ITMD/Data Modelling and Applications
Fall 2017 Aastha Gupta

Syllabus

Professor: **Aastha Gupta**
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Course Catalog Description: Basic data modelling concepts are introduced. Hands-on database design, implementation, and administration of single-user and shared multi-user database applications using a contemporary relational database management system. **Prerequisites: None Credit:** 2-2-3 Technologies addressed in this course include SQL and relational database management systems such as the MySQL and Oracle RDBMS.

Course Outcome: Upon the completion of the course the student should be able to do the following:

- Describe the theoretical and physical concepts of a relational database.
- Understand the design methodology for databases and verify their structural correctness.
- Learn querying language, primarily SQL, and their database related supported software's
- Implement the theory behind the various database models and query languages.
- Should be able to design and build a simple database management system and demonstrate competence with the fundamental tasks involved with modeling, designing, and implementing a DBMS.
- Develop an understanding of essential DBMS concepts: database security, high availability, backup and recovery and SQL database tuning.

Lecture Days, Time & Place: Mondays 5:00pm – 7:40pm

Schedule of Topics/Readings: ***You should do all readings prior to class.***

Session	Date	Topic	Reading
1	August 21	Introduction to Database; Overview of DBMS; DBMS concepts and architecture	Chapter 1, 2
2	August 28	ER Model Concepts, Diagram Representation, Entities, Relationships and Attributes	Chapter 3, 7
3	September 4	Labor day – No class	Chapter
4	September 11	Relational Database Model and Relational Algebra	Chapter 5, 6
5	September 18	Functional Dependencies; Normalization and De-normalization	Chapter 10, 11
6	September 25	Basic Select statement; Restricting & Sorting data; Logical Operators	Chapter 1, 3, 4
7	October 2	Single Row Functions	Chapter 7
8	October 9	Fall Break Day Take-home Midterm exam	
9	October 16	Aggregated Data using Group functions; Rollup Operator	Chapter 8

10	October 23	SQL Joins; SQL constraints	Chapter 5, 10
11	October 30	Subqueries and SET operator	Chapter 6, 9
12	November 6	Data Manipulation and Data Control language	Chapter
13	November 13	Views and Indexes	Chapter 13
14	November 20	Database Transaction and Concurrency; Database Security	
15	November 27	Introduction to Oracle Database Backups and Recovery and SQL Tuning Concepts	Chapter
16	December 4	Final Project Submission and Exam	

Textbook: The textbook for this course is **mandatory.**

1. Fundamentals of Database Systems, 6th Edition Ramez Elmsari, ISBN-13: 978-0136086208

2. Learning SQL: Mastering SQL Fundamentals, O'Reilly, 2nd Edition ISBN-13: 978-0596520830

Readings/Videos: Readings for the class will be assigned from the textbook as well as in the form of online reading. Online resources and videos will be linked from or embedded in a Blackboard page. It is essential that you do all readings and/or view the videos before coming to class on the assigned date. These materials are a necessary and integral part of the class and will form the basis for any class discussions on the topic. Specific readings are assigned by topic above.

Course Objectives: At the conclusion of this course, each successful student will able to:

- At the conclusion of this course, each successful student will able to:
- Describe the theoretical and physical concepts of a relational database
- Understand the design methodology for databases and verify their structural correctness.
- Perform simple and complex queries
- Perform queries using aggregate functions
- Should be able to design and build a simple database management system and demonstrate competence with the fundamental tasks involved with modeling, designing, and implementing a DBMS.
- Perform simple and complex joins
- Understand the basics of database security and High Availability.

Course Notes: Copies of the course lecture notes in the form of a PDF of the PowerPoint presentation accompanying each lecture will be provided for each student on Blackboard. This should be useful if you must miss a class. You should be aware that note taking is encouraged and should help your understanding of the material.

Course Web Site: http://blackboard.iit.edu/

Blackboard: The course will make intensive use of Blackboard (http://blackboard.iit.edu/) for communications, assignment submissions, group project coordination, providing online resources and administering examinations. All remote students will view the course lectures online via Blackboard, and online readings will be found on Blackboard.

Guest Lectures: Guest lecturers may be featured as part of course topics. When a guest speaker is expected you should make an extra effort to be seated and ready prior to class time. Guest lectures may be in the evening in which case class will not be held during a scheduled morning period. A question & answer/ discussion period will be held at the end of each lecturer's presentation.

Attendance: If you are in a live section of the class and will not be able to attend class, please notify me via email or by text message to 857.453.0107 prior to class time. Live section students who miss a class should always watch the lecture online.

Assignments: There will be assignments posted on blackboard every week due before the next class.

Assignments will be discussed as the course progresses.

Blog and Quizzes: Each student will make an entry in the course blog in Blackboard each week of the course except the final week—and yes, this includes Fall Break. Blog entries may be links to online articles addressing topics applicable to the course, or may be personal reflections or opinions on topics applicable to the course. Each week all students must read all of the blog entries from the preceding week. Completion of appropriate blog entries and reading of the blog will be included in your class participation grade.

Examinations: The final examination will consist of a take home essay examination measuring course outcomes as discussed above. The examination will be open-book, open note, and open-Web. Internet students may complete this exam online. There will also be a final project due at the end of the exam.

(See exam statement for other options)

Academic Honesty:

Plagiarism: All work you submit in this course **must be your own**. You must fully attribute **all** material directly quoted in papers and you must document all sources used in the preparation of the paper using complete, APA-style bibliographic entries. Including directly quoted material in an assignment without attribution is always plagiarism and will always be treated as such by me. No more than thirty-three percent of material included in any paper may be direct quotes. Students have submitted plagiarized material the last six times I have taught this course and **I will not tolerate it**. If you submit plagiarized material you **WILL** receive a grade of **ZERO** for the assignment, an Academic Honesty Violation Report will be filed, and it may result in your expulsion from the course with a failing grade as per the IIT and ITM academic honesty policies. **There is no excuse for not understanding this policy** and if you do not understand it please let me know and I will be happy to discuss it with you until you do. *(Should include assignment or lab collaboration statement as necessary.)*

Grading: Grading criteria for ITMD 421 students will be as follows:

A	*Outstanding work reflecting substantial effort*	90-100%
B	*Excellent work reflecting good effort*	80-89.99%
C	*Satisfactory work meeting minimum expectations*	70-79.99%
D	*Substandard work not meeting expectations*	60-69.99%
E	*Unsatisfactory work*	0-59.99%

The final grade for the class will be calculated as follows:

Weekly Assignment	**25%**
Mid Term	**25%**
Final Exam	**25%**
Final Project	**25%**

Other Class Resources: Online readings and other class resources may be found at on Blackboard.

Our Contract: This syllabus is my contract with you as to what I will deliver and what I expect from you. If I change the syllabus, I will issue a revised version of the syllabus; the latest version will always be available on Blackboard. Revisions to readings and assignments will be communicated via Blackboard.

Disabilities: Reasonable accommodations will be made for students with documented disabilities. In order to receive accommodations, students must obtain a letter of accommodation from the Center for Disability Resources and make an appointment to speak with me as soon as possible. My office hours are listed on the first page of the syllabus. The Center for Disability Resources (CDR) is located in 3424 S. State St., room 1C3-2 (on the first floor), telephone 312.567.5744 or disabilities@iit.edu.