SPRINGFIELD TECHNICAL COMMUNITY COLLEGE

ACADEMIC AFFAIRS

COURSE DESCRIPTION: PROG-40X - VISUAL BASIC .NET 4 credits

Industry standards, object orientation, and the development of bulletproof application programs will be stressed. Students will be exposed to the .NET Framework and Common Language Runtime (CLR.) Database access will also be stressed using ADO.NET as the access method, and MSDE (desktop version of Microsoft SQL Server) as the database. Students will build business objects using Visual Basic.NET. The reading and writing of SML will also be covered. PREREQUISITE: PROG-116;

Course Number:	PROG 40X	Department:	Computer Information Technologies		
Course Title:	Visual Basic.NET	Semester:	Fall	Year:	2010

Objectives/Competencies

Course Objective	Competencies

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1. To familiarize the student with Microsoft Visual Basic.NET language syntax	1. To gain knowledge how to declare variables and objects. 2. To gain exposure to VB looping, conditional and calculation constructs 3. To gain knowledge of the VB objects, method and class syntax.
2. To familiarize the student with Microsoft Visual Basic.NET Integrated Development Environment (IDE).	1. Create well-designed forms by dragging various controls from the toolbox onto the form. The controls will be properly sized and aligned. The visual alignment tool will be used to attain precision alignment of the controls within the form.
3. Instill in students the requirement to develop programs according to industry standards. Illustrate why the standards are important and how the use of standards actually makes the development of programs easier for the developer.	1. Utilize the following sections of the IDE to efficiently develop VB.NET projects: Solution Explorer, Properties, Toolbox, Code Editor and Form Design Tool 2. Create new or modify existing projects, forms, code modules and save them to disk. 3. Understand the types of files that make a VB.NET solution. 4. Create projects with multiple forms and multiple source files. 5. Follow and utilize standard industry GUI design standards provided by the instructor. 6. Customize the Visual Studio.NET developer profile to improve developer productivity.

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4. Establish student proficiency using the following VB.NET Controls: Label, Text Box, Radio Button, Check Box, List Box, Combo Box as well as Menus, the Common Dialog Control and Form objects.	1. Code all programming assignments utilizing the comprehensive industry standards provided by the instructor. Credit will be deducted if the standards are not followed. 2. Create well-designed forms by dragging various controls from the toolbox onto the form. The controls will be properly sized and aligned. The visual alignment tool will be used to attain precision alignment of the controls within the form. 3. Properly name each of the controls used on the form according to the industry standards provided. 4. Utilize the following properties of the controls: Name, Text, Enabled, BorderStyle, MaxLength, BackColor, Visible 5. Write event handlers containing code to react to the user's interaction with the controls on the form. 6. Demonstrate the ability to determine when and why a particular control should be used to develop a well-designed form that conforms to Windows guidelines. 7. Demonstrate the ability to create intuitive and efficient

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	menus that make a form easy and intuitive for the user.
5. Stress the 80/20 rule of application development (80% of the cost of an application is spent maintaining the application over its useful life while only 20% of the cost is attributable to the initial coding of the application). Coding shortcuts and bypassing standards may save a very tiny percentage of 20% of the cost while causing a disproportionate increase in the cost to maintain the application over its useful life.	1. Develop functions and sub-routines the break the logic down to small, easily maintained groups of code. Each function of sub-routine will have a very narrow focus relative to the function it will perform. 2. All variable and constant names will follow the industry standards provided by the instructor. 3. Name all variables and constants with names that would be meaningful to a person that is unfamiliar with the program being written. 4. Utilize comments to add clarity where the purpose of a function or sub-routine contains complicated logic. 5. Utilize the object-oriented nature of VB.NET to simplify the maintenance of the application program being written. 6. Utilize Option Strict for the development of all programs to allow the compiler to assist the student in catching more bugs before the end user begins using the application to run their business.
5. Instill in the students the fact that the debugger	1. Utilize the debugger for every programming assignment.

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is one of the most crucial parts of Visual Studio.NET development environment.	2. Utilize breakpoints to stop the execution of the program at specific points within the program. 3. Examine the contents of variables after the program has started executing through use of the Immediate Window and Watch, Quick Watch debugging tools. 4. Modify the contents of variable names from within the debugger after the program execution has begun.
6. Incorporate data validation concepts as the method of enforcing business rules within an application.	1. Utilize string object Trim method to remove excess spaces from the textbox text property. 2. Utilize the IsNumeric function to determine whether the data entered by the user is numeric. 3. Utilize the String object IndexOf method to determine whether the user entered a number with decimal places. 4. Utilize range validation techniques to assure that data entered falls within the range allowed by the business rules. 5. Display errors to the user for data fields that don't meet the business rules without using a MessageBox.
7. Stress the use of the Collection.Generic.List	1. Utilize the List as a means to populate ListBox and

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and Dictionary data types instead of traditional Visual Basic dynamic arrays.	ComboxBox controls. 2. Utilize a Dictionary data type when there is a need to retrieve a particular entry by key as opposed to via iteration.
8. Introduce the VB.NET Imports directive as a way to simplify coding.	1. Utilize various Imports statements within every program that is written during the course.
9. Incorporate object-oriented development techniques into the application development process	1. Utilize the built-in object-oriented methods associated with the intrinsic data types when developing programming assignments. 2. Encapsulate the business logic such as data validation, data retrieval, and data storage within student developed business objects. 3. Develop functions and subroutines containing overloaded operators. 4. Incorporate logic within the business objects to catch exceptions and re-throw them to the consumer of the object.
10. Develop a solid understanding of ADO.NET as a means to retrieve data from a database and to update the database.	1. Utilize ADO.NET as the sole database access method within the programming assignments 2. Incorporate structured exception handling with ADO.NET in

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	all programming assignments containing database access.
11. Familiarization with SQL server database access and updating from within Visual Basic.NET programs	1. Develop programs using SQL Server as the database. 2. Utilize the Visual Basic.NET Server Explorer and SQL Server Enterprise Manager while developing programming assignments. 3. Utilize the .NET SQL Connection object as the means to create a connection to the SQL Server database. 4. Develop programs that will use the .NET SQL DataAdapter in concert with the .NET SQL Connection object to retrieve data from the database 5. Utilize the SQL DataAdapter's fill method to populate a .NET Dataset object. 6. Develop code to retrieve data from the dataset object that will be displayed on the forms utilized by the application. 7. Validate data entered on the forms and utilize that data to update the .NET dataset object. This logic will include adding new records to the dataset, changing existing records within the dataset and deleting existing records from the dataset.

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	8. The SQL Data Adapter's Update method will then be utilized to actually update the database
12. Manipulate XML from within a Visual Basic.NET program.	1. Analyze the basic components of an XML document. 2. Utilize the Visual Basic.NET XMLTextReader object to read an XML data file and utilize the data to establish a database connection. 3. Utilize the XMLTextWriter object to create an XML file from data entered on a Visual Basic.NET form. 4. Analyze XML examples using the XML Document Object Model (XML DOM) and explain when to use the full XML DOM versus when to use the XMLTextReader and/or XMLTextWriter objects.