Spring 2024 CSE 491-002

Tue/Thur 10:20-11:40am

Plant and Soil Sciences Rm A155

Professor James Mariani

CSE 491 Instructors

- James Mariani
  - Professor of Instruction
- Abigail – Teaching Assistant
  - Graduate Student
- Haobo – Teaching Assistant
  - Graduate Student

CSE 491 Office Hours

- James Mariani
  - TBA
  - EB 3145
- Abigail – Teaching Assistant
  - TBA
  - In person and by Zoom
- Haobo – Teaching Assistant
  - TBA
  - In person and by Zoom
- All Zoom links will be on Piazza
- Will start next week

CSE 491 Office Hours

- Additional meetings scheduled by email/piazza

- If many students waiting, 10 minutes per student
  - Can rejoin line

- Come to office hours early
  - Will end office hours at posted times

4

Potential Materials

- Cloud Computing Concepts, Technology & Architecture 19th Printing
  - o Zaigham Mahmood and Riccardo Puttini
- A First Course in Database Systems Third Edition
  - o Jeffrey D. Ullman & Jennifer Widom
- These books are not required, and I do not recommend buying them
- Older versions of the book are encouraged

5

Piazza/D2L

- Link to our Piazza

  – https://piazza.com/msu/spring2024/cse491002/home

- Piazza Policies

  – Expect answers within ~2 hours during following times

    - Monday-Thursday: 9:00am – 7:00pm

    - Friday: 9:00am – 4:00pm

  – Project questions won't be answered after 5pm on due date

    - You will have at least 10 days for every project

- D2L Will be used for grades and file uploads

Course Goals

- To develop an understanding of the systems commonly used for information management
- To apply information management systems to software application development
- To apply information retrieval methods
- To develop an understanding of cloud computing methodologies
- To apply cloud computing to software application development
- To understand security and privacy implications of cloud computing and client server applications

What is This Class?

- Designed to be a new required 300 level: CSE 380
  - A prerequisite to CSE 476, 477, 480, 482
- Currently running as a 491
  - Will count as a technical elective while it is 491
- This is the first time this course has ever been offered
  - Things might change
  - Will be asking for feedback throughout the semester

This Course and CSE 480

- If you've taken CSE 480 before...
  - Lucky you
- If you're currently taking CSE 480...
  - Lucky you
- If you don't know anything about CSE 480...
  - Poor you
- We'll focus a lot more on database design for application scenarios, cover none of the "under the hood" database stuff

9

Tentative Class Topics

- Introduction to Database Systems
- Data Formats
- Data Models
- SQL Querying
- Database Design
- Optimizing Information Retrieval
- Data and Database Security
- Motivation and Use Cases of the Cloud
- Major Offerings of the Cloud
- Containerization
- APIs
- Microservices
- Serverless Computing
- Cloud Security
- Perhaps more…

Course Work

- Quizzes

- Coding Projects

- Exams

- Final Exam

11

Quizzes

- Quizzes will occur throughout the first part of the semester, to test your progress on database concepts
  - The dates will be announced (rejoice)
- Can contain any material covered in class
  - Up to the previous lecture
- Will be relatively short
  - 40-50 minutes each
  - Have you been keeping up with the material
  - Can you apply database concepts to new scenarios
- If any answers are unreadable, it will be marked as incorrect
  - Left to the instructors' discretion

Coding Projects

- Four coding projects
  - Give you experience developing common applications used in cloud computing
  - Submission TBA
  - Programming Language TBA
    - Have tested in Python, JS, and Java
    - Will announce final decision early so you can prepare
- No credit if project does not run

13

Coding Projects

- Some projects build off each other
  - Will not provide reference solutions
  - Must complete project to continue with future projects
  - Will give more help during office hours after due date

14

Exams

- Three exams this semester
  - Serve as checkpoints on your progress
  - No traditional midterm exam
- Each exam split into two parts:
  - Fundamentals
  - Application
  - ExamX-f and ExamX-a
- Exam: Fundamentals
  - Can contain information from the entire semester
  - Tests your fundamental understanding of the concepts covered in class
  - Not going to trick you
  - Must achieve 75% average on fundamentals portions of all 3 exams
  - This may change, but will not be higher than 75%
- Exam: Application
  - Take what you've learned and apply it to new scenarios
  - More traditional exam questions
  - Only material since previous exam
  - No direct average requirement

Final Exam

- Friday, April 26th
  - 7:45am – 9:45am
    - Worst possible exam slot
  - Do not buy plane tickets to leave, the final is required
- Final also split into fundamentals and application
  - Same requirements as normal exams
- If any answers are unreadable, it will be marked as incorrect
  - Left to the instructors' discretion

Grade Distribution

- Projects: 40%
  - 10% each
- Quizzes: 15%
  - 5% each
- Exams: 30%
  - 10% each
- Final Exam: 15%

Grade Scale

- \>= 90% = 4.0
- 85% – 89% = 3.5
- 80% – 85% = 3.0
- 75% – 79% = 2.5
- 70% – 74% = 2.0
- 65% – 69% = 1.5
- 60% – 64% = 1.0
- < 60% = 0.0
- This scale might be adjusted so the grade cutoffs are lower, but it will never be adjusted higher

18

Minimum Required Grades

- To be eligible to pass CSE 491 you must achieve:
  - 50% of the points available in each category
  - In addition to the fundamentals requirement for exams

- Getting 50% in each category by itself is not enough to pass the course, but is required to be eligible to pass the course

Extenuating Circumstances

- You must inform me of any circumstances before class happens
  - Requires documents
  - Left to my discretion
    - Trips, interviews, etc. will not be excused
  - MSU has grief absence and religious observance policies
- See syllabus for fully written out policies

Course Policies

- Attendance Policy
  - Attendance required
  - But not checked

- Email Policy
  - All emails must be sent from your official MSU Email
  - Put [CSE 491] in the subject line, or it might get lost

- See syllabus for academic dishonest, grief absence, and religious observance policies

21

Course Policies – Academic Dishonesty

- Full Academic Dishonesty Policy on Syllabus
- A few notes:
  - Any instance of academic dishonesty is an ADR and automatic failure of CSE 491
  - There are no devices or notes allowed on any quiz/exam
    - If I see a phone or computer out during a quiz/exam it will be an automatic ADR
  - No self plagiarism
    - If you have written code for another class, or have taken CSE 480 previously…
    - Do not use that code for this semester, if it is found that you used previous code (even if it was written by yourself), it will be considered academic dishonesty

22

Course Policies

- If you have a VISA
  - Let me know ASAP
  - If I do not know of your visa before the first quiz/exam/project, I will not be able to accommodate your VISA for that quiz/exam/project

23

Tentative Course Schedule

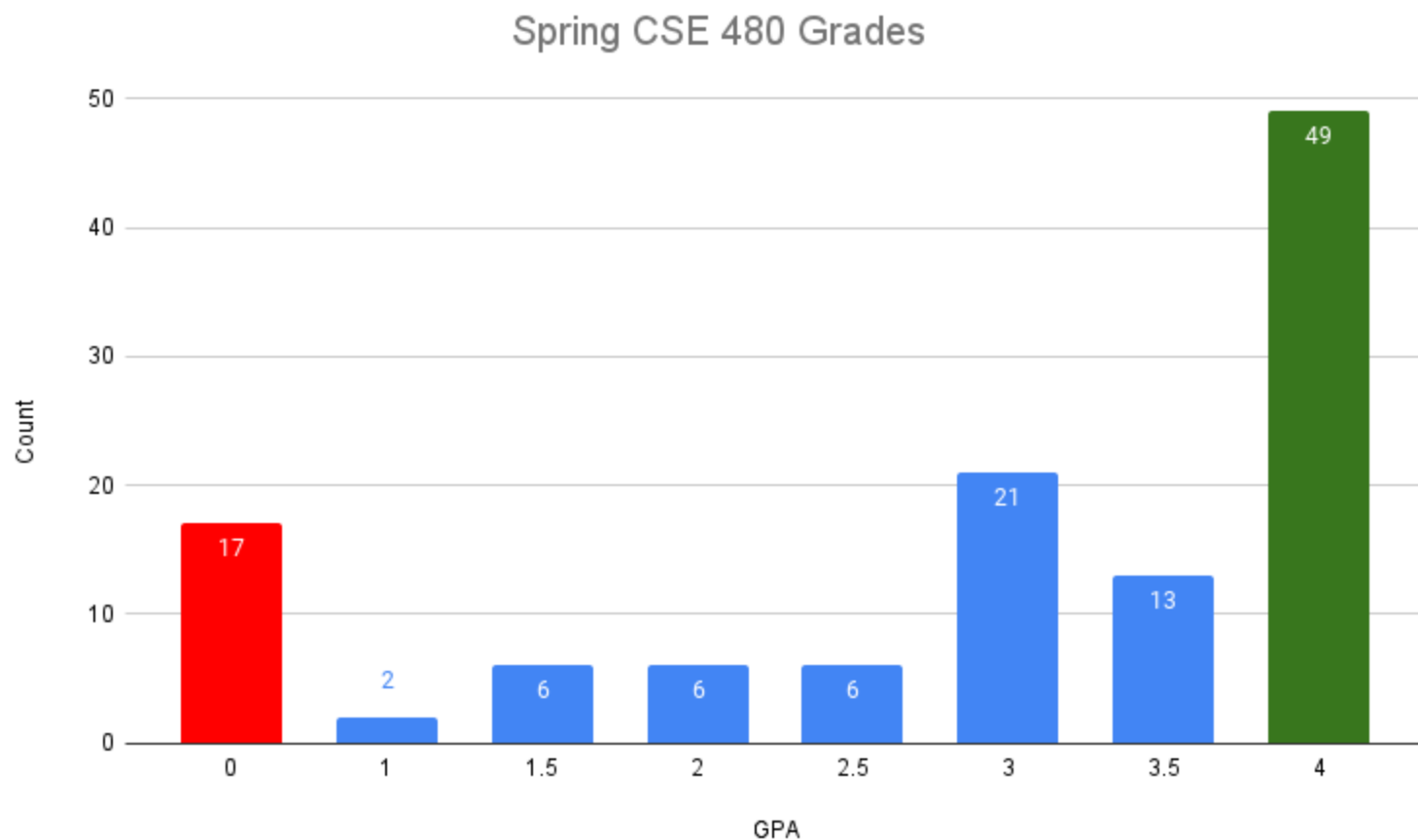| Date	Notes
January 23	Quiz 1
February 1	Quiz 2
February 15	Quiz 3
February 16	Project 1 Released
February 22	Exam 1
March 6	Project 1 Due
March 8	Project 2 Released
March 14	Exam 2
March 20	Project 2 Due
March 22	Project 3 Released
April 3	Project 3 Due
April 5	Project 4 Released
April 11	Exam 3
April 17	Project 4 Due
April 26	Final Exam

Some General Advice for Success

- This is not a class you can succeed in if you cannot manage your time
  - Projects will have at least 10 days
  - There is a reason you get this much time for projects
- Quizzes and Exams are worth a significant amount of your grade
  - To succeed you will need to be studying a little bit every week (not cramming at the end)
  - Quizzes and Exam Fundamentals will not try to trick you, if you keep up with the material and review often, you should have no trouble

Some General Advice for Success

- We have no graded projects for the first few weeks of the course, only quizzes
  - You need to be self-motivated to study

26

Grade Distribution from Spring 2023

Spring CSE 480 Grades

Class Overview

- Main topics of interest
  - Data and databases
  - Cloud computing
  - Security

Class Overview

- Data and databases
  - No graded homeworks/projects
    - Some future projects will involve a database, however
  - Quizzes (Jan 23, Feb 1, Feb 15)
  - Exam 1 heavily focused on data/databases
  - Will release sample database
  - Will release sample querying/design questions
  - It is your choice to complete them or not, but they are your study guide for the quizzes

Class Overview

- Data and databases
  - Our focus will be on general SQL querying, database design, using databases for common applications
  - I will provide SQL syntaxes on quizzes/exams
    - You just need to know how to use them

30

Class Overview

- Cloud computing
  - 4 graded projects, all with some relevance to cloud computing/cloud-style applications
    - Most will involve a database
  - Exams 2 and 3 heavily focused on cloud
  - Goal is to introduce you to the main uses of the cloud

Class Overview

- Cloud computing topics
  - What can the cloud do?
    - Motivation and use cases of the cloud
    - Major offerings of the cloud
  - How is cloud commonly used
    - Containerization
    - APIs
    - Microservices
    - Serverless
  - This might change, as I've prepared many topics on the cloud, if we have more time then more will be added

Class Overview

- Security
  - Will be part of every topic in the course
  - Will be tested in Exams, and Projects
- Security topics
  - General security ideas/terminology
  - Data and database security
  - Cloud security
  - Cloud application security

33

Class Overview

- Timeline:
  - Start with data and databases (5-6 weeks)
    - This includes data/database security
    - For the first 5-6 weeks of the course we have no projects
  - Then move onto cloud topics
    - This includes cloud/cloud application security
    - No quizzes during this time, but will have coding projects

34

Things to Do Now

- Download the SQLite desktop version
  - Can be used for practice, and will be needed for projects

- Learn how to use SQLite in python 3.X
  - You'll need to be able to interact with a database via an API, this is a good way to learn

- Download postman, or some other free API testing tool

35

Discussion

- I'm very happy to consider other topics that might be of interest to the class

- Feel free to share them now, or by email or Piazza

- The current class topics are based on my experience working with companies in CSE Capstone

Questions

- Any questions on our class setup?

End of Class

That's it for Today