COURSE NUMBER AND TITLE   494-001   Visual Basic Programming

LEVEL   2

CREDITS   5

GRADE   10-12

PREREQUISITE   A grade of "**C**" or better in course 496 or Department Chairperson
recommendation

BASIC TEXT:
MS Visual Basic Basics, Knowlton & Collins, 1999-2000

SUPPLEMENTAL READINGS
Visual Basic 6.0, Sprague-Phillips, 2000
(Visual Basic books will be available for classroom use only)

REQUIRED MATERIALS
Students are required to have a two pocket folder and a writing utensil.

COURSE DESCRIPTION
Basic Programming is designed to teach the computer language Visual Basic in the context of
personal and practical real life situations using a PC. The approach is suited to students **with no
previous computer experience**. The course is primarily project driven and includes topics such
as menu development, data types and variables, loops, graphics, and drawing. By the end of the
course, students will be able to create professional looking and well-developed windows
programs. Note: The emphasis on this course will be to explore practical applications, not just
game development.
This course is recommended for those students thinking of a career in Computer Programming,
Information Systems, Windows Development and Help Desk-Technical Support**.**

MISSION RELATED GOALS:
While using computer programming, this course will foster the development of communication
and problem- solving skills.
Students will use their higher order thinking skills to respond appropriately to a given situation
or problem.

STUDENT EXPECTATIONS FOR LEARNING ADDRESSED:
Students will communicate effectively and work towards a common goal while utilizing their
problem solving skills to solve complex problems. The application of these expectations will
allow students to contribute to the wider computer technology global society.

GENERAL PERFORMANCE OBJECTIVES:
By the end of the course, students will be able to create professional looking and well-developed
windows programs using the elements of Visual Basic programming.

MASSACHUSETTS FRAMEWORKS STRANDS

G9-12: 1.1   Identify the platform , version, properties, function, and interoperability of computing devices including a wide range of devices that compute and/or manage digital media.

G9-12: 1.7   Identify and assess the capabilities and limitation of emerging technologies.

G9-12: 2.1   Demonstrate compliance with the school's Acceptable Use Policy.

G9-12: 2.2   Explain issues related to the responsible use of technology (e.g., privacy, security)

G9-12: 2.8   Design and implement a personal learning plan that includes the use of technology to support lifelong learning goals.

G9-12: 2.9   Evaluate the authenticity, accuracy, appropriateness, and bias of electronic resources including Web sites.

G9-12: 3.11 Compare, evaluate, and select appropriate online tools to locate information and conduct research using all appropriate electronic resources (e.g., web sites, online periodical databases, online catalogs, search engines, specialized directories, RSS feeds, and email alerts).

G9-12: 3.12 Formulate a research question or hypothesis, use appropriate technology resources to collect relevant information, analyze the findings, and report the results.

G9-12: 3.21 Explain and demonstrate how specialized technology tools can be used for problem solving, decision-making, and creativity (e.g. simulation software, environmental probes, computer-aided design, geographic information systems, dynamic geometric software, graphing calculators, art and music composition software).

G9-12: 3.32 Present ideas using a variety of formats that are appropriate for various audiences.

CURRICULUM FRAMEWORKS LEARNING STANDARDS:

Standard 1. Demonstrate proficiency in the use of computers and applications as well as an understanding of concepts underlying hardware, software, and connectivity.

Standard 2. Demonstrate responsible use of technology and an understanding of ethics and safety issues in using electronic media at home, in school and in society.

Standard 3. Demonstrate ability to use technology for research, critical thinking, problem-solving, decision making, communication, collaboration, creativity and innovation.

INTERNATIONAL SOCIETY FOR TECHNOLOGY IN EDUCATION (ISTE)
Secondary Computer Science Education Program Standards

Principle 1. Knowledge of Content: Students demonstrate knowledge of Computer Science content and model important principles and concepts.

Standard I. A. Demonstrate knowledge of and proficiency in data representation and abstraction.
Standard I. B. I.B. Effectively design, develop, and test algorithms.
Standard I. C. Demonstrate knowledge of digital devices, systems, and networks.
Standard I. D. Demonstrate an understanding of the role computer science plays and its impact in the modern world.

UNITS AND THEMES:

I.	Forms, Controls and Properties - Events and Codes	1 week
	Standards 1,2,3	
II.	Mathematical Operators **-** Error Handling	1 week
	Standards 1,2,3	
III.	Data Types and Variables	2 weeks
	Standards 1,2,3	

IV.	Project # 1 Group Project	1 week
	Standards 1,2,3	
V.	Strings and Decimal Types	1 week
	Standards 1,2,3	
VI.	If Statements and Logical Operators	1 week
	Standards 1,2,3	
VII	Nested If Statements and Option Buttons	1 week
	Standards 1,2,3	
VIII.	Project #2 - Individual project	1 week
	Standards 1,2,3	
IX.	Do Loops and Input Box Functions	1 week
	Standards 1,2,3	
X.	For Next Loops and Multiple Forms	1 week
	Standards 1,2,3	
XI.	Project #3 - Individual project	1 week
	Standards 1,2,3	
XII.	Menus and Print Functions	1 week
	Standards 1,2,3	
	XIII. Lines and Shapes	1 week
	Standards 1,2,3	
XIV.	Case Study - Gaming	1 week
	Standards 1,2,3	
XV.	Final Project - Individual	2 ½ weeks
	Standards 1,2,3	
XVI.	General Review and Final Exam	½ weeks
	Standards 1,2,3	

COURSE OUTLINE

I. Forms, Controls and Properties - Events and Codes
a.   Introduction to Visual Basic
b.   Binary Code, Forms, Controls, Properties
c.   Events and Code, Images, Making .exe files
II. Mathematical Operators **-** Error Handling
a.   Calculations and Data – Mathematical Operators, Exponentiation
b.   Order of Operation, Error Handling, Integer Division, Visible property
III. Data Types and Variables
a.   Declaring variables
b.   Auto-Sizing, Scope
c.   Variant Type, Option Explicit
IV. Project # 1, Group Project
a.   A group project encompassing VB concepts of the first 4 weeks
V. Strings and Decimal Types
a.   Declaring String variables
b.   Decimal Types
c.   Enable Function
d.   SelStart, SelLength

VI.   If Statements and Logical Operators
a.   Decision making
b.   Conditional operators
c.   If Statements, If Else Statements
d.   Check Boxes, logical operators

VII.   Nested If Statements and Option Buttons
a.   Using Nested If Statements
b.   Option Buttons
c.   Form Load
d.   Select Case

VIII.   Project #2 - Individual Project
a.   Designing projects using decision making components - If Statements
b.   Select Case, If-Else Statements

IX.   Do Loops and Input Box Function
a.   What are loops and how are they utilized?
b.   Input Box functions
c.   Using the DoEvents Statements

X.   For Next Loops and Multiple Forms
a.   Using For Next Loops
b.   Using the Print Statement
c.   Using Multiple Forms
d.   About Boxes

XI.   Project # 3, Individual Project, Looping Programs
a.   Designing projects utilizing concepts learned and adding loops and multiple forms

XII.   Menus and Printing, Menu Editor
a.   Creating menus using Menu Editor
b.   Checkmarks
c.   Sub-Menus
d.   Separator lines

XIII.   Lines and Shapes
a.   Creating line and shape controls
b.   Drawing lines from code
c.   Drawing boxes
d.   Changing ScaleMode property

XIV.   Case Studies, Gaming
a.   Drawing with pixels
b.   Learning gaming techniques by analyzing the Snake program

XV.   Final Project, Individual Project encompassing all Visual Basic Concepts
a.   Students utilize as many concepts in VB to construct a meaningful program or game

XVI.   General Review and Final Exam

SUGGESTED INSTRUCTIONAL STRATEGIES
Lessons will be presented as chalkboard presentations, lectures and handouts in order to address the various learning styles of the students. Writing assignments demonstrating that each student can effectively communicate programming concepts will be utilized, and exams will be administered in various formats, vocabulary, true and false, multiple choice and individual programs and projects.

SUGGESTED INTEGRATED ACTIVITIES
Students design Visual Basic pre-school programs to be used by the Tewksbury Memorial High School's Child Care classes.

USE OF TOOLS/TECHNOLOGY
State of the Art computers, (IBM format) Internet, Scanners and Digital Cameras

ASSESSMENT TECHNIQUES
Teacher observation of skills developed after the completion of concepts discussed and demonstrated
Practical Applications involving group and individual projects
Writing assignments demonstrating that each student can effectively communicate programming concepts.
Homework assignments will be given on daily programming skills acquired. Each student will hand write a program and test it the next day in class on the computer.
Written tests, including programming vocabulary. Tests will include multiple choice, true and false and individual programming.