COURSE INFORMATION

School/Faculty:	Computing/ Engineering	Page:	1 of 6	
Program name:	Bachelor of Computer Science			
Course code:	SECJ 1013	Academic Session/Semester:		2021/2022 - 1
Course name:	Programming Technique I	Pre/co requisite (course name and code, if applicable):		-
Credit hours:	3			

Course synopsis	As a fundamental subject, this course equips the students with theory and practice on problem solving techniques by using the structured approach. Students are required to develop programs using C++ programming language, in order to solve simple to moderate problems. The course covers the following: pre-processor directives, constants and variables, data types, input and output statements, control structures: sequential, selection and loop, built-in and user-defined functions, single- and two-dimensional arrays, file operations, pointers, and structured data types.
Course coordinator (if applicable)	Dr Mohd. Razak bin Samingan

Course lecturer(s)	Name / Section(s)	Office	Contact no.	E-mail (@utm.my)
	Mr Cik Suhaimi bin Yusof / 1 & 6		019-7737170	suhaimi
	Dr Goh Eg Su / 2 & 10		012-7957279	eg.su
	Dr Tarmizi bin Adam / 3 & 8		017-6062993	tarmizi.adam
	Ms Lizawati binti Mi Yusuf / 4	N28-438-03	012-7409224	lizawati
	Dr Suriati binti Sadimon / 5		019-7464608	suriati
	Dr Noraini binti Ibrahim / 7		019-7060642	noraini_ib
	Dr Mohd. Razak bin Samingan / 9	N28-207-19	017-7470079	mrazak

Mapping of the Course Learning Outcomes (CLO) to the Programme Learning Outcomes (PLO), Teaching & Learning (T&L) methods and Assessment methods:

No.	CLO	PLO (Code)	*Taxonomies and **generic skills	T&L methods	***Assessment methods
CLO1	Solve problems systematically using problem solving methods.	PLO1 (KW)	C3	Lecture, Active Learning	T, LE
CLO2	Construct or develop a C++ program using structured approach for the analysed	PLO1 (KW), PLO2 (AP)	C3, A3 Should be C6	Lecture, Active Learning	T, LE, F

Prepared by:	Certified by:
Name: Lizawati Mi Yusuf	Name: Assoc. Prof. Dr. Radziah Mohamad
Signature:	Signature:
Date: 29/8/2020	Date:

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		problem from simple to moderate problem.				
	CLO3	Solve problems in a given time frame using C++ programming language and tools.	PLO2 (AP), PLO5 (TH)	P3, TH3	Lecture, Active Learning, Project-based Learning	A, S, T

Refer *Taxonomies of Learning and **UTM's Graduate Attributes, where applicable for measurement of outcomes achievement

***T – Test; LE – Lab Exercise; F – Final Exam; ASG – Assignment; S – Skill-Based Test etc.

Details on Innovative T&L practices:

No.	Type	Implementation
1.	Active Learning	Conducted through in-class activities
2.	Project-based Learning	Conducted through assignments. Students in a group of 2 are given 3 projects that require programming solutions.

Weekly Schedule:

Week 1 (17/10 - 23/10) *Birthday of Prophet Muhammad S.A.W (19/10 - Tuesday)*	**1 PROGRAMMING PROBLEM-SOLVING** 1.1 Problem-Solving Process 1.1.1 Input, Process, and Output 1.1.2 The Programming Process 1.1.3 Procedural and Object-Oriented Programming 1.2 Problem-Solving Techniques 1.2.1 Pseudo codes 1.2.2 Flowcharts
Week 2 (24/10 - 30/10) **LE 1**	- Flowchart Symbols - Flowchart Structures (Sequential, Selection, Repetition) - Modular Flowcharting (Functions)
Week 3 (31/10 – 6/11) *Deepavali (4/11 -Thursday)* **ASG 1**	**2 ELEMENTARY PROGRAMMING** 2.1 Variables and Assignments 2.1.1 Variables 2.1.2 Identifiers 2.1.3 Assignment statements 2.2 Input and Output 2.2.1 Input using cin 2.2.2 Output using cout 2.3 Data Types and Constants 2.3.1 Numeric data types 2.3.2 Character data type
Week 4 (7/11 – 13/11)	2.3.3 Boolean data type 2.3.4 Naming constants

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	2.4 Arithmetic Expressions
	    2.4.1 Arithmetic operators and expressions
	    2.4.1 Arithmetic operators and expressions
	    2.4.2 Type conversion
	    2.4.3 Overflow and underflow
	    2.4.4 Type Casting
	    2.4.5 Multiple assignments and combined assignment

Week 5
(14/11 – 20/11)
 	
Week 6
(21/11 – 27/11)
LE 2
	3 CONTROL STRUCTURES
	  3.1 Boolean and Logical Expressions
	  3.2 Selection/ Branch
	    3.2.1 The if statement
	    3.2.2 The if/else statement
	    3.2.3 The if/else if statement
	    3.2.4 The switch statement
	    3.2.5 The break, continue statement
	  3.3 Loop
	    3.3.1 The for loop
	    3.3.2 The while loop
	    3.3.3 The do-while loop
	    3.3.4 Nested loop

Week 7
(28/11 – 4/12)
TEST 1 (WRITTEN)
30/11/2021 (Tuesday)
	4 FUNCTION
	  4.1 Predefined/ Library Functions
	    4.1.1 Mathematical functions
	    4.1.2 Random generator
	    4.1.3 Character manipulations
	    4.1.4 String manipulations

Week 8 (5/12 – 11/12)	**MID SEMESTER BREAK**

Week 9
(12/12 – 18/12)
ASG 2
	4.2 User-Defined Functions
	    4.2.1 Function definitions and prototypes
	    4.2.2 Sending data by value
	    4.2.3 Sending data by reference

Week 10
(19/12 – 25/12)
LE 3
 	
Week 11
(26/12 – 1/1)
LE 4
	5 ARRAY
	  5.1 One Dimension
	    5.1.1 Declaration and definition
	    5.1.2 Accessing arrays
	    5.1.3 1-D Array in functions
	  5.2 Two Dimension
	    5.2.1 Declaration and definition
	    5.2.2 Accessing arrays
	    5.2.3 2-D Array in functions

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	5.3 Multidimensional Arrays
Week 12 (2/1 – 8/1) <mark>ASG 3</mark>	**6 INPUT AND OUTPUT** 6.1 Formatting Output 6.2 Formatted Input 6.3 Introduction to Files
Week 13 (9/1 – 15/1) **TEST 2 (PRACTICAL)** **11/1/2022 (Tuesday)**	**7 POINTERS** 7.1 Address of a Variable 7.2 Pointer Variable 7.3 The Relationship Between Arrays and Pointer 7.4 Pointer Arithmetic 7.5 Initializing Pointers 7.6 Comparing Pointers 7.7 Pointers as Function Parameters 7.8 Dynamic Memory Allocation 7.9 Returning Pointers from Functions
Week 14 (16/1 – 22/1) *Thaipusam (18/1 – Tuesday)* <mark>LE 5</mark>	
Week 15 (23/1 – 29/1) <mark>ASG 4</mark>	**8 STRUCTURED DATA** 8.1 Combining Data into Structures 8.2 Accessing Structure Members 8.3 Initializing the Structure 8.1 Arrays of structures 8.2 Unions and enumerated data types
Week 16 (30/1 – 5/2)	**REVISION WEEK**

Transferable skills (generic skills learned in course of study which can be useful and utilised in other settings):

Thinking skills. Programming skills

Student learning time (SLT) details:

Distribution of student Learning Time (SLT) Course content outline	Teaching and Learning Activities						TOTAL SLT
	Guided Learning (Face to Face)				Guided Learning Non-Face to Face	Independent Learning Non-Face to face	
CLO	**L**	**T**	**P**	**O**			
CLO1	5h	3h				6h	**14h**
CLO2	11h	6h	6h			26h	**49h**
CLO3	12h	6h	7h			19h	**44h**
Total SLT	**28h**	**15h**	**13h**			**51h**	**107h**

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	Continuous Assessment	PLO	Percentage	Total SLT
1	Lab 1 (CLO1)	KW	4	**1h**
2	Lab 2 - 5 (CLO2)	AP	16	**2h**
3	Test 1 - Written (CLO1 & CLO2)	KW, AP	10	**3h**
4	Test 2 - Practical (CLO3)	AP, TH	15	**2h**
5	Assignment 1 - 4 (CLO3)	AP, TH	20	As in CLO3 (44h)
	Final Assessment		Percentage	Total SLT
1	Final Examination (CLO2)	KW, AP	35	**3h**
Grand Total SLT				**120h**

L: Lecture, T: Tutorial, P: Practical, O: Others

Special requirement to deliver the course (e.g: software, nursery, computer lab, simulation room):

Computer Programming Lab and Software: Visual Studio Code @ Dev C++.

Learning resources:

Text book (if applicable)

Lizawati Mi Yusuf, Jumail Taliba, Nor Azizah Sa'adon, Noraniah Mohd. Yassin, Dayang Norhayati Abang Jawawi, Radziah Mohamad (2019). Lab Module: Programming Techniques I (C++). 7th Edition. School of Computing.

Main references

Tony Gaddis (2016), Starting out with C++: From Control Structures through Objects, Brief Version, 8th edition. Pearson Education.

D. S. Malik (2014), C++ Programming: From Problem Analysis to Program Design, 7th edition. Cengage Learning.

Additional references

Walter Savitch (2015), Problem Solving with C++. 9th edition. Pearson Education.

H.M. Deitel and P.J. Deitel (2014), C++ How to Program. 9th edition. Pearson Education.

Online
http://elearning.utm.my

Academic honesty and plagiarism: *(Below is just a sample)*

Lab exercises are individual tasks and NOT group activities (UNLESS EXPLICITLY INDICATED AS GROUP ACTIVITIES). Copying of work (texts, simulation results etc.) from other students/groups or from other sources is not allowed. Brief quotations are allowed and then only if indicated as such. Existing texts should be reformulated with your own words used to explain what you have read. It is not acceptable to retype existing texts and just acknowledge the source as a reference. Be warned: students who submit copied work will obtain a mark of **zero** for the assignment/ lab exercise and disciplinary steps may be taken by the Faculty. It is also unacceptable to do somebody else's work, to lend your work to them or to make your work available to them to copy.

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Other additional information (Course policy, any specific instruction etc.):

1. Attendance is compulsory and will be taken in every lecture session. Student with less than 80% of total attendance is not allowed to sit for final exam.
2. Students are required to behave and follow the University's dressing regulation and etiquette all the time.
3. Exercises and tutorial will be given in class and some may be taken for assessment. Students who do not do the exercise will lose the coursework marks for the exercise.
4. Assignments must be submitted on the due dates. Some points will be deducted for late submissions. Assignments submitted three days after the due date will not be accepted.
5. Make up exam will not be given, except to students who are sick and submit medical certificate which is confirmed by UTM panel doctors. Make up exam can only be given within one week of the initial date of exam.

Disclaimer:

No.	Assessment	% Total	PLO1 (KW) CLO1	PLO1 (KW) CLO2	PLO2 (AP) CLO2	PLO2 (AP) CLO3	PLO5 (TH) CLO3	Total
1	LAB 1	4	4					4
2	LAB 2 - 3	16		16				16
3	TEST 1 - WRITTEN	10	4	4	2			10
4	TEST 2 - PRACTICAL	15				12	3	15
5	ASSIGNMENT	20				16	4	20
6	FINAL EXAM (WRITTEN)	35		20	15			35
Total		**100**	**8**	**40**	**17**	**28**	**7**	**100**
TOTAL PLO			48		45		7	