Pellissippi State Community College  
Master Syllabus

ADVANCED DATABASE MANAGEMENT SYSTEMS  
CSIT 2510

Class Hours: 2.0  
Laboratory Hours: 2.0  
Credit Hours: 3.0  
Revised: August, 2015

Instructor:  
Office:  
Phone:  
Email:

Catalog Course Description:
A study of database management systems concepts. Topics include relational and object-oriented models, conceptual design, data structures, storage techniques, data administration, system security, concurrent transactions, distributed system, multi-tiered architectures, data warehousing and data mining. Practical application of techniques may include advanced application of query languages, remote access, database administration and user support.

Entry Level Standards:
The entering student should have a familiarity with the Windows environment. The student is expected to have moderate programming abilities in a high-level language. Problem solving skills will be essential.

Prerequisite: CSIT 1520 and CSIT 1810

Textbooks and Other Related Material Basic to the Course:


Additional reading material will be provided by the instructor.

I. Week/Chapter/Topic Basis:

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic(s)</th>
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<tbody>
<tr>
<td>1</td>
<td>Introduction, Review of Database Concepts (Keys, Normalization, ER Modeling)</td>
</tr>
<tr>
<td>2</td>
<td>Designing for speed of retrieval: De-normalization and Aggregation</td>
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<tr>
<td>3</td>
<td>Structured and Unstructured Data (Tabular, XML, NoSQL)</td>
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<td>4</td>
<td>Database Optimization: Indexing (B-trees), Query Optimization</td>
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<tr>
<td>5</td>
<td>Database Administration: Backup, Recovery, Security, Monitoring</td>
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<tr>
<td>6</td>
<td>Managing large databases: Partitioning, Availability, Reliability, Distributed databases</td>
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<tr>
<td>7</td>
<td>XML</td>
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<tr>
<td>8</td>
<td>Mid-term Exam, XML</td>
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<tr>
<td>9</td>
<td>Introduction to Data Warehousing: Data marts, DW schemas</td>
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<tr>
<td>10</td>
<td>Populating the DW: ETL tools, semantic layers</td>
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<tr>
<td>11</td>
<td>Mining the DW: Queries, reports, cubes, data mining</td>
</tr>
<tr>
<td>12</td>
<td>Industry KPIs, working with the business users</td>
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</tbody>
</table>
II. **Course Goals:**
The course will:

A. Enhance the student’s knowledge of the advantages and disadvantages of using a database management system and professional design tools. II III IV V
B. Build the skills to use a formal language of data definition and data manipulation to accomplish various administrative tasks. III IV V
C. Enhance the student’s knowledge of the components of alternative database models and appreciate how implementations as systems may vary from the relational model. II III IV V
D. Build the skills to transform a complex conceptual design into a logical database design and to a physical database design. II III IV V
E. Foster the ability to perform the database administration function. I II III IV V
F. Enhance the student’s knowledge of classic data structuring techniques. I II III IV V

III. **Expected Student Learning Outcomes:**
Students will be able to

1. Explain the similarities and differences of various data models. C D E
2. Perform advanced database normalization. D E
3. Develop complex Entity-Relationship Models. D E
4. Create data for data warehouses and/or data marts. A C D E
5. Explain the functions of database administration. B E
6. Write programs using query languages to accomplish administrative tasks. A B
7. Use data mining techniques to make associations and predictions. A C
8. Describe solutions to problems associated with distributed database systems. A C E
9. Use the Internet to access databases. A B C E
10. Represent data using the object-oriented model. C E F
11. Describe the concept of binary trees, B-trees, linked lists, and hash tables. A C D E F
12. Explore XML as an alternative database organization. B C D
13. Explain file organizations and access methods. A C F

IV. **Evaluation:**

A. Testing Procedures: 50% of grade
   Two comprehensive exams will be given during the course of the semester. Dates will be announced in class and each test will account for 250 points of your final grade.

B. Laboratory Expectations: 50% of grade
   Several lab projects will be assigned during the course of the semester. A late penalty may be imposed on any overdue assignment. Individual and/or group projects may be assigned to emphasize practical solutions to database problems. Failure to satisfactorily complete any assigned projects may result in a grade of F for the course. Lab projects will account for (50%) of your final grade.
C. Field Work:
   This information, if applicable, will be provided by the instructor in full detail during the first week of class via syllabus supplement.

D. Other Evaluation Methods:
   This information, if applicable, will be provided by the instructor in full detail during the first week of class via syllabus supplement.

E. Grading Scale:
   
<table>
<thead>
<tr>
<th>Grade</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>A</td>
<td>93 – 100</td>
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<tr>
<td>B+</td>
<td>88 – 92</td>
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<tr>
<td>B</td>
<td>83 – 87</td>
</tr>
<tr>
<td>C+</td>
<td>78 – 82</td>
</tr>
<tr>
<td>C</td>
<td>73 – 77</td>
</tr>
<tr>
<td>D</td>
<td>65 – 72</td>
</tr>
<tr>
<td>F</td>
<td>Below 65</td>
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</table>

V. Policies:

A. Attendance Policy:
Pellissippi State expects students to attend all scheduled instructional activities. As a minimum, students in all courses (excluding distance learning courses) must be present for at least 75 percent of their scheduled class and laboratory meetings in order to receive credit for the course. For the complete policy, please refer to the Academic Information in the online college catalog at www.pstcc.edu/catalog.

B. Academic Dishonesty:
Academic misconduct committed either directly or indirectly by an individual or group is subject to disciplinary action. Prohibited activities include but are not limited to the following practices:

   • Cheating, including but not limited to unauthorized assistance from material, people, or devices when taking a test, quiz, or examination; writing papers or reports; solving problems; or completing academic assignments.
   • Plagiarism, including but not limited to paraphrasing, summarizing, or directly quoting published or unpublished work of another person, including online or computerized services, without proper documentation of the original source.
   • Purchasing or otherwise obtaining prewritten essays, research papers, or materials prepared by another person or agency that sells term papers or other academic materials to be presented as one’s own work.
   • Taking an exam for another student.
   • Providing others with information and/or answers regarding exams, quizzes, homework or other classroom assignments unless explicitly authorized by the instructor.
   • Any of the above occurring within the Web or distance learning environment.

Please see the Pellissippi State Policies and Procedures Manual, Policy 04:02:00 Academic/Classroom Conduct and Disciplinary Sanctions for the complete policy.
C. **Accommodations for Disabilities:**
   Students that need accommodations because of a disability, have emergency medical information to share, or need special arrangements in case the building must be evacuated should inform the instructor immediately, privately after class or in her or his office. Students must present a current accommodation plan from a staff member in Disability Services (DS) in order to receive accommodations in this course. Disability Services may be contacted by sending email to disabilityservices@pstcc.edu, or by visiting Alexander 130. More information is available at [http://www.pstcc.edu/sswd/](http://www.pstcc.edu/sswd/).

D. **Computer Usage Guidelines:**
   College-owned or -operated computing resources are provided for use by students of Pellissippi State Community College. All students are responsible for the use of computing resources in an effective, efficient, ethical and lawful manner. It is each individual user's responsibility to abide by the policy available at [www.pstcc.edu/ppm/pdf/08-13-05.pdf](http://www.pstcc.edu/ppm/pdf/08-13-05.pdf). Additional requirements and procedures may be required for the authorized use of specific college computing laboratories.

E. **Make-up Assignments/Exams:**
   1. Make-up exams: All exams are required, and make-ups will be allowed only in the rarest of cases. In the event of an emergency, notification of the instructor must be made in advance.
   2. It is the student's responsibility to request help from the instructor prior to an assignment's due date.