



GIS-586: GIS FOR WEB APPLICATIONS (FORMERLY GEOG-586)

Effective Term

Fall 2025

BOT Approval Date

12/15/2022

Discipline

GIS - Geospatial Information Science

Course Number

586

Course Title

GIS for Web Applications (formerly GEOG-586)

Short Title

GIS Web Applications

Credit Status (CB 04)

D - Credit - Degree applicable

Units**Lecture Units**

3.00

Total Units

3.00

Hours**Lecture Contact Hours**

48-54

Out of Class Hours Lecture

96-108

Total Contact Hours

48 - 54

Total Out of Class Hours

96 - 108

Total Student Learning Hours

144 - 162

Distance Education

Yes

Distance Education**Distance Education Type**

Both Fully Online and Hybrid Online

Fully Online Delivery Requirements:

- a. Students must be notified via the college schedule of classes and the syllabus for the class if proctored tests are required for this course
- b. Any planned face-to-face meetings, such as an orientation or study session, must be optional

c. The MSJC curriculum committee requires the use of accessible, asynchronous discussion as a component of every fully online course

Are you using publisher content?

No

Regular Substantive Interaction

Instructor-to-student, student-to-student, and student-to-content contact shall be distributed in a manner that will ensure regular substantive interaction (RSI) is maintained not only weekly but also for the duration of the course. Instructor interactions should be equivalent in time, quality and consistency to the engagement students would receive in a face-to-face course—for example, through announcements, discussion participation, personalized feedback, video messages, or other instructional communications. Instructors are expected to be responsive to student inquiries within a 24-72 hour time frame excluding holidays. RSI will be maintained through a variety of methods:

- Orientation - Students must be oriented to the online and face-to-face portions at the start of the course.
- Announcements - Announcements using the course management system must be posted at least weekly to keep students current on course events, due dates, materials, etc.
- Discussion Forums - Content-related discussion forums within the designated CMS will include appropriate instructor participation and will be initiated and maintained, with timely feedback provided. Instructors are required to monitor the discussions and related activities to provide guidance and direction. Open-ended discussion boards may be used to further learning and interaction.
- MSJC Communication – Instructor will use MSJC-administered communication tools (such as email or the designated CMS communication tools) to regularly communicate with and provide ease of access to students.
- Timely Feedback - Timely feedback on student work will be provided by the instructor, which may include comments and/or rubrics, within the Grades area of the designated CMS.
- Scheduled Meetings – Hybrid and synchronous courses will meet at regularly scheduled times.

ADA Compliance - All course interactions and content must be designed with accessibility in mind and meet ADA requirements.

Catalog Description

This course prepares students with the geographic concepts and skills necessary for designing and developing geospatial content for web applications, internet interfaces and web environments. Students learn web based concepts, internet fundamentals, web architecture and practices as they design and create geospatial data for online data analysis, interactive mapping, and map publishing via web applications. Students use real world challenges and problem solving solutions for interoperability, customizing and sharing web services. (formerly GEOG-586)

Requisites

Recommended Preparation

Recommended Preparation (note that students can enroll in the class even if they haven't take the recommended course)

GEOG-115.

Codes

TOP Code (CB 03)

2206.10* - *Geographic Information Systems

CIP Code

45.0702 - Geographic Information Science and Cartography.

Repeatability Code

No

Grading Option

Letter grade OR P/NP

Learning Objectives

Learning Objectives

Learning Objective

1. Critique the design of a web application in consideration of its purpose and intended users.
2. Organize data acquired in the field, from images or vector data, and attribute data to create, update and maintain a web application.

3. Demonstrate working knowledge of real-time GPS/GIS mapping system architecture and functionality, and its integration in online map services.
4. Diagram the necessary steps for developing a web site that provides interactive GIS applications as they related to historically under-represent and diverse populations.
5. Plan and develop geospatial tasks that are amenable to web applications.
6. Develop positioning technology in mobile end-user web applications.
7. Diagram the sequence of functions involved in producing georeferenced information on social media sites and other web applications.
8. Examine a web application, such as an online real estate site, and discuss how it acquires and integrates public information for nearly 100 million parcels, for instance.
9. Investigate the geophysical aspects of human distribution from a socio-cultural perspective, as it pertains to race, gender identity, sexual orientation, and cultural differences particularly as they are expressed and encountered in the development of Web applications.

Learning Outcome Information

Course Learning Outcomes

Learning Outcome
1. The student will formulate, synthesize, and interpret capabilities and limitations of various web applications, and propose alternatives. .
2. The student will independently adapt knowledge and experience in the creation of a web application that performs basic GIS analytical functions, including spatial measurement, data query and retrieval.
3. The student will appraise and critique web applications for potential interface with geospatial data and GIS software functionality.
4. The student will compare and contrast benefits and shortcomings of GIS server, enterprise, hosted and subscription cloud software applications.
5. The student will evaluate the significance of web applications for real-time sharing and exploring of information from anywhere.
6. The student will critique the design of a web application in consideration of its purpose and intended users.
7. The student will discuss and evaluate trends in geospatial technology and applications as they relate to the diversity and equitable representation of human populations.

Program Learning Outcomes

Learning Outcome
Integrate spatial thinking with applied technology to analyze physical and cultural patterns, and discuss trends and relationships.
Explore spatial relationships at different scales from local, regional to global.
Apply the scientific method to objective and subjective analysis of cultural and physical environments.
Appreciate different cultural and ethnic perspectives within the context of opportunities and challenges.
Explain the interrelationship between humans and the physical environment

Institutional Learning Outcomes

Communication: The student will effectively express and exchange ideas through listening, speaking, reading, writing, visual works, and other modes of interpersonal expression.

Critical Thinking: The student will analyze problems, gather and synthesize relevant information, evaluate ideas, information, and evaluate alternative points of view to create, innovate and implement effective solutions.

Information and Technology Literacy: The student will access, interpret, evaluate, and apply relevant information sources and digital media effectively, and in an ethical and legal manner.

Scientific Awareness: The student will apply the scientific method of inquiry to assess potential solutions for real-life challenges by employing science-based knowledge and methodologies in daily life.

Personal and Professional Responsibility

Civic

Content

Course Lecture Content

I. Get started with Web GIS

- A. Web GIS and the geospatial cloud
- B. New-generation Web GIS architecture and trends
 - 1. Considerations of diversity and equity of human population distribution
 - 2. Considerations of historically under-represented and under-served human populations
 - 3. GIS Web applications that focus attention on considerations of diversity and equity issues involved in the distribution of human populations
- C. Web GIS information model. Users, web layers, maps, and apps
- D. Geotagged images—an increasingly popular GIS data source

II. Hosted feature layers and storytelling with GIS

III. Feature layers. The most common type of operational layers

- A. Smart mapping, pop-ups, and ArcGIS Arcade
- B. ArcGIS Living Atlas of the World
- C. Storytelling using Web GIS and principles of user experience design
- D. Documenting a variety of human experiences, ethnic origins, race, religious, and other diverse conditions of geographic distributions of human populations

IV. ArcGIS Experience Builder and ArcGIS Web AppBuilder

- A. Basics of Web AppBuilder and Experience Builder
- B. Using the builders to create web apps
- C. Editions of Web AppBuilder and Experience Builder

V. Mobile GIS

- A. Mobile GIS. Concepts and advantages
- B. Feature layer edit settings, views, and feature templates
- C. Mobile app development strategies
- D. ArcGIS native apps for field and indoor operations
- E. VR, AR, and other popular types of apps and frontiers

VI. Tile layers and on-premises Web GIS

- A. The need for on-premises and hybrid Web GIS
- B. ArcGIS Enterprise components and deployment
- C. Raster tile, vector tile, map image layers, and publishing strategy
- D. Workflow to share web layers from ArcGIS Pro

VII. Spatiotemporal data and real-time GIS

- A. Spatiotemporal data, IoT, and the demand for real-time GIS basics
- B. Cloud, server, and client-side technologies for real-time GIS
- C. Animate time-series data

VIII. 3D web scenes

- A. Basics of 3D GIS
- B. Web scenes and web scene layers
- C. 3D technologies in VR, indoor GIS, and urban planning

IX. Spatial analysis and geoprocessing

- A. Spatial analysis, spatial data science, and ArcGIS web tools overview
- B. ArcGIS web tools for standard analysis
- C. ArcGIS web tools for big data analysis
- D. Custom web tools and geoprocessing services
- E. Access to ArcGIS web tools using ArcGIS, InsightsSM, and ArcGIS Notebooks
- F. Artificial intelligence in ArcGIS

X. Image service and online raster analysis

- A. Raster and imagery
 - B. Image service
 - C. Raster function and online analysis
 - D. Deep learning in image analysis
- XI. Web GIS programming with ArcGIS API for JavaScript
- A. Web GIS programming overview
 - B. JavaScript, HTML, and CSS
 - C. ArcGIS API for JavaScript
 - D. Develop apps using JavaScript API
- XII. Web Application Considerations of Diversity, Equity and Inclusion
- A. Programming Considerations of diverse population issues
 - B. Developing applications for Communicating and Working with LGBTQIA individuals and populations
 - C. Considerations of web applications to reflect Socio/Economic diversity of populations being served
 - D. Taking into considerations of unique applications to reflect ethnic, religious and racial individuals and community responses as developed in Web applications.

Methods of Instruction

Method

Discussion

Integration

Students participate with the instructor in discussions focusing on geospatial mashups, web map configuration and creating web map interactions.

DE Adaptations for MOI

Students participate with the instructor in discussions focusing on geospatial mashups, web map configuration and creating web map interactions. Discussions are organized asynchronously within the course management system and follow accessibility guidelines. Students receive feedback from the instructor in the asynchronous discussion sessions within 72 hours of the student posting their responses. Formal instructor feedback and evaluation takes place within the appropriate course management system application within 72 hours after the assignments are submitted.

Method

Homework

Integration

Homework assignments include practical applications, experimenting with the design, installation and technical issues encountered in GIS web applications such as exploring open source GIS web applications and building a customized web application.

DE Adaptations for MOI

Homework assignments include practical applications, experimenting with the design, installation and technical issues encountered in GIS web applications such as exploring open source GIS web applications and building a customized web application. Homework is submitted to the course management system in a variety of applications including discussions and gradebook assignments. Formal instructor feedback and evaluation takes place within the appropriate course management system application within 72 hours after the assignments are submitted.

Method

Lecture

Integration

Lecture presents GIS terms, concepts and methods related to building and customizing web mapping applications on various platforms, while exploring case studies from various industries.

DE Adaptations for MOI

Lecture presents GIS terms, concepts and methods related to building and customizing web mapping applications on various platforms, while exploring case studies from various industries. Lecture and demonstrations are presented asynchronously in the course management system. All presentations conform to Federal guidelines and accessibility standards.

Method

Projects

Integration

Students individually customize GIS data for publishing through a web application, author and deploy their web application with security measures, and present it to the class as a consultant presenting a deliverable to a client. Instructor assists students at various phases of their project, as set forth in their proposal.

DE Adaptations for MOI

Students individually customize GIS data for publishing through a web application, author and deploy their web application with security measures, and present it to the class as a consultant presenting a deliverable to a client. Instructor assists students at various phases of their project, as set forth in their proposal. Projects are presented through teleconferencing media, such as Confer Zoom(recorded) and submitted to a discussion forum in the course management system as accessible embedded video links. The instructor assists students at various phases of their project, as set forth in their proposal, to develop accessible teleconferencing media presentations and/or asynchronously presented projects in a discussion forum or other venue within the course management system.

Method

Activity

Integration

Evaluation of web programming focusing students' attention on the consideration of diversity and equity issues involved in the distribution of human population in the construction and development of web based programming. The instructor presents examples of programming specifically written to elucidate and evaluate a variety of socio-economic influences, ethnic and racial considerations, gender and sexual identity aspects, physical and mental characteristics, as well as LGBTQIA and other issues of diversity and equity that arising in geospatial information programming. The evaluations of web programming exercises are instructor-moderate and require individual students to not only investigate and critique the programming but to comment on other students' analysis and critiques.

DE Adaptations for MOI

Evaluation of web programming focusing students' attention on the consideration of diversity and equity issues involved in the distribution of human population in the construction and development of web based programming. The instructor presents examples of programming specifically written to elucidate and evaluate a variety of socio-economic influences, ethnic and racial considerations, gender and sexual identity aspects, physical and mental characteristics, as well as LGBTQIA and other issues of diversity and equity that arising in geospatial information programming. The evaluations of web programming exercises are instructor-moderate and require individual students to not only investigate and critique the programming but to comment on other students' analysis and critiques. Evaluations are presented within the course management system. Students respond to the evaluation scenarios in the online course management system. Student evaluations are completed using discussion forums. Evaluations are graded on a rubric which includes consideration of population demographics being evaluated, authenticity of issues being evaluated, and a programming evaluation summary. Within the graded assignments option, the instructor provides responses and constructive evaluation of the exercises within the course management system. Responses are shared with students usually within 72 hours of the completion of the role-playing simulation exercises.

Methods of Evaluation**Method**

Class Participation

Integration

Discussions focus on geospatial mashups, web map configuration and creating web map interactions and are assessed based on student ability to integrate geospatial concepts and terms from lecture and demonstrations. Participation is evaluated on rubrics

specific to the discussion but include, the quality and quantity of student participation, the student's understanding of the topic of discussion and the student's ability to incorporate knowledge presented in the class or in assignments related to the topic being discussed. Class activities require students to evaluate human diversity and equity concerns as they are reflected in GIS Web applications. These concerns include discussions of a plethora of human populations representing various aspects of human distribution from a socio-cultural perspective, particularly as they pertain to race, gender identity, sexual orientation, and cultural differences as they are expressed and encountered in the development of Web applications.

DE Adaptations for MOE

Discussions focus on geospatial mashups, web map configuration and creating web map interactions and are assessed based on student ability to integrate geospatial concepts and terms from lecture and demonstrations. Participation is evaluated on rubrics specific to the discussion but include, the quality and quantity of student participation, the student's understanding of the topic of discussion and the student's ability to incorporate knowledge presented in the class or in assignments related to the topic being discussed. Class activities require students to evaluate human diversity and equity concerns as they are reflected in GIS Web applications. These concerns include discussions of a plethora of human populations representing various aspects of human distribution from a socio-cultural perspective, particularly as they pertain to race, gender identity, sexual orientation, and cultural differences as they are expressed and encountered in the development of Web applications. Class participation is organized in asynchronous discussion forums within the course management system. Evaluation takes place in asynchronous discussion sessions or within the course management assignment grading system. Instructor feedback and evaluation takes place within 72 hours after the assignments are submitted.

Method

Exams/Tests

Integration

Tests use a variety of question formats to assess student comprehension of GIS terms, concepts and methods related to building and customizing web mapping applications on various platforms for mobile access, and problem-solving techniques from case studies, as presented in lecture, demonstrations, and practical applications. Individual rubrics are designed for each examination to measure the student's level of understanding of the materials presented in lecture or in a variety of homework and in class assignments.

DE Adaptations for MOE

Tests use a variety of question formats to assess student comprehension of GIS terms, concepts and methods related to building and customizing web mapping applications on various platforms for mobile access, and problem-solving techniques from case studies, as presented in lecture, demonstrations, and practical applications. Individual rubrics are designed for each examination to measure the student's level of understanding of the materials presented in lecture or in a variety of homework and in class assignments. Tests are administered asynchronously through the tests/examination/quizzes applications within the course management system. All exams/tests meet Federal accessibility guidelines and standard. Instructor feedback and evaluation takes place within 72 hours after the examinations are submitted.

Method

Homework

Integration

Homework incorporates practical applications involving the students' ability to install and resolve technical issues in GIS web applications, and their ability to build and customize a web application that meets specific criteria set forth in the assignment. The instructor evaluates homework using rubrics designed for specific criteria set forth in a variety of assignments. Each homework assignment is evaluated using a rubric designed to measure the student's level of understanding of the concepts, procedures, terminology and applications incorporated in the homework assignment.

DE Adaptations for MOE

Homework incorporates practical applications involving the students' ability to install and resolve technical issues in GIS web applications, and their ability to build and customize a web application that meets specific criteria set forth in the assignment. The instructor evaluates homework using rubrics designed for specific criteria set forth in a variety of assignments. Each homework assignment is evaluated using a rubric designed to measure the student's level of understanding of the concepts, procedures, terminology and applications incorporated in the homework assignment. Homework is submitted asynchronously within the course management system. The instructor may provide feedback to the class as a whole within asynchronous discussion sessions and/or to individual students using asynchronous feedback through the course management systems grade book applications. Instructor feedback and evaluation takes place within 72 hours after the homework assignments are submitted.



Method

Projects

Integration

Students develop projects which customize GIS data for publishing through a web application, author and deploy their web application with security measures. Projects are present to the class as a consultant presenting a deliverable to a client. Each student is graded following a rubric that provides guidance in preparation of the project and a final critique of the student's performance as a summary of criteria and objectives met as various levels of potential critical thinking.

DE Adaptations for MOE

Students develop projects which customize GIS data for publishing through a web application, author and deploy their web application with security measures. Projects are present to the class as a consultant presenting a deliverable to a client. Each student is graded following a rubric that provides guidance in preparation of the project and a final critique of the students performance as a summary of criteria and objectives met as various levels of potential critical thinking. Projects are present asynchronously to discussion forums in the course management system using a variety of presentations format, including PowerPoint, GIS Story Maps and other presentation software. Presentations are encouraged to follow Federal accessibility guidelines. The instructor provides asynchronous feedback and evaluation in group discussion sessions or within the course management system grade book. Instructor feedback and evaluation takes place within the appropriate course management software application within 72 hours after the project assignments are submitted.

Assignments

Assignment Type

Reading

In-class and/or outside of class

Outside of class

Formative or Summative

Formative

Assignment

On the Internet search for GIS web sites and applications, published web maps, resources and data. Summarize information from a minimum of five (5) websites.

How assignment will be adapted in online format

On the Internet search for GIS web sites and applications, published web maps, resources and data. Summarize information from a minimum of five (5) websites. The assignment is detailed within the course learning management system. Student submits the assignment within the learning management system for review, and evaluation by the instructor. Instructor feedback and evaluation takes place within the appropriate course management system application within 72 hours after the assignments are submitted.

Assignment Type

Writing

In-class and/or outside of class

Outside of class

Formative or Summative

Formative

Assignment

Design and create a web application that uses geospatial data or provides geocoding services and customize the data (i.e. create widgets for Search, Find, Print functionalities, Zoom, Pan, Query, etc.).

How assignment will be adapted in online format

Design and create a web application that uses geospatial data or provides geocoding services and customize the data (i.e. create widgets for Search, Find, Print functionalities, Zoom, Pan, Query, etc.). The assignment is submitted and evaluated within the course learning management system. Instructor provides asynchronous grading and feedback to student using the grading system within the course learning management system. Group evaluation may take place in asynchronous discussion within the course management system. Formal instructor feedback and evaluation takes place within the appropriate course management system application within 72 hours after the assignments are submitted.

Assignment Type

Writing

In-class and/or outside of class

In-class

Formative or Summative

Summative

Assignment

Design and demonstrate a web application in a presentation to the class. Provide at least one example and identify the platform, utility, maintenance practices, security and subscription provisions if applicable. You will be graded for substance in content, and visual display.

How assignment will be adapted in online format

Design and demonstrate a web application in a presentation to the class. Provide at least one example and identify the platform, utility, maintenance practices, security and subscription provisions if applicable. You will be graded for substance in content, and visual display. Assignments are submitted asynchronously in discussion sessions within the course management system. The instructor evaluates and grades the assignments using the discussion and gradebook modules within the course management system. Formal instructor feedback and evaluation takes place within the appropriate course management system application within 72 hours after the assignments are submitted.

Assignment Type

Reading

In-class and/or outside of class

In-class

Formative or Summative

Summative

Assignment

Gather information to help you customize a GIS web application related to a specific human geographic distribution problem or concern. Read to identify and develop what information will be needed; explore multiple factors to be analyzed; determine which data will be used and how; and, review steps for analysis and potential outcomes. Research a method, model or application you would like to explore to enhance the successful outcome of your web application.

How assignment will be adapted in online format

Gather information to help you customize a GIS web application related to a specific human geographic distribution problem or concern. Read to identify and develop what information will be needed; explore multiple factors to be analyzed; determine which data will be used and how; and, review steps for analysis and potential outcomes. Research a method, model or application you would like to explore to enhance the successful outcome of your web application. Assignment is presented, detailed, explained, and submitted asynchronously within the course management system. Formal instructor feedback and evaluation of the assignment takes place within the appropriate course management system application within 72 hours after the assignment is submitted.

Assignment Type

Writing

In-class and/or outside of class

In-class

Outside of class

Formative or Summative

Formative

Assignment

Evaluate an example of web programming that focuses attention on the consideration of diversity and equity issues involved in the distribution of human population in the construction and development of web based programming. Review examples of programming specifically written to elucidate and evaluate a variety of socio-economic influences, ethnic and racial considerations, gender and sexual identity aspects, physical and mental characteristics, as well as LGBTQIA and/or other issues of diversity and equity that arising in geospatial information programming. The evaluations of web programming exercises shall not only investigate and critique the programming but reflect the ability of the programming to address issues of diversity, equity and inclusion.

How assignment will be adapted in online format

Evaluate an example of web programming that focuses attention on the consideration of diversity and equity issues involved in the distribution of human population in the construction and development of web based programming. Review examples of programming specifically written to elucidate and evaluate a variety of socio-economic influences, ethnic and racial considerations, gender and sexual identity aspects, physical and mental characteristics, as well as LGBTQIA and/or other issues of diversity and equity that arising in geospatial information programming. The evaluations of web programming exercises shall not only investigate and critique the programming but reflect the ability of the programming to address issues of diversity, equity and inclusion. Evaluations are presented within the course management system. Students respond to the evaluation scenarios in the course management system. Student evaluations are completed using the assignment submission features of the CMS as well as discussion forums. Evaluations are graded on a rubric which includes consideration of population demographics being evaluated, authenticity of issues being evaluated, and a programming evaluation summary. Within the graded assignments option, and within 72 hours after the assignment is submitted, the instructor provides responses and constructive evaluation of the exercises in the appropriate course management system application. Non-graded responses are shared with students usually within 72 hours of the completion of web evaluation exercise.

Assignment Type

Other

In-class and/or outside of class

In-class

Outside of class

Formative or Summative

Summative

Assignment

Investigate the geophysical aspects of human distribution from a socio-cultural perspective, as it pertains to race, gender identity, sexual orientation, and cultural differences particularly as they are expressed and encountered in the development of Web applications. Use library, internet, interview and/or other investigation techniques to gain a perspective on how Web applications reflect GIS aspects of human diversity. Design a Web applications that evaluates some aspect of human distribution from a perspective of one or more human diversity aspects.

How assignment will be adapted in online format

Investigate the geophysical aspects of human distribution from a socio-cultural perspective, as it pertains to race, gender identity, sexual orientation, and cultural differences particularly as they are expressed and encountered in the development of Web applications. Use library, internet, interview and/or other investigation techniques to gain a perspective on how Web applications reflect GIS aspects of human diversity. Design a Web applications that evaluates some aspect of human distribution from a perspective of one or more human diversity aspects. Investigations and Web designs are presented for discussion and review by classmates in the Discussion forums of the course management system. The completed project is submitted in the assignment submission module within the course management system for review and evaluation by the instructor. Formal instructor feedback and evaluation takes place within the appropriate course management system application within 72 hours after the assignments are submitted.

Assignment Type

Other

In-class and/or outside of class

In-class

Outside of class

Formative or Summative

Formative

Assignment

Evaluate one of more GIS Web applications that focus attention on considerations of diversity and equity issues involved in the distribution of human populations. Include in the evaluation discussion examples of programing specifically written to elucidate and evaluate a variety of socio-economic influences, ethnic and racial considerations, gender and sexual identity aspects, physical and mental characteristics, as well as LGBTQIA and/or other issues of diversity and equity that arising in geospatial information programming.

How assignment will be adapted in online format

Evaluate one of more GIS Web applications that focus attention on considerations of diversity and equity issues involved in the distribution of human populations. Include in the evaluation discussion examples of programing specifically written to elucidate and evaluate a variety of socio-economic influences, ethnic and racial considerations, gender and sexual identity aspects, physical and mental characteristics, as well as LGBTQIA and/or other issues of diversity and equity that arising in geospatial information programming. Evaluations are presented asynchronously within the course management system. Students respond to the evaluation scenarios in the online course management system. Student evaluations are completed using discussion forums. Evaluations are graded on a rubric which includes consideration of population demographics being evaluated, authenticity of issues being evaluated, and a programming evaluation summary. Evaluations are submitted for grading within the course management system graded assignments option. The instructor provides responses and constructive evaluation of the exercises within the course management system. Responses are shared with students usually within 72 hours of the completion of the Web application exercises.

Course Materials**Textbooks**

Fu, Pinde (2020). Getting to Know Web GIS, 4th Edition ESRI Press. ISBN. 9781589485921, ISBN 9781589485938

Open Educational Resources

Charles W. Kann III. (2018). Programming for the Web: From Soup to Nuts: Implementing a complete GIS web page using HTML5, CSS, JavaScript, Node.js, MongoDB, and Open Layers
<https://www.oercommons.org/courses/programming-for-the-web-from-soup-to-nuts-implementing-a-complete-gis-web-page-using-html5-css-javascript-node-js-mongodb-and-open-layers>

Class Size Information**Class Size**

40

Class Size Category

A - Lecture/discussion 40

Diversity and Inclusion

Explain how diversity and inclusion(e.g., gender, culture/race, sexuality, etc.) is infused into the course.

Emphasis is placed on the development of Web applications that articulate how contributions to the discipline of Geospatial Science offer students opportunities to foster empathy, expose variant interpretations, and exhibit diverse societal concerns represented the geographic distribution of humans especially as encountered in business and government situations. The course develops web applications that present not only geophysical aspects of human geospatial distribution, but as well, the socio-cultural perspective as it pertains to race, gender identity, sexual orientation, and cultural differences. Students are expected to explore and develop GIS Web applications that considers cultural, economic, political, and gender-based positioning exploring geospatial aspects of human activities. Assignments are formatted to allow students to reflect on their own cultural frame of reference and to investigate

their personal perspectives of the communities to which they associate as well as communities that are perhaps historically unrepresented in GIS web applications.

Describe how assignments, instruction, evaluation, course content, and interactions are contextualized for diverse learners promoting an equitable course.

The course acknowledges the need to recognize the strengths of diverse learners. To better support a diverse range of learners, formative and summative learning strategies are employed to support course learning objectives and outcomes. The discussions, lectures and assignments are designed support diverse learners with a wide variety of personal experiences and to allow students to bring in their own experiences while examining how Web applications present diverse socio-cultural learning perspectives and how they can designed Web applications that reflect their own work and learning styles. Students are encouraged and expected to call on their own experiences to contextualize how GIS Web applications relate to their personal experiences and learning styles and to consider how their personal experience may differ from other students. Students explore how their own diverse learning styles and methods of inquiry contribute to the expression of GIS concepts in Web design. Students are encouraged to consider factors representing their personal educational positioning in developing assignments affecting Web representations of the geospatial distribution of human activities.

Interactions

Explain how the course will incorporate student-to-student interaction.

Student-to-student interactions take place in class discussions as well as in organized out of class discussion assignments. Students are encouraged to work together to solve geospatial problems related to specific situations that occur in both business and government entities. Students evaluate and navigate the ambiguity of a variety of different cultural, ethnic, racial, gender, sexual orientation and other factors contributing to a variety of situation presented in business and government applications. Class activities, lectures and assignments are environments in which the classroom community can bring in their own cultural experiences in addition to practicing the application of new concepts from diverse socio-cultural perspectives. Individuals have the opportunity to comment and create a student-to-student dialog in the small group and whole-class discussion activities.

Explain how the course will incorporate instructor-to-student interaction.

The instructor facilitates instructor to student interactions by encouraging and requiring students to reflect on course topics and articulate an understanding of the material to the instructor and other students. Instructor to student interactions take place not only in lecture but in facilitating discussion presentations as well. Lecture instruction is designed to include group as well as intensive instructor student one-on-one instruction in the use of the ArcGIS professional software. To better support a diverse range of learners, instructors are encouraged to incorporate formative and summative active learning strategies represented in a variety of in class and out of class assignments.

Explain how the course will incorporate student-to-content interaction.

Student-to-content interactions occurs through active learning activities strategies that promote students' active participation in knowledge construction processes. Student to content interaction is incorporated in the lecture and software application presentations and assignments as well as weekly formative homework and projects. Students are encourage to formulate an understanding of the material as it relates to their individual circumstances, gender, race, ethnic and/or socio-economic background. Students are introduced to content in the lecture portion of the class and interact with the content in many ways including researching relevant information, summarizing lecture presentations, taking short quizzes, participating in discussions, project development and semester examinations. Students must interact with the course content to produce Web applications using information discussed and developed in lecture. This output represents a variety of Web data applications and presentations all of which analysis of specific geospatially related questions; what resources are being explored; who (the diversity of populations) are impacted by the resources; where the resources are congregated and the historical data influencing the geospatial distributions.

Explain how the course will incorporate student-to-self interaction (metacognitive).

The goal is to support students in connecting their experiences with the terms and concepts presented in the course and to validate the student's life experience by seeing themselves in the material and assignment requirements particularly as it relates to careers in GIS applications in business and government. Student-to-self interactions takes place in both formative and summative assignments. Web applications are being used for many GIS topics which interact with a wide variety of human populations. Class activities, reading, lecture, discussions and student designed Web application projects encourage and allow students to explore various personal interpretations and understandings of their individual relationships to the the use of the Internet in geospatial organization related to their own diversity, socio-economic status, gender, ethic-racial background and other aspects of their own identity and history.