SCHOOL OF COMPUTER TECHNOLOGY

	# LECTURE PLAN
Course:	BSc (IT, CS)
Subject Name :	Computer Mathematics
Subject Code :	MTH 1114
No. of Credit Hours :	4
Total Contact Hours :	5 (3-hour Lecture + 2-hour Tutorial)
Semester & Year :	April, 2023
Subject Lecturer : **Work Telephone:** **Extension :** **E-mail :** **Counseling Hrs :** **(Day / Time)**	Mr James Jaya Krishna (03) 7491 8622 7145 jkrishna@sunway.edu.my (whatsap 01111426248) Tuesday(12 – 2 pm)
Course Description:	The course provides a good foundation in Mathematics necessary to succeed in Computing. This subject builds on that foundation through the study of logic and proofs, set theory, number theory, basic relations and counting models that assist students in approaching problem solving in a logical manner. In addition, the study of various algorithms, graph theory and trees that form the basis of good software design.
Course Objectives :	This course teaches the student: • Problem solving using logic, number theory and various counting models • Graphs and trees that aid in the study of Computing Theory • Various algorithms that are essential in designing good software
Learning Outcomes :	Upon completion of the subject, students should be able to: • Explain various problem-solving approaches from the mathematical modelling point of view

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	• Explain the roles of graphs and trees in computer-related problems • Explain the notation and various algorithmic approaches that are commonly found in computer-related problems.	
Assessment Mode:	Examination :	(50%)
	Coursework :	(50%) Test 1 ~~15%~~ 20% Test 2 ~~15%~~ 10% Assignment 20%
	Test 1 Submission Due Date : Coursework Details:	(20%) Week 7 Logic, Proof and Set Theory
	Test 2/QUIZ : Submission Due Date : Coursework Details:	(10%) Week 12 Induction,Function, Relation Series, and Graph Theory
	Assignment Submission Due Date:	20% Week 13
	Total	100%

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	Week	Lecture Topic	Readings
Weekly Course Schedule	1	Logic and proofs • Propositions • Conditional propositions and logical equivalence •	Chapter 1 page1 – 36 of text
	2	• Quantifiers • Nested quantifiers • Proofs, resolution proofs • Mathematical induction	Chapter 1 page 36-57 of text and Chapter2 page 77 - 99
	3	Sets, functions and sequences • Sets • Functions • Sequences and strings Relations • Relations • Equivalence relations • Matrices of relations • Relational databases	Chapter 3 page117 – 164 of text
	4	Introduction to Number Theory • Divisors • Representations of integers and integer algorithms • The Euclidean algorithm	Chapter 5 page223 – 255 of text
	5	Counting models and the Pigeonhole Principle • Basic principles • Permutations and combinations • Algorithms for Generating Permutations and Combinations • Introduction to Discrete Probability •	Chapter 6 page 325 – 332 of text
	6	Revision	
	7	• **Test 1**	
		BREAK	

	8	Algorithms • Examples of algorithms • Analysis of algorithms (Recurrence relations) • Recursive algorithms	Chapter 4 page181 – 193 of text
	9	• Discrete Probability Theory • Generalized Permutations and Combinations • Binomial Coefficients and Combinatorial Identities • The Pigeonhole Principle	Chapter 6 page 277 – 320 of text
	10	Graph Theory • Paths and Cycles • Hamiltonian Cycles and the Travelling Salesperson Problem • A Shortest-Path Algorithm • Representations of Graphs • Isomorphisms of Graphs	Chapter 8 page 376 – 417 of text
	11	Trees • Terminology and Characterizations of Trees • Spanning Trees • Minimal Spanning Trees • Binary Trees • Tree Traversals • Decision Trees and the Minimum Time for Sorting	Chapter 9 page 440 – 480 of text
	12	TEST2	
	13	Presentation	
	14	Revision	

15	Examination

Assigned Text :	Johnsonbaugh, R., 2004. *Discrete Mathematics*. 6th ed. Upper Saddle River: Prentice-Hall.