

CSC 261/461: Database Systems

Eustrat Zhupa

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Office: Wegmans Hall 2107

Office Hours: Wed 2:15 - 4:00, Thu 5:00 - 6:00, OR by email

Lecture Hours: MW 12:30 - 1:45

Classroom: Harkness 115

Course Description

This course presents the fundamental concepts of database design and use. It provides a study of data models, data description languages, and query facilities including relational algebra and SQL, data normalization, transactions and their properties, physical data organization and indexing, security issues and object databases. It also looks at the new trends in databases, for example, Big Data, MapReduce, and NoSQL.

Topics covered

The course covers foundational material in the field of database systems:

- Basic introductory concepts necessary for a good understanding of database models.
- Database Management System (DBMS) concepts, terminology, and architecture.
- Entity relationship modeling and database design.
- Relational database and SQL for efficiently storing, retrieving, and updating data in a database.
- File organization on disk, indexing and hashing
- Concurrency and database recovery,

Additionally and time permitting, the course will cover more advanced topics in database systems, such as

- Distributed databases, NoSQL storage systems, Big data, MapReduce
- Basics of MongoDB and Spark.
- Database Security (if time permits)

Required Readings

- Lecture notes
- Textbook: **Fundamentals of Database Systems**, 7th Edition (ISBN: 0133970779) by Ramez Elmasri & Shamkant B. Navathe (Pearson Education, 2016).

Additional Readings

- “Database Systems: The Complete Book“, Garcia-Molina, Ullman, Widom
- “Database System Concepts“, by Silberschatz, Korth, Sudarshan.
- References from the instructor

Prerequisites

CSC 172; CSC 173 recommended

Grading Policy

- Letter grades will follow the **Official University of Rochester Grading Scheme**. Note that the University scheme puts average somewhere between C and B. The following table is an estimate of how the numeric grades will map onto the letter grades (subject to change):

A:	Excellent	$\geq 90\%$
B:	Above Average	$\geq 80\%$
C:	Minimum Satisfactory Grade	$\geq 70\%$
D:	Minimum Passing Grade	$\geq 60\%$
E:	Fail	$< 60\%$

- All appeals of grades for any component of the course (homework, project, quiz, exam, etc.) must be made within ONE WEEK of the grade being posted.
- I reserve the right to curve the scale dependent on overall class scores at the end of the semester.
- The grade will be determined taking into account the following:
 - The midterm exam is worth **15** points.
 - The final exam is worth **20** points.
 - Quizzes are worth **20** points.
 - Projects are worth **45** points.
 - Additional hw/assignments are worth **5** points. This activity is required for grad students and it can be used as an extra credit for undergrad students.

Term Paper

- part of the additional assignments for grad students
- review a conference/journal paper and implement, add features, or survey the related topics.
- submit a report based on their results, surveys or findings.
- may need to present posters

Grading Scale

Percentage score	Letter grade
90-100	A
85-89	A-
80-84	B+
75-79	B
70-74	B-
65-69	C+
60-64	C
55-59	C-
50-54	D
0-49	F

Course Policies

Accommodations for Disabilities

- The University of Rochester respects and welcomes students of all backgrounds and abilities. In the event you encounter any barrier(s) to full participation in this course due to the impact of disability, please contact the Office of Disability Resources. The access coordinators in the Office of Disability Resources can meet with you to discuss the barriers you are experiencing and explain the eligibility process for establishing academic accommodations. You can reach the Office of Disability Resources at: disability@rochester.edu; (585) 276-5075; Taylor Hall.
- After you receive accommodation approval, it is imperative that you reach out to the instructor for the appropriate arrangements.

Communication and information about the course

- Relevant information and updates about the course will be posted on the website of the course and/or on Blackboard.
- Emails sent to the instructor about this course must include in the subject "CSC261/461: ".
- Discussion boards available on Piazza.

During lecture

- You do not need any electronics in class and they will not help you or your fellow students seated near you.
- Unless you are taking notes with a laptop, you do not need it.
- Please note [Section V.7](#) of the College's Academic Honesty policy regarding Unauthorized Recording, Distribution or Publication of Course-Related Materials.

Attendance Policy

- Attendance in lectures is recommended, but not required. If you choose not to attend, please make sure you don't miss important announcements or information about the course.
- Attendance at workshops is *highly* recommended. Quizzes are part of the workshop activities.

Policies on Incomplete Grades and Late Assignments

- A grade of "I" can be given only in circumstances beyond the students' control, such as illness or personal emergency, that prevented the students from finishing the coursework on time. Please refer to the Academic Procedures for more information on this.
- Late submissions are not permitted in this course.

Academic Integrity and Honesty

- All assignments and activities associated with this course must be performed in accordance with the University of Rochester's Academic Honesty Policy. More information is available at: <http://www.rochester.edu/college/honesty>
- All the work you do in this course must be mainly your own contribution. Collaboration on homework or projects is permitted, subject to the following requirements:
 - You must acknowledge your collaborators in your submission
 - You must be able to explain anything you submit in person at any time