

SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY

SAULT STE. MARIE, ONTARIO



**SAULT
COLLEGE**

COURSE OUTLINE

COURSE TITLE:	Web GIS		
CODE NO. :	GIS416	SEMESTER:	17W
PROGRAM:	GIS		
AUTHOR:	Dan Kachur		
DATE:	Jan 2017	PREVIOUS OUTLINE DATED:	Jan 2016
APPROVED:		"Corey Meunier"	Jan 2017
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		CHAIR	DATE
TOTAL CREDITS:	4		
PREREQUISITE(S):	None		
HOURS/WEEK:	3		

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I. COURSE DESCRIPTION:

The course introduces students to Web GIS technologies. Students will acquire skills using Web-Based GIS software for the creation of interactive online and mobile GIS mapping solutions.

Participants will create online GIS maps utilizing AppBuilders and HTML, CSS, and JavaScript code. The result will be the presence of interactive custom Web GIS maps for PC, tablet and mobile users.

ESRI's ArcGIS Online software will be the platform of choice when creating and sharing GIS maps, apps, and data.

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

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 to a Web GIS Server

2. Demonstrate knowledge of Webpage / Website 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 ArcGIS Online

Potential Elements of the Performance:

- Create an ACRGIS online account
- Identify roles and features of the ArcGIS online system
- Explore topographic, imagery, transportation and terrain base maps
- Create layer symbols
- Create layers on top of the default base maps
- Create features in ArcGIS Desktop then import to ArcGIS Server
- Add layers from the web including .kml, geoRSS, gpx and .csv
- Enable and disable editing on a feature service
- Geocode points of interest in tabular form for import
- Create and manage address locators
- Publish shareable custom maps to ArcGIS Online
- Design maps for iframe layout to an independent website
- FTP your webpage to the Internet
- Publish finished products to the web using ArcGIS Server and custom websites

4. Customize / Enhance Web Maps using ArcGIS Online**Potential Elements of the Performance:**

- Explore topographic, imagery, transportation and terrain base maps
- Change layer symbols
- Change base maps
- Search and utilize ArcGIS online resources
- Configure layer pop-up windows
- Add images and charts to pop-up windows
- Examine and apply .csv files for geocoding map locations
- Edit data in the map viewer
- Create layers on top of the default base maps
- Add a layer by 'Search'
- Build an enhanced map legend

5. Utilize Map Services and Time Animation**Potential Elements of the Performance:**

- Connect to your GIS Server
- Author your map document
- Enable time on your map layers
- Publish your map as a service
- Explore your services using directory services
- Add a map service to a web map and configure time
- Build a time animation web map

6. Create Read-Write web-editing Online Maps**Potential Elements of the Performance:**

- Explore VGI and web editing
- Enable feature access
- Publish feature services
- Define editable fields
- Save edits to the server database
- Define feature templates
- Create a web app to collect public comments using VGI

7. Create Cross-Platform Apps using AppBuilder**Potential Elements of the Performance:**

- Create web apps that generate HTML 5 and JavaScript code
- Apply themes, widgets and attributes to your web app
- Modify fields, links and locations
- Create pop-up windows
- Deploy your app

8. Create Mobile GIS Apps**Potential Elements of the Performance:**

- Explore Mobile Terminology for Smartphones
- Contrast different mobile browser types
- Contrast Browser-based apps vs. JavaScript API apps
- Explain the hybrid-based approach to mobile apps
- Use mobile templates
- Deploy a web map for mobile devices

9. Create Story Maps using ArcGIS Online**Potential Elements of the Performance:**

- Identify and explore the various Story Map themes
- Apply Points, Polylines and Polygons to a selected Story Map theme
- Configure pop-ups
- Utilize URLs
- Apply charting
- Implement Hyperlinks
- Link Photos
- Add Video (i.e. YouTube Videos) or video of your choice
- Save and Share the Story Map

10. Web-GIS Project

Potential Elements of the Performance:

- Identify a topic of interest to develop a customized Web GIS mapping solution and report
- Plan and document the project before implementation
- Design, develop, deploy and implement an Interactive Mapping System that includes:
 - Data Collected (2 or more Layers Preferred)
 - Points, Polylines and / or Polygons
 - Implementation of: URLs, pop-ups, videos, images and hyperlinks
 - Creation of Web GIS Maps
 - Creation of Story Map to present the theme and Web GIS maps
 - Present your mapping project in both online and paper copy

III. TOPICS:

SPECIFIC TOPICS

- Web GIS terminology
- Webpages for Web GIS mapping
- ArcGIS Online
- Maps Services and Time Animation
- AppBuilder for Cross-Platform technology
- Mobile web map apps
- Editable online GIS maps
- Story Maps
- Web GIS project

IV. REQUIRED RESOURCES / TEXTS / MATERIALS

Textbook: Getting To Know Web GIS
Author: Pinde Fu
ESRI Press: ISBN: 9781589483842

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

V. EVALUATION PROCESS/GRADING SYSTEM:

Test 30%	30%
Assignments and Labs	45%
Course Project	25%

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:

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

Web GIS
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F (Fail)	below 50%	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:**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:

Course Hours	Deduction
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

1. Course Outline Amendments:
The faculty member reserves the right to change the information contained in this course outline depending on the needs of the learner and the availability of resources.
2. 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.
3. 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 Key Dates Calendar 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. Student Services can provide information regarding the Prior Learning Assessment and Recognition policy or it can be viewed on the student portal.

Substitute course information is available in the Registrar's office.
4. 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 announcements, news, academic calendar of events, class cancellations, your learning management system (LMS), and much more is available. Go to <https://my.saultcollege.ca>.
5. Communication:
The College considers **Desire2Learn (D2L)** 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 this Learning Management System (LMS) communication tool.

6. Accessibility 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 the Accessibility Services office. Call Ext. 2703 or email studentsupport@saultcollege.ca so that support services can be arranged for you.
7. Audio and Video Recording 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. Students with disabilities who require audio or visual recording devices in the classroom as an accommodation will receive approval from their counsellor once the Audio and Video Recording Devices in the Classroom Policy has been reviewed by the student. Recorded classroom instruction will be used only for individual academic use and will not be used for any other purpose. Recordings may only be used for individual study of materials presented during class and may not be published or distributed. Intentional misuse of audio and video recordings or intentional misrepresentation when requesting the use of a device for recording shall constitute a violation of this policy and laws protecting intellectual property.
8. Academic Dishonesty:
Students should refer to the definition of “academic dishonesty” in the *Student Code of Conduct*. Students who engage in academic dishonesty will be issued a sanction under the Student Code of Conduct which could lead to and include expulsion from the course/program. In order to protect students from inadvertent plagiarism, to protect the copyright of the material referenced, and to credit the author of the material, students must use a documentation format for referencing source material.
9. Tuition Default:
Students who have defaulted on the payment of tuition) as of the first week of November (fall semester courses), first week of March (winter semester courses) or first week of June (summer semester courses) will be removed from placement and clinical activities due to liability issues. 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.