



UNIVERSITI TEKNOLOGI MARA

CSC118: FUNDAMENTALS OF ALGORITHM DEVELOPMENT

Course Name (English)	FUNDAMENTALS OF ALGORITHM DEVELOPMENT APPROVED
Course Code	CSC118
MQF Credit	3
Course Description	This course will focus on algorithm development in problem solving. It will also introduce the students to the techniques of problem solving using modular approach. Students are expected to analyze, develop the solution to problems given. This course will also provide the overview of the computer system and introduction to array concept.
Transferable Skills	Able to recognize computer system components, know and able to apply the steps in problem solving using algorithm representations using or without modular approach. Also understand what the array is.
Teaching Methodologies	Lectures, Tutorial
CLO	CLO1 Identify the computer system components CLO2 Explain the steps in problem solving CLO3 Apply algorithm representations in problem solving design. CLO4 Display appropriate algorithms to solve simple problems using modular approach CLO5 Apply list/array in algorithm to solve simple problems
Pre-Requisite Courses	No course recommendations
Topics	
1. Overview of a computer system 1.1) introduction to computer and its component 1.2) elaboration of all components 1.3) peopleware 1.4) elaboration of how computer works	
2. Introduction to Problem Solving using Computers 2.1) what is a problem and examples of problem 2.2) types of problems (simple and typical real world) 2.3) what is a solution and sample of solutions 2.4) types of solution (algorithmic and heuristic) 2.5) steps to solve a problem using computer 2.6) algorithm 2.7) samples of problem solving	
3. Basic Concepts of algorithm 3.1) elements of algorithm 3.2) algorithm presentation (pseudocode and flowchart)	
4. Introduction to Algorithm Design 4.1) understanding about data type, data, information 4.2) operator 4.3) identifier, variable, constant 4.4) statement 4.5) simple statements: input, output, assignment	

5. Control Structure

- 5.1) sequence control structure
- 5.2) selection control structure
- 5.3) loop control structure
- 5.4) tracing
- 5.5) problem solving using above control structures

6. Algorithm Development

- 6.1) top down design
- 6.2) stepwise refinement
- 6.3) bottom up design
- 6.4) modular design
- 6.5) parameter passing
- 6.6) type of parameters
- 6.7) tracing
- 6.8) problem solving using module(s)

7. Introduction to Array

- 7.1) what is the array
- 7.2) array versus variable
- 7.3) trace algorithm using array

Assessment Breakdown	%
Continuous Assessment	100.00%

Details of Continuous Assessment	Assessment Type	Assessment Description	% of Total Mark	CLO
	Assignment	Assignment (Assessment 3)	10%	CLO3
	Assignment	Assignment (Assessment 3)	20%	CLO4
	Final Test	Final Test (Assessment 4)	10%	CLO5
	Final Test	Final Test (Assessment 4)	20%	CLO3
	Quiz	Quiz (Assessment 1)	5%	CLO1
	Quiz	Quiz (Assessment 1)	5%	CLO2
	Quiz	Quiz (Assessment 1)	10%	CLO3
	Test	Test (Assessment 2)	5%	CLO2
	Test	Test (Assessment 2)	15%	CLO3

Reading List	Recommended Text	<ul style="list-style-type: none"> Suhana Sulong, Norizan Mohmad, Azlin Dahlan 2015, <i>Fundamentals of Algorithm Development</i>, 1 Ed., Cengage Learning [ISBN: 9760357489]
	Reference Book Resources	<ul style="list-style-type: none"> Maureen Sprankle, Jim Hubbard 2011, <i>Problem Solving and Programming Concepts</i>, 8 Ed., Pearson Higher Ed [ISBN: 9780133001785] David Harel, Yishai Feldman 2014, <i>Algorithmics</i>, 2 Ed., Springer [ISBN: 3642441351] Diane Zak 2012, <i>Introduction to Programming with C++</i>, 2 Ed., Cengage Learning [ISBN: 1285061470] D. Malik 2014, <i>C++ Programming: From Problem Analysis to Program Design</i>, Cengage Learning [ISBN: 130517710X] Joyce Farrell 2014, <i>Programming Logic and Design, Comprehensive</i>, 5 Ed., Cengage Learning [ISBN: 1285982800] Stanley B. Lippman, Josée Lajoie, Barbara E. Moo 2012, <i>C++ Primer</i>, Addison-Wesley Professional; 5 edition (August 16, 2012) [ISBN: 0321714113]
Article/Paper List	This Course does not have any article/paper resources	
Other References	This Course does not have any other resources	