Department of Computer Science
Lehman College, City University of New York
Summer 2019

CMP 420 (section 01): Database Systems

Instructor: Steven Fulakeza
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Lecture Schedule: Mondays, Tuesdays, Wednesdays, and Thursdays, 4:00 pm - 7:25 pm
Lecture Location: GI 231
Office Hours: By appointment

CMP 426 Course Description: 4 hours, 4 credits
Introduction to theory of database systems and database management: theory of relational, hierarchical, and network database organization, with emphasis on the first; views of data, data organization, data dependency and redundancy, normal forms, and query language.

Prerequisite:
- CMP 338 (Data Structures and Algorithms).

Course Objectives:
At the end of the course, students should be able to:
1. Understand fundamental concepts of modern database systems.
2. Describe database systems concepts and architecture
3. Perform conceptual data modeling by ER/EER.
4. Understand the relational model.
5. Work with Structured Query Language (SQL).
6. Explain functional dependencies and normalization as database design process.
7. Understand File/index structures.
8. Explain physical database design decisions, transaction processing concepts and theory, concurrency control techniques.
9. Perform database recovery.

Textbook:
- R. Elmasri and S. Navathe, Fundamentals of Database Systems, Pearson, Edition 7, 2016. ISBN:0-13-397077-9

References:
- Lecture Notes, Blackboard, and Course Website
- J. Murach, MySQL, Edition 2, Mike Murach & Associates, 2015
- P. Dubois, MySQL, Edition 5, Addison-Wesley, 2013
- R.F. van Der Lans, SQL for MySQL Developers, Addison Wesley, 2007
- MySQL 8.0 manual: https://dev.mysql.com/doc/refman/8.0/en/preface.html

Grade Policy:
- Homework Assignments: 40 %
- Exam 1: 30%
- Final Exam: 30%

The final exam is comprehensive. If you do better on the final exam than exam 1, the final grade will replace exam 1 score.

We will also drop one of the lowest scoring homework assignments. While exams will have extra credit points, there will be **no extra credit assignments or projects**.

Makeup exam might be given only when a student's absence is unavoidable. In such a case, the student must file formal written request.

Homework Assignments
Several homework assignments will be given during lectures and some work will be posted on Blackboard. Students need to work on the homework to prepare for exams but may not need to submit the homework assignments to the instructor. **Some selected homework problems will be assigned as formal assignments to be submitted for grading.** Students must work on their own assignments unless stated otherwise. **No late assignments will be accepted.**

Exam Schedule:
- Exam 1: 07/26/2019
- Final Exam: 08/08/2019

Academic Integrity and Plagiarism Policy
Statement may be found in student handbook. For more information, refer to
https://www.lehman.edu/student-affairs/documents/Final-Student-Handbook-Lehman-College-9-19-18.pdf

Note: All incidents of cheating will be reported to the Vice President of Student Affairs.

Attendance
Students are expected to attend lectures regularly and promptly. In the event of illness, or injury, students should notify me. Students who miss a class are responsible for learning materials presented in class and reading relevant textbook portions. If you need help, please do not hesitate to contact me.

Accommodating Disabilities
Lehman College is committed to providing access to all programs and curricula to all students. Students with disabilities who may need classroom accommodations are encouraged to register with the Office of Student Disability Services. For more information, please contact the Office of Student Disability Services in Shuster Hall, Room 238, phone number, 718-960-8441.

Technology, Blackboard and Email
We will be using a Blackboard site for much of the class activities. It can be accessed through the Lehman website at www.lehman.cuny.edu. You will also need to have access to your Blackboard account. You can contact the IT Center if you have any problems accessing your account.

I will be communication with you regularly throughout the semester using your email address that is available on Blackboard. Make sure you have access to your email. If you have, any questions about your Lehman email address or your password, or if you have any problems accessing the site please call the computer helpdesk at 718-960-1111.

Course Outline: (Tentative)
Part 1 - Introduction to Databases
- Chapter 1: Databases and Database Users
- Chapter 2: Database System Concepts and Architecture

Part 2 - Conceptual Data Modeling and Database Design
- Chapter 3: Data Modeling Using the Entity – Relationship (ER) Model
- Chapter 4: The Enhanced Entity–Relationship (EER) Model

Part 3 - The Relational Data Model and SQL
- Chapter 5: The Relational Data Model and Relational Database Constraints
- Chapter 9: Relational Database Design by ER- and EER-to-Relational Mapping

Part 6 - Database Design Theory and Normalization
- Chapter 14: Basics of Functional Dependencies and Normalization for Relational Databases
- Chapter 15: Relational Database Design Algorithms and Further Dependencies

Part 7 - File Structures, Hashing, Indexing, and Physical Database Design
- Chapter 16: Disk Storage, Basic File Structures, Hashing, and Modern Storage Architectures
- Chapter 17: Indexing Structures for Files and Physical Database Design

Part 9 - Transaction Processing, Concurrency Control, and Recovery
- Chapter 20: Introduction to Transaction Processing Concepts and Theory
- Chapter 21: Concurrency Control Techniques
- Chapter 22: Database Recovery Techniques

Software Used For the Course:
- MySQL Community Server 8 (or 5.6.x or 5.7.x,)
- MySQL Workbench 8.x

Classroom Policies
- Take responsibility for your education and grades – Students have a common myth that because they pay tuition they deserve to receive a passing credit. Students earn grades in accordance with course grading policies.
- Attend every class and get to class on time
- Submit all your work on time
- When having any academic difficulties, always seek assistance from your instructor