

Title of Course: Visual Basic Programming, Level 2
Course Number: 362
Prerequisite: B or better in College Algebra

Course Description: This course introduces students to object-oriented programming using Visual Basic. Students will create a variety of applications as they learn to specialize forms and program their functionality. *This course does NOT fulfill the mathematics graduation requirement.*

State Content Standards from Technology Education Curriculum Framework:

1. Students will become aware of the world of work and its function in society, diversity, expectations, trends and requirements.
2. Students will recognize technology as the result of a creative act, and will be able to apply disciplined problem-solving strategies to enhance invention and innovation.
3. Students will identify and develop leadership attributes and apply them in team situations.

State Content Standards from Mathematics Curriculum Framework:

1. Students will make estimates and approximations, and judge the reasonableness of results.
2. Students will discover, analyze, describe, extend and create patterns, and use patterns to describe mathematical and other real-world phenomena.
3. Students will use algebraic skills and concepts, including functions, to describe real-world phenomena symbolically and graphically, and to model quantitative change.
4. Students will use the concepts and processes of discrete mathematics to analyze and model a variety of real-world situations that involve recurring relationships, sequences, networks, combinations and permutations.

Student Learning Objectives:

The student will be able to:

1. understand the basic concepts and methods of object-oriented programming
2. use the fundamentals of the Microsoft Visual Basic 6 programming system
3. use the three-step process of building Windows applications using Visual Basic 6
4. solve practical problems illustrating application-building techniques
5. take advantage of the many new capabilities of building applications in a graphical environment
6. create applications independently

Essential Questions:

- What are the advantages and disadvantages of procedural and object oriented programming methods?
- What was the past and what is the future of programming?
- What are the best control structures in different programming situations?
- What practical problems can be solved using Visual Basic applications?
- What are the moral and ethical obligations that programmers should consider when writing Visual Basic programs?
- What possible career paths are available to computer programmers?

Course Outline:

Introduction to Visual Basic Programming
Building an Application
Working with Intrinsic Controls and ActiveX Controls
Multiple Forms, Dialogs, Debugging, and EXEs
Menus, Data Controls, Common Dialogs, and General Procedures
Drag and Drop Events and More Complex Code Structures
Database Management and Reporting Applications
Creating Active X Controls and Distributing Applications

Integration of Technology:

Students will be using the computer daily using Visual Basic 6.

Evaluation:

In addition to the quizzes and tests, the student will be further assessed on his/her ability to independently create applications using newly gained knowledge.

Textbook:

Microsoft VisualBasic6 Complete Concepts and Techniques, Gary Shelly, Thomas Cashman, John Repede, and Michael Mick, 1999, Course Technology- ITP.

Other Key Materials:

Microsoft Visual Basic 6 programming system, MSDN Library Visual Studio 6.0, Visual Basic Data Disk, and the Shelly Cashman Online World Wide Web Service: www.scservices.com.

Curriculum Map:

Essential Questions	Content	Assessment	Skills	Time Frame
<p>Introduction</p> <p>What is computer programming?</p> <p>What is structured programming?</p> <p>What is OOP?</p> <p>What is Visual Basic?</p>	<p>The programming process</p> <p>GUI</p> <p>Programming development</p> <p>Life Cycle</p> <p>Control structures</p> <p>Flow charts</p> <p>Object oriented Programming and design</p> <p>The three step process of VB</p>	<p>Homework Assignments</p> <p>Classroom Assignments</p> <p>Tests</p> <p>Projects</p>	<p>Describe good interface design</p> <p>Understand Programming development Life cycle</p> <p>Define structured programming and object Oriented design</p> <p>Make flowcharts</p> <p>Understand the three step process of VB</p>	1 week
<p>VB Learning Project 1:</p> <p><i>Calculating Sales Commission</i></p> <p>What are SDI and MDI?</p> <p>What is an IDE?</p> <p>How is the 3-step process used to create a VB project</p>	<p>SDI and MDI Development</p> <p>Familiarity with VB</p> <p>Integrated development environment</p> <p>Creating a simple VB project with controls and code</p> <p>Using VB help</p>	<p>Homework assignments</p> <p>Classroom assignments</p> <p>Tests</p> <p>Projects</p>	<p>Start a VB project</p> <p>Size and locate the form</p> <p>Add controls to the form</p> <p>Set properties of controls</p> <p>Write an event procedure</p> <p>Save and run a VB project</p> <p>Print a VB project, form and code</p> <p>Use VB help</p> <p>Create an independent VB project</p>	2 weeks

Essential Questions	Content	Assessment	Skills	Time Frame
<p>VB Learning Project 2: <i>Theatre Box Office</i></p> <p>What are the intrinsic VB controls and what is the functionality of each?</p> <p>How does the computer decide between alternative actions in a program?</p> <p>How is “pretty” output created in VB?</p>	<p>Sizing and positioning the form Form Editor Toolbar: Align Controls: <i>Label</i> (AutoSize, BackStyle, BackColor, BorderStyle, & FontSize properties); <i>Listbox</i> and <i>ComboBox</i> (ListIndex, Style and List properties); <i>Shape</i>; <i>Frame</i>; <i>CheckBox</i> (Value property); <i>OptionButton</i>; <i>TextBox</i> (Locked, MultiLine, & ScrollBars properties) The Name, Caption, Text, and Visible properties ActiveX: Color CommonDialog Code: Intro to variables, VB data types, & implicit/explicit declarations; arithmetic expressions & order of operations; comparison operators; If-Then-Else statements; assignment operator; Format\$ (Currency, Fixed, Standard, Percent, Yes/No); vbNewLine; Concatenating text</p>	<p>Homework assignments Classroom assignments Tests Projects</p>	<p>Add the VB intrinsic controls mentioned under Content and set some properties Copy controls Copy code between procedures Explicitly declare variables Size and locate a form Use constants Concatenate text Use the format\$ function Write an If-Then-Else statement Write mathematical expressions Write Common Dialog control code</p>	3 weeks
<p>VB Learning Project 3: <i>SavU Loan Analyzer</i></p> <p>How are various dialog boxes added to an application?</p> <p>How are images added to an application?</p> <p>What are the methods for working with multiple forms in an application?</p> <p>How does VB Debug help find logical errors in a program?</p>	<p>Multiple forms About...dialog box StartUp form and location Creating icons for applications Image control & Picture property ScrollBar controls (Value, SmallChange & LargeChange properties) Line controls (BorderStyle & BorderWidth properties) Application dialog boxes with Msg_Box function\</p>	<p>Homework assignments Classroom assignments Tests Projects</p>	<p>Add Image controls and graphics Add CommandButton & ScrollBar controls Use controls introduced previously and set new properties Use VB Debug Use IsNumeric and Pmt functions Add an icon to a form Use the Show and Unload methods</p>	2 weeks

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	Multiple form code windows IsNumeric function If-Then-Else code block Show, Unload & SetFocus methods Financial function: Pmt Change, Scroll & Load event procedures Line continuation VB Debug features Executable applications WindowState, ControlBox & BorderStyle properties of forms Alignment property of TextBox & Label controls		Create multiple forms Write multiple event procedures Create and run an EXE file	

Essential Questions	Content	Assessment	Skills	Time Frame
<p>VB Learning Project 4: <i>GeoView Database Viewer</i></p> <p>How are menus in an application created?</p> <p>How is information from a database displayed?</p> <p>What are the differences between a sub procedure and a function procedure?</p> <p>How are the For-Next loop and the With statement implemented?</p> <p>What are ActiveX controls and how are they added to VB applications?</p>	<p>Applications with menus, submenus & pop-upmenus The Menu Editor Menu access keys, shortcuts, separator bars & check marks Data control properties: EOF, BOF Data control methods: MoveNext, MovePrevious, MoveFirst, & MoveLast</p> <p>Binding data-aware controls to a Data control: DataSource & DataField ActiveX: Font CommonDialog Control arrays Code: select records in a data base For-Next loops With statement General procedures The Not operator Adding/removing menu check marks during run time MouseDown, MouseUp event procedures Exit procedures Image control Stretch property</p>	<p>Homework assignments Classroom assignments Tests Projects</p>	<p>Use a Data control to link an application to a database Add CommonDialog font control Create menus and submenus using the Menu Editor Work with control arrays Write code using the For.Next loop and the With statement Write general sub procedures with arguments Call general procedures Set Image control Height, Width and Stretch properties Set Data control properties Use Data control methods in code</p>	3 weeks
<p>VB Learning Project 5: <i>Traffic Sign Tutorial</i></p> <p>What are the VB data types and the characteristics of each?</p> <p>How is drag-and-drop functionality added to applications?</p> <p>How are Select Case blocks and Do..Loop structures used in procedures?</p>	<p>Select case structures Do Loop structures InputBox & MsgBox functions Ucase\$ function Changing properties of a group of controls The Hide method</p>	<p>Homework assignments Classroom assignments Tests Projects</p>	<p>Call an event procedure Create a drop-down Menu Set properties for a group of controls</p>	2 weeks
<p>VB Learning Project 6: <i>TrainTrack Inventory System</i></p> <p>How is the Visual Data Manager used to create and modify data base files?</p> <p>How is the Report Designer used to design reports for an application?</p>	<p>Creating/modifying database files with the Visual Data Manager add-in Creating/Modifying forms with the Data Form Designer Code containing Data</p>	<p>Homework assignments Classroom assignments Tests Projects</p>	<p>Create a more sophisticated data base application that allows the user to modify and search the data Add tables to a database</p>	2 weeks

Essential Questions	Content	Assessment	Skills	Time Frame
<p>What are data-bound ComboBox controls and how are they added to an application?</p>	<p>control methods: AddNew, Delete, UpdateRecord & close (UnLoad Me) Using data-bound ComboBox controls Code creating a Recordset search routine (FindFirst method & NoMatch property) Code for DataControl Reposition, Validate & Error events Code for Form_Activate events Reports using Crystal Reports Pro CrystalReport ActiveX control</p>		<p>Use the data-bound ComboBox control Use the Visual Data Manager Use the Data Form Designer Use the report designer Use the Crystal Report Custom control</p>	
<p>VB Learning Project 7: <i>Multiplication Quiz</i></p> <p>How are ActiveX controls and their properties created and added to an application?</p> <p>What is the importance of random-number generating functions?</p> <p>How are the Package and Deployment Wizard and the ActiveX Document Migration Wizard used to distribute an application?</p>	<p>Creating ActiveX controls Creating properties for an ActiveX control UserControl event procedures Property procedures Compiling an ActiveX control to an .ocx file Timer controls in applications Resizing event procedures Integer division and mod operators Random number generating function A SetUp program for an application using the Package and Deployment Wizard ActiveX Document Migration Wizard Opening multiple projects in the IDE</p>	<p>Homework assignments Classroom assignments Tests Projects</p>	<p>Create a custom ActiveX control and custom properties Use the Timer control and its events and properties Use random-number generating functions Use the Resize event Use the VB Package and Deployment Wizard Use the ActiveX Document Migration Wizard Create an ActiveX document and server</p>	<p>2 weeks</p>