

TED UNIVERSITY, COURSE SYLLABUS

Faculty	Engineering	Department	CMPE
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Course Code & Number	CMPE201	Course Title	Discrete Structures of Mathematics
Type of Course	<input checked="" type="checkbox"/> Compulsory <input type="checkbox"/> Elective	Semester	2021-2022 <input checked="" type="checkbox"/> Fall <input type="checkbox"/> Spring <input type="checkbox"/> Summer
Course Credit Hours	(3+0+0) 3	Number of ECTS Credits	6
Pre-requisite	N/A	Co-requisite	N/A
Mode of Delivery	<input checked="" type="checkbox"/> Face-to-face <input type="checkbox"/> Distance learning	Language of Instruction	<input checked="" type="checkbox"/> English <input type="checkbox"/> Turkish
Course Coordinator		Course Lecturer(s)	Venera Adanova <i>Room B151</i> Aslı Gençtav <i>Room A433</i> Elif Kurtaran Özbudak <i>Room A429</i>
Required Reading	Rosen, Discrete Mathematics and Its Applications, 7 th ed. ISBN: 978-0-07-338309-0	Recommended Reading	Discrete and combinatorial mathematics: an applied introduction. R.P. Grimaldi. Fifth Edition. ISBN: 0321211030

Course Catalog Description	Logic. Theorems and proofs. Set theory. Relations and functions. Mathematical induction. Rules of counting, permutation, combination and binomial coefficients. Pigeonhole principle. Discrete probability. Graphs and trees.
Course Objectives	The objective of this course is to provide an understanding of the fundamental mathematical structures of computer science, describe common proof techniques and establish a background for future theory courses.
Course Learning Outcomes	Upon successful completion of this course, students will be able to <ol style="list-style-type: none"> 1. Identify the logical statements and argumentation in regular languages 2. Understand the propositional and predicate logic. 3. Learn basic proof techniques and strategies 4. Express and analyze set theory 5. Understanding the complexity analysis of algorithms 6. Understand the basics of number theory (congruence, Cryptography,) 7. Induction proof and recursive structures. 8. Count entities using rules of counting, combination and permutation 9. Graphs, Trees and traversal techniques 10. Modeling Computation; Finite-State Machines; Turing Machines.

Course Contents	Logic. Theorems and proofs. Set theory. Relations and functions. Mathematical induction. Rules of counting, permutation, combination and binomial coefficients. Pigeonhole principle. Discrete probability. Graphs and trees. Modeling Computation; Finite-State Machines; Turing Machines.
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Teaching Methods & Learning Activities	<input checked="" type="checkbox"/> Telling/Explaining <input checked="" type="checkbox"/> Discussions/Debates <input checked="" type="checkbox"/> Questioning <input checked="" type="checkbox"/> Reading <input type="checkbox"/> Peer Teaching <input type="checkbox"/> Scaffolding/Coaching <input type="checkbox"/> Demonstrating <input checked="" type="checkbox"/> Problem Solving <input type="checkbox"/> Inquiry <input type="checkbox"/> Collaborating <input type="checkbox"/> Think-Pair-Share <input type="checkbox"/> Predict-Observe-Explain <input type="checkbox"/> Microteaching <input type="checkbox"/> Case Study/Scenario Analysis	<input type="checkbox"/> Simulations & Games <input type="checkbox"/> Video Presentations <input type="checkbox"/> Oral Presentations/Reports <input type="checkbox"/> Concept Mapping <input type="checkbox"/> Brainstorming <input type="checkbox"/> Drama/Role Playing <input type="checkbox"/> Seminars <input type="checkbox"/> Field Trips <input type="checkbox"/> Guest Speakers <input checked="" type="checkbox"/> Hands-on Activities <input type="checkbox"/> Service Learning <input type="checkbox"/> Web Searching <input type="checkbox"/> Experiments <input type="checkbox"/> Other(s):
Assessment Methods (Formal & Informal)	<input checked="" type="checkbox"/> Test/Exam <input checked="" type="checkbox"/> Quiz/Homework <input type="checkbox"/> Oral Questioning <input type="checkbox"/> Performance Project <ul style="list-style-type: none"> <input type="checkbox"/> Written <input type="checkbox"/> Oral 	<input type="checkbox"/> Observation <input type="checkbox"/> Self-evaluation <input type="checkbox"/> Peer Evaluation <input type="checkbox"/> Portfolio <input type="checkbox"/> Presentation (Oral, Poster) <input type="checkbox"/> Other(s):

Student Workload (Total 184 Hrs)	<input checked="" type="checkbox"/> Lectures 42.. hrs <input checked="" type="checkbox"/> Course Readings 42.. hrs <input type="checkbox"/> Workshop hrs <input type="checkbox"/> Online Discussion hrs <input type="checkbox"/> Debate hrs <input type="checkbox"/> Work Placement hrs <input type="checkbox"/> Field Trips/Visits hrs <input type="checkbox"/> Observation hrs <input type="checkbox"/> Lab Applications hrs <input type="checkbox"/> Hands-on Work hrs <input checked="" type="checkbox"/> Quizzes and Homeworks..... 30.. hrs <input checked="" type="checkbox"/> Midterm I..... 20.. hrs <input checked="" type="checkbox"/> Midterm II..... 20.. hrs <input checked="" type="checkbox"/> Final..... 30.. hrs	<input type="checkbox"/> Resource Review hrs <input type="checkbox"/> Research Review hrs <input type="checkbox"/> Report on a Topic hrs <input type="checkbox"/> Case Study Analysis hrs <input type="checkbox"/> Oral Presentation hrs <input type="checkbox"/> Poster Presentation hrs <input type="checkbox"/> Demonstration hrs <input type="checkbox"/> Web Designs hrs <input type="checkbox"/> Mock Designs hrs <input type="checkbox"/> Team Meetings..... hrs <input type="checkbox"/> Other hrs
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COURSE ASSIGNMENTS	
A. Midterm I [22 %]	
B. Midterm II [23 %]	
C. Quizzes [15%]	There will be three quizzes, each quiz worth 5% of the overall grade.
D. Homework [%10]	There will be two take-home assignments each worth 5% of the overall grade.
D. Final [30%]	

COURSE POLICIES	
I . Attendance	Attendance to the course is mandatory. The students attending less than 70% (25 hours) of lecture hours will get FX grade.
II . Missed Work	Makeup for the midterm exam will be provided if the student can provide a legal document confirming a life threatening health issue at the time of the exam, or with the consensus of the CMPE faculty. <i>There will be no makeup for presentations, quizzes and the final exam.</i>
III . Late Assignment Submission Policy	Late submissions more than 2 days will not be graded. Each late day imposes 20% penalty of the total homework grade.
IV . Extra Credit	Extra credits will not be offered.
V . Assignment Rules	All assignment works must be done individually. A student can submit only one work. In case of multiple submissions, only the latest submission will be considered. Students cannot submit work on other students' behalf.
VI. Plagiarism	All of the following are considered plagiarism: <ol style="list-style-type: none"> 1. turning in someone else's work as your own 2. copying words or ideas from someone else without giving credit 3. failing to put a quotation in quotation marks 4. giving incorrect information about the source of a quotation 5. changing words but copying the sentence structure of a source without giving credit 6. copying so many words or ideas from a source that it makes up the majority of your work, whether you give credit or not" (www.plagiarism.org) <p>Plagiarism is a very serious offense and will be penalized accordingly by the university disciplinary committee. The best way to avoid accidentally plagiarizing is to work on your own before you ask for the help of other resources.</p>
VII. Cheating	Cheating has a very broad description which can be summarized as "acting dishonestly". Some of the things that can be considered as cheating are the following: <ul style="list-style-type: none"> • Copying answers on examinations, homework and laboratory works, • Using prohibited material on examinations, • Lying to gain any type of advantage in class • Providing false, modified or forged data in a report • Plagiarizing • Modifying graded material to be regraded. • Causing harm to colleagues by distributing false information about an examination, homework or laboratory <p>Cheating is a very serious offense and will be penalized accordingly by the university disciplinary committee.</p>
VIII. Class Readings	Class readings are necessary but not mandatory. The material covered in class by your instructor will only provide a fundamental understanding of the general context. These materials alone are definitely not sufficient for learning the subject. If you are willing to effectively learn something, you must actively work on it yourself. Reading is one of the most successful ways of learning about a topic.

TENTATIVE COURSE OUTLINE				
W	Day	Topics	Readings	Assignments
1	04.10-10.10	Fundamentals of logic	Sections 1.1-1.3	
2	11.10-17.10	Fundamentals of logic	Sections 1.4-1.5	
3	18.10-24.10	Quantifiers, Proof Methods	Sections 1.6-1.7	
4	25.10-31.10	Basic Structures of Discrete Math: Sets, Functions, Sequences, Sums, Matrices	Sections 2.1-2.4	
5	01.11-07.11	Algorithms, Complexity	Section 3.1-3.3	Quiz I HWI
6	08.11-14.11	Number Theory	Sections 4.1-4.6	HWI due
7	15.11-21.11	Induction and Recursion	Sections 5.1-5.4	Midterm I
8	22.11-28.11	Counting	Sections 6.1-6.5	
9	29.11-05.12	Recurrence Relations	Sections 8.1-8.5	Quiz II HW II
10	06.12-12.12	Relations; Equivalence Relations	Sections 9.1-9.6	HW II due
11	13.12-19.12	Graphs	Sections 10.1-10.5	Midterm II
12	20.12-26.12	Trees	Sections 11.1-11.4	
13	27.12-02.01	Discrete Probability	Section 7.1-7.3	Quiz III
14	03.01-09.01	Modeling Computation; Finite-State Machines; Turing Machines	Sections 13.1-13.5	

Prepared By & Date	Aslı Gencav Venera Adanova Elif Kurtaran Özbudak 17/09/2021	Revision Date	24/09/2021
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