SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY

SAULT STE. MARIE, ON.

COURSE OUTLINE

COURSE TITLE: GEOGRAPHICAL INFORMATION SYSTEMS

COURSE CODE: CIV307

PROGRAM: CIVIL ENGINEERING TECHNOLOGY

SEMESTER: VI

AUTHOR: D. ELLIOTT

DATE: JAN. 1997   **PREVIOUS DATE:** JAN 1996

APPROVED: _____   **DATE:** _JANUARY 6, 1997_
      (DEAN)

TOTAL HOURS PER WEEK: 4

PREREQUISITES: CAD120, SUR201

I.   COURSE DESCRIPTION

This course is designed to provide the student with an understanding of Geographical Information Systems (GIS) and related technologies. The topics will deal with the theory, application and maintenance of a GIS, data collection, input and management.

II.   LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE
(Generic skills learning outcomes placement on the course outline will be determined and communicated at a later date.)

A.   Learning Outcomes

1.   Demonstrate a basic knowledge of Geographical Information Systems.

2.   Demonstrate the ability to search and query a GIS for a variety of applications.

3.   Produce charts, graphs and presentation maps using a desktop GIS mapping system.

4.   Describe spatial referencing systems.

5.   Demonstrate a basic understanding of data input, output and data management methods

6.   Perform data collection using global positioning system (GPS) equipment and total station survey equipment for input into a GIS.

B.   Learning Outcomes and Elements of the Performance

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

1.   Demonstrate a basic knowledge of Geographical Information Systems.

      Elements of the Performance:
      - Define a GIS
      - Discuss applications to specific fields of endeavour
      - Describe the various components of a GIS

2.   Demonstrate an ability to search and query a GIS for a variety of applications.

      Elements of the Performance:
      - Use the ArcView software interface for moving around and displaying spatial information
      - Apply fundamental file management techniques for storing and retrieving GIS files
      - Demonstrate an ability to relate attribute information to spatial information
      - Define and describe the components of topology
      - Search and query a GIS database for a variety of applications
      - Perform spatial analysis for a small GIS project

3.   Produce charts, graphs and presentation maps using a desktop GIS mapping system.

      Elements of the Performance:
      - Prepare charts and graphs for presentation
      - Prepare presentation plans including maps, charts, tables, graphs and other appropriate map information
      - Prepare a presentation layout for a small GIS project

4.   Describe spatial referencing systems.

      Elements of the Performance:
      - Define projection systems
      - Demonstrate an understanding of the Universal Transverse Mercator projection
      - Describe vector and raster spatial referencing techniques

5.   Demonstrate a basic understanding of data input, output and data management methods

Elements of the Performance:
- Demonstrate spatial and attribute data input
- Digitize spatial information
- Describe fundamental data security, integrity and updating issues

6.   Perform data collection for input using global positioning system (GPS)
      equipment and total station survey equipment for input into a GIS.

      Elements of the Performance:
      - Describe GPS system and its relationship with GIS technology
      - Perform data pickup in the field using GPS units in static, dynamic
        modes
      - Perform differential GPS for input into a GIS
      - Perform topographical survey using total station survey equipment for
        input into GIS

III.   TOPICS

Note: Topics inherently overlap and are not necessarily developed as isolated
units or in the order presented.

1.   Introduction and GIS Fundamentals
2.   GIS Software
3.   Presentation of Charts, Tables, Graphs and Layouts
4.   Spatial Referencing
5.   Data Input, Output and Management

IV.   REQUIRED RESOURCES/TEXTS/MATERIALS

Required Text   Handouts will be provided by the instructor

                     Copies of appropriate software documentation can be
                     signed out from the instructor

V.   METHOD OF EVALUATION (GRADING)

Students will be assigned a final grade based on successful completion of
tests, assignments, projects and attendance, weighted as follows:

Assignments and projects (including fieldwork)	40%
Midterm Test	30%
Final Test	30%
TOTAL	**100%**

The course and curriculum are designed and limited to <u>time based competency</u>. Late assignments will receive a C (60) grade maximum. Assignments more than seven days overdue will receive a grade of zero.

A final letter grade will be assigned as follows:

A+	90-100%
A	80-89%
B	70-79%
C	55-69%
R	Repeat
X	A temporary grade limited to situations with extenuating circumstances, giving a student additional time to complete course requirements
U	Unsatisfactory　　(mid-term grade only)
S	Satisfactory　　(mid-term grade only)

If at the end of the semester the overall mark is below 55%, then it will be up to the instructor whether or not a rewrite will be granted. The criteria employed for arriving at that decision is class and field attendance, class participation and overall grade which must be at least 45%.

In the case a rewrite is granted, it will be permitted only once, it will cover the entire course outline and the overall maximum obtainable grade for the course will be limited to 60%.

VI.   SPECIAL NOTES

1.   Students with special needs are encouraged to discuss required accommodations in confidence with the instructor, or contact the Special Needs Office.

2.   The instructor reserves the right to modify the course and course outline as deemed necessary to meet the needs of the students.

3.   It is the responsibility of the student to retain all course outlines for possible future use in gaining advanced standing at other post-secondary institutions.

VII. PRIOR LEARNING ASSESSMENT:

Students who wish to apply for advanced credit in the course should consult with the instructor and/or the Prior Learning Assessment Office. Credit for prior learning will be given upon successful completion of the requirements of the Prior Learning Assessment (PLA) as defined in the Course Analysis Form provided for this course.