

ESM 263: Geographic Information Systems Course Syllabus, Winter 2024

Instructor: Professor Ashley Larsen (larsen@bren.ucsb.edu)
Teaching Assistant: Jamie Miller (jkmiller@bren.ucsb.edu)

Class times:

Lecture: Monday 3:30-4:45 (Bren 1414)

Labs: Tuesday 3:30-5:20 or Wednesday 3:30-5:20 (Bren 3035)

The objectives of this course are for you to:

1. Understand key GIS principles and concepts
2. Gain exposure to and experience with a range of GIS tools
3. Gain confidence applying spatial concepts and analyzing/troubleshooting spatial data

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.

Lectures: Lectures will explore different topics in GIS. It is strongly encouraged that you attend in-person lectures. In-person lectures will be recorded and posted to canvas as a resource.

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, with the first author responsible for the first and final draft, and the second author responsible for peer-review comments and explaining any differences in results. Pairs will work together for two consecutive labs so that each individual is a first and second author on one. 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 instructor asap (Larsen@bren.ucsb.edu) 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 pts) (see lab documents)

Team Lab Assignments: 4 assignments (50 points) ([template](#))

Project: 1 assignment (40 points)

Participation: 25 points

Acknowledgements: ESM 263 in 2024 was a collaborative effort between the instructor, and PhD students Jamie Miller and Brian Lee. It also builds on the shared materials of others, particularly 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****

Week	Topic	Lab
1	Introduction to GIS	Intro to Arc & mapping distribution of California Protected Areas Individual; 5pts Due Monday 1/15 @ 3:30
2	Coordinate systems & projections	Why Coordinate systems matter Individual; 5pts Due Monday 1/22 @ 3:30
3	Vector data	Vector processes; 2023 flooding Team; 10pts Due Monday 1/29 @ 3:30
4	Tabular data	Tables; joins, subsetting; Mapping agricultural extent and pesticide use in California Team; 10pts Due Monday 2/5 @ 3:30
5	Raster data	Reclassify, resample, zonal statistics; Mapping land use change near protected areas Team; 10pts Due Monday 2/12 @ 3:30
6	GIS models & workflow	Linking it all & model builder Team: 20pts (2 labs)
7	Reproducibility & programming (guest	Due Monday 2/26 @ 3:30

	lecture)	
8	Project	Project presentation & annotated slides Team: 40 pts Due Wednesday 3/13
9	Project	
10	Project & project presentations	