Mercer County Community College

Division of Business and Technology

IST 224

ORACLE PROGRAMMING WITH VISUAL BASIC

COURSE DESCRIPTION

Oracle Programming with Visual Basic will be used to create event driven programming applications to run on Windows and Server environment. Object oriented solutions for a variety of personal and business computing problems will be developed. Course includes interfacing Visual Basic with Oracle database to optimize database administration.

Text (s): **Reference Division Booklist**

Prerequisites: IST109 Basic Programming or prior programming experience

Co-requisites: None

Credits: 4 **Lecture Hours: 2** **Studio/Lab Hours: 2**

Food and drink are strictly prohibited in classrooms as per health and safety laws. Students may not bring in chemicals or cleaning fluids without the appropriate MSD sheets.

Course Coordinator: Winston H. Maddox **Latest Review: Fall 2003**

I. COURSE OBJECTIVES

The course is designed to provide the student with programming skills required to create and maintain Oracle database(s), queries and stored procedures. Students will update data using standard SQL commands, write procedural programming language using PL/SQL, and write stored procedures that can communicate with Visual Basic. Exposure will include various components required for communicating between Visual Basic on the client and Oracle database server. Also five most common data-access technologies will be covered.

II. TESTS

A minimum of six tests/mini projects will evaluate student learning. Each test/mini project will contain sentence completion, interpretation of a flowchart and/or program, and may require the writing of a program or program element.

III. QUIZZES

Students should expect a brief quiz each week based upon the previous lecture and reading assignment.

IV. LABORATORY

Students will be given a minimum of six major projects to provide a hands-on experiential component in the programming environment. All assignments will have deadlines.

V. LABORATORY EVALUATION

Students' performance of each laboratory assignment will be evaluated and assigned a point value according to the following:

Standards:	**0 to 2 points** Adherence to specified Programming Standard. Programs must contain properly identified modules. The minimum modules for any program are: Program Identification, Variable Map, Program Description, Main Routine, and EOJ Routine.
Remarks:	**0 to 2 point** Generous use of remarks within the Main and Subroutines must be made.
Use of Project Lesson:	**0 to 2 points** The Visual Basic/Oracle/both elements specified in the "project lesson" section of the assignment must be used.
Execution:	**0 to 4 points** Output must be according to the project's specifications.
Total each project:	**0 to 10 points**

VI. FINAL GRADE

The final grade is a composite based upon:

Tests (Theory/projects/both)	40%
Laboratory Major Projects (class)	30%
Midterm Examination	15%
Final Examination	15%

COURSE OUTLINE

Week	Lecture Topics	Reading Assignment and Projects
One	**Introduction to Oracle and Visual Basic** ➢ Architecture of Relational Database ➢ Oracle Server ➢ Oracle Server Advanced Features ➢ VB in Oracle World **Oracle Database Architecture** ➢ Instances and Database ➢ Memory Structure ➢ Processes and Database files ➢ Data Concurrency and Data Consistency ➢ Schemas and How Oracle works	Chapter 1 & 2
Two	**Creating a Database** ➢ Administration Tools ➢ Oracle Installation ➢ Initialization Files ➢ Starting up and Shutting Down the database ➢ Creating the database ➢ Configuring the network	Chapter 3
Three	**Database Administration** ➢ Backup Procedures ➢ Data Export and Import ➢ Mirroring the Redo logs ➢ Mirroring the Control files ➢ Ensuring Archive files are active ➢ Doing Hot Backups ➢ Recovering a database ➢ Setting database security ➢ Regular maintenance tasks ➢ Using Enterprise Manager	Chapter 4
Four	**Database Design** ➢ Conceptual Design and Logical Design ➢ Using Primary, Surrogate and Foreign keys ➢ Automating the Design Process **Implementation** ➢ Creating Tablespace and Creating a Table ➢ Specifying Constraints, Creating Indexes ➢ Creating and Using Sequences ➢ Audit Trails, Other Schema Objects ➢ Setting Privileges ➢ Using Microsoft Database Designer	Chapter 5 and 6
Five	**Queries** ➢ A SQL Overview and Types of SQL Commands ➢ The Basic SELECT Command ➢ Group Functions ➢ Queries form More Than One Table	Chapter 7

Week	Lecture Topics	Reading Assignment and Projects
	➢ Subqueries ➢ Optimizing Your Queries ➢ Specifying Schemas	
Six	**Updating Database** ➢ A Philosophy for Updating Tables ➢ Inserting, Updating and Deleting Rows ➢ Transaction Control and Security ➢ Database Triggers ➢ Bulk Loading of Data ➢ Dates and the Year 2000 Problem **Introduction to PL/SQL** ➢ PL/SQL as an Extension of SQL ➢ Stored Procedures ➢ Packages ➢ Tools for Creating Stored Procedures ➢ Error Handling in PL/SQL	Chapter 8 and 9
Seven	**Creating Stored Procedures** ➢ PL/SQL Data Types ➢ Declaring Variable ➢ Statements and Assignments ➢ Flow of Control Statements ➢ User Defined Data Types ➢ Cursor Variables ➢ Using Triggers, Providing Transaction Audit ➢ Procedures and Visual Basic	Chapter 10
Eight	**Client-Side Technology** ➢ The Software Layers ➢ Setting Up Net8 SQL *Net ➢ ODBC ➢ Sources of ODBC Drivers ➢ Setting Up an ODBC Data Source ➢ Creating an ODBC Connection String ➢ Potential Problems with the ODBC Setup	Chapter 11
Nine	**Accessing Oracle from Visual Basic** ➢ The JET Engine ➢ Remote Data Objects ➢ ODBCDirect ➢ The ODBC API ➢ ActiveX Data Objects ➢ Oracle Objects for OLE ➢ Comparison of Object Model ➢ Exporting an Access Table to Oracle ➢ Oracle Export Wizard	Chapter 12
Ten	**Visual Basic Design Issue** ➢ Logging On the Database ➢ Views, Synonyms, and Schemas ➢ Cursor Selection ➢ Querying and Updating of Database	Chapter 13

Week	Lecture Topics	Reading Assignment and Projects
	➢ Transaction Control ➢ Locking Issues and Using BLOB-Type Data ➢ Error Handling	
Eleven	**The DAO Object Hierarchy** ➢ Accessing a Database ➢ Creating Recordsets ➢ Executing SQL Commands ➢ Calling Stored Procedures ➢ Error handling ➢ Viewing Structure of Database ➢ Drawbacks to DAO	Chapter 14
Twelve	**Remote Data Objects** ➢ The Object Hierarchy ➢ Databases and Connections ➢ Working with rdoResultsets ➢ Using doResultset Event ➢ Exploring rdoResultset Methods and Properties ➢ Using rdoQuery Objects, Executing SQL Commands and Calling Stored Procedures ➢ Asynchronous Operation ➢ Retrieving PL/SQL Tables and Error Handling ➢ Disadvantages and Future of RDO	Chapter 15
Thirteen	**ODBCDirect** • ODBCDirect Object Hierarchy ➢ Accessing ODBCDirect ➢ Creating Recordsets and Using QuerDefs ➢ Calling Stored Procedures ➢ Asynchronous Operation ➢ Drawbacks to ODBCDirect	Chapter 16
Fourteen	**ActiveX Data Objects** ➢ ADO Object Model ➢ Connecting to Oracle ➢ Working With Recordsets and Recordset Events ➢ Executing SQL Commands ➢ Calling Stored Procedures ➢ Retrieving PL/SQL Tables ➢ Asynchronous Operation ➢ Error Handling ➢ Using the Data Environment ➢ Drawbacks to ADO	Chapter 17

Week	Lecture Topics	Reading Assignment and Projects
Fifteen	**Oracle Objects for OLE** ➢ Oracle Objects for OLE Object Hierarchy ➢ Early Binding Issue ➢ Accessing a Database ➢ Creating OraDynasets ➢ Exploring the OraDynaset Methods ➢ Executing SQL Commands ➢ Calling Stored Procedures ➢ Retrieving Cursor Variables ➢ Retrieving PL/SQL Tables ➢ Using OraSQLStmts ➢ Batch Updates ➢ Error Handling ➢ Drawbacks to OO4O	Chapter 18

ACADEMIC INTEGRITY STATEMENT

"A student who a.) knowingly represents work of others as his/her own; b.) uses or obtains unauthorized assistance in the execution of any work; or c.) gives fraudulent assistance to another student is guilty of cheating. Violators will be penalized." (Student Handbook)

CLASSROOM CONDUCT STATEMENT

It is the students' responsibility to attend all of their classes. If they miss a class meeting for any reason, students are responsible for all content that is covered, for announcements made in their absence, and for acquiring any materials that may have been distributed in class. It is expected that students be on time for all their classes. If students walk into a class after it had begun, it is expected that they choose a seat close to where they entered the room so they do not disrupt the class meeting.

Students are expected to follow ordinary rules of courtesy during class session. 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 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 and pride and respect; we are all here to work cooperatively and to learn together.