

Course Schedule:

This course will be available on Sakai

<https://sakai.rutgers.edu/portal>

Asynchronous Lectures: Tuesdays, Thursdays

Lecture's participation exercises due by 11:55pm on the day of the lecture.

In-person Recitations: See schedule

Instructor: Antonio Miranda-Garcia

email: antonio.miranda@cs.rutgers.edu

Usually answered within 2 business days.

Office Hours:

Mondays 3pm-4pm: Webex (<https://rutgers.webex.com/meet/am2073>)

Wednesdays 3pm-4pm : In-person (Hill 363) or Webex

Technology requirements:

- Phone camera or Scanner is required.
- Computer, tablet or phone is required.
- Fast internet connection is recommended.

Please visit the Rutgers Student Tech Guide page for resources available to all students. If you do not have the appropriate technology for financial reasons, please email Dean of Students deanofstudents@echo.rutgers.edu for assistance. If you are facing other financial hardships, please visit the Office of Financial Aid at <https://financialaid.rutgers.edu/>.

Course Goals: This course will consider various languages for representing and accessing the different kinds of information, methodologies for using them, *theoretical principles* underlying them, and some fundamental algorithms. However, in contrast to standard database courses, we will be very skimpy on implementation aspects of DBMS, such as data storage, and transaction processing, which are covered in 198:437.

Text: *Database Management Systems* by R. Ramakrishnan and M. Gehrke, 3rd edition, McGraw-Hill (ISBN:978-0072465631).

Students are responsible for knowing all the material (a lot) that will be covered in class and is NOT in the book.

Other useful books:

- *A First Course in Databases* by J. Ullman and J. Widom
- *Database Systems: concepts, languages, and architectures* by P. Atzeni, S. Ceri, S. Prabhochi, R. Torlone
- *Fundamentals of Database Systems* by R. Elmasri and S. Navathe

Class Policy:

- Attendance. Watching all video-lectures during the scheduled time is required. The instructor assumes that all students have knowledge of every announcement made during the lectures as well as all material covered.
- Exams. The exams will include material from:
 - lectures
 - homeworks
 - project
 - class participation

There is NO pre-scheduled general makeup exam. A makeup exam may be given to specific individuals only on the basis of a **legitimate, documented** conflict, or a **university approved** reason, or any other emergency that is deemed a legitimate reason for taking a makeup.

Students are expected to attend all classes; if you expect to miss one or two classes, please use the University absence reporting website <https://sims.rutgers.edu/ssra/> to indicate the date and reason for your absence. An email is automatically sent to me.

- Participation Exercises. At the end of each video lecture an exercise about the material covered in the lecture will be assigned. The participation exercise must be turned in through Sakai by 11:55pm of that same day. There is NO make-up for participation exercises but the lowest one will be dropped.
- Homeworks There will be 4 or 5 homeworks. They will be posted on Sakai. Late homeworks (less than 2 days) will still be accepted but with a 30% penalty even if they are 1 minute late. After 3 days late homeworks will **NOT** be accepted. You have plenty of time to work in each homework, and you are responsible for planning and managing your time.

Your best strategy for working on homeworks is to start early, and hand in something at least a full day before the deadline. You can continue working on the homework and submit as many updated versions of your homework as you want before the deadline.
- Project. For the project you will work (remotely) in groups. The programming project will be graded principally on functionality. **In order to pass the course, a working programming project must be completed and handed in.** Individual contributions to the project will be measured and taken into account, the instructor may request an oral examination to further evaluate a student's understanding of the material involved and the way in which the program works. The only communication between teams should concern very general topics such as how to log in, how to install software and the like. Reusing software written by others or for other courses/projects is prohibited, unless approved by the instructor/TA.
- Feedback. **Given the special circumstances of remote instruction, it will take some time for the TAs or instructors to answer questions about the assignments. We will do our best to try to answer them as soon as possible but not receiving an answer on time should not be a reason for not turning in your assignment. Start working early so that if you have questions, there will be time for us to answer them.**

- **Regrading.** You have one week after the grade of an exam, homework, project, or participation exercise is released to the class to request a regrade. After that period, the grade becomes permanent and cannot be changed. The grade of the final exam becomes permanent one week after it is released through Sakai.
- **Grading.**

Homeworks	20%
Programming Project	25%
2 Midterm exams	30%
Final exam	15%
Participation exercises	10%

The grade assigned as final grade cannot be changed, even by doing additional work. In order to be fair to all students, any option to improve grades (if any) will be given to every student, NOT just to one particular student.

- **Academic Integrity.**

We take academic integrity quite seriously. Copying answers from any source including published solutions is considered academic dishonesty as is posting and copying answers from services such as Chegg.

<http://nbacademicintegrity.rutgers.edu/home-2/for-students/>

Honor pledge:

All students will need to sign the Rutgers Honor Pledge on every major exam, assignment, or other assessment as follows:

On my honor, I have neither received nor given any unauthorized assistance on this examination (assignment, paper, quiz, etc.).

- **Rutgers CS Diversity and Inclusion Statement.**

Rutgers Computer Science Department is committed to creating a consciously anti-racist, inclusive community that welcomes diversity in various dimensions (e.g., race, national origin, gender, sexuality, disability status, class, or religious beliefs). We will not tolerate micro-aggressions and discrimination that creates a hostile atmosphere in the class and/or threatens the well-being of our students. We will continuously strive to create a safe learning environment that allows for the open exchange of ideas while also ensuring equitable opportunities and respect for all of us. Our goal is to maintain an environment where students, staff, and faculty can contribute without the fear of ridicule or intolerant or offensive language. If you witness or experience racism, discrimination micro-aggressions, or other offensive behavior, you are encouraged to bring it to the attention to the undergraduate program director, the graduate program director, or the department chair. You can also report it to the Bias Incident Reporting System <http://inclusion.rutgers.edu/report-bias-incident/>

Course Outline:

Lecture	Book Chapters	Topics
9/2	1.1-1.8	Database Management Systems
9/7	2.1-2.2	Conceptual Modeling
9/9	2.3-2.4.2	Entity Relationship Diagram basics
9/14	2.4.3-2.4.5	Weak entities, classes, aggregation
9/16	2.5	n-ary relationships and reification
9/21	3.1-3.2	Relational Model
9/23	3.2-3.4	Integrity constraints
9/28	3.5.1-3.5.4	From E/R to Relations
9/30	3.5.5-3.5.6	Translating weak and class entities
10/5	3.5.7-3.5.8	Merge rule
10/7	5.1-5.3	SQL basics
10/12		Midterm exam 1
10/14	5.3-5.4	Set operations and subqueries
10/19	5.5	Aggregate operators
10/21	5.6	Joins and advanced queries
10/26	5.7-5.9	Constraints, assertions, and triggers
10/28		Advanced SQL examples
11/2	4.1-4.2	Relational Algebra
11/4		Queries in Relational Algebra
11/9	19.1-19.2	Functional dependencies
11/11		Midterm exam 2
11/16	19.3-19.4	Closures and keys
11/18	19.4-19.5	Lossless decompositions and Normal forms
11/23	19.6	BCNF and 3NF decomposition
11/30	16.1-16.3	Transactions and ACID properties
12/2	16.4-16.6	Locks and isolation levels in SQL
12/7	24.1-24.3	Deductive databases (datalog)
12/9	27.6-27.8	Introduction to NoSQL

Adjustments to this schedule, as well as to the order of the topics will be made as necessary.

Important Dates:

Exam 1	October 12, 2021
Exam 2	November 11, 2021
Final Exam	TBD