

SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY

SAULT STE. MARIE, ONTARIO



**SAULT
COLLEGE**

COURSE OUTLINE

COURSE TITLE:	Introduction to ArcGIS	
CODE NO. :	GIS426	SEMESTER: 16F
PROGRAM:	Geographic Information Systems Applications Specialist	
AUTHOR:	Heath Bishop	
DATE:	June, 2016	PREVIOUS OUTLINE DATED: May, 2015
APPROVED:	<hr/>	<hr/>
	DEAN	DATE
TOTAL CREDITS:	5	
PREREQUISITE(S):	None	
HOURS/WEEK:	5	

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I. COURSE DESCRIPTION:

As a foundational course in the program, this course provides much more than just an introduction to GIS theory and concepts. Through hands-on application of industry leading ArcGIS software, students will learn how the various components of the software can be used together to solve complex spatial problems. Specific attention will be paid to the following topics: the ArcGIS interface, data management and geoprocessing, presenting data, manipulating, editing and creating data, attribute and spatial queries, raster analysis and coordinate systems.

II. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE:

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

1. Use ArcMap, ArcCatalog and ArcToolbox (ArcGIS)**Potential Elements of the Performance:**

- Create map layouts using ArcMap
- Edit and input data using ArcMap
- Perform data conversion, projection and analysis operations using ArcToolbox
- Perform GIS file management using ArcCatalog

2. Coordinate Systems**Potential Elements of the Performance:**

- Understand the fundamental concepts of geodesy, datums, geographic and projected and coordinate systems
- Learn how to define and project coordinate systems properly
- Troubleshoot coordinate system errors

3. Query and work with Tabular Data**Potential Elements of the Performance:**

- Perform queries using attribute data
- Learn SQL query methods on attribute data
- Perform table joins and relates in ArcMap

- Perform locational queries

4. Geoprocessing

Potential Elements of the Performance:

- Perform geoprocessing tasks within ArcGIS
- Use problem solving to determine efficient methods of geoprocessing
- Use ArcToolbox as means to perform geoprocessing

5. Cartography

Potential Elements of the Performance:

- Apply cartographic design through map creation
- Apply appropriate space, colour and balance to maps
- Understand how to use proper symbology
- Apply labeling and annotation

6. Joining Data

Potential Elements of the Performance:

- Perform spatial and attribute joins to GIS data
- Understand relationship cardinality

7. Editing Data

Potential Elements of the Performance:

- Perform data creation
- Edit existing spatial data using snapping functionality
- Edit and create attribute data

8. Raster Data

Potential Elements of the Performance:

- Understand basic raster principles
- Work with raster data to solve problems
- Perform site selection analyses

III. TOPICS:

1. ArcGIS – ArcMap, ArcCatalog and Toolbox

- ArcCatalog - creating a Geodatabase, GIS file management
 - ArcMap – data editing, digitizing, topology and map production
 - ArcToolbox – data conversion, projections and spatial analysis
 - Coordinate systems and projections
2. Coordinate Systems
 - Datums and Spheroids
 - Projecting on the fly
 - Projecting Data
 - Defining Projections
 - Troubleshooting Coordinate System Errors
 3. Tabular Data
 - Types and structures of tables in ArcGIS
 - Creation and modification of tables
 - Editing fields and calculating new values in tables
 - Querying, calculating statistics, creating summaries
 - Creating joins and relationships between tables
 4. Geoprocessing
 - Various tools such as clip, erase, buffer, union, intersect
 5. Cartography
 - Symbology
 - Cartographic Principles
 - Labelling and Annotation
 - Colour, balance and space
 6. Joining Data
 - Spatial joins
 - Distance and inside joins
 - How Coordinate systems affect spatial joins
 7. Editing Data
 - Snapping
 - Vertices
 - Tolerance Values
 - Stream and point mode digitizing
 8. Raster Data
 - Raster format
 - Advantages and disadvantages
 - Raster attribute tables

- Raster calculator
- Processing rasters

IV. REQUIRED RESOURCES/TEXTS/MATERIALS:

Price, M. 2015. Mastering ARCGIS, Seventh Edition. McGraw-Hill Education.

V. EVALUATION PROCESS/GRADING SYSTEM:

Assignments	50%
Midterm Test	25%
Final Test	<u>25%</u>
Total	100%

Note: Students must achieve an average mark of at least 50% on the Test components AND achieve at least 50% on all of the assignments in order to pass the course.

Note: All assignments are due at the beginning of class on the scheduled due date, or may be subject to a 10% penalty. Each subsequent day that the assignment is not handed in by 9:30am is an additional 10% deduction.

The following semester grades will be assigned to students:

<u>Grade</u>	<u>Definition</u>	<u>Grade Point Equivalent</u>
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.

If a faculty member determines that a student is at risk of not being academically successful, the faculty member may confidentially provide that student's name to Student Services in an effort to help with the student's success. Students wishing to restrict the sharing of such information should make their wishes known to the coordinator or faculty member.

VI. 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.

Course Outline:

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.

VII. COURSE OUTLINE ADDENDUM:

The provisions contained in the addendum located in D2L and on the portal form part of this course outline.