**ESM 263: Geographic Information Systems**
**Course Syllabus, Winter 2025**

**Instructors**: Lab - Jamie Miller (jkmiller@bren.ucsb.edu )
Lecture - Sean C. Reid (seanreid@ucsb.edu)
**TA**: Esaú Casimiro Vieyra

**Office Hours**:
Jamie: Tues/Weds 5:20-6:00 after lab (Bren 3035); Weds 1:00-2:00 (Bren 3035)
Sean: *TBD*
TA Office Hours: *TBD*

**Class times**:
Lecture: Monday 3:30-4:45 (Bren 1414)
Labs: Tuesday 3:30-5:20 or Wednesday 3:30-5:20 (Bren 3035)

**Course Introduction**
Welcome to ESM 263: Geographic Information Systems (GIS)! We are excited to have you and we hope to make this class beneficial for everyone. This course is designed to be an advanced "introduction" to GIS. We will move through topics quickly to allow time to practice essential skills on lab assignments. If you have never taken a GIS class before, things will feel like they are moving quickly. If you have some GIS experience, things will feel a bit slow at first but we hope to round out your GIS skills and provide additional insights. We understand that there are varying levels of exposure to GIS among the students in the course and we hope to work together with you all to create a helpful and cohesive learning environment.

The objectives of this course are for you to:

1. Understand core GIS principles and concepts covering data types, management, analysis, and visualization
2. Gain exposure to and experience with a range of GIS tools, with a primary focus on ESRI products
3. Gain confidence applying spatial concepts and analyzing/troubleshooting spatial data problems

**Course Structure:** For the majority of the course, there will be one lecture on a key concept in GIS, paired with a computer lab exercise. In the final weeks of the quarter, you will apply your knowledge and skills to a project where you use the comprehensive skills you've learned in the course.

**Lectures:** Lectures will explore different topics in GIS. In class attendance is required and participation will count towards your final grade.

**Lab and Lab Assignments:** Lab sections are designed to expose you to common GIS tools and processes. Students will use real data to address a short spatial analysis problem. You are expected to try troubleshooting and googling issues on your own, but instructors are there for help navigating hurdles that google didn't solve. All *analyses* should be completed individually, though peer-to-peer discussion is encouraged. The first two assignments you will turn in individually, with specific deliverables noted in the lab activity. Later labs are more involved, as are the write-ups. These assignments will be completed

in pairs. Pairs may work together for two consecutive labs, but are encouraged to switch partners to foster collaboration. Pair are expected to contribute to the lab report equitably and will receive the same grade on the assignment. See template for team labs. Lab directions will use and be supported by the instructors in ArcGIS Pro, though students are welcome to complete the exercise in the GIS program of their choice.

**Project:** The project is your chance to synthesize and apply your knowledge, and hopefully gain exposure to new tools we didn't cover! There will be dedicated time to work on projects during class. You are welcome to work individually or in pairs, but all students are expected to conduct meaningful GIS analyses. More details will be posted to Canvas in the coming weeks.

**Attendance & Participation:** Like all skills, developing GIS skills requires motivation and patience. Please come to class on time and prepared to focus the entire period. Troubleshoot via Google, ask thoughtful questions, engage with your classmates and the material. Please post GIS questions to the class Google Doc Q&A rather than direct emails and please respond to callouts from your classmates or the instructors. Consistent, meaningful participation is crucial to your learning (and grade) outcomes. Please email the instructors asap if you become ill or for other unexpected conflicts.

**Grading:** Grading is based primarily on lab, projects and participation. A rubric for the labs will be posted to canvas.

*Intro Labs:* 2 assignments, individual (10%) (see lab documents)
*Team Lab Assignments:* 4 assignments (40%) (template)
*Project:* 1 assignment (30%)
*Participation and Quizzes:* 20%

**Assignments are due at the day and time listed on Canvas.** Late assignments will lose 1 point if it is not turned in by midnight on the day it is due and 1 additional point each day that it is late, up to a maximum of 50% of the assignment value (i.e. it is always better late than never). We will make exceptions in rare and extenuating circumstances, but will do our utmost to be fair to the entire class.

---

**Acknowledgements:** ESM 263 builds on a collaborative effort and shared materials developed by Ashley Larsen, Jamie Miller, Brian Lee, Jim Frew, Niklas Griessbaum and Paul Bolstad. We seek to incorporate student ideas and comments as much as possible, and thank you all in advance for answering surveys and helping us continue to improve this course for current and future students.

****Consider the syllabus a living document. Lecture topics & schedule are subject to change ****

**Tentative Schedule:**

| Week | Topic | Lab |
|---|---|---|
| 1 | Introduction to GIS | Intro to Arc & mapping distribution of California Protected Areas<br>Individual; 5pts<br>Due Monday 1/13 @ 3:30 |
| 2 | Coordinate systems & projections | Why Coordinate systems matter<br>Individual; 5pts<br>Due Monday 1/20 @ 3:30 |
| 3 | Vector data | Vector processes; 2023 flooding<br>Team; 10pts<br>Due Monday 1/27 @ 3:30 |
| 4 | Tabular data | Tables; joins, subsetting; Mapping agricultural extent and pesticide use in California<br>Team; 10pts<br>Due Monday 2/3 @ 3:30 |
| 5 | Raster data | Reclassify, resample, zonal statistics; Mapping land use change near protected areas<br>Team; 10pts<br>Due Monday 2/10 @ 3:30 |
| 6 | GIS models & workflow | Linking it all & model builder<br>Team: 20pts (2 labs)<br>Due Monday 2/24 @ 3:30 |
| 7 | Reproducibility & programming (guest lecture) | |
| 8 | Special topics (lecture); Project (lab) | Project presentation & annotated slides<br>Team: 30 pts<br>Due Wednesday 3/12 |
| 9 | Special topics (lecture); Project (lab) | |
| 10 | **Finalize Projects** | |

# University and Course Policies

**Academic Integrity Policy**
All UCSB students must complete original assignments with academic integrity.

"It is expected that students attending the University of California understand and subscribe to the ideal of academic integrity, and are willing to bear individual responsibility for their work. Any work (written or otherwise) submitted to fulfill an academic requirement must represent a student's original work. Any act of academic dishonesty, such as cheating or plagiarism, will subject a person to University disciplinary action. Cheating includes, but is not limited to, looking at another student's examination, referring to unauthorized notes during an exam, providing answers, having another person take an exam for you, etc. Representing the words, ideas, or concepts of another person without appropriate attribution is plagiarism. Whenever another person's written work is utilized, whether it be a single phrase or longer, quotation marks must be used and sources cited. Paraphrasing another's work, i.e., borrowing the ideas or concepts and putting them into one's "own" words, must also be acknowledged. Although a person's state of mind and intention will be considered in determining the University response to an act of academic dishonesty, this in no way lessens the responsibility of the student."
http://www.sa.ucsb.edu/Regulations/student_conduct.aspx

When in doubt, cite the sources of ALL ideas in your work, including websites, blogs, reviews, articles, newspapers, as well as scholarly references.

All course materials (class lectures and discussions, handouts, examinations, web materials) and the intellectual content of the course itself are protected by United States Federal Copyright Law and the California Civil Code. UC Policy 102.23 expressly prohibits students (and all other persons) from recording lectures or discussions and from distributing or selling course materials without the prior written permission of the instructor. (See http://policy.ucop.edu/doc/2710530/PACAOS-100). Students are permitted to make notes solely for their own private educational use. Exceptions to accommodate students with disabilities may be granted with appropriate documentation.

The use of artificial intelligence models also fall under the purview of the Academic Integrity Policy. The growing number of useful models can be a resource to you in this class but you cannot use AI chatbots to produce any of your submitted work. If you use AI to assist you, then you must include a disclaimer in your assignments/projects detailing how AI was used. We will discuss helpful (or detrimental) ways AI can be used in the field of GIS. If we suspect improper use of AI tools, you will receive a zero on the assignment/project until you have discussed it with your instructor. A grade of a zero is not placing blame but simply indicating additional information is needed. The grade can easily be reversed after meeting with the instructor. Technology is rapidly evolving and we are actively adapting to the challenges the best we can and we appreciate your patience and understanding!

**Sexual harassment**
UCSB does not tolerate sexual harassment/sexual violence, which is prohibited by University policy and state and federal law. The Title IX Compliance and Sexual Harassment Policy Compliance Office (TIX/SHPC) provides assistance in preventing and resolving and investigating complaints of sexual harassment/sexual violence and gender discrimination. UCSB's Title IX office handles all issues surround sexual harassment, according to university and federal policy: https://titleix.ucsb.edu/

**Mandatory reporting**
It is an instructor's responsibility to help create a safe learning environment on our campus. Students should be informed that instructors have a mandatory reporting responsibility related to their role as a professor. The instructor is *required* to share information regarding sexual misconduct or information about a crime that may have occurred on UCSB's campus or in the community. A result of the mandated report will be that students will receive outreach and resources from the campus Title IX office. Students may speak to someone confidentially by contacting CARE, Campus Advocacy, Resources & Education at the 24/7 advocacy line at (805) 893-4613 or visit them in person at the Student Resource Building.

**Gender and Sex Discrimination Policy and Student Support**
Under Title IX, university students are protected from harassment and discrimination based on gender and sex. If a student feels uncomfortable or in need of support at any time related to their gender, sex, and/or sexual orientation, please contact your advisor immediately. If a student would like to disclose information related to pronouns, name changes, or identities, we encourage you to do so. UCSB's Resource Center for Sexual and Gender Diversity on the 3rd floor of the Student Resource Building is also available to advocate and be of and support to students.

**Non-discrimination policy**
All students have the right to learn and participate in a classroom environment free of intimidation, harassment, and discrimination based on characteristics such as gender, race, age, sexual orientation, disability, religious or political beliefs and affiliations. I will address any related issues that surface immediately; please help me to cultivate a positive classroom environment by communicating any concerns that you have.

**Mental health services**
Personal concerns such as stress, anxiety, relationships, depression, cultural differences, can interfere with the ability of students to succeed and thrive. If you are experiencing any difficulties meeting class requirements, or any difficulties in your personal life, please contact UCSB Counseling and Psychological Services (CAPS). For information, please call (805--893--4411) or visit their website (https://caps.sa.ucsb.edu/).

In addition, UCSB has tons of resources help you gain the information, skills, and support systems you need to thrive and succeed academically: https://wellbeing.ucsb.edu/

**Food Security and Calfresh**
If you are facing any challenges securing food, and believe this may affect your performance in the class, you are urged to meet with a Food Security and Calfresh Advocate, who is aware of the broad variety of resources that UCSB has to offer (see their drop-in hours at food.ucsb.edu). You are also urged to contact the professor or teaching assistant if you are comfortable doing so. Please visit food.ucsb.edu for additional resources including Calfresh, the AS Food Bank, and more.

**Classroom Responsibility and Courtesy**
This course has a mix of experience related to GIS. Students are welcome to express their opinions, but they should be expressed (and received) respectfully. Please put your cell phones on vibrate (or off!), do not text, and limit laptop use to note-taking. Respect fellow students and the hard work of others: in other words, your work must be your work, plagiarism will not be tolerated.

**Disabled Students Program (DSP)**

Accessibility Accommodations for students with disabilities. All accommodations will be made for students with learning and physical differences, according to university and federal policy: http://dsp.sa.ucsb.edu/. If you are enrolled in the DSP program, please submit your information with the DSP office as soon as possible. We cannot accommodate requests unless they formally come from the DSP office.