



**INTERNATIONAL ISLAMIC UNIVERSITY MALAYSIA
COURSE OUTLINE**

Kulliyah	Centre for Foundation Studies																	
Department	Information and Communication Technology																	
Programme	ICT / Engineering / Physical Science																	
Name of course	Introduction to Programming																	
Course Code	IFF 1444 / SEF 1514																	
Name(s) of Academic Staff / Instructor(s)	Noor Azimah Binti Hassan																	
Rationale for the inclusion of the course / module in the programme	This course is to introduce students to basic programming language in C and skills in designing and developing simple prototype of a system.																	
Semester and Year Offered	Semester I and III																	
Status	Core																	
Level	Foundation																	
Proposed Start Date	Semester I 2011/2012																	
Batch of Students to be Affected	Intake 2010/2011 onwards																	
Total Student Learning Time (SLT)	<table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th colspan="3">Face-to-face</th> <th rowspan="2">Assessment and Others</th> <th rowspan="2">Total Guided and Independent Learning</th> </tr> <tr> <th>Lecture</th> <th>Laboratory</th> <th>Quizzes</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">35</td> <td style="text-align: center;">56</td> <td style="text-align: center;">5</td> <td style="text-align: center;">60</td> <td style="text-align: center;">156</td> </tr> </tbody> </table>				Face-to-face			Assessment and Others	Total Guided and Independent Learning	Lecture	Laboratory	Quizzes	35	56	5	60	156	
Face-to-face			Assessment and Others	Total Guided and Independent Learning														
Lecture	Laboratory	Quizzes																
35	56	5	60	156														
Credit Value / Hours	5																	

Pre-requisites (if any)	ISM 2112 (Computer 1)											
Co-requisites (if any)	None											
Course Objectives	<p>The objectives of this course are to:</p> <ol style="list-style-type: none"> 1. teach students the fundamental concepts of programming 2. expose students to C language and structured programming 3. demonstrate on methods to solve programming problems 4. distinguish the use of the different control structures 5. instill the principles of good programming practice in terms of readability, modularity, efficiency, usability and robustness. 											
Learning Outcomes	<p>Upon completion of this course, students should be able to:</p> <ol style="list-style-type: none"> 1. plan and explain steps of problem solving using a computer: problem analysis, solution design, implementation, and testing and validation. 2. outline and draw an algorithm representations, for example, a flowchart. 3. code algorithms into C language as well as compile and test programs. 4. apply correct input /output statements and control structures (selection and repetition) as needed 5. analyze and design a required prototype by breaking down problems into sub-problem. 6. work on a group project as a team. 											
Transferable Skills	<table border="1"> <thead> <tr> <th>Skills</th> <th>Development</th> <th>Assessment</th> </tr> </thead> <tbody> <tr> <td>Problem Solving Analytical</td> <td>Algorithm representation and Prototype</td> <td>Hands on/Lab assessment Project Flowchart Project Prototype</td> </tr> <tr> <td>Soft-skills</td> <td>Project</td> <td>Presentations</td> </tr> </tbody> </table>			Skills	Development	Assessment	Problem Solving Analytical	Algorithm representation and Prototype	Hands on/Lab assessment Project Flowchart Project Prototype	Soft-skills	Project	Presentations
Skills	Development	Assessment										
Problem Solving Analytical	Algorithm representation and Prototype	Hands on/Lab assessment Project Flowchart Project Prototype										
Soft-skills	Project	Presentations										
Teaching-Learning and assessment strategy	<ul style="list-style-type: none"> • Lectures • Lab sessions • Quizzes and Exams • Assignment & Project 											
Course Synopsis	<p>This course covers topics: Computing Concepts of C and Structure Programming, Numbering Systems, Program Planning and Design, Top-down Programming Development Algorithms, C Data Types and Variables Declarations, Selection and Repetitions Control Structure, User-defined and Standard Library Functions, Arrays and Strings.</p>											
Mode of Delivery	Lecture, Hands-on Lab Session											

Assessment Methods and Type / Course Assessment	LO	Method	%
	1,3,4,5	Quizzes	15
	1,3,4,5	Assignments	15
	1,2,3,4,5,6	Project	15
	1,2,3,4	Mid-Semester Exam	15
	1,2,3,4,5,6	End of Semester Exam	40
	TOTAL		100

Content outline of the course / module and the SLT per topic			
Weeks	Topics	Learning Hours	Task / Reading
1	<p>Lecture:</p> <ul style="list-style-type: none"> • Computing Concepts • Evolution of Operating systems • Programming Languages • Binary systems • Development Of C and Structured Programming <p>Lab:</p> <ul style="list-style-type: none"> • Introducing C programming • Starting a simple program • The main() function module • <i>stdio</i> header file • Simple <i>printf</i> • Compiling the program • Saving file, Exiting 	7.5	Bakar et.al Chapter 1
2	<p>Lecture:</p> <ul style="list-style-type: none"> • Program Planning and Design • Program Documentation • Top-Down program Development • Algorithms, Pseudo-code, Flowchart • Debugging <p>Lab:</p> <ul style="list-style-type: none"> • Simple Coding using <i>printf</i> , <i>scanf</i> and escape sequences • Comment statements • Simple format modifiers • Simple variable declaration 	7.5	Bakar et.al Chapter 1

3	<p>Lecture:</p> <ul style="list-style-type: none"> • Data types and Variables declarations • Assignment statement • Input/Output Statements <p>Lab:</p> <ul style="list-style-type: none"> • Declaring and using variables • Constant declaration • More format modifiers • I/O using <i>printf</i> and <i>scanf</i> 	8.5	Bakar et.al Chapter 2
4	<p>Lecture:</p> <ul style="list-style-type: none"> • Assignments, accumulators • Memory and Defined Constants • Arithmetic Expressions • Integer/ Floating Point/ Mixed Expressions • Operators Precedence and Associativity • Operators: (), *, /, %, +, - • Logical Operators >, >=, <, <=, !=, == • Formatted output <p>Lab:</p> <ul style="list-style-type: none"> • Use of Assignments, accumulators • Use of Memory and Defined Constants • Using expressions • Integer, Floating-point and Mixed Expressions 	7.5	Bakar et.al Chapter 2
5	<p>Lecture:</p> <ul style="list-style-type: none"> • Relational / Boolean expressions • Unary Logical Operators: &&, , ! • Flow of Control: Selection • Nested <i>if</i> statements • Simple Selection <p>Lab:</p> <ul style="list-style-type: none"> • Boolean variables and constants • Selections: • <i>if/else</i> statement • Nested <i>if</i> statements • <i>if/else/if</i> chain 	8.5	Bakar et.al Chapter 3
6	<p>Lecture:</p> <ul style="list-style-type: none"> • Extended forms of Selection – Multi-way selection Control Structure: Repetitions • <i>while</i> and <i>do</i> statements <p>Lab:</p> <ul style="list-style-type: none"> • The <i>switch</i> statement • Using <i>while</i> and <i>do</i> statements • Use of <i>scanf</i> within <i>while</i> loop 	7.5	Bakar et.al Chapter 3

7	<p>Lecture:</p> <ul style="list-style-type: none"> • Fixed Looping: <i>for</i> statement • Use of sentinels and validity checks • Nested loops <p>Lab:</p> <ul style="list-style-type: none"> • Using <i>for</i> statements • <i>break</i> and <i>continue</i> statements • Null statements • Use of <i>scanf</i> within <i>for</i> loop 	8.5	Bakar et.al Chapter 3
8	<p>Lecture:</p> <ul style="list-style-type: none"> • Standard library functions • Input/output library functions • Mathematical library functions • Random number function <p>Lab:</p> <ul style="list-style-type: none"> • Using standard library functions • Mathematical functions • Random number functions 	7.5	Bakar et.al Chapter 4
9-10	<p>Lecture:</p> <ul style="list-style-type: none"> • User-defined Functions <ul style="list-style-type: none"> ○ Function Prototypes ○ Function Definitions ○ Function calls • Variable Scope • Variable Storage Class • Passing By Value <p>Lab:</p> <ul style="list-style-type: none"> • Creating user-defined routines • Calling functions 	15	Bakar et.al Chapter 4
11	<p>Lecture:</p> <ul style="list-style-type: none"> • Concepts of arrays • Single-Dimensional and Two-Dimensional Arrays (character excluded) <p>Lab:</p> <ul style="list-style-type: none"> • Declaration and Initialization of arrays • Using single and two dimensional arrays 	7.5	Bakar et.al Chapter 5
12	<p>Lecture:</p> <ul style="list-style-type: none"> • Examples Using/Accessing Arrays • Passing Arrays to function(pass by reference) • Sorting and Searching Algorithms • Application of Matrices(addition/substraction) 	8.5	Bakar et.al Chapter 5

	Lab: <ul style="list-style-type: none"> • Passing Arrays to function(pass by reference) • Bubble and Selection Sort Program • Linear Search and Binary Search 		
13	Lecture: <ul style="list-style-type: none"> • Character Strings • String Input and Output • String Processing • Array of characters Lab: <ul style="list-style-type: none"> • Working with strings • Using String Library Functions • String Formatting 	7.5	Bakar et.al Chapter 6
14	Lecture: <ul style="list-style-type: none"> • String Processing • Character-by character input Lab: <ul style="list-style-type: none"> • Working with strings • Project presentation 	8.5	Bakar et.al Chapter 6

Main references supporting the course

Required

Noor Hasrina Bakar, Noor Azimah Hassan, Mohd Norhaedir Idris, Mahmoud Al-Shawabkeh, *Programming in C for Foundation, CFS-IIUM*, Petaling Jaya, Malaysia

Additional references supporting the course

Bronson, G. J., (2007). *A first book of ANSI C* (4th ed.), Pacific Grove, CA: Brooks/Cole

Forouzan, B. A., & Gilberg, R. F., (2001). *A structured programming approach using C* (2nd ed.), Pacific Grove, CA: Brooks/Cole

Hanly, J. R., & Koffman, E. B., (2010). *Problem solving and program design in C* (6th ed.), Boston, MA: Pearson Education Inc.

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