

King Saud University
College of Science
Discrete Mathematics
Course Syllabus
First Semester 1437 – 1438H

1. Course General Information:

Course Title: Discrete Mathematics	Course Code: MATH 151
Course Level: 3	Course Prerequisite: MATH 150 Co-requisites for this course (if any): None
Lecture Time: From 8 am -9am	Credit Hours: 3

2. Faculty Member Responsible for the Course:

Name	Rank	Office Number and Location	Office Hours	Email Address
Dr. Borhen Halouani	Professor	Building 4, 2A157	-	halouani@ksu.edu.sa

3. Course Description:

Students are introduced to: Elementary logic; Methods of proof; Relations, basic definitions and properties, special types of relations; Boolean algebras; Introduction to graph theory, basic definitions and properties, special types of graphs; Trees and their applications

4. Course Academic Calendar

Week	Basic material to be covered
(1-3)	Elementary logic; Methods of proof
(4-7)	Relations, basic definitions and properties, special types of relations
(8-10)	Boolean algebras
(11-13)	Introduction to graph theory, basic definitions and properties, special types of graphs
(14-15)	Trees and their applications
(16)	Final Examination

5. Course Objectives:

The course introduces the following:

- Elementary logic, some methods of proof.
- Relations, basic definitions and properties, representations of a relation, special types of relations.
- Boolean algebras, Boolean functions, logic networks.
- Introductory graph theory, basic definitions and properties, special types of graphs.
- Trees and their applications.

6. Course References:

6.1 Textbooks:

- 1- Discrete mathematics (in Arabic), M. Samhan and A. Sharary; Al-kheraiji for publishing and distribution 1426 H.
- 2- Discrete mathematics and its applications, K.H. Rosen, McGraw-Hill.

6.2 Essential References Materials (Journals, Reports, etc.)

NA

6.3 Recommended Textbooks and Reference Material (Journals, Reports, etc)

Discrete and combinatorial mathematics: an applied introduction, R.P. Grimaldi ; Addison-Wesley.

6.4 Websites:

Websites relevant to the topics covered in the course. <http://lms.ksu.edu.sa>

6.5 Other learning material such as computer-based programs/CD, professional standards or regulations and software.

Some textbooks are complemented by CDs

7. Teaching Methods:

- Classroom discussion sessions.
- Homework assignments and quizzes.
- Independent study.
- Students' presentations.

8. Learning Outcomes:

8.1 Knowledge and Understanding:

After studying this course, the student will acquire the following knowledge and be able to:

- Outline fundamental concepts of mathematical logic.
- Describe how to represent relations in various ways, and how to 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.

8.2 Cognitive Skills (Thinking and Analysis):

After studying this course, the student will be able to:

- Analyze different techniques of sentential calculus, and write down truth tables.
- Represent relations in various ways. Show whether a relation is of equivalence, of partial order or neither.
- Simplify Boolean functions using Karnaugh maps.
- Design logic networks.
- Recognize different types of graphs together with their fundamental properties.
- Develop algorithms of find breadth-first and depth-first search trees, as well as typical applications of trees.

8.3 Interpersonal Skills and Responsibility:

After studying this course, the student is expected to:

- Take part in the classroom discussions.
- Work effectively both individually and within a team.
- Be able to produce simple results using old ones.

8.4 Communication, Information Technology and Numerical Skills

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

- Acquire a working knowledge of basic research methodology, data analysis and interpretation.
- Demonstrate effective written and oral communication skills, especially the ability to explain and prove results.

9. Methods of Assessment:

Course Assessment	Mark
Participation, quizzes and homework assignments	10
Midterm Exam I	25
Midterm Exam II	25
Final Examination	40
Total	100

10. Course Policies:

- All exams are closed book.
- The final exam is comprehensive.

11. 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.