Objectives & Outcomes:

The objective in this class is for students to become familiar with Database Management Systems concepts. The student who completes this course:

- shall understand conceptual modeling concepts and be able to use ER Model to design database applications.
- shall be familiar with relational data models and be able to design relational database schemas from ER diagrams.
- shall be able to use a query language (SQL) to query the relational databases.
- shall understand the basic concepts of query optimization and learn simple query optimization techniques.
- shall gain experience in designing and implementing database systems.

Catalog Description

CPSC 4620 Database Management Systems 3 (3) Introduction to database/data communications concepts as related to the design of online information systems. Problems involving structuring, creating, maintaining, and accessing multiple-user databases are presented and solutions developed. Comparison of several commercially available teleprocessing monitor and database management systems is made. Includes Honors sections Preq: CPSC 2120 and CPSC 2150, each with a C or better.

Textbook:

(1) An Introduction to Database Systems, Eighth Edition, C. J. Date, Addison Wesley, 2004; OR
(2) Database Management Systems, R. Ramakrishnan and J. Gehrke, McGraw Hill; OR (3) Fundamentals of Database Systems, R. Elmasri and S. Navathe, Addison Wesley. [Note: Any of these three books is more than enough to cover the materials of this course; we will not follow any particular textbook in class.]
Tentative Outline of Topics:

1. Database Design Specification: Learning database concepts; discussing the database architecture and design considerations.
2. Conceptual model and ER diagram: ER Model; introducing EER diagram; studying how to use ER model to design a database system.
3. Relational data model and database schema: Learning the relational data model and studying how to convert ER model to relational database schema.
4. Database normalization: Introducing the functional dependency concepts; discussing the normal forms of relations, and the techniques used to perform the database normalization and the associated performance tradeoffs.
5. SQL language through MySQL: Studying SQL language using MySQL DBMS system; learning how to install and manage the MySQL database; writing SQL queries for retrieving information from the database.
6. Index, key, and other constraints: Discussing the concepts of indexing, key constraints, and integrity of the database.
7. Query Optimization: Introducing the query processing and query optimization techniques. We will discuss how a DBMS system processes queries and introduce the options for query optimization. Normalization will also be revisited with the emphasis on the performance tradeoffs associated to normalization.

Tentative Grading (subject to change):

The final grade for the course will be computed based upon the following distribution (tentative):

- Projects — 30%
- Homework + In Class quizzes – 15%
- 2 Tests – 30%
- Comprehensive Final Exam – 25%

For 6620 Students: There will be Additional special topics in the Projects and additional questions in tests.

Class Policy on submission: You cannot turn in work that has been turned in for credit in another course.

Grade Appeal:

Any grade challenges regarding exams, quizzes, exercises, or programs must be emailed to the instructor, with detailed justifications, within one week of the date the grades are available. No exceptions.
Attendance

Attendance is expected, but not required. We may cover material in an order different than the textbook. You are responsible for any material covered in class. You are responsible for any announcements, assignments or assignment modifications that are announced in class whether you are present or not. This also applies to arriving late to class or leaving early. We will have unannounced quizzes during class; 5 to 10 quizzes are expected during the semester. No make-ups will be given.

Projects

We will do a semester long project (using MYSQL and web portals); you'll be working in groups of two, unless otherwise approved; details will be provided in class. You should be reasonably proficient in using C on UNIX platforms; programming help may not be available.

Deadlines

Work is due at the specified deadline. Late work will not be accepted. If a project (homework, programming assignment, etc.) is only partially completed you should submit what you have by the deadline. You should expect very little to no credit for projects that still generate syntax errors.

Instructor Late: If the instructor is late for class, students are expected to wait for 15 minutes before they leave.

Cancellation of Class: If classes are cancelled by the university on the day of a scheduled test, we will reschedule the test.

Academic Integrity

As members of the Clemson University Community, we have inherited Thomas Green Clemson's vision of this institution as a "high seminary of learning". Fundamental to this vision is a mutual commitment to truthfulness, honor, and responsibility, without which we cannot earn the trust and respect of others. Furthermore, we recognize that academic dishonesty detracts from the value of a Clemson degree. Therefore, we shall not tolerate lying, cheating, or stealing in any form. Read the university academic integrity statement (along with other important information). Unless otherwise specified in an assignment, you are expected to work independently on projects and labs. If you are in doubt about the type of help you may give or receive on a project: ASK!

University Accessibility Statement:
Clemson University values the diversity of our student body as a strength and a critical component of our dynamic community. Students with disabilities or temporary injuries/conditions may require accommodations due to barriers in the structure of facilities, course design, technology used for curricular purposes, or other campus resources. Students who experience a barrier to full access to this class should let the professor know, and make an appointment to meet with a staff member in Student Accessibility Services as soon as possible. You can make an appointment by calling 864-656-6848, by emailing studentaccess@lists.clemson.edu, or by visiting Suite 239 in the Academic Success Center building. Appointments are strongly encouraged – drop-ins will be seen if at all possible, but there could be a significant wait due to scheduled appointments. Students who receive Academic Access Letters are strongly encouraged to request, obtain and present these to their professors as early in the semester as possible so that accommodations can be made in a timely manner. It is the student’s responsibility to follow this process each semester. You can access further information here: http://www.clemson.edu/campus-life/campus-services/sds/.

The Clemson University Title IX (Sexual Harassment) Statement

Clemson University is committed to a policy of equal opportunity for all persons and does not discriminate on the basis of race, color, religion, sex, sexual orientation, gender, pregnancy, national origin, age, disability, veteran’s status, genetic information or protected activity in employment, educational programs and activities, admissions and financial aid. This includes a prohibition against sexual harassment and sexual violence as mandated by Title IX of the Education Amendments of 1972. This policy is located at http://www.clemson.edu/campus-life/campus-services/access/title-ix/. Mr. Jerry Knighton is the Clemson University Title IX Coordinator. He also is the Director of Access and Equity. His office is located at 110 Holtzendorff Hall, 864.656.3184 (voice) or 864.656.0899 (TDD).

Academic Calendar Fall 2017

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
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<tbody>
<tr>
<td>Aug 21, Mon</td>
<td>New Student Convocation</td>
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<tr>
<td>Aug 21, Mon - Aug 22, Tue</td>
<td>Late enrollment</td>
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<tr>
<td>Aug 22, Tue</td>
<td>University Convocation</td>
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<tr>
<td>Aug 23, Wed</td>
<td>Classes begin</td>
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<tr>
<td>Aug 29, Tue</td>
<td>Last day to register or add a class or declare Audit</td>
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<tr>
<td>Sep 5, Tue</td>
<td>Last day to drop a class or withdraw from the University without a W grade</td>
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<tr>
<td>Sep 12, Tue</td>
<td>Last day to apply for December graduation</td>
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<tr>
<td>Oct 13, Fri</td>
<td>Last day for instructors to issue midterm evaluations</td>
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<tr>
<td>Oct 16, Mon - Oct 17, Tue</td>
<td>Fall break</td>
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<tr>
<td>Oct 31, Tue</td>
<td>Last day to drop a class or withdraw from the University without final grades</td>
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<tr>
<td>Nov 6, Mon</td>
<td>Registration for spring and summer terms begins</td>
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<tr>
<td>Nov 22, Wed - Nov 24, Fri</td>
<td>Thanksgiving holidays</td>
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Dec 7, Thu - Dec 8, Fri  Classes meet; exams permitted in labs and one-hour courses only

Dec 11, Mon - Dec 15, Fri  Examinations
Dec 18, Mon  9:00 A.M.--Deadline to submit candidate grades
Dec 20, Wed  9:00 A.M.--Deadline to submit other grades
Dec 20, Wed  Candidates for graduation may access grades
Dec 20, Wed  Doctoral Hooding at the Brooks Center
Dec 21, Thu  Graduation