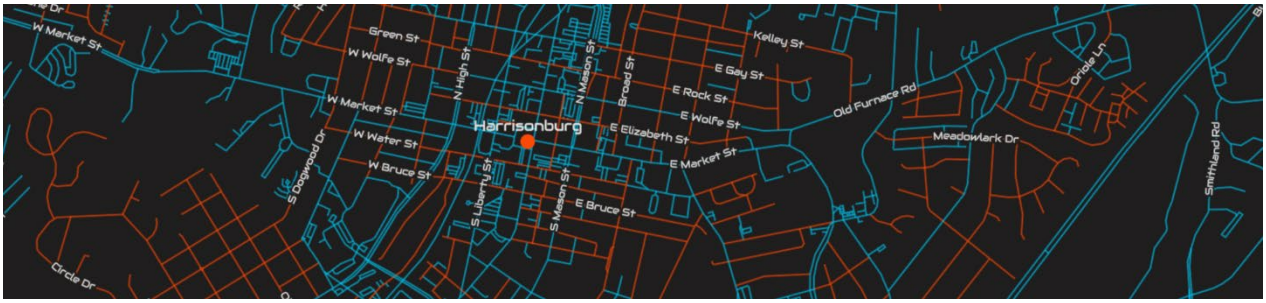
Geography 366: Fall 2025

Intermediate Geographic Information Science



Instructor

Dr. Tim Prestby (he/him/his) | Assistant Professor of Applied GIS | YQVC5Z@jmu.edu

- Office Hours: Mondays and Wednesdays 3:30-5:00pm or by appointment.
- Held in Engineering/Geosciences 2133

Course location: Engineering/Geosciences (Room 2014)

- Mondays and Wednesdays 9:35-10:50 AM

Teaching Assistant:

Sarah Bell | bell3sg@dukes.jmu.edu

- Office Hours: Tuesday 3:45-5:15pm (Room 2005)

Course Description

Geographic information science is much more than knowing how to press buttons to use ArcGIS Pro. It is a way of addressing geographic problems by integrating geographic concepts, logical arguments, and workflows. In this course, you will advance your GIS abilities by connecting GIScience concepts to GIS skills and GIS applications. Course meetings will be a mix of lecture and laboratory formats. Lectures will detail key tools and ways of conceptualizing geographic phenomena to address problems. Laboratory exercises highlight the practical uses of QGIS and ArcGIS Pro software to address different types of questions and problems. GEOG 366 prioritizes the use of both QGIS and ArcGIS to ensure that software becomes a crutch in solving spatial problems. Instead, students will be software agnostic and will rely on their GIS skills and knowledge. Students will work with both vector and raster datasets in lab across many domains.

This course will revisit but expand upon concepts introduced in GEOG 215 and will introduce new concepts.

Course Prerequisite

GEOG 215 with a grade of C or better.

Disclaimer Statement

Please note that as the semester progresses, I might make changes to this syllabus in order to improve the learning environment. Changes to the syllabus shall be given to you in written (paper or electronic) form.

Course Details

Credit Load

GEOG 366 is a 3-credit course with 3 hours of classroom contact per week. Students should expect to spend around 6 - 9 hours of self-directed study and GIS work outside of class per week.

Course Materials

All students taking a geospatial technologies course are required to purchase an external **solid state drive** (**not** a thumb drive) by the start of the second week of class. This drive should be over 500 GB in size, solid state in nature, and have a USB-C connection. Using a drive that does not meet these specifications may result in slower performance, corrupt data, and other issues. Suitable hard drives can be purchased at the JMU bookstore, as well as at discount department stores and electronics stores. Examples of appropriate SSDs: https://www.amazon.com/Netac-Portable-External-Aluminium-Android/dp/B088BTGZ43/?th=1

https://www.amazon.com/SSK-Portable-External-Transmission-Smartphone/dp/B0BGKXX9TK/

Readings are optional and draw from the following text: Bolstad, P. & S. Manson 2022. *GIS Fundamentals: A First Text on Geographic Information Systems. 7th edition* is available in either digital or book form. The digital version can be obtained from RedShelf, or from VitalSource, or through the bookstore. For reasons that are unclear to me presently, the bookstore is unable to reach an agreement with the publisher to shelve the hard copy of this text. If you prefer to read and study with the book, you can order the paperback version here from the publisher Baker & Taylor. Note the differences in price and purchase/rental options between the digital and book versions.

Readings for each class are indicated. Other readings will be available for class use on Canvas. You are advised to do the reading prior to the respective lecture.

Software

The primary software programs for this course are ArcGIS Pro with some use of QGIS, which you can get at https://qgis.org/en/site/.
If you have any questions about this software, please let me know. Both ArcGIS and QGIS software are available on the desktop computers. ArcGIS Desktop might still be utilized on rare occasion for certain data prep tasks.

Course Mode

This is a resident course. It does not include an online or hybrid mode. Course sections are offered in-person only. All content, assignments, and grading will be delivered through Canvas.

Course Goals

Upon completion of this course, you should be able to:

- Understand the role of GIS in society and the workplace.
- Apply the data models used to represent spatial data.
- Detail the importance of topology in the configuration of spatial data.
- Break down the organizational structures of databases.
- Configure geodesy and projections for maps.

- Execute various spatial analysis techniques.
- Create maps and presentations that best reflect the analytical work carried out.

Assessment Policy

Grades are calculated using this set scale:

A-: 90 – 92%	A: 93 – 100%	
B-: 80 - 82%	B: 83 – 87%	B+: 88 – 89%
C-: 70 - 72%	C: 73 – 77%	C+: 78 – 79%
D-: 60 - 62%	D: 63 – 67%	D+: 68 – 69%
F: ≤59%		

The course will be out of a total of 1,000 points. Therefore, each percent of your grade constitutes 10 points. For example, a 7% lab will be out of 700 points.

Labs (70%; 700 points)

There will be ten lab assignments in this course. Each is worth 7% of the course grade. These labs are where you apply concepts introduced in lecture to use GIS to create data, analyze spatial relationships, create maps, and more! Labs are due on the dates and times as indicated on Canvas.

Lab Assignment Grading

A rubric is provided for each lab assignment to indicate how it is graded. The penalty for a late lab assignment is 10% of the total score per day late. **Zero points for a lab late by more than one week.** Submission of an assignment the day it is due, but after the deadline, count as one day late. Labs are due as indicated on Canvas. Technical complications (e.g., disk errors, ArcGIS Crashing) are not reason for extension; be sure to back-up copies of all of your work and version meticulously.

Article Review (Possibly +3.5%; 35 points)

There will be a single article review assignment where you will read a journal article related to GIS and critically analyze it. This is **extra credit**

'Final' Project (27%; 270 points)

There will be a final project where you apply everything you learned in class to create your own GIS workflow to solve a problem.

Final Project Research Statement (3%; 30 points)

The GIS Question/Research Statement One paragraph that: identifies subject, states project goals (Purpose), frames the issue with spatial language, and contextualizes the problem or scenario.

Final Project Proposal (6%; 60 points)

The project proposal consists of the first half of your final paper: (1) the capstone statement; (2) the introduction and background; and (3) the conceptualization portion of your methodology section. I strongly recommend that you attempt to complete the implementation portion of your methodology section at this time, but implementation work flows are not required at the project proposal stage.

Final Project (18%; 180 points)

The final project submission is a ~7 page report on your GIS problem.

Pollinator Mapping Project (3%; 30 points)

There will be a project where you go out and collect data related to pollinators and then analyze the data collected as a class.

Attendance (Possibly -100 points)

Missing **more than** 3 class sessions (4 or more) results in one percent of the overall course grade deducted for each course period missed, up to 10% of your total course grade. Please see the "Attendance" Course policy in the next section for more details about what counts as participation and excused absences.

Course Policies

Attendance

Please come to class! I understand that you have a lot going on in various aspects of your life be it personal, academic, or something else. But coming to class will help you learn more, connect with your classmates and me, and prepare you for a career upon graduating. One of my favorite parts with teaching is connecting with my students, so please show up to class!

Attendance will be recorded each class period. If you do not attend lectures, you will miss valuable content and activities. I do not just read off slides. If you do not attend labs, your map products will not be as good as your peers who do, and your grades will reflect that. Myself and the TA are there to help you so attend lab and take advantage of them!

In the event that you cannot attend class, you need to determine if your absence is excused or not. Certain events qualify as excused absences and do not count toward the 4 class sessions you are allowed to miss without penalty. Examples of an *unexcused* absence are the following: a personal trip (e.g., visit family, attend an event), personal extension of a university holiday or weekend, or club or intramural sports conflicts Please see Section 5.1 of JMU Academic Affairs Policy #16 for what qualifies as an official "excused absence."(https://www.jmu.edu/academic-affairs/_documents/policies/aapolicy-16.pdf). If you are missing class based on the conditions outlined in Section 5.1 of JMU Academic Affairs Policy #16, please email me about the nature of the absence, ensuring that the required notice is provided (when applicable).

For medical absences, I refer to Academic Affairs Policy #16, "faculty must grant excused absences for students who experience an illness and/or medical need, pursuant to the terms specified in their syllabus. Students are not required to disclose the underlying medical circumstance and faculty are not permitted to request such information." This policy is implemented in this course as follows: The instructor requires proof of medical need through a JMU Self-Care note for regular absences or dated non-medical documentation from a medical provider (e.g., hospital discharge papers with the patient's name but no medical information) for missed exams.

Please let me know before the absence if possible. Regardless of whether your absence is excused or not, I encourage you to reach out to myself, the TA, and your fellow students on what you missed.

Deadlines

Any job you get after graduating from JMU will require you to do things to meet deadlines. You should strive to complete assignments by their assigned due dates. The labs in the class take a lot of time, and falling behind on them will make it difficult to learn a lot in the class. Still, I understand that life happens. If you **absolutely** need an extension on an assignment, please reach out to me **before** the due date via email. In this email, you **must** outline a plan for finishing the assignment in a reasonable manner. I will not provide feedback for materials submitted over a week past their original deadline.

Academic Integrity

Academic integrity is fundamental to the learning at JMU. It involves honesty and ethical behavior in all aspects of your academic work. This includes, but is not limited to, doing assignments independently, using proper citations to avoid plagiarism, and taking exams without unauthorized assistance.

To uphold academic integrity in this course:

- Complete all coursework independently unless explicitly instructed otherwise.
- Use only permitted sources for your assignments and research.
- Refrain from sharing information about or from course quiz with others.
- Avoid using unauthorized aids during exams and assignments.

Collaborative learning is encouraged, such as discussing course material or providing feedback on map designs. However, all submitted work must be your own original creation.

Violations of academic integrity will be taken seriously and may result in severe penalties. Refer to JMU's policy The JMU Honor Code for more information.

Artificial Intelligence Statement

With regard to the use of AI tools, like ChatGPT, there is a growing concern that these tools might become crutches— potentially hindering students from honing their writing skills and, more crucially, discouraging independent thought. These concerns are legitimate and demand our attention. At the same time, these tools can complement the learning experience. They can serve as catalysts for exploring and understanding complex concepts. Furthermore, they can assist in identifying and rectifying common writing errors that writers should ideally avoid. The policy for this course is designed to strike a balance. Al tools, including ChatGPT, are allowed for use, but subject to specific conditions: 1) Disclosure: Every assignment in this course must include a statement clarifying whether or not an Al tool has been utilized and, if so, in what capacity. 2) Al may not be used in any way to **generate** your writing, maps, images, etc. for you. This means that drafts of writings, summaries of your maps, and other written works may not be created using Al. Similarly, all maps created in this class must be through GIS software. 3) Al Statement: If you choose to incorporate an Al tool into your process, you are required to include a separate "Al Statement" within your assignment. Think of this statement as a brief reflection essay. It should be about 250 words in length. In it, you should not only describe your experience of using the Al tool but, more importantly, convincingly convey the significant insights and lessons you gained through the process. These insights should be on par with what you might have learned had you completed the assignment without Al assistance. The assignment will be graded in light of your explanations in the Al statement, thus it is important to persuade me that your use of Al tools provided a valuable learning experience. As a word of caution. It is essential to recognize that most generative Al programs, including ChatGPT, have their limitations. Please refrain from assuming the information provided by ChatGPT is infallible. Always verify the information, especially when it comes to references. ChatGPT has been known to generate fictional sources, making fact-checking an indispensable practice in your academic journey.

Long story short, don't cheat. This class is not excessively difficult by any means. Give it a try and I promise you'll learn some interesting (and useful!) stuff. Cheating does nothing but waste time (for both of us!) and the money you've invested in taking this course. You're here at JMU to learn—do it!

Etiquette and Classroom Conduct

To create a respectful and productive learning environment for everyone, please:

- Arrive on time and stay for the entire class period.
- Silence your phone and avoid unnecessary conversations during class.
- Refrain from eating or drinking in a disruptive manner.

Disruptive behavior may result in being asked to leave class.

Netiquette

Effective communication is essential for a successful course. When emailing your instructor or TA:

- Be respectful and clear in your message.
- Include your name and course number (Geog 215) in the subject line.
- Allow 48 hours for a response, excluding weekends and holidays.
- Politely remind us after the 48 hour period has passed

Social Media and Course Materials

Unauthorized sharing of course materials on social media or other platforms is prohibited.

- Avoid posting course materials online without explicit permission.
- Respect the intellectual property of your instructor and classmates.

Violations of this policy may result in disciplinary action. All course content is protected by copyright law.

Change in Normal Campus Operations

During the semester, there may be days during which the class will not meet due to inclement weather. Please refer to the following website for details on JMU's policy on inclement weather: http://www.jmu.edu/JMUpolicy/1309.shtml. Changes to the course in the event of campus emergencies will be communicated via Canvas/email.

Inclusivity Statement

Inclusivity is a core value of CISE and the wider university community. This means fostering a diverse, welcoming, and equitable learning environment – something that we all contribute towards. This is an inclusive classroom. As such, we embrace the rich spectrum of diversity within our community and across the globe, spanning differences in race, ethnicity, faith, sexual orientation, gender, socio-economic background, accessibility, political ideologies, or any other distinction among individuals. It is our firm stance to unequivocally condemn acts of harassment or expressions of hate directed toward individuals or groups on the basis of these differences. We will actively work to ensure that everyone is welcome and is invited to share their perspectives.

There will be absolutely zero tolerance for **racist, sexist, homophobic, transphobic, classist, ableist or otherwise discriminatory remarks and hostile behavior of any kind**. We will respect one another, even if we do not agree, and it is everyone's right to be able to participate fully and meaningfully in a learning

environment free of such behavior or attitudes. If there is any reason such a space has been compromised for you, please know my door is open for an honest and non-judgmental conversation about this and I will make every effort to address it.

To learn more, visit the JMU Inclusive Excellence website https://www.jmu.edu/cise/inclusive-excellence.shtml.

Students with Diverse Abilities

All of us learn in different ways and, depending on how those ways are applied, with varying degrees of success. If you know of any factors in your life that may hinder your ability to learn up to your potential in this course, please notify me at once. In order to receive consideration for formal accommodations provided by the university, you need to contact the Office of Disability Services (Wilson Hall, Room 107, www.jmu.edu/ods, 540-568-6705). Disability Services will provide you with an Access Plan Letter that will verify your need for services and make recommendations for accommodations to be used in the classroom. Once you have presented me with this letter, you and I will sit down and review the course requirements, your disability characteristics, and your requested accommodations to develop an individualized plan, appropriate for the course. NOTE: You are under no obligation to disclose your disability to me, I simply need to know the best ways to support you in your learning. However, it is your (the student's) responsibility to inform the instructor of any special needs before the end of the second week of classes.

JMU abides by Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act, which mandate reasonable accommodations be provided for students with documented disabilities.

Dropping and Adding Courses

Students are responsible for registering for classes and for verifying their class schedules on e-campus.

Keep the following deadlines in mind:

- The deadline for adding without academic unit permission or dropping without a "W" grade through MyMadison is **August 29th**.
- The deadline for withdrawing from the university with cancellation of tuition charges and refund is **September 9th**.
- The deadline to drop a regular semester class with a "W" grade or to change the course credit option is **October 21st**. Corresponding tuition charges will apply for all classes assigned a grade of "W."

Corresponding tuition charges will apply for all classes assigned a grade of "W." No exceptions will be made to these deadlines.

Turn It In

The JMU community uses a plagiarism detection system called *Turnitin*. Turnitin is integrated into Canvas and is available for use by all JMU faculty and students. For more information about Turnitin, refer to http://www.jmu.edu/academicintegrity.

Students Helping Students

Students are expected to help each other— especially for lab projects. Students who are already familiar with the software are expected to help those who are not. We want to create an atmosphere where everyone shares tips, short-cuts, and other information about the programs we are using for the exercises. There is much to learn about map design and production, and we want to alleviate the overhead of learning the software as much as possible. What's in it for the students already skilled with a program? The simple answer is a quote attributed over time to several sources: "The best way to learn is to teach." However, the work that you submit and do must be your own!