

Discrete Mathematics: Course Syllabus

Second Semester 2021-2022 (1443H)

1. Course General Information:

Course title: Discrete Mathematics.	Course number and code: MATH 151
Previous course requirement: MATH 150	Language of the course: English
Course level: 3	Effective hours: 3 (3, 2, 0)

2. Faculty Member Responsible for the Course:

Name	Rank	Office Number and Location	Email Address
Dr. Aymen Ben Amira	Assistant Professor	Building 4, AA129/2	abenamira@ksu.edu.sa

3. Course description:

Discrete Mathematics is the subject that studies the basic concepts of elementary logic, the relations, graph theory, and the Boolean algebra. In the case of logic, we study the methods of proofs. In the case of relations, we study the equivalence relations and partitions (resp. the order relations and Hasse diagrams). In the case of graph theory, we present the basic concepts, and study the trees and their applications. It is also an aim of this course to teach the student how to simplify of Boolean functions using Karnaugh maps, and to design logic circuits.

4. Course Academic Calendar:

Week	Basic material to be covered
(1-5)	Elementary logic; Methods of proof
(6-9)	Relations, basic definitions and properties, special types of relations
(10-11)	Introduction to graph theory, basic definitions and properties, special types of graphs
(12-13)	Trees and their applications
(14-15)	Boolean algebras
(16)	Final Examination

5. Course objectives:

Introduce the converse, inverse, and contrapositive of a conditional statement, and the logical equivalence between statements.

Learning proofs using mathematical induction or contradiction.

Present the equivalence relations, their equivalence classes, and the order relations.

Introduce the regular graphs, the bipartite graphs, and the trees.

Learning how to simplify Boolean functions using Karnaugh maps and to design logic circuits.

6. Learning outcomes (understanding, knowledge, and intellectual and scientific skills)

After studying this course, the student is expected to be able to:

Outline fundamental concepts of mathematical logic.
Represent relations in various ways, and perform operations on them.
Recognize basic properties of Boolean algebras and Boolean functions.
Design logic networks and optimize costs using different algorithms and techniques.
Summarize certain basic concepts in graph theory, some special types of graphs, as well as some important typical applications of graph theory.
Summarize certain notions related to trees, spanning trees and algorithms of find breadth-first and depth-first search trees, as well as typical applications of trees

7. Textbooks adopted and supporting references:

Discrete mathematics and its applications.	Kenneth.H. Rosen	Seventh Edition
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8. Methods of Assessment:

Course Assessment	Mark
Participation, quizzes and homework assignments	10
Midterm Exam	30
Quiz 1	10
Quiz 2	10
Final Examination	40
Total	100

9. Attendance Policy:

Absence from lectures and/or tutorials shall not exceed 25%. Students exceeding the 25% limit without an accepted medical or emergency excuse are not permitted to take part in the final examination.