Department/ Faculty:	Computer Science/ Computing	Page:	1 of 6	
Course code:	SCSI 1013	Academic Session/Semester:		20182019/1
Course name:	DISCRETE STRUCTURE	Pre/co requisite:		-
Credit hours:	3			

Course synopsis	This course introduces students to the principles and applications of discrete structure in the field of computer science. The topics that are covered in this course are set theory, proof techniques, relations, functions, recurrence relations, counting methods, graph theory, trees and finite automata. At the end of the course, the students should be able to use set theory, relations and functions to solve computer science problems, analyze and solve problems using recurrence relations and counting methods, apply graph theory and trees in real world problems and use deterministic finite automata finite state machines to model electronic devices and problems.
Course coordinator (if applicable)	Dr Nor Haizan Mohamed Radzi

Course lecturer(s)/ Section	Name	Office	Telephone (07) 55-	E-mail @utm.my
01 & 12	Dr. Nor Azizah Ali	N28-438-20	-	nzah
02 & 11	Dr. Nor Haizan Mohamed Radzi (C)	N28-438-21	32261	haizan
03 & 10	PM Dr. Azlan Mohd Zain	N28a-05-15-01	38813	azlan
04 & 09	Dr Razana Alwee	N28-438-19		razana
05	Dr. Nor Erne Nazira Bazin/ PM Dr. Roselina Sallehuddin	N28-438-21	32022	erne/ roselina
06	Dr. Noorfa Haszlinna Mustaffa	N28-438-04	-	noorfa
07	Dr. Suhaila Mohamad Yusuf	N28-438-22	32061	suhailamy
08	PM Dr. Roselina Sallehuddin	N28-438-18	32082	roselina

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

No.	CLO	PLO (ICGPA CODE)	Weight (%)	*Taxonomies and **generic skills	T&L methods	Assessment methods***
CLO1	Analyse set theory, proof techniques, relations, functions and recurrence relation to solve computer science problems	PLO1 (KW) PLO5(TH)	28	C4,TH1		AS1, AS2, Q1, TE1,
CLO2	Explain and solve the problem of counting using counting methods.	PLO1 (KW) PLO5 (TH)	19	C3, TH1		AS3, TE2
CLO3	Apply the graph theory and trees in real world problems.	PLO1 (KW) PLO5(TH)	29	C3,TH1		AS4, Q2, FE
CLO4	Identify deterministic finite automata and finite state machines to model certain electronic devices and apply coding theory to solve computer science problem.	PLO1 (KW) PLO5 (TH)	24	C4,TH1		AS5, FE
Refer *Taxonomies of Learning and **UTM's Graduate Attributes for measurement of outcomes achievement. ***T – Test; Q – Quiz; HW – Homework; L – Lab, GR – Group Project; PR – Personal Report; F – Final Exam etc.						

Prepared by: Name: Dr Nor Haizan Mohamed Radzi (Course Owner) Signature: Date: 21 August 2017	Certified by: Name: PM. Dr. Norafida Ithnin (Head of Department) Signature: Date:

COURSE OUTLINE

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Details on Innovative T&L practices:

No.	Type	Implementation
1.		
2.		

Weekly Schedule:

W 1 (9-13/9) *9/9 Agong Bday 11/9 *Maal Hijrah 1440*	**CHAPTER 1: SET THEORY & LOGIC** 1.1 Set Theory • Set and Subset • Operations on Sets 1.2 Propositions, Conditional Propositions and Logical Equivalences 1.3 Quantifiers • Basic Quantifiers
W2 (16-20/9) *16/9 Malaysia Day	• Nested Quantifiers 1.4 Proof Techniques • Direct Proof • Indirect Proof
W 3 (23-27/9)	**CHAPTER 2: RELATIONS & FUNCTIONS** 2.1 Relations • Digraph • Matrices of Relations • Characteristics of Relations • Equivalence Relations • Partial Orders
W 4 (30/9-4/10)	2.2 Functions • One-to-one, Onto, Bijection, Inverse functions • Composition
W 5 (7-11/10)	2.3 Recurrence Relation • Sequences • Solving Recurrence Relation • Recursive Algorithm
W 6 (14-18/10) *15/10 Hari Hol	**CHAPTER 3: COUNTING METHODS & PROBABILITY** 3.1 Basic Principles 3.2 Permutations

COURSE OUTLINE

W 7 (21/10-25/10)	3.3 Combinations 3.4 Pigeonhole Principle • First Form • Second Form • Third Form
W 8 28/10-1/11)	3.5 Discrete Probability Theory • Discrete Probability Theory • Bayes' Theorem
W9 (4-5/11)	
(6-8/11)	SEMESTER BREAK
W 10 (11-15/11)	**CHAPTER 4: GRAPH THEORY** 4.1 Graph Definition and Notations 4.2 Representation of Graphs
W 11 (18-22/11) *20/11 Birthday of Prophet Muhammad S.A.W	4.3 Isomorphism of Graphs 4.4 Path and Cycles 4.5 Euler Cycles 4.6 Hamiltonian Cycles 4.7 Trees
W 12 (25-29/11)	• Terminology and Characterizations of Trees • Rooted Trees • Binary Trees • Tree Traversals 4.8 Dijkstra's Shortest Path & Minimum Spanning Tree Algorithm
W 13 (2-6/12)	**CHAPTER 6: FINITE AUTOMATA** 6.1 Deterministic finite automata 6.2 Finite state machines
W 14 (9-13/12)	**CHAPTER 7:** **Coding Theory** • Introduction to Coding Theory • Binary Code • Parity Check Code
W 15 (16-18/12)	• Hamming Code and Minimum Distance • Group Code • Generating Group Code • Decoding a Group Code

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

Developing critical thinking

Student learning time (SLT) details:

Distribution of course content	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**			
CLO 1	12	3				16.5	**31.5**
CLO 2	7	2				11.6	**20.6**
CLO 3	10	2				20.8	**32.8**
CLO 4	5	1				21	**27**
Total SLT	**34**	**8**				**69.9**	**111.9h**

	Continuous Assessment	PLO	Percentage	Total SLT
1	Quiz 1 (W3)	KW	5	½h
2	Quiz 2 (W13)	KW	5	½ h
3	Test 1 (W6 - **19 Oct 2018**)	KW	15	2h
4	Test 2 (W10- **16 Nov 2018**)	KW	15	2h
5	Assignment 1 (W3)	TH	5	As in CLO1(31.5h)
6	Assignment 2 (W7)	TH	5	As in CLO1 (31.5h)
7	Assignment 3 (W11)	TH	5	AS in CLO3 (37h)
8	Assignment 4 (W14)	TH	5	As in CLO3 (37h)
	Final Assessment		Percentage	Total SLT
1	Final Exam	KW	40	**3h**
	Grand Total SLT			**120h**

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

-

COURSE OUTLINE

Learning resources:

Text book (if applicable)

Main references

Main references:
i. *Discrete Structure Teaching Module*, Department of Computer Science, UTM, 2017/2018.
ii. Johnsonbaugh, R. *Discrete Mathematics*, 8th ed. Pearson Prentice Hall, 2017.
iii. Malik, D.S. & Sen, M.K. *Discrete Mathematical: Theory and Applications*. Cengage Learning, 2012.

Additional references
i. Kenneth H. R., *Discrete Mathematical And Its Application",* 7th ed. Mc Graw Hill, 2012.
ii. Kolman, B., Busby, R.C.& Ross, S.C. *Discrete Mathematical Structure*, 4th .Ed.Prentice Hall, New Jercy, 1996.

Online

http://elearning.utm.my

Academic honesty and plagiarism:

Assignments are individual tasks and NOT group activities (UNLESS EXPLICITLY INDICATED AS GROUP ACTIVITIES). Copying of work (texts, lab 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 and exams 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.

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 confirmed by UTM panel doctors. Make up exam can only be given within one week of the initial date of exam.

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Credit hours:	3			

No.	Assessment	% Total	PLO1(KW) CLO1	PLO1(KW) CLO2	PLO1(KW) CLO3	PLO1(KW) CLO4	PLO5 CLO1	PLO5 CLO2	PLO5 CLO3	PLO5 CLO4	Total
1	Quiz 1	5	5								5
2	Quiz 2	5			5						5
3	Assignment 1	5					4				5
4	Assignment 2	5					4				5
5	Assignment 3	5						4			5
6	Assignment 4	5							4		5
8	Test 1	15	15								15
9	Test 2	15		15							15
10	Final Exam	40			20	20					40
Overall Total		100	20	15	25	20	8	4	4	4	100
			80				20				

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