

Subject **DISCRETE MATHEMATICS AND APPLICATIONS**
Faculty FAKULTI SAINS & TEKNOLOGI INDUSTRI
Passing Mark 40

Prerequisite

Synopsis This subject introduces and discusses the fundamental of the discrete as apply to computer science, focusing on providing a basic theoretical foundation for further work. Students are exposed to logic and proof techniques, set theory, elementary number of theory, functions and relations, graph, tress, modelling computations and abstract algebra. This course integrates symbolic tools, graphical concepts, and numerical calculations.

Objective 1 Acquire fundamental principle of discrete mathematics.
 2 Analyze mathematical problem using discrete mathematics.
 3 Provide solution to discrete mathematics problems arise from computer science and engineering field.

Contact Hour

References 1 Rosen K.H. Discrete Mathematics & Its Applications, (Seventh Edition) McGraw-Hill 978-0-0-7-33830
 2 Epp S.S. Discrete Mathematics with Applications, (Fourth Edition) Thomson Learning
 3 Ram Rabu Discrete Mathematics Pearson
 4 Walls W.D. A beginner's guide to Discrete Mathematics Springer

Assessment Plan	QUIZ 1	2 %
	QUIZ 2	2 %
	TEST 1	20 %
	QUIZ 3	2 %
	QUIZ 4	2 %
	TEST 2	20 %
	QUIZ 5	2 %
	ASSIGNMENT	10 %
	FINAL EXAM	40 %

Subject Planning

Week	Chapter	Topic	Assessment
1	1	Number Theory 1.1 Factorability 1.2 Primes 1.3 The Division Algorithm	

Week	Chapter	Topic	Assessment	
2	1	Number Theory 1.4 Greatest Common Divisors (GCD) 1.5 Least Common Multiples (LCM)		
3	1	Number Theory 1.6 Euclidean Algorithm 1.7 Extended Euclidean Algorithm 1.8 Modular Arithmetic	QUIZ 1	2%
4	2	Sets, Relations and Functions 2.1 Set Terminologies and Concepts 2.2 Operation on Sets 2.3 Cartesian Products		
5	2	Sets, Relations and Functions 2.4 Power Sets 2.5 Application of Set Theory		
6	2	Sets, Relations and Functions 2.5 Introduction to Functions 2.6 One-to-One and Onto Functions	QUIZ 2	2%
7	2	Sets, Relations and Functions 2.7 Relations and Their Properties - Reflexive - Symmetric - Transitive		
8			TEST 1	20%
9	3	Basic Logic 3.1 Propositional Logic 3.2 Logical Connectives 3.3 Propositional Equivalences		
10	3	Basic Logic 3.4 Predicates and Quantifiers 3.5 Rules of Inference	QUIZ 3	2%
11	4	Proof Techniques 4.1 Direct Proof 4.2 Indirect Proof 4.3 Contradiction Method		
12	4	Proof Techniques 4.4 Mathematical Induction 4.5 Strong Induction and Well-Ordering	QUIZ 4	2%

Week	Chapter	Topic	Assessment
13	5	Abstract Algebra 5.1 Groups 5.2 Abelian Groups	
14	5	Abstract Algebra 5.3 Semigroups and Monoid 5.4 Subgroups 5.5 Cyclic Groups	QUIZ 5 2%
15	5	Abstract Algebra 5.6 Rings 5.7 Commutative Rings 5.8 Field	TEST 2 20%