Syllabus

CSE 344 - Introduction to Data Management | Autumn 2024

Administrivia

Course website: https://courses.cs.washington.edu/courses/cse344/24au/

Lectures: MWF 9:30-10:20 JHN 102
Sections at various times on Thursdays
Recordings of lecture will be available after class on Canvas' zoom page
Instructor: Dan Suciu
Office hours: see calendar
Course message board: Ed

See the course website for more contact information, a full list of TA office hours, and an up-to-date calendar.

Course Goals

Databases are at the heart of modern commercial application development. Their use extends beyond this to many other environments and domains where large amounts of data must be stored for efficient update, retrieval, and analysis. The purpose of this course is to provide a comprehensive introduction to the use of management systems for applications. Some of the topics covered are the following: data models (relational and json), query languages (SQL, relational algebra, SQL++), transactions, parallel data processing, and database as a service. For the detailed list of topics and schedule, please see the lecture list on the course website.

Format

There are three lectures per week. Please attend all lectures. We will make recordings of the lectures available, but you learn significantly more by attending the lectures than by watching videos. We encourage questions during the lecture, we may ask questions to class, we may call on you. We reserve the right to take points off for students who regularly skip lectures.

We encourage you to also read the material in the textbook, but this is optional: many students will do perfectly well in class without the textbook, by being engaged and active during the lecture. We will indicate for each lecture the sections in the book that best cover it. Some material in the lectures are not covered in the textbook.

In addition to the lectures there will be sections taught by the TAs. They discuss the material taught in class and give detailed instructions on how to use some of the software needed for the homework assignments. Please attend all sections.

Catalog Description

Introduces database management systems and writing applications that use such systems; data models (e.g., relational, semi-structured), query languages (e.g., SQL, SQL++), language bindings, conceptual modeling, transactions, security, database tuning, data warehousing, parallelism, and web-data management. Prerequisite: CSE 311.

Here is a more specific list of potential topics that will be covered in this quarter's 414:

- Data models
- Query languages (e.g. SQL)
- Schema, logical, and physical design
- Database applications
- Transactions
- Data analytics
- NoSQL
- Cloud database systems

As this class is evolving, the list of topics might change over the quarter.

Grading

- Homework assignments: 50%
- Midterm: 20%
- Final exam: 30%

Homework Assignments

Each homework assignment is due on the date listed on the calendar, by 11pm Seattle time.

Regrades

If you think one of your homework or exam questions was misgraded, submit a regrade request on Gradescope explaining which part you would like regraded and why you think you deserve more points. The window for regrades will only be open for three days after grades are released.

Midterm and Final Exam

The midterm is in class, on `Oct 25, 2024`, 9:30-10:20.

The final exam is scheduled by the university, on Wednesday, `Dec 11, 2024`, 8:30-10:20.

You need to attend both exams in person. Please bring your ID, we may check it.

Main Textbook

Database Systems: the Complete Book, by Hector Garcia-Molina, Jennifer Widom, and Jeffrey Ullman. Available from the University Bookstore. Second edition.

Other texts:

The library has the following that you might find useful if you require another explanation of a topic.

- Fundamentals of database systems by Elsmasri and Navathe.
- Database management systems by Raghu Ramakrishnan and Johannes Gehrke.
- Foundations of database systems by Abiteboul, Hull and Vianu.

Late Policy

You are allowed a total of 6 late-days with at most 2 late-days per assignment (unless otherwise noted) that you can use in 24-hour chunks at any time. There is no penalty to your grade for using late days.

Once you use-up your late days, no additional extensions are granted. Late days are a safety net in case of a true emergency, not a convenience. We expect the vast majority of students to use no late days during the entire quarter, and a very small number to use 1 or 2 late days. If you need more than six late days, you should drop the class so you can focus on your personal emergencies.

Grading Research Tool

We are using an automated verification tool for grading some of your homework assignments, and may use your class work to improve that tool. For example, we may use anonymized student assignments to design or improve the algorithms or build new tools to help database users. Any student who wishes to opt out can contact the instructor or TA to do so after final grades have been issued. This has no impact on your grade in any manner.

Programming

Some programming will be necessary in this course. One can only start to appreciate database systems by actually trying to use one. Databases only hold the data, the application logic needs to be written in some general purpose language. We will use the following tools in class:

- SQLite
- SQL Server on Windows Azure (Microsoft's Web Service)
- Java
- AsterixDB

Collaboration Policy

You are encouraged to discuss the content of this course with anyone you like.

- **Do** complete each homework assignment individually.
- **Do** discuss concepts, do help each other practice problems, but see the item above.
- **Don't** show your work or solution to anyone else.
- **Don't** put your work in a publicly available place.
- **Don't** look at anyone else's work, or at work found online from prior CSE 344/414.
- **Don't** use AI-assistance such as GitHub Copilot, ChatGPT, etc. for your answer.

Consider the "Gilligan's Island Rule": after having a conceptual discussion with classmates, do something mind numbing for half an hour (such as watching a Gilligan's Island rerun). If you still understand the concept after that, congratulations, you've probably learned instead of copying!

Using AI language models (e.g. ChatGPT, GitHub Copilot) is considered the same as asking for outside assistance. If you are pasting the question prompts into a LLM prediction tool and copying the answers to your homework, this is not completing the assignment yourself. Often these tools give incorrect answers as well, so we strongly recommend posting such questions on the message board where we are happy to answer them.

Academic Integrity

Any attempt to misrepresent the work you submit will be dealt with via the appropriate University mechanisms, and your instructor will make every attempt to ensure the harshest allowable penalty. The guidelines for this course and more information about academic integrity are in a separate document (including, but not limited to, the Allen School's Academic Misconduct page and the College of Engineering's Academic Misconduct Process). You are responsible for knowing the information in these documents.

All material you submit in the homeworks and quizzes must be written by you. Copying the work of another student or external documents is a violation of the above integrity policy. In summary:

Computer Use Policy

Some excerpts from the campus policies. Take them seriously: "You must use all UW [computing] resources in strict accordance with local, state, and federal laws. These laws cover such areas as illegal access to computer systems, networks, and files; copyright violations; and harassment issues... Software and information resources provided through the university for use by faculty, staff, and students may be used on computing equipment only as specified in the various software licenses. Unauthorized use of software, images, or files is regarded as a serious matter and any such use is without the consent of the University of Washington...If abuse of computer software, images, or files occurs, those responsible for such abuse will be held legally accountable."

Accommodations

Please refer to university policies regarding disability accommodations and religious accommodations.