

# TEMPLATE FOR COURSE SPECIFICATION

## HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

### COURSE SPECIFICATION

This Course Specification provides a concise summary of the main features of the course and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. It should be cross-referenced with the programme specification.

1. Teaching Institution	University of Technology
2. University Department/Centre	Chemical Engineering Department
3. Course title/code	Computer Programming (I)/ 123
4. Programme(s) to which it contributes	BE.3207, CE.123, BE.3406, EG 104, BE.3106
5. Modes of Attendance offered	Full
6. Semester/Year	2 semesters/year
7. Number of hours tuition (total)	3
8. Date of production/revision of this Specification	15/10/2015
9. Aims of the Course	
<ol style="list-style-type: none"> <li>1. Learn the basics of computer and operation system Windows 7 and application program Office 2010 and programming language (Visual Basic) and used to solve the problems of chemical engineering. develop the mathematical skills necessary to solve practical problems</li> <li>2. emphasizes the general principles and techniques of computer programming, which can be applied to almost any programming language. Although the emphasis is on programming in any language, this course focuses on one language, in particular, called Visual Basic. It provides the students with a basic understanding and appreciation of the various essential programming-languages constructs, programming paradigms, evaluation criteria and language implementation issues.</li> <li>3. develop the mathematical skills necessary to solve practical problems</li> </ol>	
4. Equip you with the knowledge and skills for a range of careers in technology and computer-based industry	
5. developing critical thinking skills, solving open ended problems and to work in teams.	

## **10• Learning Outcomes, Teaching, Learning and Assessment Method**

### **A- Knowledge and Understanding**

- A1. Demonstrate the knowledge and understanding of the core ideas of programming languages.
- A2. Analyze a problem, and identify and define the computing requirements appropriate to its solution.
- A3. Apply algorithmic principles, and computer science in the design of problem solutions.
- A4. Understand and apply a wide range of programming principles to solve problems in different areas.

### **B. Subject-specific skills**

- B1. Use basic components of Visual Basic programming language to produce valid computer programs.
- B2. Communicate questions to clarify program requirements
- B3. Compare between alternative programming languages approaches.
- B4. Apply appropriate programming language techniques to the development of advanced problem solutions.
- B5. To apply computer software to analyze practical problem

### **Teaching and Learning Methods**

. Lectures using whiteboard and data show, Practical classes using software development tools and computers, Reports prepared by students and open discussion, Practical computer laboratory sessions & Exercises.

### **Assessment methods**

- 1- Oral discussion after each lecture to assess understanding of the lecture content.
- 2- Midterm Exam to assess understanding of the 1<sup>st</sup> part of the course.
- 3- Oral Exam to discuss the student's projects.
- 4- Discussion of Semester work to assess how to write a correct report.
- 5- Final practical exam to assess acquiring of the practical and professional skills of the course
- 6- Final written exam to assess acquiring of the knowledge and understanding as well as all skills of the course.
- 7- Quizzes: Sometimes we do these quizzes to keep the student always in the course and to evaluate the intellectual skills and the understanding.
- 8- Home works: To test and help student training on exams.

### **C. Thinking Skills**

- C1. Be able to write well-structured complex programs.
- C2. Apply design and development principles in the construction of programs used to solve problems in different areas.
- C3. To develop the students' ability to work effectively and to reinforce their individual responsibility for their own learning.
- C4. To interact positively with colleagues in a group context

**D.General and Transferable Skills (other skills relevant to employability and personal development).**

D1. Discussion of various types of programming languages

D2. Work effectively as a part of a team to apply skills gained throughout the course to construct programs that can be used to solve different problems

**11. Course Structure**

Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
<b>1<sup>st</sup> semester</b>					
1	3	Introducing Microsoft Windows 7	<b>Microsoft Windows 7</b>	Lectures and practical applications	partial test
2	3	Introducing Microsoft word	<b>Microsoft word</b>	Lectures and practical applications	Discussion /dialogue oral and evaluate opinions
3	3	Introducing Microsoft excel	<b>Microsoft excel</b>	Lectures and practical applications	Discussion /dialogue oral and evaluate opinions
4	3	Introducing Microsoft power point	<b>Microsoft power point</b>	Lectures and practical applications	Discussion /dialogue oral and evaluate opinions

5	3	Ability to characterization and specify of the programming issues related to the chemical engineering problems using visual basic	<b>Introduction To Visual Basic Programming</b>	Analysis of cases related to industrial applications	Discussion /dialogue or and evaluate opinions
6	3	Description relations and their uses	<ul style="list-style-type: none"> <li>• Menu bar</li> <li>• Tools bar</li> <li>• Project explorer</li> <li>• Tool box</li> <li>• Properties windows</li> <li>• Form</li> <li>• Code</li> </ul>	Lectures and practical applications	Discussion /dialogue or and evaluate opinions
7	3	Description relations and their uses	<ul style="list-style-type: none"> <li>• Controls: Command Buttons, Label, Textbox, Pointers, Picture box, frame.</li> <li>• Naming Controls.</li> <li>• Properties for controls: Height, Width, Left, Top, Font, Forecolor, Backcolor, Name, Caption, Text, and Visible.</li> </ul>	Lectures and practical applications	partial test
8	3	The ability to characterize and identify issues for programming	<ul style="list-style-type: none"> <li>• Events.</li> <li>• Saving Visual Basic Project.</li> <li>• Examples: Chemical Engineering Applications.</li> </ul>	Analysis of cases related to industrial applications	Discussion /dialogue or and evaluate opinions
9	3	Description relations and their uses	<b>Mathematics</b> <ul style="list-style-type: none"> <li>• Arithmetic Operations: +, -, *, /, \, mod, ^ . (Using Simple Example for each Operation).</li> </ul>	Lectures and practical applications	Discussion /dialogue or and evaluate opinions
10	3	The ability to characterize and identify issues for programming	<ul style="list-style-type: none"> <li>• Logical Operations. AND, OR, NOT. And the Truth Table for each Operation.</li> </ul>	Lectures and practical applications	Discussion /dialogue or and evaluate opinions

11	3	Descriptionrelations and their uses	<ul style="list-style-type: none"> <li>• (Using Simple Example for each Operation).</li> <li>• Relational Operation: &gt;, &lt;, &gt;=, &lt;=, &lt;&gt;, =.</li> <li>• String Concatenation (&amp;).</li> </ul>	Lectures and practical applications	Discussion /dialogueoral and evaluate opinions
12	3	Descriptionrelations and their uses	<ul style="list-style-type: none"> <li>• Operation Precedence. For all arithmetic, logical, relational operators.</li> </ul>	Lectures and practical applications	Discussion /dialogueoral and evaluate opinions
13	3	The ability to characterize and identify issues for programming	<ul style="list-style-type: none"> <li>• Print statement and Formatting. Illustrate (colon, comma, and semicolon).</li> </ul>	Lectures and practical applications	Discussion /dialogueoral and evaluate opinions
14	3	The ability to characterize and identify issues for programming	<ul style="list-style-type: none"> <li>• Examples: Chemical Engineering Applications.</li> </ul>	Analysis of cases related to industrial applications	partial test
15	3	Descriptionrelations and their uses	<b>Built In Functions</b> <ul style="list-style-type: none"> <li>• Built-in math functions:</li> <li>• Abs(x), Int(x), Rnd(x), sgn(x), sqr(x), str(x), val(x), round(x, n), CInt(x), Fix(x).</li> <li>• String Functions</li> </ul>	Lectures and practical applications	Discussion /dialogueoral and evaluate opinions
2nd semester					
16	3	The ability to characterize and identify issues for programming	<ul style="list-style-type: none"> <li>• InputBox.</li> <li>• MsgBox.</li> <li>• Examples: Chemical Engineering Applications.</li> </ul>	Lectures and practical applications	Discussion /dialogueoral and evaluate opinions
17	3	Descriptionrelations and their uses	<b>Selection Structure</b> <ul style="list-style-type: none"> <li>• Single Selection: If/Then structure.</li> <li>• Double Selection: If/Then/Else structure.</li> <li>• Nested If/Then/Else structure.</li> </ul>	Lectures and practical applications	Discussion /dialogueoral and evaluate opinions
18	3	The ability to characterize and identify issues for programming	<ul style="list-style-type: none"> <li>• Select Case Multiple Selection Structure.</li> <li>• Examples: Chemical Engineering Applications.</li> </ul>	Lectures and practical applications	Discussion /dialogueoral and evaluate opinions
19	3	The ability to characterize and identify issues for programming	<b>Repetition Structure</b> <ul style="list-style-type: none"> <li>• For ... Next Loop.</li> <li>• While ... Wend</li> </ul>	Analysis of cases related to industrial applications	Discussion /dialogueoral and evaluate opinions
20	3	The ability to characterize and identify issues for programming	<ul style="list-style-type: none"> <li>• Do .... While ... Loop.</li> </ul>	Lectures and practical applications	partial test
21	3	Descriptionrelations and their uses	<ul style="list-style-type: none"> <li>• Do ... Loop Until</li> </ul>	Analysis	Discussion

		onsand their uses	<ul style="list-style-type: none"> <li>• <b>Exit Do, Exit For</b> <b>Examples: Chemical Engineering Applications</b></li> </ul>	ofcasesrelatedtoind ustrialapplications	/dialogueoralandevaluate opinions
22	3	Descriptionrelati onsand their uses	<ul style="list-style-type: none"> <li>• <b>Variables</b></li> <li>• <b>Data Types: Boolean, Integer, Long, Single, Double, String.</b></li> <li>• <b>Valid Naming of Variables.</b></li> <li>• <b>Initial Value for each Type of the Variables (Initial Value for each Data Type).</b></li> <li>• <b>Size of each Variable Type in Bytes.</b></li> </ul>	Lectures and practical applications	Discussion /dialogueoralandevaluate opinions
23	3	Descriptionrelati onsand their uses	<ul style="list-style-type: none"> <li>• <b>How to Declare Variables. (Dim statement).</b></li> <li>• <b>Using: Dim variable-name As Data type.</b></li> <li>• <b>Using Suffix: Integer, Long, Single, Double, String.</b></li> <li>• <b>Constant Variable. • Examples: Chemical Engineering Applications.</b></li> </ul>	Analysis ofcasesrelatedtoind ustrialapplications	Discussion /dialogueoralandevaluate opinions
24	3	The ability tocharacterizea ndidentifyissues forprogramming	<b>ARRAYS</b> <ul style="list-style-type: none"> <li>• <b>Introduction: Defining Arrays.</b></li> <li>• <b>Array Declaration Statement.</b></li> <li>• <b>Assigning Values for Arrays (i.e. filling array's element value either by loop or by direct assignment statement).</b></li> <li>• <b>ReDim Statement.</b></li> <li>• <b>Using Loops with Arrays. (i.e. writing an application on array using loops).</b></li> </ul>	Lectures and practical applications	partial test
25	3	Descriptionrelati onsand their uses	<ul style="list-style-type: none"> <li>• <b>Two Dimensional Arrays.</b></li> <li>• <b>Operations on Arrays:</b></li> <li>• <b>Fill Array Elements with Random Numbers</b></li> </ul>	Analysis ofcasesrelatedtoind ustrialapplications	Discussion /dialogueoralandevaluate opinions

			<b>using Rnd Function.</b> <b>• Sorting.</b> <b>• Searching. (i.e. Linear search).</b> <b>• Swapping Two Elements. • Examples: Chemical Engineering Applications.</b>		
26	3	The ability to characterize and identify issues for programming	<b>Graphics In Visual Basic</b> <b>• Graphics control</b> <b>• Picture box</b> <b>• Image box</b> <b>• Coordinate system</b> <b>• Pixel</b> <b>• Graphics methods (Line, Circle, pset)</b> <b>• Examples: Chemical Engineering Applications.</b>	Analysis of cases related to industrial applications	Discussion / dialogue or oral and evaluate opinions
27	3	Description relations and their uses	<b>Data Base</b> <b>• Accessing Database</b> <b>• Data Control DAO, ADO, RDO</b> <b>• Visual Basic and Access Connectivity •</b> <b>Examples: Chemical Engineering Applications.</b>	Analysis of cases related to industrial applications	Discussion / dialogue or oral and evaluate opinions
28	3	The ability to characterize and identify issues for programming	<b>Designing Reports</b> <b>• Introduction</b> <b>• Objective</b>	Lectures and practical applications	Discussion / dialogue or oral and evaluate opinions
29	3	The ability to characterize and identify issues for programming	<b>• Introduction to Report Designer</b> <b>• Creating Report</b> <b>• Data</b> <b>• Report</b> <b>• Data Environment</b> <b>Examples: Chemical Engineering Applications.</b>	Analysis of cases related to industrial applications	Discussion / dialogue or oral and evaluate opinions
30	3	Description relations and their uses	<b>Examples: Chemical Engineering Applications.</b>	Analysis of cases related to industrial applications	Discussion / dialogue or oral and evaluate opinions

## 12. Infrastructure

<p>Required reading:</p> <ul style="list-style-type: none"> <li>· CORE TEXTS</li> <li>· COURSE MATERIALS</li> <li>· OTHER</li> </ul>	<ul style="list-style-type: none"> <li>○ Lecturers</li> <li>○ Book</li> </ul> <p>The Complete Reference VB.6 By: Noel Jerke</p> <ul style="list-style-type: none"> <li>○ Other support books :-</li> </ul> <p>Programming in VB By: P.K. McBride  Mastering in VB By: Evangelos Petroutsos  Programming in VB.6 By: Rajendra Salokhe</p>
<p>Special requirements (include for example workshops, periodicals, IT software, websites)</p>	<p>1. Software development tools.  2. Data show and computers.  3. Websites</p> <p><a href="http://www.uotechnology.edu.iq/dep-chem-eng/LECTURE/1Y/B/computer/Visual%20Basic%201.pdf">http://www.uotechnology.edu.iq/dep-chem-eng/LECTURE/1Y/B/computer/Visual%20Basic%201.pdf</a></p>
<p>Community-based facilities (include for example, guest Lectures, internship, field studies)</p>	<p>internship</p>

13. Admissions	
Pre-requisites	Before undertaking this module the student should have undertaken the following: mathematics and handling computer
Minimum number of students	Central Admission
Maximum number of students	Central Admission