



## Course Specifications

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

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## A. Course Identification

<b>1. Credit hours:</b>	<b>03 Hours/Week</b>
<b>2. Course type</b>	
a.	University <input type="checkbox"/> College <input type="checkbox"/> Department <input checked="" type="checkbox"/> Others <input type="checkbox"/>
b.	Required <input checked="" type="checkbox"/> Elective <input type="checkbox"/>
3. Level/year at which this course is offered: <b>L8/Y4</b>	
4. Pre-requisites for this course (if any): <b>Math 251</b>	
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)	
	<b>Total</b>	<b>45</b>

## 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	<b>Knowledge and Understanding</b>	
1.1	Students will be able to recall the concepts of rigorous argument and formal proofs of discrete mathematics.	K1
1.2	Students will be able to demonstrate knowledge of basic concepts and procedures of discrete mathematics.	K2
2	<b>Skills :</b>	
2.1	Students will be able to solve complex problems using procedures and techniques of discrete mathematics.	S1
2.2	Students will be able to apply the methods, ideas and theories in real world applications.	S3
2.3	Students will be able to communicate mathematical concepts effectively and clearly.	S4
3	<b>Values:</b>	
3.1	Students will be able to work in groups while committed to ethics.	V1
3.2	Students will be able to manage duties and time.	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	<b>Mid-Exam#1</b>	
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	<b>Mid-Exam#2</b>	
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	<b>Revision &amp; Final Exam</b>	3 Hrs
<b>Total</b>		<b>45 Hrs</b>

### 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	<b>Knowledge and Understanding</b>		
1.1	Students will be able to recall the concepts of rigorous argument and formal proofs of discrete mathematics.	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 demonstrate knowledge of basic concepts and procedures of discrete mathematics.		

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
<b>2.0</b>	<b>Skills</b>		
2.1	Students will be able to solve complex problems using procedures and techniques of discrete mathematics.	Lectures Class Discussions	Quizzes I II Midterm Exams Final Exams Homework assignments.
2.2	Students will be able to apply the methods, ideas and theories in real world applications.		
2.3	Students will be able to communicate mathematical concepts effectively and clearly.		
<b>3.0</b>	<b>Values</b>		
3.1	Students will be able to work in groups while committed to ethics.	Lectures Class Discussions	Quizzes Homework assignments Group work
3.2	Students will be able to manage duties and time.		

## 2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Activities	Weekly basis	5%
2	Homework	Weekly basis	5%
3	Quizzes	Weekly basis	10%
4	Mid Exam	6 <sup>th</sup> week	20%
5	Mid Exam	11 <sup>th</sup> week	20%
6	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

<b>Required Textbooks</b>	D. G. Zill & P. D. Shanahan, "A First Course in Complex Analysis with Applications", Jones & Bartlett Publishers, New York, 2003.
<b>Essential References Materials</b>	Brown; Churchill, "Complex Variables and Applications," 6 <sup>th</sup> Ed., McGraw-Hill, 1996.
<b>Electronic Materials</b>	None
<b>Other Learning Materials</b>	None

### 2. Facilities Required

Item	Resources
<b>Accommodation</b> (Classrooms, laboratories, demonstration)	1. Lecture room with maximum capacity of 30 students and equipped with White Board, Overhead projector and

Item	Resources
rooms/labs, etc.)	internet connection. 2.Library
<b>Technology Resources</b> (AV, data show, Smart Board, software, etc.)	Projectors
<b>Other Resources</b> (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

<b>Council / Committee</b>	The Curriculum committee
<b>Reference No.</b>	
<b>Date</b>	25/08/2021