EECS 484 Syllabus and Schedule - Winter 2020

Instructors: Peter Honeyman, Professor, EECS, University of Michigan
Raed Almomani, Lecturer, EECS, University of Michigan

Textbook: Database Management Systems (3rd edition) - by Raghu Ramakrishnan and Johannes Gehrke, McGraw Hill, 2003, ISBN: 0-07-115 110-9. The book has a supporting website, where you can find answers to odd-numbered exercises. The book is really useful, especially for exams. We follow it pretty closely.

Prerequisites: EECS 281 or EECS 403. You should have the background from a data structures course (e.g., lists, hash tables, arrays, search trees) and strong programming experience. Michigan undergrads typically take 3 programming courses, including the data structures, prior to taking EECS 484 The projects are in Java, C++, and JavaScript. You should know C++ really well. For Java and JavaScript, given your programming maturity, we would expect you to be able to pick up the languages on your own quickly, to the extent needed for the projects.

Points: 10% each for the 4 projects; 25% Midterm; 25% Final; 10% for Homeworks/Quizzes. See Lecture 1 slides for more details.

Honor Code: Engineering Honor Code applies to the course. See Lecture 1 slides for course-specific policies. Any violation of the Honor Code will be reported to the Honor Council and may lead to severe penalties, including failing the course.

Key rules:

- Key Principle: No unfair advantage
- Submit only your own original work
- No peeking at old solutions, no sharing of code (partial or full), no sharing of homework solution fragments, and no sharing of solution. This is for your own protection as well, since we may use automated tools and manual checks to detect similar code or solutions.
- Discussing your solutions with the teaching staff is OK
- No discussion of the specifics of a project or homework solution with those outside your group. If something does not seem right to post publicly on Piazza, it is likely not right to share with someone outside your group
- OK to discuss the homework specs or project specs and lecture concepts or discussion material with others outside your group
- No public posting of solutions, even after the course is over. (e.g., Posting to a public Git Repo is a violation of this policy). We don't want code from your project to show up as a submission in a subsequent semester!
- Private repos to share with your project partner are OK and encouraged.
- We understand that you may want to show your EES 484 skills to potential employers by showing them some of your code. That is OK to do after a project is completed (or with permission of the instructor if you need to do so earlier). There are several ways to accomplish that without making the code public: (1) Just share the repo with the specific individual at the company in a private manner; (2) Provide a copy of the project via email, while letting them know that it is not for public sharing; or (3) Provide a cryptographic link to the project to the potential employer (e.g., a Google Drive link), with the link required to view the project.

Communication Tools:

- Office Hours
- Piazza -- Join at this link: Piazza
- Email to teaching staff: eecs484-w20@umich.edu. We prefer Piazza for any technical or project/homework specific questions
- Email to Instructors: Peter Honeyman: honey@umich.edu
  Raed Almomani: almomani@umich.edu

Project Repo

- Please use a private Git repo to maintain your project code, regardless of whether you are working alone or in a group. GitHub now permits unlimited private repos, though with some restrictions (sharing with up to 3 people -- which should suffice for the course). BitBucket.org

Disabilities and Accommodation Requests:

Please notify the instructor as early as possible of any accommodation that will be required by providing a copy of the form from the university. We may be unable to accommodate requests that are received within 3 weeks before the accommodation is needed. In some cases, especially for the midterm and the final, we may need even longer lead times. We will announce links where you can submit requests.

If you have a conflict with the scheduled exam, we would need to know very early after the exam is announced of the conflict so that we can find the resources to try to offer a resolution.

Course Schedule (Tentative -- will be updated as we progress through the semester):

Lect. # or Disc. #	Date	Topic	Readings	Assignments
L1	Jan 9	Introduction	Ch.1	
D0	Jan 10	Self learn Java (No discussion)		
L2	Jan 14	ER Model	Ch.2	
L3	Jan 16	ER model cntd; Relational Model	Ch. 3	HW 1 out
D2	Jan 17	Project 1 Intro		Project 1 out
L4	Jan 21	Relational Model; ER to Relational;	Ch. 3	
L5	Jan 23	ER to Relational, Triggers, SQL	Ch. 3, Ch 5.8	HW 1 due, 11:55 PM
D3	Jan 24	HW 1 solutions; Project 1 discussion		
L6	Jan 28	Relational Algebra	Ch. 4	HW 2 out
L7	Jan 30	SQL	Ch. 5	
D4	Jan 31	SQL		
L8	Feb 4	SQL + Relational Calculus	Ch. 5	
L9	Feb 6	DB App Programming Data in Society	Ch. 5, Ch 6, except 6.4 & 6.5	Project 1 due, 11:55 PM. Project 2 out.
D5	Feb 7	JDBC; Project 2 discussion;	Read SQL Handout	
L10	Feb 11	Schema Refinement / Normalization	Ch. 19 except 19.8, and Ch. 20.7-20.9	
L11	Feb 13	Normalization (cntd.)		HW2 due, 11:55 PM.
D6	Feb 14	Normalization + Project 2 Q&A		
L12	Feb 18	Storage/Indexing	Ch. 8, Ch9, except 9.2, Ch. 10	HW 3 out.
L13	Feb 20	Storage/Indexing (continued)		
D7	Feb 21	Midterm Exam Review		
L14	Feb 25	Review of the 1st half + questions		
Midterm Exam	Feb 27	7-9 PM		Project 2 due, 11:55 PM.
	Mar 2 - 6	Spring Break. No classes or office hours		
L15	Mar 10	Tree-based indexing	Ch. 11	Project 3 out
L16	Mar 12	Tree-based indexing (cont'd)	Ch. 13	HW 4 out
D8	Mar 13	HW3 review + Project 3 logistics		

L17	Mar 17	Hash-based indexing		
L18	Mar 19	Hash-based indexing (cont'd)	Ch. 12, 14	
D9	Mar 20	HW3 solutions + Project 3 Q&A + Other Relational Operators		
L19	Mar 24	Query Evaluation: Selection.	Ch. 12, 14	
L20	Mar 26	Query Evaluation: Joins	Ch. 15	HW 5 out. HW 3 due, 11:55 PM. Project 4 out
D10	Mar 27	Joins, Project 3 Q&A;		
L21	Mar 31	Query Evaluation: Other operators.		Project 3 due on April 1, 11:55 PM.
L22	April 2	Query Optimization		HW4 due, 11:55 PM.
D11	April 3	Project 4 discussion, HW4 review.		
L23	April 7	Transaction Management Overview	Ch. 16	
L24	April 9	Concurrency Control	Ch. 17, up to and including 17.4	
D12	April 10	HW 4 Solns + HW 5 review + Project 4 Q&A		
L25	April 14	Logging and Recovery	Ch. 18, except 18.6 and 18.8	Project 4 due, 11:55 PM.
L26	April 16	External Sort (if time)		HW5 due, 11:55 PM.
D13	April 17	Transaction Management Review		
L27	Apr 21	Final Exam Review		
Final Exam	**April 23**	**7-9 PM**		