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Course Code: Title	GIS416: WEB GIS
Program Number: Name	4018: GIS-APPLICATION SPEC
Department:	GEOGRAPHIC INFORMATION SYSTEMS
Semester/Term:	18W
Course Description:	The course introduces students to Web GIS technologies. Students will acquire skills using Web-Based GIS tools 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. 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.
Total Credits:	4
Hours/Week:	3
Total Hours:	36
Vocational Learning Outcomes (VLO's): **Please refer to program web page for a complete listing of program outcomes where applicable.**	**4018 - GIS-APPLICATION SPEC** #1. Understand the general concepts of spatial information and the current methodologies used to input, store, manipulate, and retrieve this type of data in a computer based environment; #2. Understand the typical data structures, algorithms, and computational problems that are encountered in various GIS technologies; #3. Be aware of the variety of sources of spatial data, such as surveying and remote sensing, that feed into a GIS, and the methods by which these data are realized in a GIS system; #4. Understand the ways in which GIS technologies can be applied within specific disciplines (see assumption above), and the advantages, changes in method, developmental problems, and restructuring that may result from the adoption of these technologies; #5. Be capable of designing and executing, in a progressive manner, algorithms and programs to handle spatial data and associated hardware devices in a programmatic environment of a GIS; #6. Be aware of the issues surrounding the communication of data extracted from a GIS to a variety of potential end users;

Essential Employability Skills (EES):

#1. Communicate clearly, concisely and correctly in the written, spoken, and visual form that fulfills the purpose and meets the needs of the audience.
#2. Respond to written, spoken, or visual messages in a manner that ensures effective communication.
#4. Apply a systematic approach to solve problems.
#5. Use a variety of thinking skills to anticipate and solve problems.
#6. Locate, select, organize, and document information using appropriate technology and information systems.
#7. Analyze, evaluate, and apply relevant information from a variety of sources.
#10. Manage the use of time and other resources to complete projects.
#11. Take responsibility for ones own actions, decisions, and consequences.

Course Evaluation:

Passing Grade: 50%, D

Other Course Evaluation & Assessment Requirements:

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.

Evaluation Process and Grading System:

Evaluation Type	Evaluation Weight
Assignments	45%
Course Project	25%
Tests	30%

Course Outcomes and Learning Objectives:

Course Outcome 1.

1. Demonstrate knowledge of Web GIS Terminology.

Learning Objectives 1.

1.1 Identify and explain components of Web GIS.
1.2 Contrast the role of GIS Server, Web Server and Database Server.
1.3 Diagram and explain GIS / Web Server Architecture.
1.4 Explain the Cloud Computing process in relation to Web GIS.
1.5 Define and explain the structure of Databases including SQL Server allowing for the storage, access and editing of GIS data.
1.6 Login to a Web GIS Server.

Course Outcome 2.

9. Create Story Maps using ArcGIS Online.

Learning Objectives 2.

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

Course Outcome 3.

10. Create and manage a Web GIS project.

Learning Objectives 3.

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

Course Outcome 4.

2. Demonstrate knowledge of Webpage / Website Programming.

Learning Objectives 4.

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

Course Outcome 5.

3. Create Web Maps using ArcGIS Online.

Learning Objectives 5.

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

Course Outcome 6.

4. Customize / Enhance Web Maps using ArcGIS Online.

Learning Objectives 6.

4.1 Explore topographic, imagery, transportation and terrain base maps.
4.2 Change layer symbols.
4.3 Change base maps.
4.4 Search and utilize ArcGIS online resources.
4.5 Configure layer pop-up windows.
4.6 Add images and charts to pop-up windows.
4.7 Examine and apply .csv files for geocoding map locations.
4.8 Edit data in the map viewer.
4.9 Create layers on top of the default base maps.
4.10 Add a layer by â€ Searchâ€™.
4.11 Build an enhanced map legend.

Course Outcome 7.

5. Utilize Map Services and Time Animation.

Learning Objectives 7.

5.1 Connect to your GIS Server.
5.2 Author your map document.
5.3 Enable time on your map layers.
5.4 Publish your map as a service.
5.5 Explore your services using directory services.
5.6 Add a map service to a web map and configure time.
5.7 Build a time animation web map.

Course Outcome 8.

6. Create Read-Write web-editing Online Maps.

	Learning Objectives 8. 6.1 Explore VGI and web editing. 6.2 Enable feature access. 6.3 Publish feature services. 6.4 Define editable fields. 6.5 Save edits to the server database. 6.6 Define feature templates. 6.7 Create a web app to collect public comments using VGI. **Course Outcome 9.** 7. Create Cross-Platform Apps using AppBuilder. **Learning Objectives 9.** 7.1 Create web apps that generate HTML 5 and JavaScript code. 7.2 Apply themes, widgets and attributes to your web app. 7.3 Modify fields, links and locations. 7.4 Create pop-up windows. 7.5 Deploy your app. **Course Outcome 10.** 8. Create Mobile GIS Apps. **Learning Objectives 10.** 8.1 Explore Mobile Terminology for Smartphones. 8.2 Contrast different mobile browser types. 8.3 Contrast Browser-based apps vs. JavaScript API apps. 8.4 Explain the hybrid-based approach to mobile apps. 8.5 Use mobile templates. 8.6 Deploy a web map for mobile devices.
Date:	Friday, January 19, 2018
	Please refer to the course outline addendum on the Learning Management System for further information.