

**SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY**

**SAULT STE. MARIE, ONTARIO**



Sault College

**COURSE OUTLINE**

**COURSE TITLE: Visual Basic For GIS**

**CODE NO. : GIS4010**

**SEMESTER: 1**

**PROGRAM: Geographic Information Systems Specialist**

**AUTHOR: Willem de Bruyne**

**DATE: 07/07/04 PREVIOUS OUTLINE DATED: 07/07/03**

**APPROVED:**

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**DEAN**

\_\_\_\_\_  
**DATE**

**TOTAL CREDITS: Three**

**PREREQUISITE(S):**

**HOURS/WEEK: FOUR**

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School of Technology, Skilled Trades & Natural Resources*

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**I. COURSE DESCRIPTION:**

The course will overview the tools Visual Basic has to offer, and how to incorporate the various components into Visual Basic applications. The course will focus on introductory application building as well as the features of the language are covered, and the programming environment. We will be using Microsoft's .NET Framework as the integrated development environment. Once the student becomes familiar with Visual Basic's programming environment, he / she will be ready to create their own programs. In doing so, we will cover setting property values of objects, writing code, testing programs, saving/opening/modifying existing projects, as well as printing form images, object properties, and program instructions. As well as the common controls, students will work with ActiveX controls. The course will guide the students in comfortably creating a Visual Basic front-end to a database application. The end-result will be the packaging of your Visual Basic projects into complete Windows applications including the creation of a setup file.

**II. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE:**

Upon successful completion of this course, the student will demonstrate the ability to:

**1. An Introduction to Visual Basic .NET and Program Design**Potential Elements of the Performance:

- Describe Visual Basic .NET
- Describe the VB programming language
- Describe programs, programming, applications, and program development
- Define an algorithm
- Define objects, attributes, and methods
- Explain object-oriented programming and design

**2. The Visual Basic .NET Integrated Development Environment**Potential Elements of the Performance:

- Start VB .NET
- Customize the VB .NET integrated development environment
- Open a VB .NET project
- Describe the basic components of the VB .NET integrated development environment

- Run a VB .NET project
- Set a property on a control
- Navigate the code window
- Modify code in an existing project
- Save a VB .NET project
- Print a VB .NET project's forms and code
- Use VB .NET project help

### 3. Building an Application in the Visual Basic .NET Environment

#### Potential Elements of the Performance:

- Design a VB .NET application
- Start a new VB .NET project
- Change the size of a form
- Change the property values of a form
- Add controls to a form
- Move and resize controls
- Use the Label, TextBox, NumericUpDown, and Button controls
- Change the property values of controls
- Change the Name property to rename a control
- Write the code for the Click event procedure
- Display line numbers in the code window
- Use control properties in a method
- Document code with a comment header and comment statements

### 4. Working with Variables, Constants, Data Types and Expressions

#### Potential Elements of the Performance:

- Use the RadioButtons and GroupBox controls
- Use the Layout toolbar to size and align controls
- Set a default button on a form
- Lock controls on a form
- Declare variables and constants
- Use variables and constants within code
- Describe VB .NET data types
- Convert between data types
- Code a form Load event procedure
- Use the Option Strict statement
- Use arithmetic expressions
- Describe the order of operation in code

## 5. Decision Making

### Potential Elements of the Performance:

- Use the ComboBox control
- Code an If..Then...Else statement
- Code a nested If..Then...Else statement
- Code a Select Case statement
- Validate user input
- Use the MessageBox class

## 6. Repetition and Multiple Forms

### Potential Elements of the Performance:

- Add additional forms to a project
- Change the default icon on the title bar of a form
- Use the CheckBox controls
- Use the Anchor property
- Work with Collections in code
- Code a variety of looping structures
- Specify a Startup object for a project

## 7. Using Menus, Common Dialogs, Procedures, Functions, and Arrays

### Potential Elements of the Performance:

- Add a menu bar and menus to an application using the MainMenu control
- Add a shortcut menu to an application using the ContextMenu control
- Use the PictureBox control
- Use common dialog boxes in an application to interact with the user
- Use one-dimensional and multidimensional arrays in code

## 8. Debugging, Creating Executable Files, and Distributing a Windows application

### Potential Elements of the Performance:

- Describe the difference between syntax, logic, and run-time

errors

- Find syntax errors during design time
- Find run-time errors and logic errors during run time
- Set breakpoints
- Create an executable file
- Create a setup program to distribute a Windows application

### III. TOPICS:

1. An Introduction to Visual Basic .NET and Program Design
2. The Visual Basic .NET Integrated Development Environment
3. Building an Application in the Visual Basic .NET Environment
4. Working with Variables, Constants, Data Types and Expressions
5. Decision Making
6. Repetition and Multiple Forms
7. Using Menus, Common Dialogs, Procedures, Functions, and Arrays
8. Debugging, Creating Executable Files, and Distributing a Windows application

### IV. REQUIRED RESOURCES/TEXTS/MATERIALS:

MICROSOFT Visual Basic .NET Comprehensive Concepts and Techniques

*Authors: Shelly, Cashman, Quasney*

### V. EVALUATION PROCESS/GRADING SYSTEM:

The mark for this course will be arrived at as follows:

Quizzes 4 @	15%
Assign 3 @	12%
Participation	<u>4%</u>
	100%

The following semester grades will be assigned to students:

<b>Grade</b>	<b><u>Definition</u></b>	<i>Grade Point Equivalent</i>
A+	90 – 100%	4.00
A	80 – 89%	3.00
B	70 - 79%	2.00
C	60 - 69%	1.00
D	50 – 59%	0.00
F (Fail)	49% and below	0.00

CR (Credit)	Credit for diploma requirements has been awarded.
S	Satisfactory achievement in field /clinical placement or non-graded subject area.
U	Unsatisfactory achievement in field/clinical placement or non-graded subject area.
X	A temporary grade limited to situations with extenuating circumstances giving a student additional time to complete the requirements for a course.
NR	Grade not reported to Registrar's office.
W	Student has withdrawn from the course without academic penalty.

## VI. SPECIAL NOTES:

### Special Needs:

If you are a student with special needs (e.g. physical limitations, visual impairments, hearing impairments, or learning disabilities), you are encouraged to discuss required accommodations with your professor and/or the Special Needs office. Visit Room E1101 or call Extension 703 so that support services can be arranged for you.

### Retention of Course Outlines:

It is the responsibility of the student to retain all course outlines for possible future use in acquiring advanced standing at other postsecondary institutions.

### Plagiarism:

Students should refer to the definition of “academic dishonesty” in *Student Rights and Responsibilities*. Students who engage in “academic dishonesty” will receive an automatic failure for that submission and/or such other penalty, up to and including expulsion from the course/program, as may be decided by the professor/dean. In order to protect students from inadvertent plagiarism, to protect the copyright of the material referenced, and to credit the author of the material, it is the policy of the department to employ a documentation format for referencing source material.

### Course Outline Amendments:

The professor reserves the right to change the information contained in this course outline depending on the needs of the learner and the availability of resources.

Substitute course information is available in the Registrar's office.

Other Special Notes:

- Students will receive a grade of zero for late assignments unless prior permission is granted from the instructor.
- Students are expected to attend classes on a regular bases and treat their peers and instructors in a business like manner.
- Students are expected to inform the instructor via phone or e-mail if they are unable to attend class.
- Students missing a test will receive a grade of zero unless prior permission is granted from the instructor

**VII. PRIOR LEARNING ASSESSMENT:**

Students who wish to apply for advanced credit in the course should consult the professor. Credit for prior learning will be given upon successful completion of a challenge exam or portfolio.

**VIII. DIRECT CREDIT TRANSFERS:**

Students who wish to apply for direct credit transfer (advanced standing) should obtain a direct credit transfer form from the Dean's secretary. Students will be required to provide a transcript and course outline related to the course in question.