

Instructor: Marc G. Fine

Course URL: <http://marcfine.com>

Phone:

School: 508 841-8800 x2050

Home: 860 974-1136

E-mail

School: mfine@shrewsbury.k12.ma.us

Home: mgfine@charter.net

Course description: This semester course is designed to introduce high school students, with little background in computers or computer programming, to the basic concepts of computer structure and computer programming. In our course students create engaging Windows® applications using the Visual Basic.Net programming language. Visual Basic (VB) has become one the most popular programming languages for learning to code. VB is easy to learn, which makes it an excellent tool for understanding elementary programming concepts.

In this course students are introduced to the methods and techniques of Visual Basic .NET programming, such as writing pseudo code, user interface design; using variables, decisions, menus, functions, multi-form projects, looping, and printing. This course is designed to bring students up to the necessary skill and knowledge level for an intermediate-level programming course. The course will allow students to explore the world of programming, practice creating code and develop a better sense of what it means to be a computer programmer.

In this "hands on" program, students will learn to use the computer as a problem-solving tool. Through project-based activities, students will develop basic programming technique and style. Typically, students will be presented with practical problems designed to lead them through the development of their understanding

Expectations for Student Learning

How does a participation in this class support the expectations for learning adopted by the community of Shrewsbury? While we strive to support all ten of the identified objectives, our class offers a unique opportunity support the following:

Academic Expectations

- 1. Apply critical thinking and creative literacy skills to formulate and express opinions in a variety of ways.*

The topics covered in class are presented as projects, designed to challenge students to develop unique presentation solutions while using a toolbox of new technology tools. This approach to learning (often described as authentic assessment) is supported by the assumption that you will be motivated to know a topic in order to present it.

- 3. Exhibit effective speaking, writing and reading skills.*

In our class we support the development of these traditional communication skills and learn to support them with modern technology presentation skills.

- 4. Demonstrate a variety of technological skills.*

Here is where we shine! Our students develop competency with a wide variety of the technology tools they will encounter as they prepare to live, work, and learn in a technologically advanced, global community.

Social Expectations

6. *Participate in collaborative and cooperative learning.*

Much of the learning opportunity in our class is presented as challenges requiring collaborative solutions. Students develop information technology workplace skills such as work-flow management, the use collaboration applications, and development of an understanding of system concepts.

Audience:

This course is intended for high school students who wish to:

- Gain a greater understanding about the role of programming in our world.
- Learn basic programming concepts and syntax.
- Explore career opportunities within the programming field.
- Develop a solid foundation for continued programming training.

Prerequisite Skills and Knowledge:

This course assumes students have these skills:

- Basic familiarity using a computer, such as browsing the Internet or using a word-processing application.
 - The ability to use a mouse and keyboard to navigate through the Microsoft Windows® user interface.
 - The ability to perform simple file management tasks, such as opening and saving files and creating file folders.

Software Tools:

- Microsoft Windows (XP SP 2)
- Microsoft Visual Studio.Net
- Internet Explorer
- Adobe Acrobat Reader (<http://www.adobe.com>)
- Macromedia FLASH Plug-in (<http://www.macromedia.com>)
- Microsoft's Silverlight browser plugin

Course Length:

- One Semester (20 weeks)

- One class period per day (approximately 50 minutes)

Student Assessments

- Students will submit programming application projects at the culmination of each unit of study
- Programming extensions will allow students to increase their grade for each project
- A detailed task list is provided for more details on each project

Course Outcomes:

After completing this course, students will be able to:

- Identify different ways we interact with programs in our everyday life
- Identify career opportunities for technology professionals
- Describe the logic of programming through pseudo code
- Navigate in Visual Basic.Net and identify IDE components
- Build and execute a program in the Visual Basic.Net IDE
- Identify common elements of Forms including Form objects, IDE Toolbox, and events
- Define Properties using the IDE Property Window and code
- Define variables and understand various data types
- Create assignment statements using simple arithmetic operators
- Perform simple debugging
- Create simple and complex "If" statement
- Create "For" loops, "Do Until" loops, and "Do While" loops
- Call built-in functions
- Write and call user-defined functions
- Create and manipulate arrays
- Describe different programming language options, and the similarity of their basic capabilities
- Describe the concept of syntax and its variability among different programming languages

Students will explore current developments:

- *Technology In the marketplace*
- *Careers In technology*
- *Social and ethical issues*

Visual Basic.Net Scope and Sequence

1. Opening and running Visual Basic.Net Programs

How to start Visual Studio.Net

Setting up and using the development environment (IDE)

Opening and running a Visual Basic program

Controls and changing property settings

Move, resize, dock, and auto hide tool windows
Use on-line help and exit Visual Studio

Projects

Music Trivia

2. Write your first program

Create a user interface
Setting properties for objects
Writing program code
Saving and running programs
Building an executable file

Project:

Lucky 7

3. ToolBox Controls

Textbox and button controls
DateTimePicker
CheckBox, RadioButton, ListBox, and ComboBox to process user input
LinkLabel to display a WebPage

Projects

Birthday
CheckBox
Hello
Input Controls
WebLink

4. Menus and Dialog Boxes

Add menus

Program code to process menu commands
OpenFileDialog and ColorDialog controls

Projects

Dialog
Menu

5. Variables and operators

Use variables to store data
Get user input with the InputBox function
Display messages with the MsgBox function
Work with different data types
Use math operators and functions in formulas
Use math methods in the System.Math class

Projects

Advanced Math
Basic Math
Constant Checker
Data Types
Framework Math

Input Box
Variable Test

6. Using Decision Structures

Conditional expressions
If...Then statements
Short-circuit an If...Then statement
Detect and manage mouse events

Projects

Case Greeting
Password Validation
User Validation

7. Using Loops and Timers

For...Next loops
String concatenation
Do loop
Timer objects

Projects

Celsius Conversion
Counter Variable
Digital Clock
For Loop Icons
Timed Password

8. Debugging Visual Basic.Net Programs

Identify error types
Set breakpoints to correct errors
Use a Watch window to examine variables
Use the Command window to change variables and execute commands

Projects

Debug Test

9. Tracking Errors Using Structured Error Handling

Manage runtime errors using the Try...Catch error handler
Using the Catch When statement
Using Err.Number and Err.Description properties
Build nested Try...Catch statements
Defensive programming techniques
Using the Exit Try statement.

Projects

Disk Drive Error
Disk Drive Handler

10. Modules and Procedures

Create standard modules
Declare and use public variables
Create user defined procedures

Call user defined procedures

Projects

Final Track Wins
Module Test
Text Box Sub
Track Wins

11. Using Arrays and Collections to Manage Data

Fixed-length and dynamic arrays
Re-dimensioning arrays

Projects

Dynamic Array
Fixed Array
URL Collection

12. Text Files And String Processing

Using a Text Box to display a text file
Saving notes to a text file
Sorting and encrypting text files

Projects

Encrypt Text
Quick Note
Sort Text
Text Browser

13. Adding Graphics and Animation Effects

Use the System.Drawing namespace to add graphics to your forms.
Create animation effects on your forms.
Expand or shrink objects on your form at runtime.
Change the transparency of a form

Projects

Build a graphics application

Grading policy: Each student will be graded in the following manner:

Student projects: Projects will be assigned with a due date and timely completion is expected.	60%
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Daily work habits: Homework when assigned Set-up of student work environment Development of "technology work skills" Collaborative effort	20%
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(Many projects are cooperative in nature)

with responsibilities shared with other students).

Final exam or final projects

20%

General course requirements:

1. Projects will be due on the date announced*
2. Students will be responsible for taking notes, when necessary and organizing and maintaining their "technology workspace".
3. Students will participate as responsible members of collaborative teams.
4. Students will be responsible users of technology, following acceptable use policies as adopted by the School Board.

* In order to meet the due dates for projects, some students may find it necessary to work in the computer lab after school, during study periods, or at home. Failure to complete assignments on time could result in the student not being ready to progress to new material. We understand that "Murphy's Law" is a potential in the real world of technology tools. Students with problems will have access to make-up time. Work that is not passed in on time may be recorded as a zero until it is done.

Extra help: The instructor will be available after school every day except when there are scheduled staff meetings. Please let me know when you plan to stay.

Receipt of class curricula must be acknowledged by a parent or guardian of students enrolled in any class. Please [follow this link](#) to a form that must be filled out and submitted to indicate you have seen and have a general understanding of our class curriculum.

Thank you.

Marc fine, Instructor.