

course Unit Title	<b>COMPUTER PROGRAMMING FOR ENGINEERS</b>		
Course Unit Code	ACSC104		
Course Unit Details	BSc Automotive Engineering (Required Courses) - BSc Mechanical Engineering (Required Courses) - BSc Civil Engineering (Required Courses) -		
Number of ECTS credits allocated	6		
Learning Outcomes of the course unit	<p>By the end of the course, the students should be able to:</p> <ol style="list-style-type: none"> <li>1. Identify the components that constitute a computer system both in terms of hardware and software and effectively use core operations of a modern operating system</li> <li>2. Distinguish the advantages of imperative programming and object oriented programming using a language such as VB .Net and being able to comprehend programs of small and medium size complexity.</li> <li>3. Demonstrate the ability to express elementary algorithms using the syntax of a programming language thus choosing the appropriate data types, applying the correction operations, and forming the necessary statements.</li> <li>4. Analyse simple engineering problems, and construct algorithms to programmatically solve them.</li> <li>5. Illustrate the ability to formulate programs using selective, iterative, and sequential statements and implement them using a programming language.</li> </ol>		
Mode of Delivery	Face-to-face		
Prerequisites	NONE	Co-requisites	NONE
Recommended optional program components	NONE		
Course Contents	<p>- <b>Introduction to Computers:</b> Computers and Peripherals, Software and Hardware, Input and Output Devices, Memory, Difference between Main Memory (RAM) and Secondary Memory (Hard Disk), Central Processing Unit, Units of Storage and Speed, Operating Systems, Graphical User Interface and File Management.</p> <p>- <b>Systems Analysis and Design:</b> Systems Analysis and Design principles, Systems Development Life Cycle (SDLC), SDLC Diagram, Development models sequential and iterative.</p> <p>- <b>Algorithms and Flowcharts:</b> Algorithms, Flowcharts, Pseudocode Algorithms and Statements, Pseudocode and Variables, Testing, and Debugging Algorithms and Flowcharts.</p>		

	<p>- <b>Introduction to Programming:</b> About Programming and Program Execution, Programming Steps, Learning to Program, Integrated Development Environment, “Hello World!” Program, Program Explanations.</p> <p>- <b>Variables and Arithmetic Expressions:</b> Simple Programs, Program Explanations, Arithmetic Operations, Program Explanations, Data Types (Dim ... as Integer, Double, Char, String, Boolean) and Memory Allocation, Further Program Explanations, and Examples.</p> <p>- <b>Input/Output in VB .Net:</b> Converting Input (CInt, CDbI, CChar, CDec, CStr, CBool) Formatted Output (Console.Write("..."), Console.WriteLine("...")), Examples, Formatted Input (x = Console.ReadLine(), Console.ReadKey()), Examples, and Program Explanations.</p> <p>- <b>Types, Operators and Expressions:</b> Variables, Constants, Examples, Arithmetic Operators ( , - , * , /), Example, Relational Operators, Math Library, Example, Logical Operators (NOT, AND, OR), Example, Assignment Operator, Example, Control Flow (If ... Then ..., If ... Then ... Else, If ... Then ... Else if ... Else ..., and Select Case ..., Case ..., Select Case ..., Case 1 To 10 ..., Case Else ...), and Examples.</p> <p>- <b>Iteration:</b> VB .Net syntax, While loop, For loop, Do – While loop, Examples, Debugging Loops, and Avoiding Infinite Loops.</p> <p>- <b>Arrays:</b> Visual Basic arrays, One Dimensional Array, Array Indexing, Using Arrays, Arrays, Examples, Multi-dimensional Arrays, Using Multi-dimensional Arrays, Strings, String Functions, String Example, and Examples. Initializing arrays, Storing values, Process the array, and Print the results on screen. Array sorting using Bubble sort.</p>
Recommended and/or required reading:	
Textbooks	<ul style="list-style-type: none"> <li>• Michael Halvorson, Microsoft Visual Basic 2010 Step by Step, Microsoft Press, 2010</li> </ul>
References	<ul style="list-style-type: none"> <li>• Thearon Willis, Bryan Newsome, Beginning Visual Basic 2010, 1st Edition, Wrox, 2010.</li> <li>• Rod Stephens, Visual Basic 2010 Programmer's Reference, 1st Edition, Wrox, 2010.</li> <li>• Anne Boehm, Murach’s Visual Basic 2010, 4th Edition, Mike Murach &amp; Associates, 2010.</li> </ul>
Planned learning activities and teaching methods	<p>The taught part of course is delivered to the students by means of lectures, conducted with the help of computer presentations. Lecture notes and presentations are available through the e-learning platform and the web for students to use in combination with the textbooks.</p> <p>Lectures are supplemented with extensive laboratory work. During laboratory sessions, students are able to practice the material delivered during the lectures and experience solving various mathematics and engineering problems using Visual Basic as a programming Language.</p>

Assessment methods and criteria	Assignment 10% Midterm Test 15% Laboratory Works 15% Final Exam 60%
Language of instruction	English
Work placement(s)	NO