SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY

SAULT STE. MARIE, ONTARIO

Sault College

COURSE OUTLINE

COURSE TITLE: Advanced Analysis in GIS

CODE NO. : GIS417   **SEMESTER:** 09F

PROGRAM: Geographic Information Systems Applications Specialist

AUTHOR: Heath Bishop

DATE: August 2009   **PREVIOUS OUTLINE DATED:** June 2008

APPROVED:

"B. Punch"

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               CHAIR   **DATE**

TOTAL CREDITS: 4

PREREQUISITE(S): None

HOURS/WEEK: 4

I. COURSE DESCRIPTION:

GIS software and applications develop rapidly. The most recent software (ArcGIS 9.3) will be reviewed with attention given to the changed GIS environment. Specifically, the following topics will be covered: the ArcGIS environment, Geodatabases, presenting data, manipulating data, editing and creating data, querying data and geocoding.

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

2. Develop GIS applications using a Geodatabase

    Potential Elements of the Performance:
    - Describe and design a Geodatabase
    - Construct and edit a Geodatabase using ArcCatalog
    - Explore the relational database behind a Geodatabase
    - Understand the geometry inherent in a Geodatabase
    - Import and export other GIS formats to a Geodatabase

3. Create and Edit Spatial Data

    Potential Elements of the Performance:
    - Import and digitize data using on-screen digitizing
    - Learn fundamental aspects of manipulating and creating geographic data
    - Perform advanced editing of spatial data

4.   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

5.   Geocoding / Address Matching

Potential Elements of the Performance:
- Describe and perform Geocoding and Address Matching analyses
- Perform database editing to prepare data for geocoding

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.   Geodatabases

- Geodatabase theory
- Designing a Geodatabase
- Geodatabase geometry and topology
- Relational databases and geodatabases
- Coverage, shapefile and projection import and export

3.   Spatial Data Editing

- Basic editing process
- Use of snapping in the editing process
- Adding features to map layers
- Using sketching tools and context menus to precisely position features

4.   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

5. Geocoding / Address Matching

- Geocoding locations based on addresses and reference files

IV. REQUIRED RESOURCES/TEXTS/MATERIALS:

Price, M. 2009. Mastering ARCGIS, Fourth Edition. McGraw-Hill.

V. EVALUATION PROCESS/GRADING SYSTEM:

Exercises	50%
Midterm Test	25%
Final Test	25%
Total	100%

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

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:

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.

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 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.

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

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.

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*. 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.

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

Electronic 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. With the exception of issues related to accommodations of disability, the decision to approve or refuse the request is the responsibility of the faculty member. Recorded classroom instruction will be used only for personal use and will not be used for any other purpose. Recorded classroom instruction will be destroyed at the end of the course. To ensure this, the student is required to return all copies of recorded material to the faculty member by the last day of class in the semester. Where the use of an electronic device has been approved, the student agrees that materials recorded are for his/her use only, are not for distribution, and are the sole property of the College.

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.

Tuition Default:
Students who have defaulted on the payment of tuition (tuition has not been paid in full, payments were not deferred or payment plan not honoured) as of the first week of November will be removed from placement and clinical activities. 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.