Autumn 2024

GEOG 5212 Geospatial Databases for GIS

Course Information

- **Course times and location:**
  - Lecture: Weekly Online Asynchronous
  - Lab: Thursdays, 12:45 PM – 2:05 PM, Derby Hall 0135
- **Credit hours:** 3.0
- **Mode of delivery:** Hybrid

Instructor

- **Name:** Dr. Chayanika Singh
- **Email:** singh.1883@osu.edu
- **Office location:** 1123 Derby Hall

- **Office hours:**
  - Thu 2:00 pm – 3:00 pm (in-person) or Zoom by appointment
- **Preferred means of communication:**
  - My preferred method of communication for questions is **email.** Please have the email subject as "**Geog5212_.....",** to make sure it gets my attention.

Teaching Assistant

- **Name:** Mostahidul Alam
- **Email:** alam.146@osu.edu
- **Office location:** 1083 Derby Hall

- **Office hours:**
  - Mon 2:30 pm – 3:30 pm & Wed 2:30 pm – 3:30 pm
  - In- person or via Zoom by appointment

Course Prerequisites

GEOG 5210 and CSE 1114, or consent of instructor.

Course Description

This course focuses on designing, implementing, querying, and managing geospatial databases or persistent data stores where most entities have footprints in geographic space and time. This is critical for designing and implementing GIS for projects and organizations. It is also crucial for moving beyond GIS to the bigger world of geographic information services.

In designing any GIS project, a fundamental decision is how to represent the world of interest in the computer. This is critical since no GIS or spatial analysis tools – no matter how powerful – can extract more information than is designed in the database representation. The growing size of geospatial databases requires these databases to support efficient querying and searching. A well-designed spatial database can also evolve as the questions in the project or organization change over time. A poorly designed spatial database is difficult to rewind and fix.

Understanding spatial database design and management is not only essential for designing and implementing GIS, but also to support a much wider range of geographic information services such as Google Maps and location-based services such as the location apps on your smartphone. This is a much bigger market than the market for professional GIS service.

Database technologies. The most common spatial database management system (SDBMS) technology is a specialized object-relational database management system (ORDBMS). An ORDBMS supports objects within a relational (table-based) database and its associated query language, Structured Query Language (SQL). An ORDBMS is a SDBMS if it also supports spatial objects through spatial indexing and spatial (geometric) operations.

ORDBMS with spatial objects is the approach used by ESRI's Geodatabase as well as open-source software such as PostGreSQL/PostGIS. It is also supported by other major vendors such as IBM.

In this course, we will be working with ESRI's ArcGIS Geodatabase and PostGreSQL/PostGIS. There will be a series of assignments using these technologies. These will be provided via the course website and discussed in lectures.

Your lectures are **online asynchronous** & labs will be **in person** in Derby Hall 0135. **There are two separate canvas pages** dedicated to lecture and lab content, for this course. You must have access to both. For convenience we have merged the content of both lecture and labs into one canvas page. The other one is only a place holder.

Important: Do not expect to complete entire lab assignments during the scheduled lab time. Lab sessions are 80 minutes, and it usually takes longer than 80 minutes to complete a lab. Therefore, you will need to either 1) finish the lab using software installed on your own computer or 2) return to the computer lab when it is not being used for other classes.

Credit Hours and Work Expectations

This is a 3 credit-hour course. According to Ohio State bylaws on instruction (go.osu.edu/credit hours), students should expect around 3 hours per week spent on direct instruction (instructor content and Carmen activities, for example) in addition to 6 hours of homework (reading and assignment preparation, for example) to receive a grade of C average.

Learning Outcomes

By the end of this course, students should successfully be able to:

- Understand database design with spatial objects.
- Write spatial queries.
- Understand physical data storage and performance tuning.
- Have hands-on skill to create a working GIS database.

Mode of delivery

Your **lectures will be online**, and your **labs (recitations) will be in person** in Derby Hall 0135.

Lectures:

- Please note that **lectures in this course are *asynchronous***, meaning that *there are no required sessions when you must be logged in to Carmen at a scheduled time.* Lectures are pre-recorded, and you will be provided with a link to each week's ecture's video on Carmen Canvas lecture page, which you can view anytime during the week that the lecture is assigned.

Labs:

- Please note that **in-person attendance at labs is strongly recommended**. However, if you are unable to attend due to COVID-19 or some other reasons, please let the lab TA know as soon as possible and we will make special arrangements as per lab policies. All lab related material will be available on canvas lab page.
- Attendance in labs meetings have assigned point weightage towards the final grade as extra credits. Contact your lab TA for detail lab policies.

Alternative to in-person class instructions

Should in-person lab be canceled (due to any reason such as extreme weather, sickness etc.), I/TA will notify you as to which alternative methods (remote lab) of teaching will be offered to ensure continuity of instruction for this class. Communication will be via Carmen Canvas.

Course Materials and Technologies

Required Materials and/or Technologies

Textbook: No specific textbook is required for this course. There will be several references given to you from various web sources (such as YouTube links, tutorials, podcasts... etc) to expand your learnings of different topics covered but not extensively described in this course.

Readings: Excerpts from the following texts will be provided in digital (PDF) format:

• **B**: Bolstad, P. (2019). *GIS Fundamentals*, 6th edition.

• **CM**: Coronel, C. & Morris, S. (2016). *Database Systems: Design, Implementation, and Management*, 12th edition.

• **EN**: Elmasri, R. & Navathe, S. (2016). *Fundamentals of Database Systems*, 7th edition.

• **N**: Nasser, H. (2014). *Learning ArcGIS Geodatabases*.

• **OH**: Obe, R. & Hsu, L. (2015). *PostGIS in Action,* 2nd edition.

• **R+**: Rigaux, P., Scholl, M., & Voisard, A. (2002). *Spatial Databases with Application to GIS*.

• **RG**: Ramakrishnan, R. & Gehrke, J. (1999) *Database Management Systems*, 2nd edition.

• **SC**: Shekhar, S. & Chawla, S. (2003) *Spatial Databases: A Tour*.

• **WD**: Worboys, M. & Duckham, M. (2004) *GIS: A Computing Perspective*, 2nd edition.

• **Z**: Zeiler, M. (2010) *Modeling Our World: The ESRI Guide to Geodatabase Concepts*, 2nd edition.

Data Storage: A portable memory device (with 16GB or larger) or access to cloud drive (Box, OneDrive, Dropbox etc.) is needed for data storage.

Required Equipment

Computer: current Mac (MacOS) or PC (Windows 10) with high-speed internet connection

Webcam: built-in or external webcam, fully installed and tested

Microphone: built-in laptop or tablet mic or external microphone

Other: a mobile device (smartphone or tablet) to use for BuckeyePass authentication

If you do not have access to the technology you need to succeed in this class, review options for technology and internet access at go.osu.edu/student-tech-access.

Required Software

Please keep in mind that **you are NOT required to purchase any software for this class**. The following list should help you access the software free-of-cost to you as a student in this class.

ArcGIS Pro

- Please refer to associated installation documents on Carmen for details (Getting Started with ArcGIS Pro). Privacy policies of Esri products can be found here. System requirements of the ArcGIS Pro can be found here.

ArcGIS Online

- Please refer to associated installation documents on Carmen for details (Getting Started with ArcGIS Online). Privacy policies of Esri products can be found here. There is no specific system requirement for ArcGIS Online and you can use it if you have a web browser.

Microsoft Office 365

- All Ohio State students are now eligible for free Microsoft Office 365 ProPlus through Microsoft's Student Advantage program. Each student can install Office on five PCs or Macs, five tablets (Windows, iPad®, and Android™), and five phones.
- Office 365 is installed within the student's BuckeyeMail account. Full instructions for downloading and installation can be found here.

QGIS

- This is the leading open-source desktop GIS software that is available free-of-cost. You can download the software from here: https://qgis.org/en/site/forusers/download.html.
- Q: What version of QGIS should I have? A: I recommend the "Long term release repository (most stable)" and "QGIS Standalone Installer". Specifically, I'll be using version 3.16 this semester. Other versions should work just fine, but you may notice differences between the lab instructions and what you see on your screen.
- TECHNICAL SUPPORT: Successful download and installation of QGIS is ultimately the student's responsibility. You may contact your instructor/TA with installation-related questions, but we cannot guarantee that we'll be able to resolve all issues.

PostgreSQL, PostGIS, and pgAdmin

- PostgreSQL, also known as Postgres, is a free and open-source relational database management system emphasizing extensibility and SQL compliance. PostGIS adds support for geographic objects to the PostgreSQL object-relational database. pgAdmin is a management tool for PostgreSQL.
- You can download the installer for PostgreSQL from this site: https://www.postgresql.org/download.
- The installation of PostgreSQL includes pgAdmin, and it is during the final step of installing PostgreSQL that you have the option to install additional packages as well. You want to do this, because this is when you'll have the opportunity to select PostGIS, which will then be installed.
- Additionally, **remember to record the passwords** that you create during the installation process. You'll need this information.

- TECHNICAL SUPPORT: Successful download and installation of PostgreSQL, PostGIS, and pgAdmin is ultimately the student's responsibility. You may contact your instructor/TA with installation-related questions, but we cannot guarantee that we'll be able to resolve all issues.

Have Question regarding software installation?

- **Post your questions in the Software Installation Q&A discussion board BEFORE reaching out to the other technical support resources provided.**
- There are many installation-related questions that we can answer because they are common. We may have heard them in past semesters and already know how to respond. However, if we are unable to help, we'll let you know that, and we'll confirm which technical support contact is most appropriate for your problem. Be sure to include us on your email communication with technical support so that we can better understand your problem and help others experiencing the same.

Remote Lab Access

If you have any trouble with downloading, installing, or using the required software (see details in next section) on your own machine, you may access the computers in the Derby Hall 0135 and 0140 computer labs via remotelab.osu.edu.

- Instructions for using Remote Lab can be found at the course website in Carmen.
- Important: It is best if you can download, install, and use the required software (see details in next section) on on your own machine, rather than via Remote Lab, because there are a limited number of computers available remotely, so please only use this option of absolutely needed.
- Email Jens Blegvad at belgvad.1@osu.edu for Remote Lab technical support.

CarmenCanvas Access

You will need to use BuckeyePass (buckeyepass.osu.edu) multi-factor authentication to access your courses in Carmen. To ensure that you are able to connect to Carmen at all times, it is recommended that you do each of the following:

Register multiple devices in case something happens to your primary device. Visit the BuckeyePass - Adding a Device (go.osu.edu/add-device) help article for step-by-step instructions.

Request passcodes to keep as a backup authentication option. When you see the Duo login screen on your computer, click **Enter a Passcode** and then click the **Text me new codes** button that appears. This will text you ten passcodes good for 365 days that can each be used once.

Install the Duo Mobile application (go.osu.edu/install-duo) on all of your registered devices for the ability to generate one-time codes in the event that you lose cell, data, or Wi-Fi service.

If none of these options will meet the needs of your situation, you can contact the IT Service Desk at 614-688-4357 (HELP) and IT support staff will work out a solution with you.

Technology Skills Needed for This Course

Basic computer and web-browsing skills

Navigating CarmenCanvas (go.osu.edu/canvasstudent)

CarmenZoom virtual meetings (go.osu.edu/zoom-meetings)

Recording a slide presentation with audio narration and recording, editing and uploading video (go.osu.edu/video-assignment-guide)

Technology Support

For help with your password, university email, CarmenCanvas, or any other technology issues, questions or requests, contact the IT Service Desk, which offers 24 x 7 support.

- **Self Service and Chat**: go.osu.edu/it
- **Phone:** 614-688-4357 (HELP)
- **Email:** servicedesk@osu.edu

Classroom door locks

As we begin a new semester, safety is top of mind. Please **watch this brief video** explaining the three types of door locks used across campus, and how to use them effectively in the event of an active aggressor situation.

Grading and Faculty Response

Your Grades will be calculated based on the following assignment weightage.

Assignment Category	Points
Syllabus Quiz + Lab 0	1%
Labs (10)	50%
Quizzes (9)	9%
Project	20%
Exams (2)	20%
Total	**100%**
Attendance (extra credits)	5%

Descriptions of Major Course Assignments

Syllabus Quiz & Lab 0

The first week will provide you a detailed explanation of course expectations, policies, deliverables, schedule of classes etc. You are expected to read the syllabus and get familiar with all the requirements in this course. It is highly encouraged to be prepared to ask questions about course content in the very first week. There will be an online syllabus quiz to be taken during the first week to make sure you know the syllabus.

Lab 0 will provide instructions for getting started with several required software installation and basic skills. More information will be provided in the first week's lab session.

Labs

There will be 10 labs (1 to 10) to do hands on practice. You will be provided with data and step-by-step instructions for each lab, but keep in mind that the process of completing any given lab may not go as smoothly as planned. Unexpected challenges may arise, so it is best to plan for this. Set a goal to submit each lab in advance of the deadline. That way, if unexpected challenges do arise, you have time to deal with them before the deadline passes.
Labs are submitted in a quiz-like format. You are given all the questions in advance, at the end of the lab instructions. When you are ready to submit your lab, you open the lab assignment, enter your answers, upload any required files, and click Submit.

Lab questions: If you have any questions on lab contents and/or grades (can't finish specific steps, tools are not working, etc.), **please contact your TA via email and/ or visit TA's office hours.**

Project

You would need to create a final project to showcase your skills learnt in lab and knowledge acquired from the lectures. You can choose ANY topic of your own interest and collect data to create a working spatial database. Deliverable will include a proposal, a presentation, and a report. More information will be provided later via carmen.

Quizzes & Exams

There will be 9 non-cumulative, open-book quizzes based on a weekly topic covered in lectures. They will contain multiple choices and blank filling questions. There will be two (Midterms and Final) non-cumulative exams based on all the topics discussed in the lecture. You must take all the quizzes & exams to receive credits.
Each quiz and exam will be:

- *Online.* administered using course canvas website.
- *Timed.* If you are registered with SLDS for extended time accommodations, please confirm that extended time has been granted before you begin the exam.
- *Open note.* This means that you can use the lecture slides, the handouts, your notes, the textbook, etc.
- *Completed independently.* You should complete the exam by yourself. Collaboration with one or more other persons will be considered academic misconduct.
- *Allowed only one attempt.* Be sure that you are ready to complete the exam in one sitting before you begin.

No make-up exams will be given unless legitimate documents for medical or personal emergency are presented in advance. Exam must be taken at the scheduled time unless you have informed your instructor *before* the exam with proper reasons and documents and got approved by the instructor. **Please contact your instructor in advance of the scheduled exam to schedule a make-up exam**, except in the case of emergency. Make-up exams for excused absences will not be penalized. Make-up exams for unexcused absences will be penalized 15%.

Q: What happens if I lose internet connection while taking the Exam?

A: If you lose connection momentarily, you should be able to resume the exam. If you lose connection for longer than the exam is available, the exam will automatically submit with the time is up.

- *Tip 1:* If you have a smartphone with a web browser, you should be able to use your cellular network (even if the WiFi connection is unavailable) to log in to Carmen on your cell phone's web browser and resume the exam, as long as the time isn't up. It's not ideal since you probably won't be able to access any notes efficiently, but at least you can still access the exam and enter answers.
- *Tip 2:* To make your internet connection a little more stable, make sure nothing is streaming like video or online games. If you have roommates that are watching Netflix or

gaming, you might want to ask them to take a break while you take your exam so that your WiFi access can be prioritized.

Do your best to ensure that you have a reliable internet connection and a reliable device (desktop, laptop, tablet, or phone) for accessing the exam *before* you get started. If you do completely lose access, cannot resume, and the exam submits before you can reestablish connection and submit answers, be sure to let me know. There may not be much that I can do, in the interest of fairness to all students, but I certainly want to hear about the situation to investigate it, etc.

Attendance

Attendance (in labs) will be recorded. Presence during classes help students to understand and work in a coherent way. Our prior experience shows that those students who regularly show up in classes learn more from their peers and instructors than those who prefer to work/study on their own (skipping class attendance). To encourage class presence and productivity, **attendance is made worth up to 5% of EXTRA CREDITS** counted towards the final grades in this course. However, 2 unexcused absences are allowed to cover any emergency or unexpected event that may prevent you coming to the labs. In case of any health emergency such as COVID19 related absences, please make sure to inform your Lab TA and me as soon as possible to get special arrangements as per policies. Documented proof may be required to get your attendance excused.

Late Assignments

Please refer to Carmen course website for due dates of assignments. Assignments will be penalized 10% for each day late. Thus, assignments submitted 10 days after the deadline will be graded 0. Extensions will not be granted due to lost work; **be sure you back up and keep all your work.**

Academic integrity and collaboration: Your written assignments, including discussion posts, should be your own original work. In formal assignments, you should follow APA style to cite the ideas and words of your research sources. You are encouraged to ask a trusted person to proofread your assignments before you turn them in but no one else should revise or rewrite your work.

Use of artificial intelligence in completing assignments

There has been a significant increase in the popularity and availability of a variety of generative artificial intelligence (AI) tools, including ChatGPT, Sudowrite and others. These tools will help shape the future of work, research and technology but when used in the wrong way, they can stand in conflict with academic integrity at Ohio State.

With effect from January 1, 2024, after a review by the Council on Student Affairs, the Committee on Academic Misconduct (COAM) clarifies that **the unauthorized use of generative artificial intelligence (AI) systems or similar technologies to complete academic activities is prohibited conduct.**

All students have important obligations under the **Code of Student Conduct** to complete all academic and scholarly activities with fairness and honesty. Our professional students also have the responsibility to uphold the professional and ethical standards found in their respective academic honor codes. Specifically, **students are not to use unauthorized assistance in the laboratory, on field work, in scholarship or on a course assignment unless such assistance has been authorized specifically by the course instructor**. In addition**, students are not to submit their work without acknowledging any word-for-word use and/or paraphrasing of writing, ideas or other work that is not your own.**

To maintain a culture of integrity and respect, these generative AI tools should not be used in the completion of course assignments unless specifically cited in the assignment submission. For example, in this course, **you may take help of GenAI tools to enhance your writing skills and/or formatting skills for a writing intensive assignment. If using such tools, you are required to acknowledge it while submitting the assignment.** Failure to acknowledge any work not done by yourself solely and where GenAI tools were used, will result in severe grade penalty (a failing grade might be assigned).

If you have questions about fair use of AI tools for specific assignments, please contact your instructor or TA.

Instructor Feedback and Response Time

I am providing the following list to give you an idea of my intended availability throughout the course. Remember that you can call 614-688-4357 (HELP) at any time if you have a technical problem.

Preferred contact method: If you have a question, please contact me first through my Ohio State email address. I usually reply to emails within **24 to 48 hours on school days**. If you do not get a response within 2 days, you should send a follow up email. To make sure your email does not go in my junk folder, **start the subject line as "GEOG_5212 …..".**

Class announcements: I will send all important class-wide messages through the Announcements tool in CarmenCanvas. Please check your notification preferences (go.osu.edu/canvas-notifications) to ensure you receive these messages.

Discussion board: I will check and reply to messages in the discussion boards once mid-week and once at the end of the week.

Grading and feedback: For assignments submitted by the due date, you may expect to receive feedback and grades within **14 days after the due date**. Assignments submitted after the due date may have reduced feedback, and grades may take longer to be posted.

Grading Scale

93–100: A
90–92.9: A-
87–89.9: B+
83–86.9: B
80–82.9: B-
77–79.9: C+
73–76.9: C
70–72.9: C-
67–69.9: D+
60–66.9: D
Below 60: E

Other Course Policies

Discussion and Communication Guidelines

The following are my expectations for how we should communicate as a class. Above all, please remember to be respectful and thoughtful.

Writing style: While there is no need to participate in class discussions as if you were writing a research paper, you should remember to write using good grammar, spelling, and punctuation. A more conversational tone is fine for non-academic topics.

Tone and civility: Let's maintain a supportive learning community where everyone feels safe and where people can disagree amicably. Remember that sarcasm doesn't always come across online. I will provide specific guidance for discussions on controversial or personal topics.

Citing your sources: When we have academic discussions, please cite your sources to back up what you say. For the textbook or other course materials, list at least the title and page numbers. For online sources, include a link.

Backing up your work: Consider composing your academic posts in a word processor, where you can save your work, and then copying into the Carmen discussion.

Synchronous sessions: During our Zoom sessions I ask you to use your real name and a clear photo of your face in your Carmen profile. During our full-group lecture time, you may turn your camera off if you choose. When in breakout rooms or other small-group discussions, having cameras and mics on as often as possible will help you get the most out of activities. You are always welcome to use the free, Ohio State-themed virtual backgrounds (go.osu.edu/zoom-backgrounds). Remember that Zoom and the Zoom chat are our classroom space where respectful interactions are expected.]

Academic Integrity Policy

Academic integrity is essential to maintaining an environment that fosters excellence in teaching, research, and other educational and scholarly activities. Thus, The Ohio State University and the Committee on Academic Misconduct (COAM) expect that all students have read and understand the university's Code of Student Conduct (studentconduct.osu.edu), and that all students will complete all academic and scholarly assignments with fairness and honesty. Students must recognize that failure to follow the rules and guidelines established in the university's *Code of Student Conduct* and this syllabus may constitute "Academic Misconduct."

The Ohio State University's *Code of Student Conduct* (Section 3335-23-04) defines academic misconduct as: "Any activity that tends to compromise the academic integrity of the university or subvert the educational process." Examples of academic misconduct include (but are not limited to) plagiarism, collusion (unauthorized collaboration), copying the work of another student, and possession of unauthorized materials during an examination. Ignorance of the university's *Code of Student Conduct* is never considered an excuse for academic misconduct, so I recommend that

you review the *Code of Student Conduct* and, specifically, the sections dealing with academic misconduct.

If I suspect that a student has committed academic misconduct in this course, I am obligated by university rules to report my suspicions to the Committee on Academic Misconduct. (Note that "warnings" are not given due to an offense being one's first offense, due to ignorance of what constitutes academic misconduct, or due to any other circumstances.). If COAM determines that you have violated the university's Code of Student Conduct (i.e., committed academic misconduct), the sanctions for the misconduct could include a failing grade in this course and suspension or dismissal from the university.

If you have any questions about the above policy or what constitutes academic misconduct in this course, please contact me.

Other sources of information on academic misconduct (integrity) to which you can refer include:

Committee on Academic Misconduct (go.osu.edu/coam)

Ten Suggestions for Preserving Academic Integrity (go.osu.edu/ten-suggestions)

Eight Cardinal Rules of Academic Integrity (go.osu.edu/cardinal-rules)

Collaboration for the purposes of troubleshooting is highly encouraged in this course, but everyone is expected to complete all assignment tasks themselves and submit their own unique work.
Here are some examples of acceptable and unacceptable behavior:

• Acceptable:
o Asking a classmate how to resolve an unexpected error message, how to find a hidden setting in the software, or similar troubleshooting tasks.
o Participating in a study group study the course material.
o Asking a trusted person to proofread (without revising or rewriting) your assignments before you turn them in.
• Unacceptable:
o Using another student's work (in part or in full) as your own.
o Sharing files and/or using shared files that contain intermediate or final results.
o Submitting the same work (even if modified) from a past semester or from another course.
o Comparing and/or sharing answers before submitting a graded assignment.
o Forgetting to cite sources, including the course materials, websites visited, etc.

There are many other acceptable/unacceptable actions than those exemplified here, so if you have any questions or concerns about acceptable/unacceptable actions or what constitutes academic misconduct in this course, ask your instructor for clarification/permission.

Copyright disclaimer

The materials used in connection with this course may be subject to copyright protection and are only for the use of students officially enrolled in the course for the educational purposes associated with

the course. Copyright law must be considered before copying, retaining, or disseminating materials outside of the course.

Statement on title IX

All students and employees at Ohio State have the right to work and learn in an environment free from harassment and discrimination based on sex or gender, and the university can arrange interim measures, provide support resources, and explain investigation options, including referral to confidential resources.

If you or someone you know has been harassed or discriminated against based on your sex or gender, including sexual harassment, sexual assault, relationship violence, stalking, or sexual exploitation, you may find information about your rights and options at titleix.osu.edu or by contacting the Ohio State Title IX Coordinator at titleix@osu.edu. Title IX is part of the Office of Institutional Equity (OIE) at Ohio State, which responds to all bias-motivated incidents of harassment and discrimination, such as race, religion, national origin and disability.

The university is committed to stopping sexual misconduct, preventing its recurrence, eliminating any hostile environment, and remedying its discriminatory effects. All university employees have reporting responsibilities to the Office of Institutional Equity to ensure the university can take appropriate action:

All university employees, except those exempted by legal privilege of confidentiality or expressly identified as a confidential reporter, have an obligation to report incidents of sexual assault immediately.

The following employees have an obligation to report all other forms of sexual misconduct as soon as practicable but at most within five workdays of becoming aware of such information: 1. Any human resource professional (HRP); 2. Anyone who supervises faculty, staff, students, or volunteers; 3. Chair/director; and 4. Faculty member.

Statement on diversity

The Ohio State University affirms the importance and value of diversity in the student body. Our programs and curricula reflect our multicultural society and global economy and seek to provide opportunities for students to learn more about persons who are different from them. We are committed to maintaining a community that recognizes and values the inherent worth and dignity of every person; fosters sensitivity, understanding, and mutual respect among each member of our community; and encourages each individual to strive to reach his or her own potential. Discrimination against any individual based upon protected status, which is defined as age, color, disability, gender identity or expression, national origin, race, religion, sex, sexual orientation, or veteran status, is prohibited.

To report harassment, discrimination, sexual misconduct, or retaliation and/or seek confidential and non-confidential resources and supportive measures, contact the Office of Institutional Equity: Online at equity.osu.edu, or email at equity@osu.edu

Your Mental Health

As a student you may experience a range of issues that can cause barriers to learning, such as strained relationships, increased anxiety, alcohol/drug problems, feeling down, difficulty concentrating and/or lack of motivation. These mental health concerns or stressful events may lead to diminished academic performance or reduce a student's ability to participate in daily activities. No matter where you are engaged in distance learning, The Ohio State University's Student Life Counseling and Consultation Service (CCS) is here to support you. If you find yourself feeling isolated, anxious or overwhelmed, on-demand mental health resources (go.osu.edu/ccsondemand) are available. You can reach an on-call counselor when CCS is closed at 614- 292-5766**. 24-hour emergency help** is available through the National Suicide Prevention Lifeline website (suicidepreventionlifeline.org) or by calling 1-800-273-8255(TALK). The Ohio State Wellness app (go.osu.edu/wellnessapp) is also a great resource.

Supporting students through tragedy

Tragic events and crises can occur at any point in the semester and may have a profound emotional and cognitive impact on students and instructors. The **Drake Institute has produced resources** that can be used by instructors to provide students support during difficult times. The **Student Advocacy Center** and **Counseling and Consultation Service** are additional resources that help students in crisis.

Accessibility accommodations for students with disabilities

The University strives to make all learning experiences as accessible as possible. If you anticipate or experience academic barriers based on your disability (including mental health, chronic or temporary medical conditions), please let me know immediately so that we can privately discuss options. To establish reasonable accommodations, I may request that you register with Student Life Disability Services. After registration, make arrangements with me as soon as possible to discuss your accommodations so that they may be implemented in a timely fashion. SLDS contact information: slds@osu.edu; 614-292-3307; slds.osu.edu; 098 Baker Hall, 113 W. 12th Avenue.

Religious Accommodations

Our inclusive environment allows for religious expression.

> *"It is Ohio State's policy to reasonably accommodate the sincerely held religious beliefs and practices of all students. The policy* ***permits a student to be absent for up to three days each academic semester for reasons of faith or religious or spiritual belief.***
>
> ***Students planning to use religious beliefs or practices accommodations*** *for course requirements* ***must inform the instructor in writing no later than 14 days after the course begins.*** *The instructor is then responsible for scheduling an alternative time and date for the course requirement, which may be before or after the original time and date of the course requirement. These alternative accommodations will remain confidential. It is the student's responsibility to ensure that all course assignments are completed."*

For more information about religious accommodations at Ohio State, visit Religious Holidays, Holy Days and Observances | Office of Academic Affairs, The Ohio State University (osu.edu).

Course Schedule

This course syllabus provides a general plan for the course; deviations may be necessary. Such deviations may be made for individuals or for the entire class, as deemed appropriate by the instructor. Any changes that affect the entire class will be announced by the instructor with as much advance notice as possible.

Week			5212	*Only Labs are Due @12:30 pm Others * Due Sunday@ midnight*
1	**8/20/2024**	T	**Overview & Database basics**	
	8/22/2024	R	Lab 0: getting started	syllabus quiz*
2	8/27/2024	T	**SQL basics**	
	8/29/2024	R	Lab 1: SQL	Lab 0
3	9/3/2024	T	**Spatial Databases**	Quiz 1*
	9/5/2024	R	Lab 2: SQL	Lab 1
4	9/10/2024	T	**Conceptual modeling**	Quiz 2*
	9/12/2024	R	Lab 3: ER diagram	Lab 2
5	9/17/2024	T	**Logical modeling**	Quiz 3*
	9/19/2024	R	Lab 4: Normalizing tables	Lab 3
6	9/24/2024	T	**Object Orientation**	Quiz 4*
	9/26/2024	R	Lab 5: Creating Geodatabase	Lab 4
7	10/1/2024	T	Project Overview and Prep time	Quiz 5*
	10/3/2024	R	Lab 6: Create PostgreSQL database	Lab 5
8	10/8/2024	T	**EXAM 1**	*open all day*
	10/10/2024	**R**	**No lab (Autumn Break)**	
9	10/15/2024	T	**Spatial objects & Modeling**	proposal*
	10/17/2024	R	Lab 7: Spatial Datatypes in PostGIS	Lab 6
10	10/22/2024	T	**Data Storage**	Quiz 6*
	10/24/2024	R	Lab 8: SpatialFunctions in PostGIS	Lab 7
11	10/29/2024	T	**Indexing**	Quiz 7*
	10/31/2024	R	Lab 9: Geometry & Geography in PostGIS	Lab 8
12	11/5/2024	T	**DBMS Architecture**	Quiz 8*
	11/7/2024	R	Lab 10: Spatial Queries in PostGIS	Lab 9
13	11/12/2024	T	Open week prep time	Quiz 9*
	11/14/2024	R	Open Lab for project help	Lab 10
14	11/19/2024	T	**EXAM 2**	*open all day*
	11/21/2024	R	Open Lab for project help	
15	11/26/2024	T	**Project presentations**	*due by midnight*
	11/28/2024	**R**	**No lab (Thanksgiving Break)**	
16	**12/3/2024**	T	**Project report & peer reviews**	*due by midnight*