

Course of Study for: Computer II (Visual Basic)

Prepared July, 2007 by James Haver

Prerequisites: No previous programming experience is required or assumed.

Scope:

Computer II is an introduction to programming using Microsoft Visual Basic.NET. The goal of this course is to provide the students the best possible introduction to programming using Visual Basic.NET, whether they will continue on to more advanced computer science courses or end their programming education with this introductory course. This course will offer students an invaluable opportunity to develop problem-solving skills. The process of defining a problem, breaking it down into series of smaller problems, and finally writing a computer program to solve it exercises a student's logical abilities. Additionally, the student is made aware of the capabilities and limitations of a computer and soon realizes that the programmer—the human element—is more important than the machine.

Assessment:

Assessment comes in a variety of forms and wherever possible should be used to reflect and enhance the teaching and learning process that occurs in a classroom. Assessment should not be seen as a separate activity, but as an integral part of the teaching and learning process. Alternative assessments apply to any and all assessments that differ from multiple choice, timed, one-shot approaches that characterize most standardized and classroom assessment. Authentic assessments are assessments that engage students in applying knowledge and skills in the same way they are used in the real-world.

The **TIME** column offers a suggested time-line so that all topics listed in the **CONTENT/SKILLS** column are feasibly met. It is understood that times will need adjustments as the course develops. The **APPLICATION/PROJECT IDEAS** column offers suggestions and sources for the teacher. This column should be updated periodically to keep current and as new ideas are generated.

Textbook:

Title:	<u>An Introduction to Programming Using Microsoft Visual Basic</u>
Author:	Beth Brown
Publisher:	Lawrenceville Press 2006
ISBN #:	1-58003-113-7

TIME	CONTENT/SKILLS	APPLICATIONS/ PROJECT IDEAS	COMMENTS
January 3 days	<p>Chapter 1: Intro to Computer Technology</p> <ul style="list-style-type: none"> • Set up Class folders • Introduce Lab and Text • Drop Box • Basic Computer Technology vocabulary • History of Computers 	<p>**Textbook: An Introduction to Programming Using Microsoft Visual Basic.NET</p> <p>2005 Lawrenceville Press</p>	<p>*The first few days of class are used to get the students acquainted with the lab. Time is needed to set up student accounts.</p> <p>*Student read and answer questions from chapter 1(History of computers and basic vocabulary)</p>

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February (4-5 days)	<p><u>Chapter 2 Introduction to Visual Basic</u></p> <ul style="list-style-type: none"> • Intro Forms, toolbar • Opening and Saving Documents • Property Panel • Using IntelliSense • Assignment Statements • Radio Buttons • Menu Bar 	<ol style="list-style-type: none"> 1. Review: Message <ul style="list-style-type: none"> a. p38, 41,44, 47, 49 2. Review: HelloWorldInternational <ul style="list-style-type: none"> a. p52 3. Review: Calculations <ul style="list-style-type: none"> a. p55 4. Exercises # 4, 7, 10 <ul style="list-style-type: none"> a. p62-65 	<p>*The students need to become comfortable with layout of program.</p> <p>* They should know how to put programs in dropbox and online.</p> <p>* INSTALL program at home!!!</p>
February (5-6 days)	<p><u>Chapter 3 Variables and Constants</u></p> <ul style="list-style-type: none"> • Declaring variables • Assigning values to variables • Naming conventions • Textbox control • Val Function • Data Types • Variable Scopes (local vs global) • Naming Constants • Identifiers and Keywords • Debugging <p><u>Chapter 4 Decision Structures</u></p>	<ol style="list-style-type: none"> 1. Review: Square Area 1 and 2 <ul style="list-style-type: none"> a. p68, 70 2. Review: Scope Demo <ul style="list-style-type: none"> a. p74 3. Review: TotalDistance <ul style="list-style-type: none"> a. p73 4. Review: SkyhooksIntenational <ul style="list-style-type: none"> a. p75 5. Exercises: #7, 8, 9 <ul style="list-style-type: none"> a. 	<p>*Introduce writing basic programs by hand.</p> <p>*FIRST WRITTEN TEST</p>

TIME	CONTENT/SKILLS	APPLICATIONS/ PROJECT IDEAS	COMMENTS
February (10–12 days)	<ul style="list-style-type: none"> • If...Then Statement • Inequality symbols (Boolean Operators) • If...Then...Else Statement • Nested If...Then...Else Statement • If...Then...ElseIf Statement • Select...Case Statement • Select...Case Is Statement • Generating Random Numbers • Rnd(),Int() functions • Static Variables • Compound Boolean Expressions • MessageBox • Counter Variables • CheckBox • Line–Continuation Character <p><u>Chapter 5 Looping Structures</u></p> <ul style="list-style-type: none"> • Do...Loop • Do...While • Infinite Loop • Input Box • Accumulator Variables • For...Next Statement • String Class(Char, length, ToUpper...etc..) • String Concatenation (&) • Char Structure • Unicode • Comparing Strings • Like Operator <p><u>Chapter 6 Procedures</u></p> <ul style="list-style-type: none"> • Sub Procedures • PictureBox control 	<ol style="list-style-type: none"> 1. Review: TestGrade <ul style="list-style-type: none"> a. p94, 95, 96, 98 2. Review: Hurricane <ul style="list-style-type: none"> a. p97 3. Review: GuessingGame <ul style="list-style-type: none"> a. p103, 108 4. Review: MorningToDo <ul style="list-style-type: none"> a. p111 5. Exercises: #'s 3, 8, 9, 10, 11 Bonus #15 	<p>**Encourage the students to do more than what the projects ask for.</p> <p>**Give a individual project for over the break.</p> <p>**TEST #2</p> <p>**Continue to have the students write code by hand.</p>
March (10–12 days)	<p><u>Chapter 5 Looping Structures</u></p> <ul style="list-style-type: none"> • Do...Loop • Do...While • Infinite Loop • Input Box • Accumulator Variables • For...Next Statement • String Class(Char, length, ToUpper...etc..) • String Concatenation (&) • Char Structure • Unicode • Comparing Strings • Like Operator <p><u>Chapter 6 Procedures</u></p> <ul style="list-style-type: none"> • Sub Procedures • PictureBox control 	<ol style="list-style-type: none"> 1. Review: Prime Number <ul style="list-style-type: none"> a. p131 2. Review: AverageScore <ul style="list-style-type: none"> a. p134 3. Review: Factorial <ul style="list-style-type: none"> a. p137 4. Review: LetterCount, StringTest, FindString <ul style="list-style-type: none"> a. p140–141 5. Review: FullName, SecretMessageDecoder, CompareWords <ul style="list-style-type: none"> a. p142–145 	<p>*Remember: Programs will not work of the server if they contain input boxes. Place program on desktop.</p> <p>**Split this chapter at String Class.</p> <p>**Multiple Choice practice.</p> <p>**PIG LATIN PROJECT AT THE END.</p> <p>**Assign more Exercises.</p>

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April (10–12 days)	<ul style="list-style-type: none"> • Value Parameters • Reference Parameters • Control Object Parameters • Event Handler Procedure • Tag Property • Function Procedure 	<ol style="list-style-type: none"> 1. Review: Friends <ol style="list-style-type: none"> a. p163 2. Review: GuessingGame pts 1–4 <ol style="list-style-type: none"> a. p167 3. Review: NumberBreakdown <ol style="list-style-type: none"> a. p169 4. Review: SortNumbers <ol style="list-style-type: none"> a. p171 5. ShellGame <ol style="list-style-type: none"> a. p174–176 6. LetterGrade <ol style="list-style-type: none"> a. p179 7. Exercise #'s 2, 3, 10 	<p>*TEST #3</p> <p>*Have students work together on exercises.</p>
April (15 days)	<p><u>Chapter 7 Mathematical and Business Functions</u></p> <ul style="list-style-type: none"> • Math Class <ul style="list-style-type: none"> ○ Abs(), Sqrt(), Sign() • IsNumeric() Function • Round() Method • Formatting Numeric Output • BusinessFunctions <ul style="list-style-type: none"> ○ annuity, Pmt(), PV(), FV() • Processing Business Data • ListBox control • ComboBox control • Window Application Standards <ul style="list-style-type: none"> ○ access key, focus, disable <p><u>Chapter 8 Arrays and Structures</u></p> <ul style="list-style-type: none"> • Array index, array declaration and initialization 	<ol style="list-style-type: none"> 1. Review: RoundTheNumber <ol style="list-style-type: none"> a. p205 2. Review: LoanPayment pt1–3 <ol style="list-style-type: none"> a. p208, 215, 217 3. Review: CreditCardLoan <ol style="list-style-type: none"> a. p210, 218 4. Review: WatchYourMoneyGrow <ol style="list-style-type: none"> a. p210 5. TuitionCalculator <ol style="list-style-type: none"> a. p212, 214, 218 	<p>**Split this chapter at business functions.</p> <p>**Add Trig. functions if time allows.</p>

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May (12 days)	<ul style="list-style-type: none"> • Using Arrays <ul style="list-style-type: none"> ○ Accessing an element ○ Assignment ○ Index out of range (-1) ○ Array class ○ Traversing an array • Array Parameters <ul style="list-style-type: none"> ○ Passing an array argument ○ Passing and array element • Arrays with meaningful Indexes • Search and Array (linear search) • Dynamic Arrays <ul style="list-style-type: none"> ○ ReDim, Array with zero elements ○ Preserve • Two-Dimensional Arrays <ul style="list-style-type: none"> ○ accessing elements ○ traversing a two-dimensional array ○ ReDim, 2D parameters • Structures <ul style="list-style-type: none"> ○ declaring ○ Structure Arrays ○ Enumerated Types • Arrays of Objects <p><u>Chapter 9: Color, Sound and Graphics</u></p> <ol style="list-style-type: none"> 1. Using Color <ol style="list-style-type: none"> a. Changing color in the design window 	<ol style="list-style-type: none"> 1. Review: StudentNames <ol style="list-style-type: none"> a. p244 2. Review: DiceRolls <ol style="list-style-type: none"> a. p249 3. Review: NumberOccurences <ol style="list-style-type: none"> a. p249 4. Review: DynamicArrayDemo <ol style="list-style-type: none"> a. p253 5. Review: FindName <ol style="list-style-type: none"> a. p253 	<p>****We need to add a few basic programs here.</p> <p>****Check your course pace before you attempt to add this topic.</p>

TIME	CONTENT/SKILLS	APPLICATIONS/ PROJECT IDEAS	COMMENTS
May (7-8 days)	<ul style="list-style-type: none"> b. Transparent color c. Parent vs. Child control d. Changing colors at run time e. Imports Systems.Drawing <ol style="list-style-type: none"> 2. The ColorDialog Control <ul style="list-style-type: none"> a. ShowDialog, color property 3. Using Images <ul style="list-style-type: none"> a. Tiled b. BacgroundImage property c. Image Property d. Change images at run time 4. Making Sounds <ul style="list-style-type: none"> a. Beep() Function b. Imports Systems.Media c. Play(); Stop() 5. The Timer Control <ul style="list-style-type: none"> a. Name b. Interval c. Enabled 	<ol style="list-style-type: none"> 1. Review: ChangeFormColor <ul style="list-style-type: none"> a. p280, 281 2. Review: ChangeImage <ul style="list-style-type: none"> a. p283 3. Review: TestSounds <ul style="list-style-type: none"> a. p283 4. Review: WakeUp <ul style="list-style-type: none"> a. p284 5. Review: Blinky <ul style="list-style-type: none"> a. p287 	<p>****Try to introduce some of these features in the earlier chapters. This should help keep the student's interest.</p>