COURSE OUTLINE

IST 253  
Course Number  

Database Concept  
Course Title  

Credits  

2  
Class or Lecture Hours  

2  
Laboratory Work Hours  

N/A  
Clinical or Studio Hours  

N/A  
Practicum, Co-op, Internship  

15  
Course Length (15 week, 10 week, etc.)  

Performance on an Examination/Demonstration  
(Placement Score (if applicable); minimum CLEP score)  

Alternate Delivery Methods  
(Online, Telecourse [give title of videos])  

Not Applicable  
Not Applicable  

Required Materials:  
Textbook:  

Material:  
Flash drive  

Catalog Description:  
This course teaches students relational database technology and how to apply it in solving basic and advanced database problems and cases. It provides the foundation for the advanced study of individual database management systems, electronic commerce, and enterprise computing.  

Prerequisites:  IST 109  

Corequisites:  None  

Last Revised:  01/24/11  

Course Coordinator (name, email, phone extension):  
Assistant Professor Queen E. Okike  
okeqe@mccc.edu  
Extension  3464  

Available Resources:  (Identify library resources relevant to the course, including books, videos, journals, electronic databases, recommended websites.)
Course Goals.

The student will be able to:

- Explain business rules in data modeling, guidelines for analyzing business information needs, design errors in data modeling, functional dependency identification, and query optimization tips.

- Apply parallel database technology, query rewriting for materialized views and transparency in Oracle distributed database.

- Explain deadlock control, database recovery check pointing, user interaction time in transaction design, time presentation in dimension tables, data warehouse maturity.

- Explain Web services in client-server database processing, and commercial acceptance of object database architecture.

- Apply SQL for both Microsoft Access and Oracle database to solve problems.

- Explain problem solving guidelines to aid acquisition of key skills and the ER assistant

- Apply SQL commands such as CREATE TABLE, SELECT, UPDATE, INSERT, DELETE, CREATE VIEW, CREATE TRIGGER statements

- Apply SQL syntax to support instruction with other prominent database management systems

COURSE CONTENT

Unit I  Introduction to Database Management
Learning Objectives:
The student will be able to:

- Explain Fundamentals of relational databases
- Explain Data modeling and normalization
- Explain Database application development
- Explain Database administration and database processing environments

Unit II  Broad Goals of Database Development
Learning Objectives:
The student will be able to:

- Develop a common vocabulary
- Define data meaning
- Ensure data quality
- Provide efficient implementation
- Business rules support organizational policies
- Identify restrictiveness of business rules
- Explain too restrictive: reject valid business interactions and too loose: allow erroneous business interactions
Unit III The Relational Data Model
Learning Objectives:
The student will be able to:
- Explain relational model basics
- Identify Integrity rules
- Identify rules about referenced rows
- Apply relational Algebra
- Develop relational model

Unit IV Query Formulation with SQL
Learning Objectives:
The student will be able to:
- Explain background
- Join tables
- Summarizing tables
- Apply problem solving guidelines
- Identify advanced problems
- Apply data manipulation statements
- Apply physical models
- Apply Structured Query Language
- Apply Language for database definition, manipulation, and control
- Explain International standard
- Explain Standalone and embedded usage
- Explain Intergalactic database speak

Unit V Understanding Entity Relationship Diagrams
Learning Objectives:
The student will be able to:
- Explain notation basics
- Explain Entity relationships
- Explain generalization hierarchies
- Explain business rule representation
- Explain diagram rules
- Explain alternative notations

Unit VI Developing Data Models for Business Databases
Normalization of Relational Tables
Learning Objectives:
The student will be able to:
- Identify guidelines for analyzing business information needs
- Explain transformations for generating alternative designs
- Explain finalizing an ERD
- Explain Schema Conversion
- Explain modification anomalies
- Explain functional dependencies
- Explain major normal forms
- Explain relationship independence
- Explain practical concerns
Unit VII  
Physical Database Design
Advanced Query Formulation with SQL

Learning Objectives:
The student will be able to:
- Review overview of Physical Database Design
- Explain file Structures
- Apply Query Optimization
- Apply Index Selection
- Identify additional Choices in Physical Database Design
- Identify outer join problems
- Explain Type I nested queries
- Explain Type II nested queries and difference problems
- Apply Nested queries in the FROM clause
- Solve Division problems
- Explain Null value effects

Unit VIII  
Application Development with Views
Stored Procedures and Triggers

Learning Objectives:
The student will be able to:
- Create views and using views
- Process queries that reference views
- Identify updatable views
- Identify data requirements for hierarchical forms
- Identify data requirements for reports
- Explain database programming language background
- Apply stored procedures
- Apply triggers

Unit IX  
View Design and Integration
Database Design for Student Loan Limited

Learning Objectives:
The student will be able to:
- Explain motivation for view design and integration
- Apply view design with forms
- Apply View integration
- Describe the final report to management
- Explain Case description
- Explain conceptual data modeling
- Explain logical database design
- Explain physical database design
Unit X  Data and Database Administration
Transaction Management

Learning Objectives:
The student will be able to:
- Explain Organizational context
- Identify tools of database administration
- Explain processes for database specialists
- Review overview of processing environments
- Explain transaction basics
- Explain concurrency control
- Explain recovery management
- Explain transaction design issues
- Explain workflow management

Unit XI  Data Warehouse Technology and Management

Learning Objectives:
The student will be able to:
- Explain basic concepts and characteristics
- Explain business architectures and applications
- Identify data cube concepts and operators
- Identify relational DBMS features
- Explain maintaining a data warehouse

Unit XI  Client-Server Processing, Parallel Database Processing,
and Distributed Databases

Learning Objectives:
The student will be able to:
- Explain Client-Server Database Architectures
- Explain Parallel Database Architectures
- Explain architectures for Distributed Database Management Systems
- Explain transparency for Distributed Database Processing
- Explain Distributed Database Processing

Unit XII  Object Database Management Systems

Learning Objectives:
The student will be able to:
- Explain motivation for object database management
- Identify Object-oriented principles
- Explain architectures for object database management
- Identify Object database definition and manipulation in SQL:2003
- Identify Object database definition and manipulation in Oracle 10g
**Evaluation of Student Learning**

Weekly class attendance and participation  
Average of weekly homework and laboratory assignments  

Four units of Tests/Projects:

- Units I, II, III: 10%
- Units IV, V, VI: 10%
- Units VII, VIII: 10%
- Units IX, X: 10%

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**Audit:**
If you audit the course, you will receive an “X” grade—this cannot be changed to a letter grade at a later date.

**Withdrawal Course Requirements:**
To receive a W grade for any course, a student must consult with the course instructor or an appropriate division representative and then withdraw officially before two-thirds of the course has been completed by submitting a withdrawal form to the Office of Student Records. Withdrawal after this point results in a grade other than W (usually F). At any time before two-thirds of the course has been completed, the instructor may also withdraw with a W grade any student who has been absent excessively. A student thus withdrawn will not be entitled to any refund of tuition or fees. The student may appeal this action.
**Attendance Policy**
Mercer County Community College does not have a “cut system.” Students are expected to attend all classes of every course on their schedules. Only illness or serious personal matters may be considered adequate reasons for absence. It is the prerogative of the instructor to excuse absences for valid reasons, provided the student will be able to fulfill all course requirements.

Student performance in classes is formally verified at each class meeting. If a student’s attendance has been infrequent or performance unsatisfactory, he or she may receive notification in the mail. At any time, the instructor may withdraw the student from class for insufficient attendance.

**Classroom Conduct Statement**
It is the student’s responsibility to attend all classes. If a student misses a class meeting for any reason, he/she is responsible for all content that is covered, for announcements made, and for acquiring any materials that may have been distributed in class. It is expected that students be on time for all classes. Students who walk into class after it has begun are expected to choose seats close to where they entered the room so that they do not disrupt the class meeting.

Students are expected to follow ordinary rules of courtesy during the class sessions. Engaging in private, side conversations during class time is distracting to other students and to the instructor. Leaving class early without having informed the instructor prior to class is not appropriate. Unless there is an emergency, leaving class and returning while the class is in session is not acceptable behavior. Disruptive behavior of any type, including sharpening pencils during class while someone is speaking, is not appropriate.

The college welcomes all students into an environment that creates a sense of community of pride and respect; we are here to work cooperatively and to learn together.

**Academic Integrity Statement**
A student who knowingly represents work of others as his/her own, uses or obtains unauthorized assistance in the execution of any academic work, or gives fraudulent assistance to another student is guilty of cheating. The penalty for violating the honor code is severe. *(See Student Handbook.)* Any student violating the honor code is subject to receive a failing grade for the course and will be reported to the Office of Student Affairs. If a student is unclear about whether a particular situation may constitute an honor code violation, the student should meet with the instructor to discuss the situation.

It is permissible to assist classmates in general discussions of computing techniques; general advice and interaction are encouraged. Each person, however, must develop his or her own solutions to the assigned homework and laboratory exercises. Students may not “work together” on graded assignments. Such collaboration constitutes
cheating, unless it is a group assignment. A student may not use or copy (by any means) another's work (or portions of it) and represent it as his/her own.