اعتماد
NCAAA

T4

2020

Course Specifications

Course Title:	Discrete Mathematics
Course Code:	MATH 462
Program:	Bachelor of Science in Mathematics
Department:	Mathematics
College:	Science
Institution:	University of Tabuk

Table of Contents

A. Course Identification

1. Credit hours:	**03 Hours/Week**

2. Course type

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

3. Level/year at which this course is offered: **L8/Y4**
4. Pre-requisites for this course (if any): **Math 251**
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**	45	100%
2	**Blended**		
3	**E-learning**		
4	**Distance learning**		
5	**Other**		

7. Contact Hours (based on academic semester)

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

B. Course Objectives and Learning Outcomes

1. Course Description

The main purpose of this course is to improve the student's logical thinking and skills in solving problems by using the basic concepts of discrete mathematics. The course also offers an opportunity for students to apply their knowledge and understanding to solve practical problems.

2. Course Main Objective

- Students will be able recall basic concepts of mathematical reasoning, set and graph theories.
-Students will be able to use mathematical reasoning techniques to perform logic proofs.
-Students will be able to recognize graphs and trees and in solving real world problems.

3. Course Learning Outcomes

CLOs		Aligned PLOs
1	**Knowledge and Understanding**	
1.1	Students will be able to recall the concepts of rigorous argument and formal	K1

		CLOs	Aligned PLOs
		proof, and an appreciation of the power and generality of abstract formulation and the analytic method.	
1.2		Students will be able to recognize the importance of discrete mathematics in other fields.	K2
2	**Skills :**		
2.1		Students will be able to solve problems using concepts and theorems developed during the course.	S3
2.2		Students will be able to use the methods, ideas and theories in real world applications.	S3
2.3		Students will be able to communicate mathematical concepts effectively and clearly.	S5
3	**Values:**		
3.1		Students will be able to develop enhanced self-learning.	V1
		Students will be able to work independently and in groups.	V2

C. Course Content

No	List of Topics	Contact Hours
1	Basic of discrete mathematics - Formal logic	3 Hrs
2	Formal logic – continue – sets	3 Hrs
3	Sets-identities	3 Hrs
4,5	Algebraic basic rules-semigroups, linear code	6 Hrs
6	**Mid-Exam#1**	
6,7	Graph theory: graphs-directed graphs	6 Hrs
8	Paths-walks-Eulerian and Hamiltonian graphs	3 Hrs
9	Shortest path-planar graphs	3 Hrs
10,11	Path coloring-trees-spanning trees-different algorithms	6 Hrs
11	**Mid-Exam#2**	
12	Table of transition planning graphs - Isomorphism in graphs	3 Hrs
13	The partial regression functions-languages and rules	3 Hrs
14	The regular expression	3 Hrs
15	**Revision & Final Exam**	3 Hrs
Total		**45 Hrs**

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	Students will be able to recall the concepts of rigorous argument and formal proof, and an appreciation of the power and generality of abstract formulation and the analytic method.	Introducing new ideas through case study Lectures Class Discussions	Quizzes I II Midterm Exams Final Exams Homework assignments
1.2	Students will be able to recognize the importance of discrete mathematics in other fields.		

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
2.0	**Skills**		
2.1	Students will be able to solve problems using concepts and theorems developed during the course.	Lectures Class Discussions	Quizzes I II Midterm Exams Final Exams Homework assignments.
2.2	Students will be able to use the methods, ideas and theories in real world applications.		
2.3	Students will be able to communicate mathematical concepts effectively and clearly.		
2.4			
3.0	**Values**		
3.1	Students will develop enhanced self-learning.	Lectures Class Discussions	Quizzes Homework assignments Group work
3.2	Students will be able to work independently and in groups.		

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Home works and Assignments and Quizzes	Weekly basis	10%
2	Mid Exam-I	6th week	25%
3	Mid Exam-II	11th week	25%
4	Final Exam	At end of the Semester	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 :
Six office hours per week in the lecturer schedule.

F. Learning Resources and Facilities
1. Learning Resources

Required Textbooks	S. Lipschutz and M. L. Lipson, Discrete Mathematics, Third Edition, Schaum's Outline Series (ISBN: 978-0-07-161587-7) Mc Graw Hill (2007).
Essential References Materials	Daniel Grieser, Exploring Mathematics: Problem-Solving and Proof (ISBN 978-3-319-90321-7) Springer Nature Switzerland (2018).
Electronic Materials	- https://ocw.mit.edu/courses/mathematics/
Other Learning Materials	None

2. Facilities Required

Item	Resources

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	1.Lecture room with maximum capacity of 30 students and equipped with White Board, Overhead projector and internet connection. 2.Library
Technology Resources (AV, data show, Smart Board, software, etc.)	Projectors
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	None

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Effectiveness of teaching and assessment	Students	Direct and Indirect
Extent of achievement of course learning outcomes	Teachers	Direct
Quality of learning resources	Students	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	Program and study plan committee
Reference No.	
Date	25/08/2021