

Course Description	
Course Code	YZ 106
Course Name	DISCRETE STRUCTURES
Prerequisite Courses	
Language of the Course	English
Course Coordinator	
Instructor(s)	Assistant Prof. Dr. Fatih SARIKOÇ
Course Assistants	
The aim of the course	The aim of this course is to provide an introductory survey in discrete and combinatorial mathematics. To explain the application of discrete mathematics in computer science. To obtain the solutions and algorithms of some mathematical problems.
Course Content	A branch of mathematics that teaches basic computer infrastructure.

Weekly Course Content	
Week 1	Logic and Propositional Equivalences, Chapter 1.1-1.2 (Rosen)
Week 2	Predicates and Quantifiers, Nested Quantifiers Chapters 1.3 and 1.4 (Rosen)
Week 3	Methods of Proof, Chapter 1.5 (Rosen)
Week 4	Sets, Set Operations and Functions Chapter 1.6, 1.7, 1.8 (Rosen)
Week 5	Midterm Exam I
Week 6	Algorithms, The Growth of Functions, Complexity of Algorithms Chapter 2.1-2.3 (Rosen)
Week 7	Mathematical Reasoning, Induction and Recursion, Chapter 3.1-3.5 (Rosen)
Week 8	Basics of Counting, Permutations and Combinations Chapter 4.1, 4.3, 4.4 (Rosen)
Week 9	Relations and their Properties, n-ary Relations and Their Applications, Representing Relations Chapter 7.1.-7.3
Week 10	Midterm Exam II
Week 11	Introduction to Graphs, Graph Terminology, Special Graphs, Shortest Path Problems, Chapter 8.1-8.3, 8.6 (Rosen)
Week12	Introduction to Trees, Applications of Trees, Chapter 9.1-9.2 (Rosen)
Week 13	Traversal Algorithms, Spanning Trees, Chapter 9.3-9.4 (Rosen)
Week 14	Modeling Computation, Language and Grammars, Finite State Machines, chapter 11.1-11.3 (Rosen)
Week 15	Final Exam.

Course Learning Outcomes	
1	To familiarize students with the basic concepts and methods of mathematics in order to ensure the ability required in later studies of mathematics and computer sciences.
2	To interpret the computer application of discrete mathematics
3	To analyze the discrete contractions
4	To form algorithms for mathematical problems
5	To gain the solution to daily life problems.
6	To solve the problems by graphs
7	To obtain the solution to some problems
8	To understand the solution to some problems through graphs
9	To gain counting methods

Contribution of the Course to Program Qualifications		Contribution Level
01	The student will have the ability to apply an analytical approach, mathematics, and science knowledge in software and engineering issues.	4
02	The student will have the ability to identify, define, formulate and solve a problem in software and computer systems.	3
03	The student will have gained scientific research skills in software and engineering problems and has the ability to design a system, part, or process.	4
04	The student will have the ability to use the design capability, techniques, and tools required for engineering applications.	5
05	The student will have the ability to design, implement and interpret experimental work and software projects by analyzing the results.	4
06	The student will have the ability to work between disciplines and teamwork.	5
07	The student will have the ability to work in international environments and adapt to different cultures.	5
08	The student will have verbal and written communication skills in Turkish and English.	5
09	The student will have the awareness of the necessity of lifelong learning and the ability to realize it.	4
10	The student will gain knowledge of legal issues with an awareness of professional and ethical responsibility.	3
11	The student will have managerial skills (leadership, organization, time and risk management, quality awareness, efficiency, etc.).	5
12	The student will be able to participate in social activities, acquire regular sports habits and use time in the best way.	4
13	The student will have the ability to find unusual ways and produce projects.	4
14	The student will have professional self-confidence, be an entrepreneur, and take initiative.	3
15	It is sensitive to the problems of the age and looks after the national interests.	4

ECTS WORKLOAD			
	Number	Duration (hours)	Number*Duration
Face-to-face education	14	3	42
Out-of-class study time (pre-study, reinforcement)	13	2	26
Homeworks	6	1	6
Presentation / Seminar preparation	0	0	0
Quizzes	0	0	0
Preparation for midterm exams	8	2	16
midterm exams	2	2	4
Project (Semester assignment)	0	0	0
Lab	0	0	0
fieldwork	0	0	0
Preparation for the final exam	8	1	8
Semester final exam	1	2	2
Research	0	0	0
TOTAL WORKLOAD			104
ECTS			3

Evaluation		
SEMESTER EVALUATION	Number	Contribution Percentage
Midterm	2	100
Quiz	0	0

Homework	0	0
SEMESTER TOTAL		100
The contribution rate of mid-term evaluations to success		40
The contribution rate of the final exam to success		60
GRAND TOTAL		100

RESOURCES	
Textbook	Kenneth H.Rosen, Discrete Mathematics, and Its Applications, 5th ed., Mc.Graw Hill, 2003.
Helpful Resources	Kenneth H.Rosen, Discrete Mathematics, and Its Applications, 5th ed., Mc.Graw Hill, 2003.