers to a view
- add labels to a layer
- make a data frame active

4. Be able to manipulate basic TABLE properties and operations.

Potential Elements of the Performance:

- build a new table
- edit a table by adding and deleting fields
- perform a query using the Field Calculator function
- retrieve statistics and advanced calculations relating to a table
- make and save a summary table

5. Be able to create a CHART from a table.

Potential Elements of the Performance:

- manipulate chart properties and operations including type of chart, the chart axes, labels, scale and colors

6. Manipulate and customize the symbology for feature classes within a layer (theme).

Potential Elements of the Performance:

- change symbols for features in a layer
- save and load a legend
- access and retrieve different symbol palettes and add labels to symbols

7. Create and print a LAYOUT

Potential Elements of the Performance:

- manipulate layout properties and operations
- add components to the layout including the data frame, the legend, the scale bar, the north arrow, the chart, the table, and picture

8. Use ArcToolbox to perform geoprocessing tasks.

Potential Elements of the Performance:

- be able to analyze spatial data by buffering features, overlaying data and calculating attribute values
- be able to properly use the merge, dissolve, clip, union, erase, intersect and calculate areas tools to manipulate layers

9. Integrating GPS with GISPotential Elements of the Performance:

- be able to upload and download waypoints and tracks between a GPS and GIS using DNR Garmin
- be able to manually enter GPS coordinates into ArcGIS
- be able to edit waypoints and tracks using the editor function
- be able to georeference an aerial photograph and/or satellite image

III. TOPICS:

1. Introducing ArcGIS desktop
2. Exploring ArcMap
3. Exploring ArcCatalog
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:

- None
- Students will receive appropriate handouts covering the course material when necessary. Students may obtain the following as a reference text if they desire.

Getting to Know ArcGIS desktop
(2nd edition updated for ArcGIS 9)
ISBN 1-58948-083-X ESRI Press

This text comes with a 180 day free trial version of ArcGIS (ArcView version 9.1) which students can load onto their home computers. It will run on Windows 2000, Windows NT, Windows XP/Vista but **not** on Windows 95 or 98. I will also distribute version 9.2 for those students requesting it.

V. EVALUATION PROCESS/GRADING SYSTEM:

Evaluation will be based on practical tests, weekly quizzes and problem solving exercises.

Practical Tests 2 @ 25%	50%
Quizzes (weekly)	10
Exercises/Assignments	<u>40</u>
	100%

Quizzes are given at the beginning of each class. Students who arrive late forfeit the quiz mark.

The following semester grades will be assigned to students:

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

Communication:

The College considers **WebCT/LMS** as the primary channel of communication for each course. Regularly checking this software platform is critical as it will keep you directly connected with faculty and current course information. Success in this course may be directly related to your willingness to take advantage of the **Learning Management System** communication tool.

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, records of achievement, unofficial transcript, and outstanding obligations, in addition to announcements, news, academic calendar of events, class cancellations, your learning management system (LMS), and much more. 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.

Course Name

Code No.

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) 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.