Adama Science and Technology University
School of Applied Natural Sciences
Department of Applied Mathematics
Course outline

Course title: Discrete Mathematics
Course code: Math2206
Credit hours: lecture hrs 3: Tutorial hrs 0
Prerequisite: Applied Mathematics I
Course category: Basic Compulsory

Chapter -1 : Propositional logic.

   1.1 logical connectives

   1.2 Compound propositions

   1.3 Truth table for compound propositions

   1.4 Equivalent propositions

   1.5 Predicate logic and open propositions

   1.6 Quantifies and open propositions

   1.7 Simple Mathematica proof techniques

   1.8 Arguments and validity

   1.9 The Boolean algebra and Digital logic

Chapter -2 : Theory of Sets

   2.1 Set Description

   2.2 Set Inclusion and Equality of sets

   2.3 Set Operations

   2.4 Operation with collection of sets

 Chapter -3 : Basics of Relations and Functions

   3.1 Ordered pairs and Relations

   3.2 Domain and Range of a relation

   3.3 Equivalent Relations

   3.4 Survey of functions

Chapter -4 : Fundamentals of Counting Techniques

   4.1 Addition and Multiplication principles

   4.2 Combinations and Permutations with and without repetition

   4.3 Inclusion and Exclusion principles

4.4 The Pigeon hole principle

4.5 Binomial Theorem and the Pascal identities

4.6 Basics of recurrence relation

4.7 Fundamentals of Discrete probability

4.8 Computational Complexity and elementary computability.

Chapter -5 : Theory of Graph

5.1 Definition of Graph

5.2 Types of Graphs

5.3 Representation of Graphs

5.4 Sub graphs and Graph Isomorphism

5.5 Walks in a graph

5.6 Eulerian and Hamiltonian Graphs

5.7 Trees and its Applications

Text: Discrete.Mathematics.and.Its.Applications_.Kenneth.Rosen_.7ed

Reference: 1. Discrete Mathematics ,Kevin Ferland ,2019.

2. Steven Roman, An Introduction to Discrete Mathematics.

:3. Rowan Grnier and Taylor Discrete Mathematics for New Technology
:4. Russell Merris Cobinatorics , second edition

Assessment : Mid-Exam :   about 30%

Assignment : about 20%

Quiz: about 10%

Final-exam : about   40%