

**SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY**

**SAULT STE. MARIE, ONTARIO**



**SAULT  
COLLEGE**

**COURSE OUTLINE**

<b>COURSE TITLE:</b>	Web GIS		
<b>CODE NO. :</b>	GIS416	<b>SEMESTER:</b>	14W
<b>PROGRAM:</b>	GIS		
<b>AUTHOR:</b>	Dan Kachur		
<b>DATE:</b>	Jan 2014	<b>PREVIOUS OUTLINE DATED:</b>	Jan 2013
<b>APPROVED:</b>		"Colin Kirkwood"	Jan 3/14
		_____	_____
		<b>DEAN</b>	<b>DATE</b>
<b>TOTAL CREDITS:</b>	4		
<b>PREREQUISITE(S):</b>	None		
<b>HOURS/WEEK:</b>	3		

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**I. COURSE DESCRIPTION:**

The course introduces students to Web GIS technologies. Students will acquire skills in Web architecture and Web application structure required for the delivery of online GIS mapping solutions. Participants will develop hands-on webpages / websites in conjunction with standard website creation languages including HTML, CSS, and JavaScript. The result will be the online presence of interactive custom online Web GIS maps.

Students will proceed to the use of ESRI's ArcGIS Online software as an enhanced platform for creating and sharing GIS maps, apps, and data.

Open source and additional commercial map servers will also be introduced and implemented as learning tools.

A regional-based geographic Web GIS project will be assigned during the course to allow students to gain practical hands-on learning.

The course is organized around lectures, lab activities, case study analysis, testing evaluation and a course project

**II. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE:**

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

**1. Demonstrate knowledge of Web GIS Terminology****Potential Elements of the Performance:**

- Identify and explain components of Web GIS
- Contrast the role of GIS Server, Web Server and Database Server
- Diagram and explain GIS / Web Server Architecture
- Explain the Cloud Computing process in relation to Web GIS
- Define and explain the structure of Databases including SQL Server allowing for the storage, access and editing of GIS data
- Login and configure a live Web Server

**2. Demonstrate knowledge of Webpage Programming**Potential Elements of the Performance:

- Identify common Web Editors used by Industry professionals for Webpage design
- Contrast HTML, PHP, CSS and JavaScript code
- Create dynamic webpages using HTML and GUI
- Apply text, graphics, hyperlinks, forms, videos and special features into a web page
- Implement CSS and JavaScript into webpages for GIS
- Utilize 'iframes' in preparation for Web Map deployment
- FTP web pages to live websites
- Work with templates as an alternative solution to creating a foundation for web-based GIS maps

**3. Create Web Maps using Google Maps, Google Earth and Bing**Potential Elements of the Performance:

- Contrast DD, DD.MM, DD.MM.SS, UTM, NAD83, WGS84,
- Create interactive customized web-maps using Google and Bing
- Import tables containing latitude, longitude and key values into Google and Bing
- Display custom Maps in iframes via imported database tables
- Enhance webpages using customized scripting
- Import and Export .kml and .gpx formats
- Publish shareable custom maps to the Web

**4. Create Web GIS Maps using ArcGIS Online**Potential Elements of the Performance:

- Identify roles and features of the ArcGIS system
- Study the available public ArcGIS map collection
- Explore topographic, imagery, transportation and terrain base maps
- Create operation layers on top of the default base maps
- Create a feature service that allows for enterprise data editing
- Add layers from the web including .kml, geoRSS, and .csv
- Integrate ArcGIS Desktop with ArcGIS Server
- Enable and disable editing on a feature service

- Geocode points of interest in tabular form for import
- Create and manage address locators
- Design a map for image caching
- Utilize and implement tiled and feature maps
- Build a base map
- Publish finished products to the web using ArcGIS Server

### 5. **Create Web GIS Maps using Open-Source Applications**

#### Potential Elements of the Performance:

- Identify alternative solutions to Web GIS using freeware and open source applications
- Install your personal freeware solution
- Create Web GIS maps using 3<sup>rd</sup> party applications

### 6. **Custom Web GIS Work Project**

#### Potential Elements of the Performance:

- Identify a topic of interest to develop a customized Web GIS mapping solution
- Plan and document the project before implementation
- Design, develop, deploy and implement an Interactive Mapping System
- Present your mapping project in both online and paper copy

## III. **TOPICS:**

### **SPECIFIC TOPICS**

- Become proficient with Web GIS terminology
- Develop webpages for Web GIS mapping
- Create web maps using Google and Bing
- Create web maps using ArcGIS Server
- Create web maps using Open Source Solutions
- Design and develop a customized Web GIS mapping solution

#### IV. REQUIRED RESOURCES / TEXTS / MATERIALS

Labs: All labs and assignments for this course will be posted on LMS

Hand-outs: Reference hand-outs will be distributed accordingly in class

#### V. EVALUATION PROCESS/GRADING SYSTEM:

Tests (2 Tests) 20% each	40%
Assignments and Labs	40%
Course Project	20%

Some minor modifications to the above percentages may be necessary. The professor reserves the right to adjust the mark based upon leadership, creativity and whether there is an improving trend. Students must have passing grades in the tests/quizzes and assignments portion to pass the entire course.

Students must complete and pass the tests and assignment portion of the course in order to pass the entire course.

All Assignments must be completed satisfactorily to complete the course. Late hand in penalties will be 5% per day. Assignments will not be accepted past one week late unless there are extenuating and legitimate circumstances.

The professor reserves the right to adjust the number of tests, practical tests and quizzes based on unforeseen circumstances. The students will be given sufficient notice to any changes and the reasons thereof.

A student who is absent for 3 or more times without any valid reason or effort to resolve the problem will result in action taken.

The following semester grades will be assigned to students:

<b>Grade</b>	<b><u>Definition</u></b>	<b><u>Grade Point Equivalent</u></b>
A+	90 - 100%	4.00
A	80 – 89.9%	3.00
B	70 – 79.9%	2.00
C	60 – 69.9%	1.00
D	50 – 59.9%	1.00
F (Fail)	below 50%	0.00

**Web GIS**  
**Course Name****GIS416**  
**Course Code**

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:**Attendance:

Absenteeism will affect a student's ability to succeed in this course. Absences due to medical or other unavoidable circumstances should be discussed with the professor. Students are required to be in class on time and attendance will be taken within the first five minutes of class. A missed class will result in a penalty in your marks unless you have discussed your absence with the professor as described above. The penalty depends on course hours and will be applied as follows:

<b>Course Hours</b>	<b>Deduction</b>
5 hrs/week (75 hrs)	1% / hr
4 hrs/week (60 hrs)	1.5% /hr
3 hrs/week (45 hrs)	2% /hr
2 hrs/week (30 hrs)	3%/hr

## **VII COURSE OUTLINE ADDENDUM**

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