Course Number & Name: CSC 231 Database Design

Credit Hours: 4.0  Contact Hours: 4.0  Lecture: 4.0  Lab: N/A  Other: N/A

Prerequisites: Grade of “C” or better in CSC 122

Co-requisites: None  Concurrent Courses: None

Course Outline Revision Date: Fall 2010

Course Description: This course introduces the concepts and techniques associated with the manipulation of mass storage based files. Topics explored include various file processing environments, access methods, typical data structures, and file design and implementation. Students must be prepared for extensive individual work in the computer laboratory.

Course Goals: Upon successful completion of this course, students should be able to do the following:

1. discuss the impact that database designs have on user interfaces and application program structures;
2. design and implement a relational database and supporting applications;
3. design and implement a data dictionary for a relational database; and
4. explain multi-user database processing on LANs in client-server systems.

Measurable Course Performance Objectives (MPOs): Upon successful completion of this course, students should specifically be able to do the following:

1. Discuss the impact that database designs have on user interfaces and application program structures:
   1.1 describe various database designs;
   1.2 discuss the advantages and the disadvantages of each database design variety; and
   1.3 construct a database and an interface application program

2. Design and implement a relational database and supporting applications:
   2.1 normalize database tables; and
   2.2 implement a database system
Measurable Course Performance Objectives (MPOs) (continued):

3. Design and implement a data dictionary for a relational database:
   3.1 design a data dictionary for a relational database; and
   3.2 implement the data dictionary in a relational database

4. Explain multi-user database processing on LANs in client-server systems:
   4.1 describe issues of multi-user database processing;
   4.2 demonstrate fundamentals of SQL in programming projects; and
   4.3 explain terminology and programs associated with LAN client server systems

Methods of Instruction: Instruction will consist of lectures, laboratory demonstrations and assignments, and programming examples.

Outcomes Assessment: Exam questions are blueprinted to course objectives. Checklist rubrics are used to evaluate the programming projects for the presence of course objectives. Data is collected and analyzed to determine the level of student performance on these assessment instruments in regards to meeting course objectives. The results of this data analysis are used to guide necessary pedagogical and/or curricular revisions.

Course Requirements: All students are required to:

1. Maintain regular attendance and take part in class discussions.
2. Complete assigned homework and programming projects on time.
3. Take all exams as scheduled.

Methods of Evaluation: Final course grades will be computed as follows:

<table>
<thead>
<tr>
<th>Grading Components</th>
<th>% of final course grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homework, class participation and attendance</td>
<td>10%</td>
</tr>
<tr>
<td>Students must practice skills on their own by doing homework to be able to master course objectives. Homework assignments relate to these objectives. Attendance and class participation are necessary for students to benefit from the guidance of the instructor.</td>
<td></td>
</tr>
<tr>
<td>3 or more programming projects</td>
<td>35%</td>
</tr>
<tr>
<td>Programming projects will show evidence of the extent to which students meet course objectives. Students should show that they have synthesized a combination of concepts.</td>
<td></td>
</tr>
</tbody>
</table>
Methods of Evaluation (continued):

<table>
<thead>
<tr>
<th>Grading Components</th>
<th>% of final course grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Midterm Exam</td>
<td>25%</td>
</tr>
<tr>
<td></td>
<td>The Midterm Exam will provide evidence of the extent to which students have mastered course objectives and synthesize material taught in the first half of the course.</td>
</tr>
<tr>
<td>Final Exam</td>
<td>30%</td>
</tr>
<tr>
<td></td>
<td>The Final Exam will provide evidence of the extent to which students have mastered course objectives and synthesize material taught in the second half of the course.</td>
</tr>
</tbody>
</table>

Academic Integrity: Dishonesty disrupts the search for truth that is inherent in the learning process and so devalues the purpose and the mission of the College. Academic dishonesty includes, but is not limited to, the following:

- plagiarism – the failure to acknowledge another writer’s words or ideas or to give proper credit to sources of information;
- cheating – knowingly obtaining or giving unauthorized information on any test/exam or any other academic assignment;
- interference – any interruption of the academic process that prevents others from the proper engagement in learning or teaching; and
- fraud – any act or instance of willful deceit or trickery.

Violations of academic integrity will be dealt with by imposing appropriate sanctions. Sanctions for acts of academic dishonesty could include the resubmission of an assignment, failure of the test/exam, failure in the course, probation, suspension from the College, and even expulsion from the College.

Student Code of Conduct: All students are expected to conduct themselves as responsible and considerate adults who respect the rights of others. Disruptive behavior will not be tolerated. All students are also expected to attend and be on time for all class meetings. No cell phones or similar electronic devices are permitted in class. Please refer to the Essex County College student handbook, *Lifeline*, for more specific information about the College’s Code of Conduct and attendance requirements.
**Course Content Outline:** based on the text *Database Systems Design, Implementation, and Management*, 5th edition, by Peter Rob and Carlos Coronel; published by Course Technologies

<table>
<thead>
<tr>
<th>Week</th>
<th>(3 meetings @ 80 minutes)</th>
<th>Topic/Chapter</th>
</tr>
</thead>
</table>
| 1    |                           | Chapter 1 File Systems and Databases  
1.1 File Systems  
1.2 Database Systems  
1.3 Database Mode |
| 2    |                           | Chapter 2 The Relational Model  
2.1 Logical View of Data  
2.2 Integrity Rules  
2.3 Relational Database Operators  
2.4 Relational Database Software Classification  
2.5 Data Redundancy |
| 3    |                           | Chapter 3 E-R Modeling  
3.1 Data Models  
3.2 The E-R Model  
3.3 Developing an E-R Diagram  
**Project #1** focused on Relational Database |
| 4 – 6|                           | Chapter 4 Normalization of Database Tables  
4.1 Normalization  
4.2 First Normal Form  
4.3 Second Normal Form  
4.4 Third Normal Form  
4.5 Boyce-Code Normal Form |
| 7 – 9|                           | Chapter 5 Introduction to SQL  
5.1 Data Definition Commands  
5.2 Data Management  
5.3 Queries  
5.4 Advanced Data Management Commands  
**Project #2** focused on Database Normalization  
Midterm Exam Review  
**Midterm Exam** |
| 10 – 12|                         | Chapter 6 Database Design  
6.1 Systems Development Life Cycle  
6.2 Database Life Cycle |
<table>
<thead>
<tr>
<th>Week (3 meetings @ 80 minutes)</th>
<th>Topic/Chapter</th>
</tr>
</thead>
</table>
| 13                            | Chapter 12 Client Server Systems  
|                               | 12.1 Client/Server Environment  
|                               | 12.2 Client/Server Architecture  
|                               | 12.3 Managerial Expectation  
|                               | **Project #3** focused on Client Server Systems |
| 14 – 15                       | Chapter 14 Internet Databases  
|                               | 14.1 Internet Technology and Databases  
|                               | 14.2 Intranet Architecture  
|                               | **Final Exam Review**  
|                               | **Final Exam** |