

GEOG 4150/5150: Spatial Database Development

Fall 2021

Instructor Information

Instructor	Email	Office Location & Hours
Dr. Elizabeth Delmelle	edelmell@uncc.edu	Virtually Tuesdays 9:00am EST or by appointment
Yu Lan (TA)	ylan1@uncc.edu	Virtually Wednesday 10:00am-12:00pm EST or by appointment

General Information

Description

This course will guide you through learning about relational database design, Structured Query Language (SQL), and spatial databases. We will primarily be using PostgreSQL and PostGIS - two open source (free!) relational databases. You will need to install these on your own personal computer (I'm assuming that you have a computer if you have registered for an online class. They are both friendly to Macs and PCs!

Learning Outcomes

- Be able to design and implement effective relational database
- Be proficient in writing SQL queries
- Understand the fundamentals of spatial databases
- Write spatial queries and perform basic spatial analyses within a spatial database

Course Materials

Required Materials

- Practical SQL. A Beginner's Guide to Storytelling with Data by Anthony DeBarros
- <https://postgis.net/workshops/postgis-intro/index.html>
- Beginning Database Design Solutions by Rod Stephens (e-book available through UNCC library. Follow link on Canvas.)

Course Evaluation

- Weekly Quiz - to test your knowledge of the presented material. There are 13 quizzes in total and they must be completed by Friday 5:00pm (EST). These range from 2-5 points each for a total of 40 possible points throughout the semester (18% of total grade).
- Homework - Most weeks there will be a homework assignment where you get to practice what you've learned. Homework assignments are on average worth 10 points for 120 possible points throughout the semester (55% of grade).
- Mini-Projects - In lieu of exams, you will be assigned two mini-projects that enable you to put together the pieces we've learned each week. The first will focus on database design,

implementation, and SQL queries and the second will use PostGIS to build and query a spatial database. Each will be worth 30 points for 60 possible points (27% of grade).

Course Logistics

This is an asynchronous online course. Logistically, that means that each week (by Monday morning at the latest, but I will aim for Sunday), a new module will be opened to you on Canvas that includes lectures, details on the weekly readings, the homework assignment and quiz. The homework and quiz (unless for some reason noted otherwise) will be due by the end of the working day on Friday (5pm). It is therefore imperative that you pace yourself throughout the week on completing the work. Plan for the equivalent of 2 class periods plus homework time that you devote to in-person classes. Due to the technical nature of the material, it is best grasped by you sitting down and really trying to understand the material and by practicing! I will be your guru guide through this experience, but the learning is up to you! I have chosen the topics, exercises, book, etc. in a way that through years of teaching this course, I believe will optimize your chances of successfully understanding the content.

Communication\Office Hours

The TA and I are here to help you in your spatial database journey! I will have regular, virtual ‘drop-in’ office hours each Tuesday at 9am EST. The TA will also have regular, virtual ‘drop-in’ office hours each Wednesday at 10am-12pm EST. If this time does not work for you, please email us and we will gladly arrange an alternative time to meet!

You are welcome to email me questions you have regarding the course. Please bear in mind the time zone differences this semester. I am 6 hours ahead of you, so you will likely not get an instant response in the evening, but rather a very early one the next morning. Please allow for 24hours for an email response. Your TA is in your time zone, so you can send her questions!

Course Schedule

Week	Topic	Reading	Exercises
Week 1: 8/23	Database Fundamentals	Stephens Ch. 1 SQL Book	Install PostgreSQL Quiz 1
Week 2: 8/30	Relational Database Fundamentals	Stephens Ch. 2&3 SQL Book Ch. 1	HW 1 - Create Tables Quiz 2
Week 3: 9/7	SQL Queries	SQL Book Ch. 2	HW 2 - Select Statements Quiz 3
Week 4: 9/13	Data Types & Data Entry	SQL Book Ch. 3&4	HW 3 - Data Entry Quiz 4
Week 5: 9/20	ER Diagrams	Riccardi Chapter (Posted on Canvas)	HW 4 - ER Diagram Quiz 5
Week 6: 9/27	ER to Relational Databases	Elmasri & Navathe (Posted on Canvas)	HW 5 Quiz 6
Week 7: 10/4	Normalization	Stephens Ch. 7	HW 6 Quiz 7
Week 8: 10/11	Joining Tables & Table Design	SQL Book Ch. 6&7	HW 7 Quiz 8

Week	Topic	Reading	Exercises
Week 9: 10/18	Group By & Summarize	SQL Book Ch. 8	HW 8 Quiz 9
Week 10: 10/25	Advanced Query Topics	SQL Book Ch. 9&12	HW 9 Quiz 10
Week 11: 11/1	Mini-Project (put the pieces together so far)		
Week 12: 11/8	Introduction to Spatial Databases & PostGIS	SQL Book Ch. 14	Quiz 11
Week 13: 11/15	Digging into PostGIS & SQL		HW 11 Quiz 12
Week 14: 11/22	<i>Thanksgiving Week</i>		
Week 15: 11/29	PostGIS Continued		HW 12 Quiz 13
Week 16: 12/6	Final Project Assigned		

Academic Integrity

All students are required to read and abide by the Code of Student Academic Integrity. Violations of the Code of Student Academic Integrity, including plagiarism, will result in disciplinary action as provided in the Code. Definitions and examples of plagiarism are set forth in the Code and on the [Student Conduct and Academic Integrity website](#). The Code is available from the Dean of Students Office or online at legal.uncc.edu/policies/up-407. Additional resources are available on the [Student Conduct and Academic Integrity website](#).

Turn in only work that is your own!

The standards and requirements set forth in this syllabus may be modified at any time by the course instructor. Notice of such changes will be by email/Canvas announcement or by changes to this syllabus posted on the Canvas course page.