اعتماد
NCAAA

T4

2020

Course Specifications

Course Title:	Discrete Mathematics
Course Code:	Math 151
Program:	Bachelor Computer Sciences
Department:	Computer Sciences
College:	College of computer sciences
Institution:	King Saud University

Table of Contents

A. Course Identification

1. Credit hours: 3(3+2)	

2. Course type

a. University ☐ College ☑ Department ☐ Others ☐		
b. Required ☑ Elective ☐		

3. Level/year at which this course is offered: Fourth level/ Second year.

4. Pre-requisites for this course (if any)**:**
Calculus I (Math 150).

5. Co-requisites for this course (if any)**:**

None

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	**Traditional classroom**	75	100%
2	**Blended**	0	0
3	**E-learning**	0	0
4	**Distance learning**	0	0
5	**Other**	0	0

7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	**Lecture**	45
2	**Laboratory/Studio**	0
3	**Tutorial**	30
4	**Others** (specify)	0
	Total	75

B. Course Objectives and Learning Outcomes

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

2. Course Main Objective
The aim of this course is to introduce the following concepts:
1. Elementary logic
2. Methods of proof
3. Relations
4. Introduction to graph theory
5. Trees and their applications
6. Boolean algebra

3. Course Learning Outcomes

	CLOs	Aligned PLOs
1	**Knowledge and Understanding: The student will be able to**	
1.1	Explain fundamental concepts of mathematical logic, relations, graph theory and Boolean algebra.	
1.2	Describe how to represent relations in various ways, and how to perform operations on them as well as basic properties of Boolean algebra.	
2	**Skills : The student will be able to**	
2.1	Apply different techniques of proof to prove proposition and theorem, and algorithms to find breadth-first and depth-first search trees, as well as typical applications of trees.	
2.2	Show whether a relation is an equivalence, partial order or neither.	
2.3	Distinguish different types of graphs together with their fundamental properties.	
2.4	Write Boolean functions using Karnaugh maps.	
2.5	Present mathematics to others clearly, in written form and in a well-organized matter.	
3	**Values:**	
3.1		
3.2		
3.3		
3...		

C. Course Content

No	List of Topics	Contact Hours
1	Elementary logic and methods of proof	9
2	Relations	12
3	Introduction to graph theory	9
4	Trees and their applications	6
5	Boolean algebras	9
Total		**45**

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	**Knowledge and Understanding**		
1.1	Explain fundamental concepts of mathematical logic, relations, graph theory and Boolean algebra.	Through discussion sessions in virtual classes. Give example, tutorials	Exams, quizzes, homeworks
1.2	Describe how to represent relations in various ways, and how to perform	Through discussion sessions in virtual classes. Give example, tutorials	Exams, quizzes, homeworks

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
	operations on them as well as basic properties of Boolean algebra.		
2.0	**Skills: The student will be able to**		
2.1	Apply different techniques of proof and algorithms of find breadth-first and depth-first search trees, as well as typical applications of trees.	Through discussion sessions in virtual classes. Give example, tutorials	Exams, quizzes, homeworks
2.2	Show whether a relation is equivalence, partial order or neither.	Through discussion sessions in virtual classes. Give example, tutorials	Exams, quizzes, homeworks
2.3	Distinguish different types of graphs together with their fundamental properties.	Through discussion sessions in virtual classes. Give example, tutorials	Exams, quizzes, homeworks
2.4	Write Boolean functions using Karnaugh maps.	Through discussion sessions in virtual classes. Give example, tutorials	Exams, quizzes, homeworks
2.5	Present mathematics to others clearly, in written form and in a well-organized matter.	Through discussion sessions in virtual classes. Give example, tutorials	Exams, quizzes, homeworks
3.0	**Values**		
3.1			
3.2			
…			

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Exersice	weekly	10%
2	First Quiz	Week 4 or 5	10%
3	Midterm Exam	Week 6 or 7	30%
4	Second Quiz	Week 8 or 9	10%
5	Final Exam	Week 12 or 13	40%

Assessment task (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice :
Office hours: 3 hours per week.

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	Discrete mathematics and its applications, K.H. Rosen, McGraw-Hill.

Essential References Materials	Discrete and combinatorial mathematics: an applied introduction, R.P. Grimaldi ; Addison-Wesley.
Electronic Materials	LMS E-course.
Other Learning Materials	Websites on the internet which are relevant to the topics of the course.

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	Not applicable
Technology Resources (AV, data show, Smart Board, software, etc.)	we use of data show.
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	Not applicable.

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Course evaluation by students.	students	survey
Preparation of model answers with detailed distribution of Faculty grades.	Faculty	Indirect

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)
Evaluators (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)
Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Council / Committee	
Reference No.	
Date	