IS 631
Enterprise Database Management

Course Syllabus

SPRING 2018

Instructor: Songhua Xu

Lecture: Thursday: 6:00 PM – 9:05 PM, CKB212

Office Hour: Thursday: 4:55 PM – 5:55 PM, GITC 5107

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Course textbook:

- Avi Silberschatz, Henry F. Korth, S. Sudarshan, Database System Concept, McGraw-Hill, ISBN 0-07-352332-1, 6th edition.

Supplementary readings:

- Microsoft SQL Server 2012 Step by Step (Step by Step Developer), ISBN-13: 978-0735663862 ISBN-10: 0735663866

- A First Course in Database Systems (3rd edition) by Ullman and Widom.

- Database Systems: The Complete Book (2nd edition) by Garcia-Molina, Ullman, and Widom.

- Database Management Systems (3rd edition) by Ramakrishnan and Gehrke.

- Fundamentals of Database Systems (6th edition) by Elmasri and Navathe.

- P. Rob, C. Coronel, S, Morris DATABASE MANAGEMENT: DESIGN, IMPLEMENTATION, AND MANAGEMENT 10e (Tenth Edition), Thomson/Course Technology – Cengage Learning. ISBN 13: 987-1-111-96960-8. (in case you do not have basic database concepts and knowledge.)

Course Description:

This course introduces the foundations of database systems, focusing on data modeling, query design, and applications. It provides an understanding of the issues in designing and managing database systems as an essential organizational resource. The components of enterprise data management are covered, with a strong emphasis on data modeling as well as the

DBLC (Data Base Life Cycle). Implementing a database using SQL is an art and a science and will be addressed in the course. Data warehousing and data mining issues will also be examined.

Course Requirements:

Before enrolling in this course, students should pass IS331 with a decent performance. All content of IS331 is required for pursing subject matters in this course. More specifically, students should have a good knowledge and working skills with: (1) data modeling (primarily E-R data modeling), (2) relational database design (including database integrity issues), (3) professional and ethical responsibilities of database professionals, (4) query design in SQL, (5) identifying poorly designed databases and their rectification, (6) optimal design of databases invoking conceptual topics in relational decomposition, functional/multivalued dependencies and normalization (through 3NF, BCNF, 4NF and DKNF), (7) Denormalization and read-only/non-updateable databases, including data warehouses, and (8) Structured Query Language (SQL) and popular DBMS products.

Class Communication Space/Learning Management System:

We will be using Moodle, a state-of-the-art, open source, Learning Management System (LMS), and is nationally/internationally the fastest-growing LMS. We will be using this system for both online and face to face sections of the class, where I will be posting additional resources as needed throughout the semester. The powerpoint slides for each lecture will be available for download in Moodle.

Course Goals:

At the end of the course, you should be able to develop a set of business requirements and implement a database that fulfills those requirements.

1. To understand the design and development issues regarding databases and enterprise database management.
2. To convert a set of requirements into an effective database structure.
3. To obtain a strong conceptual foundation of the underpinnings of database design and enterprise database management.
4. To implement a database using some commercial database management systems, such as using SQL within Oracle.
5. To communicate effectively through oral presentations and written documents.

Course Grade Components:

· Class Participation and Activity Awards: 30 points
· Homework Assignments: 10 points
· Midterm Exam: 35 points
· Final Exam: 25 points

Grading Policy:

- Overall course score >=90: A
- Overall course score >=85: B+
- Overall course score >=80: B
- Overall course score >=75: C+
- Overall course score >=70: C
- Overall course score >=60: D
- Overall course score <60: F

Our Strict Policy on Collaboration/Cheating:

Every assignment/project is to be regarded as an examination. The NJIT Honor Code will be upheld. A description of the NJIT Honor Code is available for your review at http://www.njit.edu/academics/honorcode.php. Students found cheating or collaborating or plagiarizing will be **immediately** referred to the Dean of Students and the NJIT Committee on Professional Conduct and subject to Disciplinary Probation, a permanent negative marking on their record, **possible dismissal and a definite grade of 'F' in the course. All submitted assignments are carefully checked for similarities, and plagiarism and guilty students will be identified. This also includes use of instructor materials no matter how they were provided to you.**

Policy on Submission of Assignments/Projects : The format of submission will be announced with each assignment/project. Assignments and projects are to be posted in Moodle.

Our Strict Policy on Lateness of Submission: Every assignment/project will have a due date, and all submissions **are expected to be** made by this due date. **Assignments submitted after the due date will not be accepted regardless of any reason you might have.**

Below are the TOPICs covered in the course and the related TEXTBOOK readings. Remember one of the keys to success in IS631 is your own self-discipline - your goal should be to maintain currency each week, and NEVER fall behind! (*Note: this is a very tentative schedule, and I reserve the privilege to modify and edit these topics and textbook readings for the benefit of the course.*)

Week #	TOPIC
0	Please read chapters 1 & 2 prior to the first class meeting
1	Introduction to SQL
2	Intermediate SQL
3	Advanced SQL
4	Formal Relational Query Languages
5	Database Design: The Entity-Relationship Approach

6		Relational Database Design
7		Midterm Exam
8		Storage and File Structure
9		Indexing and Hashing
10		Query Processing
11		Query Optimization
12		Transactions
13		Concurrency Control
14		Recovery System
15		Comprehensive Final Examination

Note: 1. Details of the mid-term and the final exam will be announced later.

2. The syllabus may be changed to be adjusted to provide better educational services. In such a case, the changes will be announced in advance.