

DEPARTMENT OF COMPUTER AND MATHEMATICAL SCIENCES UNIVERSITI TEKNOLOGI MARA CAWANGAN PULAU PINANG

PROGRAMME	Diploma in Civil Engineering	
	Diploma in Mechanical Engineering	
COURSE/CODE	Fundamentals of Computer Problem Solving / CSC128	
CREDIT HOUR	3	
CONTACT HOUR	Lecture – 3H/week	
	Lab – 2H/week	
PART	2,4	

COURSE OUTCOME

After completing this course, the student should able to:

- identify the steps in problem solving
- design appropriate algorithm to solve simple problems
- write a simple computer program using structured approach
- write programs using modular approach

COURSE DESCRIPTION

This course is an introduction to problem solving using computers. It emphasizes various aspects of problem solving, mainly consisting of the problem domain, phases of problem solving and basic techniques in designing a solution.

The approach to problem solving is via structured programming. At this stage, the emphasis will be on computer problem solving rather than syntactical aspects of the chosen programming language.

TEACHING METHODOLOGY

Class lectures Practical sessions will be conducted in the computer lab. Notes – Introduction to C++ Programming Software – Dev C++

ASSE	<u>SSMENT</u>			
Final	Examination		-	50%
Cours	se Work		-	50%
•	Test	-	15%	
•	Quizzes	-	12%	
•	Assignment	-	13%	
•	Mini Project	-	10%	
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				1000/

Total:

100%

RECOMMENDED TEXT

Wan Anisha, Azlina ,Sopiah, Introduction to C++ Programming, Oxford Fajar Sdn Bhd ,2015.

Y. Daniel Liang [2010]. Introduction to Programming with C++, 2nd ed. Pearson.

REFERENCES

- 1. Malik, D.S., C++ Programming: From Problem Analysis To Program Design, Course Technology, 2002
- 2. Farrell, Joyce, Programming Logic and Design Comprehensive, 2nd edition, Course Technology 2002.
- 3. Zak, Dianne, An Introduction to Programming with C++, 2nd edition, Course Technology, 2001.
- 4. Jamal Othman, Fundamentals of Programming: With Examples in C, C++ and Java, 1st edition, UPENA, 2010.

LESSON PLAN

Week / Date	Lecture Session	Lab Session	Note
w1 5/3/18 - 9/3/18	 Topic 1: Introduction to Computer, Programming Language Introduction to Programming Definition of computer and computer program Importance of computer program Importance of good program Relationship between compilers, interpreters, assemblers and programs At the end of this class, student should be i. Understand the concept and importance of compiler, interpreters, interpreters 	 Fogram and Programming Language Introduction to C++ Integrated Development Environment (IDE). Compile and execute simple program 	Entrance Survey
w2 12/3/18 - 16/3/18	Topic 1: Introdu Program Development Life Cycle – Problem analysis, design, implementation, testing, maintenance (documentation) At the end of this class, student should b i. Apply the steps in program developm	 Debug and execute given programs <i>be able to:</i> <i>nent life cycle.</i> 	
w3 19/3/18 - 23/3/18	 Topic 2: Basic Elements Identifiers, variables, constants, and reserved words. Rules for naming identifiers. Declaring data variables and constants Basic data types - integer, float, double, bool, char (including sequence of characters without using the string keyword) Arithmetic operators - addition, subtraction, multiplication, division, modulus Arithmetic expression - unary and binary operands Operator precedence & associativity 	 of Computer Program Complete a source code base on problem that is being discussed Convert from a given flowchart to a program to get an output 	

Week / Date	Lecture Session	Lab Session	Note
w4	 Topic 2: Basic Elements of C Assignment statement Assign (copy) a string 	 omputer Program (cont'd) Debug and execute a given program (arithmetic expression) 	Quiz 1
26/3/18 - 30/3/18	 Introduce some mathematical library functions - sqrt(), abs(), pow(), etc. 	 Solve a problem by applying an arithmetic expressions and string input statement 	(6%) Topic 1&2
	At the end of this class, student should b i. Understand and apply the input/out ii. Justify the process of error handling	e able to: tput statement	
W5 2/4/18 – 6/4/18	 Topic 2: Basic Elements of C Input/output statement (avoid arithmetic expression in output) String input statement (gets(), getline(), etc.) C++ program structure Programming process, debugging and error handling Three types of control structure – sequential, selection, repetition/looping 	 omputer Program (cont'd) Complete a source code base on problem that being discussed. Convert from a flowchart and pseudocode given to a program to get an output. Debug and execute a given program (arithmetic expression) 	
	At the end of this class, student should b i. Write a simple program	be able to:	
MALC	Topic 3 : Selection	Control Structure	
9/4/18 -	 Boolean values Relational operators Simple Boolean expressions Logical operators Compound Boolean Expressions 	 Debug and execute a given program (arithmetic expression) Solve a given problem by 	Assignment 1 Topic 1-3
15/4/18	Precedence & associativity At the end of this class, student should b i. Interpret the concept of relation	applying arithmetic expressions be able to: nal and logical operators	(6%)

Week / Date	Lecture Session	Lab Session	Note
W7 16/4/18 - 20/4/18	 Topic 3 : Selection Cont Types of selection control structure One-way selection Two-way selection Multiple selection Types of selection control structure (cont'd) Multiway selection (nested-if) String compare (strcmp()) Switch statement 	 apply if statement in decision making problem solve a problem using one-way and two-way selection control structures Introduce the nested if problem, explain the output based on the various input from the user Solve a problem using multi- way selection and strcmp() function 	
	At the end of this class, student should b i. Solve the problem by using multi – w	e able to: vay selection	
W8 23/4/18 - 27/4/18	 Topic 4 : Repetition Requirements - Loop control variable & loop condition Operations - initialization, evaluation & updating Repetition structure using while, for dowhile At the end of this class, student should be i. Differentiate between the three type 	 Control Structure explain the output from the source code given, solve repetition problem by using while, do while and for statements be able to: be sof repetition control structure 	TEST 1 (7.5%) Topic 1, 2 , &3
W9 30/4/18 - 4/5/18	Topic 4 : Repetition • Types of repetition structure • Counter-controlled loop • Sentinel-controlled loop • Flag controlled loop • Nested loop (for statement) • Continue and break statement	 Control Structure Debug and execute a given program (repetition control structure) Solve iteration problems using sentinel, counter and flag structures Solve nested loop problems using for loop statements only be able to: ontrolled loop, sentinel controlled 	Release the Incrementa projects

Week / Date	Lecture Session	Lab Session	Note
	Tonic 5 ·	Function	
W10 7/5/18 - 11/5/18	 Introduction to function Predefined function – introduce some common mathematical functions sqrt(), abs(), pow(), setw(), setprecision() Types of variable and its scope – block, local & global User-defined function Function prototype Function definition (header and body) Function invocation 	 Debug and execute sample program using predefined function Solve a problem using predefined function 	
	<i>i.</i> Understand the two types of funct.	ions.	
	ii. Solve the problem by using predefi	ined function	
	Topic 5 : Fu	inction (con't)	
W11 14/5/18 –	 Types of parameter – actual and formal Parameter passing Without parameter With parameter (by value) With parameter (by reference) 	 Debug and execute sample program that used predefine function Solve a problem by using predefined function 	Quiz 2 (6%) Topic 4
18/5/18	At the end of this class, student shoul	d be able to:	_
	i. Understand the function of local and global variables.		
	ii. Identify the three function eleme	nts.	
	Transie f. Frank		_
	Return value	Debug and execute sample	
W12	- By value	program using user-defined	
21 /5 /10	- By reference	function	
21/J/10 -		• Solve a problem using user- defined function.	
25/5/18	At the end of this class, student shoul Develop a program using function	d be able to:	

Week / Date	Lecture Session	Lab Session	Note
	Mid Semester Break 28 May – 3 June 2018 (Wesak: 29 May 2018) (Harvest Festival: 30 – 31 May 2018)		
W13	(·····	
4/6/18 - 8/6/18	 INCREMENTAL PROJECT PREPAR Develop Group project Complete report submiss complete program (mean indentation, with approp input and output. 	ATION sion including analysis, algorithm, ningful identifiers, correct riate comments) and samples of	Assignment 2 (7%) All Topik
W14	input and carpati		
11/6/18 - 14/6/18	 INCREMENTAL PROJECT PRESENT Group presentation Submit complete report stalgorithm, complete programindentation, with appropringut and output. 	TATION submission including analysis, gram (meaningful identifiers, correct riate comments) and samples of	
	Revisio	n Week	
	15-21 JU (Fid Al-Fitri: 15	NE 2018 – 16 June 2018)	
	Final J 22 June - 15	Exam. 5 July 2018	