

School of Engineering and Natural Sciences / Computer Engineering (English)

2022 - 2023 Academic Year

DISCRETE MATHEMATICS

Syllabus

Course Description					
Name	Code	Semester	T+A Hour	Credit	ECTS
DISCRETE MATHEMATICS	COE2218970	Spring Semester	3+0	3	5
Prerequisites Courses	MATEMATİK I				
Recommended Elective Courses					
Language of Instruction	English				
Course Level	First Cycle (Bachelor's Degree)				
Course Type	Required				
Course Coordinator	Assist.Prof. Cihan Bilge KAYASANDIK				
Name of Lecturer(s)	Assist.Prof. Cihan Bilge KAYASANDIK				
Assistant(s)					
Aim	The course is aimed at equipping students with logical and mathematical thinking. The course is designed to accomplish five major themes: (i) Mathematical reasoning, (ii) combinatorial analysis,(iii) discrete structures,(iv) algorithmic thinking,(v) applications and modeling.				
Course Content	This course contains; Week 1: Fundamentals of Logic,Week 2: Fundamentals of Logic (Ct'd),Week 3: Methods of Proof,Week 4: Methods of Proof (Ct'd),Week 5: Sets,Week 6: Structural Induction,Week 7: Corretness of Algorithms,Week 8: Functions,Week 9: Mathematical induction and recursion,Week 10: Recurrence Relation,Week 11: Basic Graph Theory,Week 12: Basic Cryptography ,Week 13: Basic Problems on Graphs and Tree representation,Week 14; Applications of Graph theory.				
Course Learning Outcomes			Teaching Methods	Assessment Methods	
1. Students will be able to write an argument using logical notation and determine if the argument is or is not valid			1, 15, 2, 3	A, C	
2. Students will be able to demonstrate the ability to write and evaluate a proof.			1, 15, 2, 3	A, C	
3. Students will be able to understand the basic principles of sets and operations in sets and prove basic set equalities.			1, 15, 2, 3	A, C	
4. They will be able to describe the properties of functions and show the relationships between them, gain an introductory knowledge of graph theory and cryptology.			1, 15, 2, 3	A, C	
Teaching Methods	1: Lecture, 15: Problem solving, 2: Question - Answer, 3: Discussion				
Assessment Methods	A: Written Exam, C: Homework				
Lecture Schedule					
Sequence	Topics	Preliminary Preparation			
1	Week 1: Fundamentals of Logic				
2	Week 2: Fundamentals of Logic (Ct'd)				
3	Week 3: Methods of Proof				
4	Week 4: Methods of Proof (Ct'd)				
5	Week 5: Sets				
6	Week 6: Structural Induction				
7	Week 7: Corretness of Algorithms				
8	Week 8: Functions				
9	Week 9: Mathematical induction and recursion				
10	Week 10: Recurrence Relation				
11	Week 11: Basic Graph Theory				
12	Week 12: Basic Cryptography				
13	Week 13: Basic Problems on Graphs and Tree representation				
14	Week 14; Applications of Graph theory				
Evaluation Methods		Weight(%)			
Midterm Exam		30			
General Exam		70			

Resources
Discrete Mathematics and Its Applications, Kenneth H. Rosen, 7th edition, McGraw-Hill, 2012