COURSE INFORMATION

School/Faculty:	Computing/ Engineering	**Page:**	1 of 6
Program name:	Bachelor of Computer Science		
Course code:	SECJ 1013	**Academic Session/Semester:**	2020/2021 - 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)	Ms Lizawati binti Mi Yusuf

Course lecturer(s)

Name	**Office**	**Contact no.**	**E-mail (@utm.my)**
Ms Lizawati binti Mi Yusuf	N28-438-03	0127409224	lizawati
Dr Mohd. Razak bin Samingan	N28-207-19		mrazak
Dr Adila Firdaus binti Arbain	N28A-02-20-01	0174482905	adilafirdaus
Dr Zuraini Ali Shah	N28A-05-10-01		aszuraini
Dr Noor Hidayah binti Zakaria			noorhidayah.z
Dr Suriati binti Sadimon			suriati
Dr Goh Eg Su			eg.su
Mr Rosely bin Kumoi			rosely

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), PLO6 (DS)	C3 TH3	Lecture, Active Learning, Project-based Learning	T, L, A
CLO2	Construct or develop a C++ program using structured approach for the analysed	PLO1 (KW),	C3 C3 TH3	Lecture, Active Learning	T, L, F

Prepared by:	**Certified by:**
Name: Lizawati Mi Yusuf	Name: Assoc. Prof. Dr. Radziah Mohamad
Signature:	Signature:
Date: 6/10/2020	Date:

	problem from simple to moderate problem.	PLO2 (CG), PLO6 (DS)			
CLO3	Solve problems in a given time frame using C++ programming language and tools.	PLO3 (PS), PLO6 (DS)	P3 TH3	Lecture, Active Learning, Project-based Learning	A, S, F
Refer *Taxonomies of Learning and **UTM's Graduate Attributes, where applicable for measurement of outcomes achievement ***T – Test; L – Lab Exercise; F – Final Exam; A – 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 4 projects that require programming solutions.

Weekly Schedule:

Week 1 (18/10 - 24/10)	**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 - Flowchart Symbols - Flowchart Structures (Sequential, Selection, Repetition) - Modular Flowcharting (Functions)
Week 2 (25/10 - 31/10) **Birthday of Prophet Muhammad S.A.W (29/10 - Thursday)* **LE 1**	
Week 3 (1/11 – 7/11) **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 (8/11 – 14/11)	

**Deepavali* *(14/11 – Saturday)*	2.3.3 Boolean data type 2.3.4 Naming constants 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 (15/11 – 21/11)	**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 6 (22/11 – 28/11) **LE 2**	
Week 7 (29/11 – 5/12) **TEST 1 (MCQ & SHORT ANSWERS - ONLINE)** **30/11/2020 (Monday, 8.30 pm)**	**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 (6/12 – 12/12)	**MID SEMESTER BREAK**
Week 9 (13/12 – 19/12) **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 (20/12 – 26/12) **LE 3**	**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

Week 11 (27/12 – 2/1) **TEST 2 (SBT – ONLINE)** **28/12/2020 (Monday, 8.30 pm)**	5.2 Two Dimension 5.2.1 Declaration and definition 5.2.2 Accessing arrays 5.2.3 2-D Array in functions 5.3 Multidimensional Arrays
Week 12 (3/1 – 9/1) **LE 4**	**6 INPUT AND OUTPUT** 6.1 Formatting Output 6.2 Formatted Input 6.3 Introduction to Files
Week 13 (10/1 – 16/1) **ASG 3**	**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 (17/1 – 23/1) **LE 5**	
Week 15 (24/1 – 30/1) **ASG 4**	**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 (31/1 – 4/2)	**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				8h	**16h**
CLO2	11h	6h	6h			26h	**49h**
CLO3	12h	6h	7h			21h	**46h**

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Total SLT	**28h**	**15h**	**13h**			**51h**	**111h**

Continuous Assessment		PLO	Percentage	Total SLT
1	Lab 1 (CLO1)	KW, DS	4	Inclusive in CLO1 (1h)
2	Lab 2 - 5 (CLO2)	CG, DS	16	Inclusive in CLO2 (3h)
3	Test 1 (CLO1 & CLO2)	KW	10	**2h**
5	Test 2 (SBT) (CLO3)	PS	15	**2h**
6	Assignment 1 (CLO1)	KW, DS	5	Inclusive in CLO3 (3h)
7	Assignment 2 – 4 (CLO3)	PS, DS	15	Inclusive in CLO3 (9h)
Final Assessment			Percentage	Total SLT
1	Final Examination – Part 1 (CLO2)	KW, CG	20	**2.5h**
2	Final Examination – Part 2: Practical (CLO3)	PS	15	**2.5h**
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 Lab (with internet connections): For Lab Exercises and practical tests

Software: C++ IDE such as Microsoft VS Code, Microsoft Visual Studio, Dev C++, etc.

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 the final exam.
2. Students are required to behave and follow the University's dressing regulations and etiquette all the time.
3. Exercises and tutorials 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. Makeup exams will not be given, except to students who are sick and submit a medical certificate which is confirmed by UTM panel doctors. Makeup exams can only be given within one week of the initial date of the exam.

Disclaimer:

			PLO1(KW)		PLO(CG)	PLO3(PS)	PLO6 (DS)			
No.	**Assessment**	**% Total**	**CLO1**	**CLO2**	**CLO2**	**CLO3**	**CLO1**	**CLO2**	**CLO3**	**Total**
1	LAB 1	4	3				1			4
2	LAB 2 - 5	16			12			4		16
3	TEST 1 (MCQ & SHORT ANSWER)	10	5	5						10
4	TEST 2 (SKILL-BASED TEST)	15				15				15
5	ASSIGNMENT 1	5	4				1			5
6	ASSIGNMENT 2 - 4	15				12			3	15
7	FINAL EXAM (MCQ & SHORT ANSWER)	20		10	10					20
8	FINAL EXAM (PRACTICAL)	15				15				15
Total		100	12	15	22	42	2	4	3	100
TOTAL PLO			27				9			