



# BROWARD COLLEGE COURSE OUTLINE

**LAST REVIEW:** 2008 - 2009      **NEXT REVIEW:** 2013 - 2014      **STATUS:** A

**COURSE TITLE:** Business Development Using Visual Basic

**COMMON COURSE NUMBER:** COP 2706C

**CREDIT HOURS:** 3

## **CONTACT HOUR BREAKDOWN**

*(per 16 week term)*

**CLOCK HOURS:**

*(Voc. Course ONLY)*

Lecture: **48**

Lab: **16**

Clinic:

Other:

**PREREQUISITE(S):** COP 2821C

**COREQUISITE(S):** None

**PRE/COREQUISITE(S):**

## **COURSE DESCRIPTION**

This course will teach Visual Basic programmers, who currently build desktop applications and access corporate databases, the basics of how to build three-tier client/server solutions. Utilization of the Application Architecture Model. Utilize the VB programming system to build COM, DLLs and implement them in a multiuser environment using Transaction Server. Utilize MTS to address application infrastructure issues associated with building server-side COM objects that are used by the client. Create COM objects that use MTS services to participate in transactions and that use security. Utilize ActiveX Data Objects (ADO) from the middle tier to access data and invoke business and data services implemented in SQL. Implement business and data services in SQL Server database through the use of stored procedures. Apply basic debugging, error handling, and security techniques in a three-tier application.

General Education Requirements – Associate of Arts Degree (AA), meets Area(s):

Area

General Education Requirements – Associate in Science Degree (AS), meets Area(s):

Area

**Common Course Number: COP2706C**

**UNIT TITLES**

1. Business Development Strategy
2. Building COM DLLs with Visual Basic
3. Introduction to Transaction Server
4. Using MTS Transaction Services
5. Accessing Data from the Middle Tier
6. Building Stored Procedures with SQL
7. Implementing Security
8. Implementing COM with Visual Basic
9. Advanced Client/Server Technologies

**Common Course Number: COP2706C**

Please provide a brief description (250 characters maximum) that details how students will be evaluated on the course outcomes.

**EVALUATION:**

Utilization of the Application Architecture Model. Utilize the VB programming system to build COM, DLLs and implement them in a multiuser environment using Transaction Server. Utilize MTS to address application infrastructure issues associated with building server-side COM objects that are used by the client. Create COM objects that use MTS services to participate in transactions and that use security. Utilize ActiveX Data Objects (ADO) from the middle tier to access data and invoke business and data services implemented in SQL. Implement business and data services in SQL Server database through the use of stored procedures. Apply basic debugging, error handling, and security techniques in a three-tier application.

*\*\*\* Complete the following only if course is seeking general education status \*\*\**

## GENERAL EDUCATION Competencies and Skills \*:

Please highlight in **green** font all Competencies/Skills from the list below that apply to this course. In the box to the right of the Competency/Skill, enter all specific learning outcome numbers (i.e. 1.1, 2.7, 5.12) that apply.

<b>1. Read with critical comprehension</b>	
<b>2. Speak and listen effectively</b>	
<b>3. Write clearly and coherently</b>	
<b>4. Think creatively, logically, critically, and reflectively</b> (analyze, synthesize, apply, and evaluate)	
<b>5. Demonstrate and apply literacy in its various forms:</b> (highlight in <b>green ALL</b> that apply) ( 1. technological, 2. informational, 3. mathematical, 4. scientific, 5. cultural, 6. historical, 7. aesthetic and/or 8. environmental )	
<b>6. Apply problem solving techniques to real-world experiences</b>	
<b>7. Apply methods of scientific inquiry</b>	
<b>8. Demonstrate an understanding of the physical and biological environment and how it is impacted by human beings</b>	
<b>9. Demonstrate an understanding of and appreciation for human diversities and commonalities</b>	
<b>10. Collaborate with others to achieve common goals.</b>	
<b>11. Research, synthesize and produce original work</b>	
<b>12. Practice ethical behavior</b>	
<b>13. Demonstrate self-direction and self motivation</b>	
<b>14. Assume responsibility for and understand the impact of personal behaviors on self and society</b>	
<b>15. Contribute to the welfare of the community</b>	

*\* General Education Competencies and Skills endorsed by '05-'06 General Education Task Force*

## **UNITS**

### **Unit 1 Business Development Strategy**

#### **General Outcome:**

- 1.0 The student shall be able to explain enterprise development, describe an Island Hopper News sample Visual Studio 08 development system, enterprise Edition.**

#### **Specific Measurable Learning Outcomes:**

**Upon successful completion of this unit, the student shall be able to:**

- 1.1 Explain the general terms related to client/serve architecture.**
- 1.2 Describe the high level architecture of an enterprise solution using business development strategy.**
- 1.3 Describe the component object model and its advantages.**
- 1.4 Describe the main features of the Process and Application Models in the Solutions Framework.**
- 1.5 Describe the Island Hopper News sample used as the business problem in this course.**
- 1.6 List the development tools, products, and technologies that will be used to build the technical solutions to the course labs.**

**Unit 2**

**General Outcome:**

- 2.0 The student shall be able to discuss and implement business services using Visual Basic, and work with COM DLL projects as well as COM DLL registration.**

**Specific Measurable Learning Outcomes:**

**Upon successful completion of this unit, the student shall be able to:**

- 2.1** List the ways to implement business services in an enterprise solution that is developed in Visual Basic.
- 2.2** Utilize class modules to define an object in a Visual Basic project.
- 2.3** Create a COM DLL that exposes methods.
- 2.4** Set compile properties for a COM DLL.
- 2.5** Test a COM DLL.
- 2.6** Register a COM DLL.

**Common Course Number: COP2706C**

**Unit 3 Introduction to Transaction Server**

**General Outcome:**

- 3.0 The student shall be able to provide an overview of MTS architecture, using MTS Explorer and deploying an MTS component.**

**Specific Measurable Learning Outcomes:**

**Upon successful completion of this unit, the student shall be able to:**

- 3.1** List the issues related to developing multiuser, three-tier applications.
- 3.2** Explain how MTS addresses three-tier issues.
- 3.3** Describe the MTS architecture.
- 3.4** Create a package with MTS Explorer.
- 3.5** Add an existing component to the MTS package.
- 3.6** Configure a client computer to use MTS components.

**Common Course Number: COP2706C**

**Unit 4 Using MTS Transaction Services**

**General Outcome:**

- 4.0 The student shall be able to provide and overview of the building of MTS components, manage object state, explain debugging and error handling, and MTS programming best practices.**

**Specific Measurable Learning Outcomes:**

**Upon successful completion of this unit, the student shall be able to:**

- 4.1** Describe what a transaction is and how it conforms to the ACID (atomicity, consistency, isolation, durability) properties.
- 4.2** Describe how MTS manages context for objects.
- 4.3** Participate in transactions by calling the SetComplete, Set Abort, 4,4 EnableCommit, and Disable methods of the MTSObjectContext object.
- 4.4** Describe four ways to manage state for an MTS object.
- 4.5** Use the Shared Property Manager to store shared state for MTS objects.
- 4.6** Debug an MTS object at runtime.

**Unit 5**

**General Outcome:**

- 5.0 The student shall be able to demonstrate a universal data access overview, retrieve and modify records using ActiveX Data Objects; and utilize ADO from the middle tier and execute stored procedures from the command object.**

**Specific Measurable Learning Outcomes:**

**Upon successful completion of this unit, the student shall be able to:**

- 5.1** Compare and contrast the universal data access architecture and data access technologies available in enterprise development.
- 5.2** List and describe the objects in the ADO object hierarchy.
- 5.3** Write an MTS component in Visual Basic that retrieves and updates records in a SQL Server database.
- 5.4** Use ADO to call a stored procedure.
- 5.5** Through the use of ADO, utilize advanced, SQL Server specific features from an MTS component, such as prepared statements, cursors, and disconnected record sets.
- 5.6** Write MTS components that are optimized for data access in an enterprise solution.

**Common Course Number: COP2706c**

**Unit 6 Building Stored Procedures With SQL**

**General Outcome:**

- 6.0 The student shall be able to demonstrate and understanding of SQL Server, implement business and data services with SQL Server, program with Transact-SQL, and create stored procedures.**

**Specific Measurable Learning Outcomes:**

**Upon successful completion of this unit, the student shall be able to:**

- 6.1** Choose when to implement services in database or MTS objects.
- 6.2** Implement business and data services by using stored procedures.
- 6.3** Explain the role of data integrity when implementing data services in an enterprise solution.
- 6.4** Write a stored procedure that uses SQL programming constructs, such as conditional branching and looping structures, and error checking.
- 6.5** Describe the characteristics of SQL transactions and explain how they work with MTS transactions.
- 6.6** Write a stored procedure that generates return.
- 6.7** Debug a stored procedure.

**Common Course Number: COP2706C**

**Unit 7 Implementing Security**

**General Outcome:**

- 7.0 The student shall be able to demonstrate and understanding of security, implementing security in MTS applications, discuss SQL Server security, use SQL Server integrated security, and explain security best practices.**

**Specific Measurable Learning Outcomes:**

**Upon successful completion of this unit, the student shall be able to:**

- 7.1** List the advantages of three-tier security over two-tier security in enterprise solutions.
- 7.2** Implement declarative security for MTS packages by using MTS roles and Windows NT user and group accounts.
- 7.3** Describe the three security modes available in SQL Server.
- 7.4** Assign permissions to a login using SQL Serve Enterprise Manager.
- 7.5** Implement integrated security by using Windows NT user accounts and SQL Security Manager.
- 7.6** List best practices associated with implementing security in enterprise solutions.

**Common Course Number: COP2706C**

**Unit 8 Implementing COM With Visual Basic**

**General Outcome:**

**8.0 The student shall be able to implement an interface.**

**Specific Measurable Learning Outcomes:**

**Upon successful completion of this unit, the student shall be able to:**

- 8.1** Define, create, and implement an interface.
- 8.2** Create multiple classes that use the same interface and multiple interfaces per class using Visual Basic.
- 8.3** Describe the purpose of Interface Definition Language (IDL) files and use OLEVIEW to view the contents of an IDL file.
- 8.4** Describe how IDispatch is used to implement Automation servers to expose services to objects and how dual interfaces make the process more efficient.
- 8.5** Describe the types of binding that Visual Basic uses with objects, and choose the correct type of binding based on performance and flexibility requirements.

**Common Course Number: COP2706C**

**Unit 9      Advanced Client/Server Technologies**

**General Outcome:**

- 9.0    The student shall be able to discuss client/server technologies, message queuing, server clustering, and mainframe data access.**

**Specific Measurable Learning Outcomes:**

**Upon successful completion of this unit, the student shall be able to:**

- 9.1** Describe a scenario where an asynchronous message queuing model is used.
- 9.2** Using Message Queue Explorer, create a new message queue and set properties for the queue, such as size and security.
- 9.3** Write a Visual Basic-based application that sends messages to or receives messages from a message queue.
- 9.4** Describe how Cluster Server can be used to enhance the availability of server applications.
- 9.5** List the technologies that enable access to data in legacy database systems.