

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 environment/resources 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 environment/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 environment/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 the current MicroSoft Windows software

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

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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.

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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.

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 | <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.

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.

Geographic Information Systems

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