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

AUTHOR: Erwin Goertz

DATE: Dec. 2008   **PREVIOUS OUTLINE DATED:** May '08

APPROVED: "B. Punch"

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                              CHAIR   **DATE**

TOTAL CREDITS: 3

PREREQUISITE(S): none

LENGTH OF COURSE: 4 hours/week   64

TOTAL CREDIT HOURS:

Geographic Information Systems   NRT208

_____   _____
                    Course Name   Code No.

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 GIS

Potential 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 sateliite 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	**40**
	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	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 (Fail)	49% or below	0.00
CR (Credit)	Credit for diploma requirements has been awarded.	
S	Satisfactory achievement in field/clinical placement or non-graded subject areas.	
U	Unsatisfactory achievement in field/clinical placement or non-graded subject areas.	
X	A temporary grade limited to situations with extenuating circumstances giving a student additional time to complete the requirements for a course	

VI.   SPECIAL NOTES:

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.

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.

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*. Students who engage in "academic dishonesty" will
receive an automatic failure for that submission and/or such other penalty,
up to and including expulsion from the course/program, as may be decided
by the professor/dean. 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.

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.

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

VII.   PRIOR LEARNING ASSESSMENT:

Students who wish to apply for advanced 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.

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