



GIS-585: GIS FOR CATASTROPHES (FORMERLY GEOG-585)

Effective Term

Fall 2026

BOT Approval Date

03/20/2025

Discipline

GIS - Geospatial Information Science

Course Number

585

Course Title

GIS for Catastrophes (formerly GEOG-585)

Short Title

GIS for Catastrophes

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 provides students with an introduction to the use of GIS in emergency management, natural hazard assessment and public safety. Students learn about GIS applications to various types of emergency response, natural hazards and homeland security scenarios for which GIS is commonly used for making quick and critical decisions. Emphasis is placed on analytical techniques for mitigating disasters, allocating emergency resources, identifying hot spots for crime or analyzing potential homeland security threats. (formerly GEOG-585)

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

Minimum Qualifications

Minimum Qualifications	And/Or
Ecology	Or
Biological Sciences (Masters Required)	Or
Environmental Technologies	Or
Geography (Masters Required)	Or
Administration of Justice	Or
Fire Technology	Or
Earth Science (Masters Required)	End

Learning Objectives

Learning Objectives

Learning Objective

1. Analyze various types of emergency situations, disasters and problem solving potentials with GIS.
2. Develop geodatabases, maps, plans and procedures necessary for decision makers prior and during emergency response and disaster management.
3. Create, manage and maintain spatial and temporal data for various disaster/emergency situations, domestically and internationally.
4. Evaluate significance of historic geographic data for before and after comparisons of disaster areas.
5. Compare domestic and international world emergency situations, organizations, resources and collaboration in the event of disaster or terrorism.
6. Compare, contrast and appraise data and maps using open source data applications, such as QGIS, GRASS GIS, uDIG, SAGA GIS, ILWIS for emergency management and natural disaster response.
7. Develop emergency application skills with a perspective from the students' own age, ethnic, racial, gender and/or socio-economic background.
8. Evaluate responses to a variety of disaster and other catastrophic emergency situations specifically related to the diversity, socio-economic status, gender, ethnic-racial background and other aspects of the geospatial distribution of human populations.

Learning Outcome Information

Course Learning Outcomes

Learning Outcome

1. The student will independently adapt knowledge and experience about catastrophe management as sources of data to support theories to explain, or processes to solve each new challenge.
2. The student will formulate, synthesize, and interpret catastrophe management geographically referenced data.
3. The student will apply knowledge and skills of disaster management to the collection and interpretation of geospatial information.
4. The student will exercise reflective thought concerning GIS solutions for emergency management and public safety.
5. The student will develop and foster empathy, expose variant interpretations, and exhibit diverse societal concerns when dealing with catastrophes affecting diverse human populations.

Content

Course Lecture Content

- I. A Survey of GIS for Disaster Management
 - A. The Continued Need for GIS in Disaster Management
 - B. Increased Awareness and Advocacy of GIS Mapping
 - C. Spatial Thinking and Disaster Management
 - D. Population Diversity Issues during Catastrophic Emergency
 - E. Distributions of Human Populations
 - 1). Socio-economic influences
 - 2). Ethnic and Racial Considerations
 - 3). Gender aspects of disaster preparation
 - 4). LGBTQ issues arising in disaster management
 - F. Management.
 - 1). Issues relating to ethnic, racial, religious diversity
 - 2). Age and gender differing reactions to disaster events
- II. Fundamentals of Geographic Information and Maps
 - A. Data vs. Information
 - B. Scale, Map Projection, Coordinate Systems
 - C. Basic Principles of Cartography
 - D. Designing Usable Maps in a GIS Context

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- III. Geographic/Geospatial Information Science
 - A. What is GIS?
 - B. GIS Metadata
 - C. Understanding GIS Data Models
 - D. Specific GIS Technology
 - 1). ArcGIS / ESRI
 - 2). Open Source
 - E. Choosing the right GIS Technology for Disaster Management
 - IV. GIS and Allied Technologies
 - A. What is GPS?
 - B. How GPS Works?
 - C. Unmanned Aircraft Systems or Drones
 - D. Remote Sensing
 - E. Remote Sensing and Disaster Management
 - F. Remote Sensing and International Disaster Management Support Mechanisms
 - V. Disaster Management and GIS
 - A. Disaster Management Cycle
 - B. Role of GIS within Disaster Management Policy and Practice
 - a. Policy in the USA: NIMS (The National Incident Management Systems)
 - b. ICS – Incident Command System
 - c. HSE – US Homeland Security Enterprise
 - d. US National Spatial Data Infrastructure
 - e. State
 - f. Federal
 - g. FEMA
 - e. GIS and Other US Federal Agencies
 - f. Private Sector
 - C. International Disaster Management Community and GIS
 - a. Non - Government Organizations
 - b. International Disaster Management Support and Policy Mechanisms
 - c. Global Perspectives on GIS and Disaster Management
 - d. United Nations
 - VI. GIS and Disaster Planning and Preparedness
 - A. Geographic Information Capacity for Disaster Management Preparedness
 - B. Technology and Dataset Planning Preparation
 - C. Department of Homeland Security Geospatial Data Model
 - D. Organizational Perspectives
 - E. Using GIS to Support Planning and Preparation
 - VII. GIS and Disaster Response
 - A. Disaster Response in the USA
 - B. International Disaster Response Laws, Rules and Principles (IDRL)
 - C. Geographical Aspects of Situation Awareness
 - D. Maps and Emergency Operation Centers
 - E. Spatial Data Deluge
 - F. Disaster Response GIS Products
 - G. GIS and Damage Assessment
 - H. The Public and Disaster Response Mapping – Crisis Mappings and Citizen Reporting
 - VIII. GIS and Disaster Recovery
 - A. Geographical Aspects of Disaster Recovery

- B. Using GIS to Support Disaster Recovery Tasks
- C. Transition from Recovery to Mitigation
- IX. Geographic Information Systems and Disaster Mitigation
 - A. Introduction to:
 - a. Vulnerability,
 - b. Resilience Disaster
 - c. Mitigation Policy
 - d. United States National Mitigation: UNDRR
 - B. GIS Techniques for Disaster Mitigation
- X. Special Topics, Future Technology, Professional Career Options, GIS Trends
 - A. Special Topics
 - a. Multi spectral digital imaging
 - b. Thermal digital imaging
 - c. LiDAR digital imaginis
 - B. Future of GIS for Disaster Management
 - C. Developing a GIS for Disaster Management Career
- XI. Disaster Management – Catastrophes Scenarios and Events
 - A. Historical Examples
 - B. Current and Future Projections
 - C. Emergency Master Plan

Methods of Instruction

Method

Discussion

Integration

Discussion focuses on GIS applications and methods, problem-solving and decision support systems, for preparation and response to disasters, emergencies, public safety/crime and catastrophes.

DE Adaptations for MOI

Weekly instructor-moderated group discussions in the online course management system focus on GIS applications and methods, problem-solving and decision support systems, for preparation and response to disasters, emergencies, public safety/crime and catastrophes. All discussion is done in accordance with accessibility standards.

Method

Homework

Integration

Computer activities consist of practical applications for emergency management and disaster response for real world scenarios that involve problem-solving methods and decision-making techniques.

DE Adaptations for MOI

Weekly homework assignments are submitted to the course management system and consist of practical applications for emergency management and disaster response for real world scenarios that involve problem-solving methods, decision-making techniques and GIS applications. Software applications for hazards with GIS software developed for various scenarios encourage critical thinking about how applications can be applied to similar situations. All applications meet accessibility requirements. The instructor provides timely evaluation feedback via rubrics and grading tools found in the CMS.

Method

Lecture

Integration

Lecture and demonstrations present GIS terms and concepts related to catastrophes, public safety/crime analysis, emergency management and disaster response in a variety of scenarios.

DE Adaptations for MOI

Lectures consist of online presentations and demonstrations that are asynchronously available in the course management system and/or in interactive real-time webinars that are recorded. These lectures and webinars are embedded within the course management software. All lectures and presentations meet ADA accessibility requirements.

Method

Projects

Integration

Students work in management teams to design and implement an Emergency Master Plan for a specific scenario with a timeline for upgrades, maintenance and improvements, and deliverable, i.e. interactive map on a server, which is professionally presented to the class both orally and in written format. Emergency Master plan projects are presented to the class as a poster, slide presentations and/or accessible audio-visual video to instruct the class.

DE Adaptations for MOI

Students work in groups within the course management system to design and implement an Emergency Master Plan. The projects are presented to the class asynchronously in a variety of formats within the course management system. The projects are also submitted to the CMS in written form in the appropriate submission file. Student and instructor input is presented in a discussion forum organized within the course management system. All submission will be in approved ADA format.

Method

Film/video Viewing and Discussion

Integration

Software demonstrations are provided as video and animated lectures using a variety of GIS hazard software applications for natural disasters. Videos and animated lectures are discussed in class.

DE Adaptations for MOI

Software demonstrations are asynchronously available in the course management system. These video and animated lectures are embedded within the course management software. All lectures and presentations meet ADA accessibility requirements.

Methods of Evaluation**Method**

Class Participation

Integration

In-class discussions focus on GIS applications and methods, problem-solving and decision support systems, for preparation and response to disasters, emergencies, public safety/crime and catastrophes, and are assessed for student ability to integrate geospatial concepts from lecture and demonstrations.

DE Adaptations for MOE

Graded in class participation is facilitated within the course management system. Class participation is evaluated via specifically designed rubrics for each class participation assignment. The instructor provides timely evaluation feedback via rubrics and grading tools found in the CMS. All participation is done in accordance with ADN accessibility standards.

Method

Exams/Tests

Integration

Tests use a variety of question formats to assess student assimilation of GIS terms and concepts, methods and applications, applied to public safety or crime analysis, emergency management, and disaster response.

DE Adaptations for MOE

Tests are available in the course management system and use a variety of question formats. Each examination/test is graded with a rubric specific to the materials covered in the assessment. Students are given feedback as to the correct answers to questions upon completion of the assessment. The instructor provides timely evaluation feedback via rubrics and grading tools found in the CMS.

Method

Homework

Integration

Homework practical application assignments represent a variety of scenarios for preparing for or responding to catastrophes, emergencies or disasters, public safety or crime analysis. These homework assignments are graded for performance and comprehension of various topics concerning a variety of disaster management scenarios, and encourage critical thinking. Grading rubrics are provided for each homework application.

DE Adaptations for MOE

Homework is described, submitted and evaluated within the CMS. A variety of homework application scenarios for different disaster and emergencies hazards are used to provide supplemental information to lecture materials. This homework assignments are presented in formats which meet ADA accessibility requirements. The homework is submitted to the course management system for grading. The instructor provides timely evaluation feedback via rubrics and grading tools found in the CMS. All materials are designed to meet accessibility standards.

Method

Projects

Integration

Students are graded individually, and as part of their group, for performance on a management team preparing an Emergency Master Plan that is professionally presented to the class. Individual and team performance expectations are defined in specially designed rubrics for each aspect of the Emergency Master Plan.

DE Adaptations for MOE

Students are graded individually, and as part of their group, for performance on a management team preparing an Emergency Master Plan. Projects are developed using a rubric specifically prepared for each aspect of the Master Plan. Students receive individual feedback for each aspect of the project, individual and group performance, in graded assignments within the course management system. The instructor provides timely evaluation feedback via rubrics and grading tools found in the CMS.

Method

Group Projects

Integration

Explore with at least one other of your classmates a variety of different cultural, ethnic, racial, gender, sexual orientation and other factors contributing to inclusion of individuals when consideration of geographic database information in dealing with catastrophe management practices. Summarize your considerations in both oral and written form in a presentation to the class.

DE Adaptations for MOE

Student groups participate in discussion sessions within the course management system. Oral presentation are submitted using appropriate synchronous meeting tools available in the CMS or with asynchronous video presentations. Written summarizations are submitted within the CMS. Presentations will meet accessibility requirements. Projects are graded with an assessment rubric defined within the CMS. Project evaluation is submitted privately to individual students within the course management system. Students receive assessment and other timely feedback from the instructor via rubric and grading tools in the CMS.

Assignments

Assignment Type

Writing

In-class and/or outside of class

In-class

Outside of class

Formative or Summative

Summative

Assignment

In your disaster management team, create a master plan for emergency management, for instance, earthquake, flood, or hurricane, consisting of geospatial information. Each team will present their plan to the class in an approximately, 20 minute, presentation based on the rubric in the syllabus for an individual grade.

How assignment will be adapted in online format

Written assignments are presented and evaluated within the course management system. These assignments focusing on GIS applications and methods, problem-solving and decision support systems, for preparation and response to disasters, emergencies, public safety/crime and catastrophes. Written descriptions of the disaster preparedness presentations are uploaded to the course management system. Written presentations are assessed using a rubric that measures student ability to integrate geospatial concepts from lecture and demonstrations. Feedback is presented to students in relationship to the required rubric descriptions. The instructor provides timely evaluation feedback via rubrics and grading tools found in the CMS.

Assignment Type

Reading

In-class and/or outside of class

Outside of class

Formative or Summative

Formative

Assignment

Read a minimum of three internet articles to gather information to help your disaster management team develop an emergency plan related to a specific disaster or catastrophe. Read to identify and develop the plan; 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 plan.

How assignment will be adapted in online format

Summaries of various reading assignments are presented, including bibliographic information and pertinent applicable GIS information and submitted in the course management system. These reading assignments focusing on GIS applications and methods, problem-solving and decision support systems, for preparation and response to disasters, emergencies, public safety/crime and catastrophes. Assignments are assessed using rubrics that measure student completion of the reading activities and their ability to integrate the readings into the geospatial concepts from lecture and demonstrations. The instructor provides timely evaluation feedback via rubrics and grading tools found in the CMS.

Assignment Type

Writing

In-class and/or outside of class

Outside of class

Formative or Summative

Summative

Assignment

Research and develop a procurement and maintenance schedule for equipment and supplies necessary to deal with a specific hypothetical disaster.

How assignment will be adapted in online format

The assignment is presented, detailed, explained, and submitted in the course management system. The assignment focuses on GIS applications and methods, problem-solving and decision support systems, for preparation and response to disasters, emergencies, public safety/crime and catastrophes. Written assignments are presented and evaluated within the course management system. Written presentations are assessed using a rubric that measures student ability to integrate geospatial concepts from lecture and demonstrations. Feedback is presented to students in relationship to the required rubric descriptions. The instructor provides timely evaluation feedback via rubrics and grading tools found in the CMS.

Assignment Type

Reading

In-class and/or outside of class

In-class

Outside of class

Formative or Summative

Formative

Assignment

Identify and read at least two internet articles related to the impact a specific catastrophic event, including population data collection and analysis, might have on diverse groups of human populations. Using the information gathered by the research effort, describe and presents to the class a review of how a defined disaster might affect one or more specifically identified diverse human population groups. Presents the review to the class and lead a discussion as to how the collection and interpretation of the data might be perceived by members of different populations.

How assignment will be adapted in online format

Assignment is presented, detailed, explained, and the research review is submitted in the course management system. The review of various reading research materials, including bibliographic information and pertinent applicable GIS data, is submitted in the course management system. A specially designed rubric that measure student completion of the reading activities and their ability to integrate the readings into the geospatial concepts is used to assess the research methodology and the review. The instructor provides timely evaluation feedback via rubrics and grading tools found in the CMS.

Assignment Type

Writing

In-class and/or outside of class

Outside of class

Formative or Summative

Summative

Assignment

Research, evaluate and develop an emergency preparedness plan for a hypothetical disaster which you might personally be involved in. Be sure to include how someone of your own age, ethnic, racial, gender and/or socio-economic background would respond to the hypothetical scenario. The assignment should focus on GIS applications and methods, problem-solving and decision support systems, for preparation and response to a hypothetical disaster, emergency, public safety/crime or catastrophe. Summaries of research used, including bibliographic information and pertinent applicable GIS information shall be included in the plan.

How assignment will be adapted in online format

The assignment is presented, detailed, explained, and submitted in the course management system. The assignment is assessed using rubrics that measure student completion of the reading and writing activity and their ability to integrate the readings into the geospatial concepts from lecture and demonstrations. Summaries of various reading assignments are presented, including



bibliographic information and pertinent applicable GIS information and submitted in the course management system. The instructor provides timely evaluation feedback via rubrics and grading tools found in the CMS.

Assignment Type

Reading

In-class and/or outside of class

Outside of class

Formative or Summative

Summative

Assignment

The student will read and summarize the scholarly article, "An Integrated Decision Support System for Improving Wildfire Suppression Management". This article is available in digital format at, https://www.mdpi.com/2220-9964/10/8/497?utm_campaign=releaseissue_ijgiutm_medium=emailutm_source=releaseissueutm_term=titlelink10

How assignment will be adapted in online format

The reading assignment and specific article will be presented in the CMS. Students will be required to submit a summary of the article in the CMS. A student/instructor discussion session will be available in the CMS. Evaluation and grading will use a rubric specifically designed for the assignment. Individual students will receive evaluation and grading of assignments within the course learning management system. Instructions for the development of the reading summary and the discussion session will meet accessibility requirements. The instructor provides timely evaluation feedback via rubrics and grading tools found in the CMS.

Course Materials**Textbooks**

Tomaszewski, B. (2020). Geographic Information Systems (GIS) for Disaster Management, 2nd Ed. Routledge. ISBN:9781138489868, 1138489867

Other Resources

Dealing with Disasters: GIS for Emergency Management (Applying GIS, 2), ESRI Press, 2021

GIS Technology for Disasters and Emergency Management <https://www.esri.com/library/pdfs/disastermgmtPDF>, by R Johnson · 2000

Open Educational Resources

Tomaszewski, B. (2020). Geographic Information Systems (GIS) for Disaster Management <http://jgs-jo.net/wp-content/uploads/2020/05/GIS-for-Disaster-Management.pdf>

Class Size Information**Class Size**

40

Class Size Category

A - Lecture/discussion 40

Diversity and Inclusion

Course Design and Materials: Course will incorporate diverse perspectives, authors, and examples that reflect a variety of cultures, identities, and lived experiences. Instructional materials will be reviewed regularly to ensure representation, inclusivity, and alignment with equity-minded practices across disciplines.

Inclusive Learning Environment: Instructors will establish classroom norms and policies that promote respect, civil discourse, and belonging in both online and face-to-face classes. Clear expectations for communication and engagement will support a learning space where all students feel valued and heard.

Accessible Instruction: Course content will be delivered using accessible design. Materials will follow accessibility guidelines within the CMS, including captioned media, readable document formats, and multiple means of engagement to support diverse learning.

Equitable Teaching Practices: Instructors will use transparent and grading criteria, varied assessment methods, and timely feedback to promote fairness and student success. Opportunities for revision, reflection, and multiple demonstrations of learning may be incorporated when appropriate to the discipline.

Culturally Responsive Pedagogies: Instructional strategies will encourage critical thinking about diverse perspectives and systems of power relevant to the course content. Faculty will foster opportunities for students to connect course material to real-world contexts.

Ongoing Reflection and Improvement: Faculty will engage in continuous professional development related to IDEAA principles and reflect on course practices using metacognition to identify opportunities for increased equity, inclusion, and accessibility.

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

The course offers students' opportunities to foster empathy, expose variant interpretations, and exhibit diverse societal concerns represented by the geographic distribution of humans around the globe particularly as it relates to dealing with diverse community in natural or human originated disasters. The course operates with a foundational intention of diversity and inclusion and it has been seen in recent disasters that these issues are extremely important considerations that must be dealt with effectively. Included in the objectives, is the necessity of teaching diverse content from multicultural and intersectional perspectives across all aspects of the course content. Emphasis is placed on the articulation of how catastrophe/disaster management data collection and analysis contribute to the discipline of geospatial science. The course content is designed to align objectives with and to create opportunities for students from a variety of backgrounds to hone new skills while acknowledging and honoring their diverse, existing knowledge base. The course emphasizes the need to investigate not only geophysical aspects of catastrophes but to consider the human geospatial distribution, as well as the socio-cultural perspective as it pertains to race, gender identity, sexual orientation, and cultural differences. Students are expected to consider cultural, economic, political, and gender-based positioning in developing assignments affecting how emergency management personal respond to catastrophic situations. Assignments are formatted to allow students to reflect on their cultural frame of reference and to investigate their personal perspectives as to the geospatial aspects of the communities to which they associate.

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

Students evaluate how disaster management data collection and analysis are contextualized in relationship to their own learning styles and previous learning experiences. The course assignments emphasize the need for students to considered their own learning styles while investigating the geospatial information. Methods of instruction and evaluation are designed to foster a variety of inquiry styles and activities to accommodate diversity in student learning. To better support a diverse range of learners, instructors are encouraged to incorporate formative and summative active learning strategies in the assignments. Students are encouraged to explore how their own diverse learning styles contribute to the analysis, design and implementation of disaster management planning. Students are encouraged to consider factors representing their personal learning as defined by their cultural, economic, political, and gender-based positioning in developing assignments affecting the geospatial distribution of human activities especially as they relate to emergency disaster and catastrophic events. Students are urged to consider not only how "time and place" have affected their own methods of inquiry but how their own interpretation of "historical context" is used to capture a deeper personal connections to the socio-historical forces that affect the geospatial distribution of humans as it relates to dealing with catastrophic events.

Interactions

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

Students are encouraged to work together in "disaster teams" to solve disaster and other catastrophe related geospatial problems using geospatial information and digital data applications. Student are required to participate in weekly student to student discussion sessions on topics related to the course materials. Class activities, lectures and assignments are learning and assessment 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. Students work in "disaster management teams" to solve problems related to hypothetical catastrophic events. In distant education course environments student to student interactions take place asynchronously in a variety of formats within the course management systems. Open "discussions" are available within the course management system to promote student to student interaction outside the course required assignments.

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. Instruction is designed to include "disaster management teams" that have intensive instructor student one-on-one instruction in the use of the GIS data collection applications and software to manage catastrophic events. Instructors are encouraged to incorporate formative and summative active learning strategies in the assignments which promote students to ask questions and get clarification of examples from the instructor. For distance education formats, instructor to student interaction is facilitated by asynchronous discussions with the instructor within the course management system communication options. The instructor uses a variety of communication tools within the course management system to provide supportive and instructive communication with individual and focused groups of students.

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

Student to content interaction is incorporated in lecture presentations and assignments as well as weekly and semester projects. Students are required to apply lecture content to the application assignments. 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. Assignments require students to produce individualized disaster management plans using information discussed and developed in lecture. These plans represents a variety of data presentations all of which include mapping and data analysis of specific geospatially related catastrophe management 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 of the affected populations. For distance education formats, student to content interaction is facilitated by asynchronous information, lectures, video presentations and discussion within the course management system communication options.

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

The goal is to support students in connecting their personal and professional experiences with the terms and concepts presented in the course and to validate the student's life experience by seeing themselves in the use of the material and assignment requirements. Class activities, reading, lecture, discussions and student disaster management plans encourage and allow students to explore various personal interpretations and understandings of their individual relationships to the geospatial organization of catastrophe management related to their own diversity, socio-economic status, gender, ethnic-racial background and other aspects of their own identity and history. The instructor works with individual students both in their capacity as students and/or in their professional roles or preparation for professional roles in disaster management. Through readings, lectures, activities, and discussions, students are encouraged to explore connections between course content and societal concerns to demonstrate how disaster management skills can be a vehicle for analyzing the contemporary socio-economic impact of ecological disasters on human populations. The instructor works with students to emphasize that the analytical and critical thinking skills they hone by analyzing disaster scenarios in the class have broad applications in real life situations beyond the classroom. For distance education formats, student to self interaction is facilitated by asynchronous information, lectures, video presentations and discussion specifically designed to encourage student self reflection and incorporation of the material within the course management system communication options.

Key: 1691