Geography 416/518: GIS Project Management

- **Course number:** GEOG 416 (CRN 54356) or GEOG 518 (CRN 54359)
- **Class location:** Burchfiel Geography Building (BGB) Room 404
- **Class time**: 11:20 am - 12:35 pm (Tuesdays & Thursdays)
- **Instructor:** Shih-Lung Shaw, Professor (BGB 317)
- **Office hours:** Tuesdays and Thursdays, 12:40 – 1:10 pm or by appointment
- **Contact information:** Email: sshaw@utk.edu or Phone: 865-974-6036 (office)

Class Website (Canvas):

- Class webpage is available at Canvas. You can access Canvas at https://oit.utk.edu/instructional/tools/online/canvas/default.html

Textbook:

- No required textbook. This class will use materials from various sources.
- Reference book: Roger Tomlinson, 2013. *Thinking about GIS: Geographic Information System Planning for Managers*, Fifth Edition, Esri Press.

Course Description:

This class simulates a real-world work environment to develop, design, and implement two GIS projects that are selected and defined by the class members. The main course objective is to gain knowledge and skills of implementing GIS projects successfully in the real world. Each class member will play a major role in one of the three teams described below:

(1) Management Team:
- Responsible for tasks related to management and implementation of each GIS project such as coordination, scheduling, assessment, standards, QA/QC, documentation, presentations, reports, etc.

(2) Application Team:
- Responsible for tasks related to defining the scope and deliverables of each GIS application project, data requirements and acquisition, database creation and maintenance, functional requirements, analysis requirements, user interface design, application documentation, etc.

(3) Technical Team:
- Responsible for tasks related to technical aspects of each GIS project such as data integration, data sharing, database design, application programming, customized user interfaces, technical documentation, etc.

Course Design:

Three teams (i.e., management, application, and technical) will be formed among the class members in this class. Class discussions and interactions will take place within and between the teams. TEAM WORK is essential to the success of this class. Class meetings will be run by the class members simulating real-world project meetings. The instructor will serve as a consultant to the class members. Each team is expected to hold its own meetings outside the scheduled class meeting time to carry out its tasks. Class members will work together to identify and implement two GIS application projects in this semester. Each application

project must include a complete process of project planning, specification, design, development, implementation, documentation, reports, and presentations.
Each class member will play at least one of the following roles:

1. GIS Manager (1 person): GIS Manager is responsible for overall planning, coordination, scheduling, management, assessment, deliverables, weekly meetings (meeting agenda and meeting minutes), etc.
2. Assistant GIS Manager (1 person): Assistant GIS Manager assists the GIS Manager on various tasks.
3. Application Team Leader (1 person for each of the two application projects): Application Team Leader is responsible for coordinating an application project and managing project tasks such as application project design, data needs specification, data collection, database creation, functional specifications, application documentation, etc.
4. GIS Application Specialists (3-4 persons for each application project): Application specialists are responsible for tasks such as data collection, database creation, application workflows, GIS analyses, user interface design, visualization, application documentation, etc.
5. Technical Team Leader (1 person for each of the two application projecta): Technical Team Leader oversees and coordinates tasks among the GIS programmers/analysts, including tasks such as identifying and learning technical skills needed to complete the application project, coordinating work among GIS programmers/analysts, providing technical trainings, etc.
6. GIS Programmers/Analysts (3-4 persons for each application project): GIS Programmers/Analysts are responsible for technical feasibility assessment, database design, user interface implementation, application programming, technical documentation, etc. in support of the application project.

- The GIS Manager must post a meeting agenda of each project meeting (including discussion topics, responsible persons, time allocation, etc.) on the Canvas class website by 12 noon one day before each project meeting. At the beginning of each project meeting, the GIS Manager or designees should give a report that summaries work progress since the last project meeting. The minutes of each project meeting (in Word format) must be posted on the Canvas course website by 5 pm of each project meeting day.

- Canvas course website is the main communication mode to post and archive all documents for this class. Your UT email account will be used for communications between the instructor and the class members as well as among the class members. It is critical that you check the Canvas course website and your UT email account frequently to stay informed and engaged. The project manager can use other communication channels to facilitate collaboration among the class members.

- ArcGIS software family (including ArcGIS Pro, ArcGIS Online, ArcGIS StoryMaps, etc.) is the GIS platform selected for project implementation in this class. All GIS data should be stored in ArcGIS geodatabase format. Metadata documentation in ArcCatalog is required for all GIS data sets. Class members can use additional open-source software to enhance their application projects.

The FINAL DELIVERABLES must include:

1. In-person final project presentation and live GIS demonstrations in BGB 404 **at 3:30 – 6:00 PM on Tuesday, December 10, 2024**;
2. A shared "Documentation" Google drive folder that consists of: (a) a PDF copy of the Final Project Report which includes title page, table of contents, list of figures, list of tables, executive summary, main text body, list of references, and all relevant appendices (e.g., application and technical documentations, user manuals, etc.), and (b) PDF copies of all relevant documents (e.g., meeting agendas, meeting minutes, progress reports, technical documents, user guides, presentation files, etc.) must be made available to the instructor **by 12 noon on Tuesday, December 10, 2024**;
3. A shared "GIS" Google drive folder that includes all data sets and custom application programs which are ready to run with ArcGIS must be made available to the instructor **by 12 noon on Tuesday, December 10, 2024** (Note: Make sure that you use "relative path" to access data in your ArcGIS Pro project files.).
4. Submit the final project Powerpoint presentation file to the shared "Documentation" Google drive folder **by 3:30 pm on Tuesday, December 10, 2024**.

Central Learning Objectives:

Students who successfully complete this class are expected to gain the following knowledge/experience:

- Understand the process of developing, managing, implementing, and presenting GIS application projects,
- Develop knowledge and skills of defining GIS applications, collecting relevant data, creating GIS databases, performing GIS analyses, and presenting project work; and
- Gain experience of working with other people in management, application, and technical teams to contribute collectively to the success of GIS projects.

Degree Learning Objectives:

- Students will gain practical knowledge and skills of managing GIS projects.
- Students will be able to connect various GIS knowledge and skills in a simulated real-world environment.
- Students will gain experience of working as a team for their future careers.

Prerequisites and Other Important Notes:

- Class members are expected to have basic knowledge of geographic information science and hands-on experiences of ArcGIS software equivalent to GEOG 311/411 classes.
- Course materials will be posted on UT Canvas course website. Students are expected to access and read the Canvas course website frequently.
- Students are expected to attend classes, actively participate in teamwork, and contribute to class projects.
- No make-up course work or incomplete grade will be allowed except for extenuating circumstances with appropriate documents approved by the instructor.
- No individual student is allowed to perform extra credit work in order to increase their grade. Any extra credit options will be made available to the entire class.
- Some class meetings may be held online via Zoom. These online class meetings will be announced in class and posted on the Canvas course website ahead of each online class meeting.
- Students who feel they may need an accommodation based on the impact of a disability should contact the Office of Student Disability Services (SDS) at 865-974-6087 or sds@utk.edu in Blount Hall l, 1534 White Avenue to document their eligibility for services. SDS will work

with students and faculty to coordinate reasonable accommodations for students with documented disabilities.

- Cheating, plagiarism, and other forms of academic dishonesty will not be tolerated.
- It is important to recognize that the classroom is an environment that requires respect for all participants. Therefore, students are expected to conduct themselves in a considerate manner. All participants in the class must respect the classroom environment by being on time, muting cell phones, and refraining from reading non-class materials.
- In this course, students are encouraged to use Google and Generative AI Tools such as ChatGPT, Microsoft Copilot, Google Gemini, etc. to support their work. To maintain academic integrity, students must disclose any AI-generated material they use and properly attribute it, including in-text citations, quotations, and references. A student should include the following statement in assignments to indicate their use of a Generative AI Tool: "The author(s) would like to acknowledge the use of [Generative AI Tool Name], a language model developed by [Generative AI Tool Provider], in the preparation of this assignment. The [Generative AI Tool Name] was used in the following way(s) in this assignment [e.g., brainstorming, grammatical correction, citation, which portion of the assignment]."
- When using AI tools, it is important to be aware that the user data supplied might be utilized for training AI models or other purposes. Consequently, there is no guarantee that the information you provide will remain confidential. Students should exercise caution and avoid sharing any sensitive or private information when using these tools. Examples of such information include personally identifiable information (PII), protected health information (PHI), financial data, intellectual property (IP), and any other data that might be legally protected.

Grading System:

Grading will be based on the weights allocated to the components listed below:

1. Evaluation by the instructor based on class attendance, participation, and contributions of each individual class member: 30%
2. Peer review among class members: 20%
3. Evaluation of the group performance by the instructor: 50%
    - Group performance will be evaluated based on group efforts, creative and innovative ideas, project challenge level, problem-solving ability, group collaboration, steady progress, deliverables, presentations, etc.

Final course letter grades will be determined as follows:

- A: >= 93%, A-: 90-92.99%, B+: 87-89.99%, B: 83-86.99%, B-: 80-82.99%, C+: 77-79.99%, C: 73-76.99%, C-: 70-72.99%, D+: 67-69.99%, D: 63-66.99%, D-: 60-62.99%, F: < 60%

Course Schedule

Date	Topics	Tasks/Discussions
1 (8/20, T)	▪ Self-introduction ▪ Course introduction	* *Post your self-introduction document (no more than 500 words) under the Discussions link in Canvas by 5 pm on Friday, 8/23*
2 (8/22, R)	▪ Lecture	* Lecture: Introduction
3 (8/27, T)	▪ Lecture	* Lecture: GIS Planning Stages
4 (8/29, R)	▪ Lecture	* Lecture: Information Products
5 (9/3, T)	▪ Project organization meeting	* Class members get to know each other, discuss potential application project ideas, and assess pros/cons and feasibility of potential applicationn project ideas
6 (9/5, R)	▪ Project organization meeting	* Class members meet to identify the top three application project ideas * Class members meet to discuss which role(s) each class member may play and contribute to the top application project ideas
7 (9/10, T)	▪ Project organization meeting	* Discuss specific information products of each application project idea * Choose the top two application projects * Identify the role(s) of each class member will play in this course
8 (9/12, R)	▪ Lecture	* Lecture: Logical Database Model
9 (9/17, T)	▪ Project meeting	* Discuss data needed to produce the specific information products of each project * Discuss GIS functions, workflow/procedures, and technical skills needed to produce the information products of each project * Any other tasks from the management team? * Assign tasks to team mebers
10 (9/19, R)	▪ Project meeting	* Discuss data needed to produce the specific information products of each project * Discuss GIS functions, workflow/procedures, and technical skills needed to produce the information products of each project * Any other tasks from the management team? * Assign tasks to team mebers
11 (9/24, T)	▪ Lecture	* Lecture: Implementation Plan
12 (9/26, R)	▪ Project meeting	* Discuss GIS database design for each project * Discuss documents needed for the project * Any other tasks from the management team? * Assign tasks to team mebers
13 (10/1, T)	▪ Project meeting	* Discuss GIS database design for each project * Discuss documents needed for the project * Any other tasks from the management team? * Assign tasks to team mebers

14 (10/3, R)	▪ Group work session	* All class members ***Application project plans (including project specifications, specific project products, data sources, application task assignments, application project schedule, etc.) which must be posted on Canvas course website by 5 pm on Monday (10/14)***
15 (10/8, T)	▪ **No Class (Fall Break)**	
16 (10/10, R)	▪ Project meeting	* Begin GIS database creation * Discuss and develop analysis functions and workflows * Trainings needed by class members * Any other tasks from the management team? * Assign tasks to team mebers
17 (10/15, T)	▪ Group work session	* All class members
18 (10/17, R)	▪ Project meeting	* Begin GIS analysis and visualization tasks * Design and develop user-friendly application interfaces * Trainings needed by class members * Any other tasks from the management team? * Assign tasks to team mebers
19 (10/22, T)	▪ Group work session	* All class members
20 (10/24, R)	▪ Project meeting **(Instructor at a conference)**	* To be announced by the management team
21 (10/29, T)	▪ Group work session **(Instructor at a conference)**	* All class members
22 (10/31, R)	▪ Group work session	* All class members
23 (11/5, T)	▪ **No Class (Election Day)**	
24 (11/7, R)	▪ Project meeting	* To be announced by the management team
25 (11/12, T)	▪ Group work session	* All class members
26 (11/14, R)	▪ Group work session	* All class members
27 (11/19, T)	▪ Project meeting	* To be announced by the management team
28 (11/21, R)	▪ Group work session	* All class members
29 (11/26, T)	▪ Group work session	* All class members
30 (11/28, R)	▪ **No Class (Thanksgiving Recess)**	
31 (12/3, T)	▪ Project presentation rehearsal	* All class members
12/10 (Tuesday, 3:30 – 6:00 PM), BGB	▪ **In-person Final Project Presentation and Live Demonstrations, plus Final Project Report Due**	***Final deliverables must be posted on shared Google drive folders by 12 noon on Tuesday, December 10, 2024:*** 1. ***All weekly project meeting agendas,***

404		***meeting minutes, and progress reports saved in a "Documentation" Google drive folder and organized by subjects,*** **2.** ***All documentations (data documentation, application documentation, technical documentation, user manuals, etc.) saved in a "Documentation" Google drive folder and organized by subjects,*** **3.** ***Final project report saved in a "Final Report" Google drive folder, and*** **4.** ***All GIS data in ArcGIS geodatabase format and all application programs ready for the final demonstration of class project saved in a "GIS" Google drive folder.*** ***Plus, the final Powerpoint presentation file is due by 3:30 pm on Tuesday, December 10, 2024.***

*** Note: This schedule is subject to change. Updated syllabus (if any) will be posted on the Canvas website of this course. Please contact the instructor if you have questions about course materials or course requirements.**