

COURSE INFORMATION

1 .	Name of Course	Discrete Structures							
2 .	Course Code	DCS5028							
3 .	Type of Course (e.g. : Core, major, elective etc.)	Core/ Major Subject June 2016 onwards							
4 .	Synopsis	This course introduces students to ideas and techniques from discrete mathematics that are widely used in science and engineering . Among topics to be discussed are propositional and predicate calculus, quantification, mathematical induction, sets, sequences, relations and functions, as well as fundamental ideas about combinatorial analysis, recurrence relations, graphs and tree theory.							
5 .	Version (State the date of theSenate’s approval - previous and the current approval date)	Current Version: Senate Jan 2018 Previous Version: June 2017							
6 .	Name(s) of Academic Staff	Chandrika, Nun Shwu Huey, Julie Yew Mei Yee, Rubiah Mohd Yunus, Lim Liyen, Nurasma' binti Shamsuddin, Mohd Azizi Sanwani							
7 .	Semester and Year Offered	Trimester 2, Year 1							
8 .	Credit Value	4							
9 .	Pre-Requisite	None							
10 .	Objective of the course in the programme: To explain the fundamental discrete mathematical principles and techniques, which are widely used in computer science applications.								
11 .	Justification for including the course in the programme: This subject will provide students the theoretical concept and basic application of discrete mathematics in Information Technology programme								
14 .	Transferable Skills: Teamwork, Communication and Leadership								
15 .	Distribution of Student Learning Time (SLT)								
	Course Content Outline	**CLO	Teaching and Learning Activities				Guided Learning (NF2F)*	Independent Learning (NF2F)*	Total SLT
			Guided Learning (F2F)*						
			*L	*T	*P	*O			
	1 Logic and Proofs Logic; Proposition; Truth tables; Propositional Equivalences; Logical Equivalences; Predicates and Quantifiers; Implication and equivalence; Tautology; Consistency and Contradiction; First order logic; Resolution; Proof techniques.	1,2,3	6	2			2	6	16
	2 Sets, Relations and Functions Review of set theory; Binary relations; Composition of relations; Relations and partitions; Partially ordered sets and lattices, Functions, Injection, surjection and bijection.	1,3	4	2			2	4	12
	3 Induction and Recursion Principle of mathematical induction; Recursive functions.	1,2,3	4	2			1	5	12
	4 Algorithms Algorithms Characteristics; Program Tracing; Notation for Algorithm; The Euclidean Algorithm; The Least Common Multiple (LCM).	1,2,3	4	1			2	3	10
	5 5. Counting The Basics of Counting; Permutations; Combinations; Generalized Permutations and Combinations; Inclusion-exclusion principle; The Pigeonhole Principle.	1,2,3	6	2			2	6	16
	6 6. Graphs Introduction to Graphs and Graphs Terminology (Directed and undirected graphs); Eulerian paths and Cycles; Hamiltonian paths and cycles; Dijkstra’s Algorithm;	1,3	6	1			1	6	14
	7 Trees Introduction to Trees; Binary tress, Binary search trees and tree traversals; Spanning Tree.	1,3	3	1			2	2	8
	8 Boolean Algebra Boolean expressions and Boolean Functions; Logic Gates; Minimization of Circuits - Karnaugh Maps.	1,3	4	1				5	10
	9 Finite State Machines Finite-State Machines with Output; Finite-State Machines with No Output; Finite State Automation.	1,3	3	1				4	8
	Total SLT								106

SUMMATIVE ASSESSMENT					
1. Continuous Assessment		Percentage %		Total SLT	
Quiz		15%		9	
Assignment		15%		18	
Midterm		20%		5	
Total SLT for Continuous Assessment				32	
2. Final Assessment		Percentage %		Total SLT	
				F2F	ILT
Final Exam		50%		2	20
Total SLT for Final Assessment (F2F + NF2F)				22	
Grand Total		100%		160	
**Indicate the CLO based on the CLO's numbering in Item 12.					
*L= Lecture, *T= Tutorial, *P= Practical, *O= Others, F2F*= Face to Face, NF2F*= Non Face to Face					
16 .	Identify Special Requirement to Deliver the Course (e.g., software, nursery, computer lab, simulation room):				
17 .	Main References: Johnsonbaugh , R. (2018), <i>Discrete Mathematics (8th Edition)</i> . Prentice Hall.				
18 .	Additional References: Rosen, K. (2012), <i>Discrete Mathematics and Its Applications (7th edition)</i> , McGraw-Hill Malik, D.S., Sen, M.K. (2010), <i>Discrete Mathematical Structure: Theory and Applications</i> , Cengage Learning Kolman, B., Busby, R. & Ross, S.C. (2018), <i>Discrete Mathematical Structures (Classic Version) (6th edition)</i> , Pearson				