SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY

SAULT STE. MARIE, ONTARIO

COURSE OUTLINE

COURSE TITLE: Introduction to ArcGIS

CODE NO. :   GIS426   **SEMESTER:**   13F

PROGRAM: Geographic Information Systems Applications Specialist

AUTHOR: Heath Bishop

DATE: May, 2013   **PREVIOUS OUTLINE DATED:**   May, 2012

APPROVED:

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                                   DEAN   **DATE**

TOTAL CREDITS: 4

PREREQUISITE(S):   None

HOURS/WEEK: 5

I.   COURSE DESCRIPTION:

GIS software and applications develop rapidly. Industry standard software
(ArcGIS 10.1) will be reviewed with attention given to the ever-changing GIS
environment. Specifically, the following topics will be covered: the ArcGIS
environment, geoprocessing, presenting data, manipulating data, editing and
creating data, querying data, rasters 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
      - Work with Coordinate Systems
      - Working with spatial joins

2.   Coordinate Systems

      Potential Elements of the Performance:
      - Understand the importance of locational awareness
      - Learn how to define and project coordinate systems properly
      - Troubleshoot coordinate system errors

3.   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 an aid in 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:
   - Spatially join GIS data
   - Understand cardinality

7. Editing Data

   Potential Elements of the Performance:
   - Perform data creation
   - Dedit existing spatial data
   - 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
   - Know 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
   - Use 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
   - Coordinate systems and joining data

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. 2013. Mastering ARCGIS, Sixth Edition. McGraw-Hill.

V. EVALUATION PROCESS/GRADING SYSTEM:

Quizzes	10%
Assignments	50%
Midterm Test	20%
Final Test	20%
Total	100%

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

Note: All assignments are due at the beginning of class on the scheduled due date, or will be subject to a 10% penalty. Each subsequent day that the assignment is not handed in by 8:30am is an additional 10% deduction.

The following semester grades will be assigned to students:

Grade	Definition	Grade Point Equivalent
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.

VI.   SPECIAL NOTES:

<u>Attendance:</u>
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.

<u>Course Outline:</u>
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.

VI.   COURSE OUTLINE ADDENDUM:

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