ADVANCED DATABASE MANAGEMENT SYSTEMS
CSIT 2550

Class Hours: 3.0   **Credit Hours: 4.0**

Laboratory Hours: 3.0   **Revised: Fall 06**

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 MS-DOS and the Windows environment. The student is expected to have moderate programming abilities in a high-level language. Problem solving skills will be essential. The student should be able to keyboard at least 23 words per minute.

Prerequisites:

CSIT 2425

Textbook(s) and Other Course Materials:

<u>Required</u>:
Database Systems: A Practical Approach to Design, Implementation and Management, 4th.Edition, Connolly, Thomas and Carolyn Begg, Addison-Wesley, 2004.
Oracle Database 10g DBA Handbook, Loney, Kevin and Bob Bryla, McGraw-Hill, 2005.
<u>Recommended</u>:
Oracle Database 10g: The Complete Reference, Loney, Kevin, McGraw-Hill, 2004.

I. Week/Unit/Topic Basis:

Week	Topic
1	Introduction, Review of Database Concepts
2	ER Modeling and UML and Transformation
3	ER Modeling and Transformation
4	Normalization
5	Higher Normal Forms
6	B-trees, Hashing

7	Access Methods, Indexes
8	Mid-term Exam, Management and Security
9	Physical Design and Tuning, Distributed Database Design
10	Distributed Database Design and Allocation
11	Data Warehouses, Data Marts, Star Schema
12	Warehouses, OLAP, Data Mining
13	Data Mining, Remote Database Access with 3GLs
14	Remote Database Access
15	Final Exam

II. Course Objectives*:

A. Understand the advantages and disadvantages of using a database management system and professional design tools. II III IV VII IX XI XII

B. Use a formal language of data definition and data manipulation to accomplish various administrative tasks. III IV VII XI

C. Recognize the components of alternative database models and appreciate how implementations as systems may vary from the relational model. III IV VII IX XI XII

D. Transform a complex conceptual design into a logical data base design and to a physical database design. III IV VII IX XI XII

E. Perform the database administration function. I II III IV V IX XI XII

F. Recognize classic data structuring techniques. I II III IV V IV IX XI XI

*Roman numerals after course objectives reference goals of the CSIT program.

III. Instructional Processes*:

Students will:

1. Use professional tools to produce software components and documentation. *Technological Literacy Outcome, Transitional Strategy, Active Learning*

2. Learn to analyze and solve problems using structured analytical techniques. *Technological Literacy Outcome, Active Learning Strategies*

3. Use professionally accepted methods and materials in completion of applications. *Technological Literacy Outcome, Transitional Strategy, Active Learning*

*Strategies and outcomes listed after instructional processes reference TBR's goals for strengthening general education knowledge and skills, connecting course work to experiences beyond the classroom, and encouraging students to take active and responsible roles in the educational process.

IV. Expectations for Student Performance*:

Upon successful completion of this course, the student should 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 World Wide Web 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

14. Explain the concept of indexes. A C F

*Letters after performance expectations reference the course objectives listed above.

V. Evaluation:

A. Testing Procedures:

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 -- 500 points total.

B. Laboratory Expectations:

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 500 points (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:

93 – 100	A
88 – 92	B+
83 – 87	B
78 – 82	C+
73 – 77	C
65 – 72	D
Below 65	F

VI. Policies:

A. Attendance Policy:

Pellissippi State Technical Community College expects students to attend all scheduled instructional activities. As a minimum, students in all courses must be present for at least 75 percent of their scheduled class and laboratory meetings in order to receive credit for the course. [NOTE: No differentiation is noted for excused/unexcused absences. These will be treated as an absence.] (*Pellissippi State Catalog*)

B. Academic Dishonesty:

Plagiarism, cheating, and other forms of academic dishonesty are prohibited. Students guilty of academic misconduct, either directly or indirectly through participation or assistance, are immediately responsible to the instructor of the class. In addition to other possible disciplinary sanctions which may be imposed through the regular Pellissippi State procedures as a result of academic misconduct, the instructor has the authority to assign an F or a zero for the exercise or examination or to assign an F in the course. (*Pellissippi State Catalog*)

C. Accommodations for disabilities:

If you need accommodations because of a disability, if you have emergency medical information to share, or if you need special arrangements in case the building must be evacuated, please inform the instructor immediately. Please see the instructor privately after class or in his/her office. Students must present a current accommodation plan from a staff member in Services for Students with Disabilities (SSWD) in order to receive accommodations in this course. Services for Students with Disabilities may be contacted by going to Goins 127 or 131 or by phone: 694-6751(Voice/TTY) or 539-7153.

D. Other Policies:

Computer Usage Guidelines:
College-owned or –operated computing resources are provided for use by students of Pellissippi State. All students are responsible for the usage of Pellissippi State's computing resources in an effective, efficient, ethical and lawful manner. (Pellissippi State Catalog)

Other:
Plagiarism, cheating, software piracy, non-educational use of computer systems and other forms of academic dishonesty are strictly prohibited. A student caught cheating or infracting specific rules will be given a grade of "F" for the course.

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.

It is the student's responsibility to request help from the instructor prior to an assignment's due date.