

**TISHK INTERNATIONAL UNIVERSITY**  
**FACULTY OF APPLIED SCIENCE**  
**Department of INFORMATION TECHNOLOGY,**  
**2025-2026 Fall**  
**Course Information for IT 235 DISCRETE MATHEMATICS**

<b>Course Name:</b>	DISCRETE MATHEMATICS				
<b>Code</b>	<b>Regular Semester</b>	<b>Theoretical</b>	<b>Practical</b>	<b>Credits</b>	<b>ECTS</b>
IT 235	3	3	-	3	5
<b>Name of Lecturer(s):</b>	Asst. Prof. Dr. Salisu Ibrahim				
<b>Teaching Assistant:</b>	-				
<b>Course Language:</b>	English				
<b>Course Type:</b>	Main				
<b>Office Hours</b>	TBC				
<b>Contact Email:</b>	salisu.ibrahim@tiu.edu.iq				
	Tel:0712599545				
<b>Teacher's academic profile:</b>	lecturer				
<b>Course Objectives:</b>	The main objectives of the course are to: - Introduce concepts of algorithms, flowcharts, searching and sorting algorithms. - Understanding Optimization algorithms, time and space complexity. - Work with relations and investigate their properties. - Use proofs (direct, by case, by induction, by contradiction) for solving applied problems. - Introduce basic concepts of graphs, digraphs and trees.				
<b>Course Description (Course overview):</b>	Discrete mathematics is an important area in applied mathematics. It is the study of mathematical structures that are fundamentally discrete rather than continuous. It includes linear programming, coding theory and theory of computing.				

**COURSE CONTENT**

Week	Hour	Date	Topic
1	3	05-09/10/2025	Introduction to Discrete Mathematics and Applications
2	3	12-16/10/2025	Logic
3	3	19-23/10/2025	Set Theory
4	3	26-30/10/2025	Relations
5	3	02-06/11/2025	Proofs (direct, by case)
6	3	09-13/11/2025	Proofs (induction, contradiction)
7	3	16-20/11/2025	Midterm Exam
8	3	23-27/11/2025	Proofs (direct, by case, induction, contradiction) Practice
9	3	30/11-04/12/2025	Intro to Algorithms and Pseudo Code: - Searching - Sorting - Optimization
10	3	07-11/12/2025	Intro to Algorithms and Pseudo Code: - Recursive - Big-O Notation
11	3	14-18/12/2025	Time and Space Complexity of Algorithms
12	3	21-25/12/2025	Cartesian Products and Ordered Pairs
13	3	28/12-01/01/2026	Intro to Graph Theory: - Types - Applications
14	3	04-08/01/2026	Revision
15	3	11-15/01/2026	Final Exam

**COURSE/STUDENT LEARNING OUTCOMES**

1 Logic and Set Theory

- 2 Optimization Algorithms and Pseudo Code
- 3 Relations
- 4 Proofs (direct, by case, induction, contradiction)
- 5 Graph Theory and Trees

**COURSE'S CONTRIBUTION TO PROGRAM OUTCOMES**

(Blank : no contribution, I: Introduction, P: Profecient, A: Advanced )

**Program Learning Outcomes**

**Cont.**

1	Analyze a problem, and identify the computing requirements appropriate to its solution	P
2	Design, implement, and evaluate computer-based systems, process, component, or program to meet desired needs	P
3	Function effectively in teams to accomplish a common goal	P
4	Identify professional, ethical, legal, security, social, and economic issues and responsibilities	P
5	Analyze the local and global impact of computing on individuals, organizations, and society	P
6	Use current techniques, skills, and tools necessary for computing practice	A
7	Apply current technical concepts and practices in the core information technologies of human computer interaction, information management, programming, networking, web systems and technologies	A
8	Identify and analyze user needs and take them into account in the selection, creation, evaluation and administration of computer-based systems	A
9	Effectively integrate it-based solutions into the user environment	A
10	Apply problem solving skills, core it concepts, best practices and standards to information technologies	A
11	Identify and evaluate organizational requirements and current and emerging technologies	A
12	Design and integrate it-based solutions into the organizational environment	A

**Prerequisites (Course Reading List and References):**

-Discrete Mathematics and its Applications, 8th edition by Kenneth H. Rosen -Discrete Mathematics and its Applications, 8th edition by Richard Johnsonbaugh - Discrete Mathematics with Applications, 5th edition by Susanna S. Epp

**Student's obligation (Special Requirements):**

1. Students have an obligation to arrive on time and remain in the classroom for the duration of scheduled classes and activities. 2. Students have an obligation to write, homework, quizzes and final examinations at the times scheduled by the teacher or the college. Students have an obligation to inform themselves of, and respect, college examination procedures. 3. Students have an obligation to show respectful behavior and appropriate classroom deportment. Should a student be disruptive and/or disrespectful, the teacher has the right to exclude the disruptive student from learning activities (classes) and may refer the case to the Director of Student Services under the Student Code of Conduct.

**Course Book/Textbook:**

-Discrete Mathematics and its Applications, 8th edition by Kenneth H. Rosen

**Other Course Materials/References:**

My Lecture notes and the following references: [1] Richard Johnsonbaugh. Discrete Mathematics and its Applications, 8th edition [2] Susanna S. Epp. Discrete Mathematics with Applications, 5th edition

**Teaching Methods (Forms of Teaching):**

Lectures, Exercises, Presentation, Assignments, , ,

**COURSE EVALUATION CRITERIA**

Method	Quantity	Percentage (%)
Participation	1	10
Quiz	1	10
Homework	1	10
Project	1	10
Midterm Exam	1	20
Final Exam	1	40
<b>Total</b>		<b>100</b>

**Examinations:** Essay Questions, True-False, Multiple Choices, Short Answers, Matching, Problem Solving, ,

**Extra Notes:**

**ECTS (ALLOCATED BASED ON STUDENT) WORKLOAD**

<b>Activities</b>	<b>Quantity</b>	<b>Workload Hours for 1 quantity*</b>	<b>Total Workload</b>
Theoretical Hours	15	3	45
Practical Hours	15	0	0
Final Exam	1	40	40
Participation	1	1	1
Quiz	1	2	2
Homework	1	2	2
Project	1	30	30
Midterm Exam	1		0
<b>Total Workload</b>			<b>120</b>
<b>ECTS Credit (Total workload/25)</b>			<b>5</b>

**Peer review**

Signature:  
Name:  
Lecturer

Signature:  
Name:  
Head of Department

Signature:  
Name:  
Dean