İZMİR UNIVERSITY OF ECONOMICS

Faculty of Engineering
Computer Engineering
CE 215 - Discrete Mathematics for Computer Science

COURSE INTRODUCTION AND APPLICATION INFORMATION

Course Name	Discrete Mathematics for Computer Science

Code	Semester	Theory (hour/week)	Application/Laboratory (hour/week)	Local Credits	ECTS
CE 215	Fall	3	0	3	6

Prerequisites	None
Course Language	English
Course Type	Required
Course Level	First Cycle
Course Coordinator	* Profesör Dr. Cem EVRENDİLEK
Course Lecturer(s)	* Prof. Dr. Turhan TUNALI * Prof. Dr. Cem EVRENDİLEK
Course Assistants	-

Course Objectives	This course seeks to place on solid foundations the most common structures of computer science, to illustrate proof techniques, to provide the background for an introductory course in computational theory, and to introduce basic concepts of probability theory.
Course Learning Outcomes	The students who succeeded in this course; * will be able to state a logical argument. * will be able to practically use fundamental mathematical notation and concepts. * will be able to practice basic concepts of mathematical proof (direct proof, proof by contradiction, mathematical induction). * will be able to solve elementary combinatorial and counting problems. * will be able to identify the relations between sets and the properties of these relations.

Course Content	Topics include Boolean algebras, logic, set theory, relations and functions, graph theory, counting, combinatorics, and basic probability theory.

Course Category	Core Courses	X
	Major Area Courses	
	Supportive Courses	
	Media and Managment Skills Courses	
	Transferable Skill Courses	

WEEKLY SUBJECTS AND RELATED PREPARATION STUDIES

Week	Subjects	Related Preparation
1	Logic: Propositional Logic	Rosen, Discrete Mathematics and Its Applications, Chapter 1, Sections 1.1 - 1.3
2	Logic: Predicate Logic	Rosen, Discrete Mathematics and Its Applications, Chapter 1, Sections 1.4, 1.5
3	Logic: Logic and Proofs	Rosen, Discrete Mathematics and Its Applications, Chapter 1, Sections 1.6, 1.8, 1.9
4	Sets, Functions	Rosen, Discrete Mathematics and Its Applications, Chapter 2, Sections 2.1-2.3
5	Sequences and Sums	Rosen, Discrete Mathematics and Its Applications, Chapter 2, Section 2.4, 2.5
6	Number Theory: Divisibility	Rosen, Discrete Mathematics and Its Applications, Chapter 4, Sections 4.1, 4.2
7	Midterm Review	
8	MIDTERM	
9	Number Theory: Primes	Rosen, Discrete Mathematics and Its Applications, Chapter 4, Sections 4.3-4.5

10	Mathematical Induction	Rosen, Discrete Mathematics and Its Applications, Chapter 5, Sections 5.1, 5.2
11	Counting	Rosen, Discrete Mathematics and Its Applications, Chapter 6, Sections 6.1-6.4, Chapter 8, Section 8.5
12	Discrete Probability	Rosen, Discrete Mathematics and Its Applications, Chapter 7
13	Relations	Rosen, Discrete Mathematics and Its Applications, Chapter 9, Sections 9.1, 9.3, 9.5, 9.6
14	Coding Theory	Rosen, Discrete Mathematics and Its Applications, Chapter 12, Section 12.6
15	Semester Review	
16	Final Exam	

SOURCES

Course Notes / Textbooks	Discrete Mathematics and Its Applications, Kenneth H. Rosen, 8th edition, McGraw Hill, 2018, 978-1260091991
References	Discrete and combinatorial mathematics: an applied introduction. R.P. Grimaldi. Fifth Edition. ISBN: 0321211030 Discrete Mathematics for Computer Scientists, J.K. Truss, 2nd edition, Pearson, 1999, 978-0201360615

EVALUATION SYSTEM

Semester Requirements	Number	Percentage of Grade
Attendance/Participation	-	-
Laboratory / Application	-	-
Field Work	-	-
Quizzes/Studio Critics	-	-
Homework Assignments	1	30
Presentation/Jury	-	-
Project	-	-
Seminar/Workshop	-	-
Portfolios	-	-
Midterms/Oral Exams	1	30
Final/Oral Exam	1	40
Total	3	100

PERCENTAGE OF SEMESTER WORK	**2**	**60**
PERCENTAGE OF FINAL WORK	**1**	**40**
Total	3	100

ECTS / WORKLOAD TABLE

Activities	Number	Duration (Hours)	Total Workload
Course Hours (Including Exam Week: 16 x Total Hours)	16	3	48
Laboratory / Application Hours	16	-	-
Study Hours Out of Class	14	3	42
Field Work	-	-	-
Quizzes / Studio Critiques	-	-	-
Homework / Assignments	1	40	40
Presentation / Jury	-	-	-
Project	-	-	-
Seminar / Workshop	-	-	-
Portfolios	-	-	-
Midterms / Oral Exams	1	25	25
Final / Oral Exam	1	25	25
		Total Workload	**180**

THE RELATIONSHIP BETWEEN COURSE LEARNING OUTCOMES AND PROGRAM QUALIFICATIONS

#	Program Qualifications / Outcomes	* Level of Contribution				
		1	2	3	4	5
1	To have adequate knowledge in Mathematics, Science and Computer Engineering; to be able to use theoretical and applied information in these areas on complex engineering problems.					X
2	To be able to identify, define, formulate, and solve complex Computer Engineering problems; to be able to select and apply proper analysis and modeling methods for this purpose.			X		
3	To be able to design a complex system, process, device or product under realistic constraints and conditions, in such a way as to meet the requirements; to be able to apply modern design methods for this purpose.					
4	To be able to devise, select, and use modern techniques and tools needed for analysis and solution of complex problems in Computer Engineering applications; to be able to use information technologies effectively.			X		
5	To be able to design and conduct experiments, gather data, analyze and interpret results for investigating complex engineering problems or Computer Engineering research topics.					

6	To be able to work efficiently in Computer Engineering disciplinary and multi-disciplinary teams; to be able to work individually.					
7	To be able to communicate effectively in Turkish, both orally and in writing; to be able to author and comprehend written reports, to be able to prepare design and implementation reports, to present effectively, to be able to give and receive clear and comprehensible instructions.					
8	To have knowledge about global and social impact of Computer Engineering practices on health, environment, and safety; to have knowledge about contemporary issues as they pertain to engineering; to be aware of the legal ramifications of Computer Engineering solutions.					
9	To be aware of ethical behavior, professional and ethical responsibility; to have knowledge about standards utilized in engineering applications.					
10	To have knowledge about industrial practices such as project management, risk management, and change management; to have awareness of entrepreneurship and innovation; to have knowledge about sustainable development.					
11	To be able to collect data in the area of Computer Engineering, and to be able to communicate with colleagues in a foreign language. ("European Language Portfolio Global Scale", Level B1)					
12	To be able to speak a second foreign language at a medium level of fluency efficiently.					
13	To recognize the need for lifelong learning; to be able to access information, to be able to stay current with developments in science and technology; to be able to relate the knowledge accumulated throughout the human history to Computer Engineering.					

*1 Lowest, 2 Low, 3 Average, 4 High, 5 Highest