

SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY

SAULT STE. MARIE, ONTARIO



COURSE OUTLINE

COURSE TITLE: Geographic Information Systems (GIS)

CODE NO. : NET108 **SEMESTER:** Two

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

AUTHOR: Gerard Lavoie, Danika Montgomery, Miranda Moffatt

DATE: January 2017 **PREVIOUS OUTLINE DATED:** January 2016

APPROVED:

	<u>Sherri Smith</u>	<u>Jan/2017</u>
	CHAIR	DATE

TOTAL CREDITS: 3

PREREQUISITE(S): N/A

HOURS/WEEK: 4

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For additional information, please contact Sherri Smith: Chair of Natural Environment, Business & Media;
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(705) 759-2554, Ext. 2811*

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 georeferencing; 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 Elevation and Depth data with GIS AnalysisPotential Elements of the Performance:

- Generate contour lines from elevation data
- Create a bathymetric map using depth data
- Examine slope, line of sight, and hill-shading
- Perform raster clipping and mosaicking operations

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. Elevation & Depth Data Integration

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 assignments, a final exam, and class participation.

Final Exam	25%
Exercises/Assignments (9)	65%
Participation/Attendance	<u>10%</u>
	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	<u>Definition</u>	<i>Grade Point Equivalent</i>
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.	

VII. SPECIAL NOTES: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 closed, the learning process has begun. Late arrivers will not be granted admission to the room.*

Course Outline Amendments:

The faculty member 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 Key Dates Calendar 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. Student Services can provide information regarding the Prior Learning Assessment and Recognition policy or it can be viewed on the student portal.

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

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 announcements, news, academic calendar of events, class cancellations, your learning management system (LMS), and much more is available. Go to <https://my.saultcollege.ca>.

Communication:

The College considers ***Desire2Learn (D2L)*** 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 this Learning Management System (LMS) communication tool.

Accessibility 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 the Accessibility Services office. Call Ext. 2703 or email studentsupport@saultcollege.ca so that support services can be arranged for you.

Audio and Video Recording 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. Students with disabilities who require audio or visual recording devices in the classroom as an accommodation will receive approval from their counselor once the Audio and Video Recording Devices in the Classroom Policy has been reviewed by the student. Recorded classroom instruction will be used only for individual academic use and will not be used for any other purpose. Recordings may only be used for individual study of materials presented during class and may not be published or distributed. Intentional misuse of audio and video recordings or intentional misrepresentation when requesting the use of a device for recording shall constitute a violation of this policy and laws protecting intellectual property.

Academic Dishonesty:

Students should refer to the definition of “academic dishonesty” in the *Student Code of Conduct*. Students who engage in academic dishonesty will be issued a sanction under the Student Code of Conduct which could lead to and include expulsion from the course/program. In order to protect students from inadvertent plagiarism, to protect the copyright of the material referenced, and to credit the author of the material, students must use a documentation format for referencing source material.

Tuition Default:

Students who have defaulted on the payment of tuition) as of the first week of November (fall semester courses), first week of March (winter semester courses) or first week of June (summer semester courses) will be removed from placement and clinical activities due to liability issues. 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.