Database Systems II                  Class hours: 2
CIS 495                              Lab hours: 2
Spring 2012                           
Credits: 3                             

Course Description:

This is an advanced course on database management systems that builds upon the concepts covered in CIS 395 and provides in-depth understanding of the design, implementation and administration of database systems. It starts with review of relational model, E-R modeling, normalization and basic SQL. Then, it discusses topics including index structure and data storage, query processing and optimization, transaction processing, concurrency control and recovery, database administration, and security. In the application level, SQL programming, stored procedure, triggers, and Web-based database integration are also discussed. Students implement a major database application project, which includes processes of system requirement, design, architecture, implementation, installation, and server administration.

Prerequisites: Basic Skills- ENG 095, ESL 095, ACR095, MAT012/051; CIS 395 (Database Systems I) or Departmental approval

Student Learning Outcomes:

After completing this course, students will be able to:

- Apply advanced skills to effectively analyze, develop and implement large-scale database management systems
- Implement stored procedures and triggers according to system requirement specification
- Develop and execute administration process and policy for database systems, such as installation, upgrade, backup, recovery, and security
- Evaluate alternatives for same database structure and obtain the optimal solution

Required Text & Readings:

Author: Thomas Connolly and Carolyn Begg
Publisher: Addison Wesley, 2005
ISBN-10: 0321523067

Supplementary text (optional):

Other Resources: Flash/USB drive is recommended.

Use of Technology (if applicable):

Evaluation & Requirements of Students:

Test(s)                                25%
Final exam                             25%
Project                                30%
Homework                               10%
Instruction’s Evaluation               10%
                                          100%
Outline of Topics:

1. Review
   - Relational model
   - E-R modeling
   - Normalization
   - Basic SQL Database Environment

2. Index Structure and Data Storage

3. Transaction Management
   - Transaction Support
   - Concurrency Control
   - Database Recovery
   - Concurrency Control and Recovery in Commercial Products

4. Query Processing
   - Query Decomposition
   - Query Optimization
   - Cost Estimation for Relational Algebra Operations

5. Advanced Programming SQL
   - Stored Procedures
   - Triggers

6. Web Technology and DBMS
   - Internet and Web
   - Scripting Languages
   - HTTP cookies
   - Web Application Development Platforms

7. Structured and Semi-Structured Data: XML and DBMS
   - Semi-structured data
   - XML-Related Technologies
   - XML Schema
   - XML Query Language
   - XML and Database

8. DBMS Administration
   - Database Creation, Starting up and Shutting Down
   - Database Security
   - Database Backup and Recovery
   - Configuration of Database
   - Partitioning tables and indexes

College Attendance Policy:

At BMCC, the maximum number of absences is limited to one more than the number of hours a class meets in one week. For example, you may be enrolled in a four-hour class. In that class, you would be allowed 5 hours of absence (not 5 days). In the case of excessive absences, the instructor has the option to lower the grade or assign an F or WU grade.

Academic Adjustments for Students with Disabilities:

Students with disabilities who require reasonable accommodations or academic adjustments for this course must contact the Office of Services for Students with Disabilities. BMCC is committed to providing equal access to all programs and curricula to all students.
BMCC Policy on Plagiarism and Academic Integrity Statement:

Plagiarism is the presentation of someone else’s ideas, words or artistic, scientific, or technical work as one’s own creation. Using the idea or work of another is permissible only when the original author is identified. Paraphrasing and summarizing, as well as direct quotations, require citations to the original source. Plagiarism may be intentional or unintentional. Lack of dishonest intent does not necessarily absolve a student of responsibility for plagiarism.

Students who are unsure how and when to provide documentation are advised to consult with their instructors. The library has guides designed to help students to appropriately identify a cited work. The full policy can be found on BMCC’s web side, www.bmcc.cuny.edu. For further information on integrity and behavior, please consult the college bulletin (also available online).