

CS-23022
DISCRETE STRUCTURES FOR CS
Fall 2015

TR 3:45 pm – 5:00 pm

SMH 110

Instructor Maha Ali Allouzi

Office Hours Room 272 MSB

TR 2:00-3:00

And by appointment

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Class website <http://www.cs.kent.edu/~mallouzi/Discrete Mathematics>

Course Description:

Discrete Structures for Computer Scientists with a focus on: mathematical reasoning, combinatorial analysis, discrete structures, algorithmic thinking, application and modeling. Specific topics include: logic, sets, functions, relations, algorithms, proof techniques, counting, graphs, trees, Boolean algebra, grammars and languages.

Prerequisites: Math 11010 and Math 11022 or else alternatives (See Catalog Listing)

Text Book: Kenneth H. Rosen, Discrete Mathematics and Its Applications, McGraw-Hill, 2012.

Course content:

Logic, Sets, and Functions (chapter 1, 2)

Logic, Propositional Equivalences, Predicates and Quantifiers, Nested Quantifiers, Methods of proof, Sets, Set Operations, Functions.

Mathematical Reasoning, Induction, and Recursion (chapter 5)

Art and Strategy of Proof, Sequences and Sums, Mathematical Induction, Recursive Definitions and Structural Definition, Program Correctness.

Counting (chapter 6)

The Basics of Counting, the Pigeonhole Principle, Permutations and Combinations, Binomial Coefficients, Generalized Permutations and Combinations, Generating Permutations and Combinations.

Discrete Probability (chapter 7)

An Introduction to Discrete Probability, Probability Theory, Expected Value and Variance

Relations (chapter 9)

Relations and Their Properties, n-ary Relations and Their Applications, Representing Relations, Closures of Relations, Equivalence Relations, Partial Orderings.

Graphs (chapter 10)

Introduction to Graphs, Graph Terminology, Representing Graphs and Graph Isomorphism, Connectivity, Euler and Hamilton Paths, Shortest Path Problems, Planar Graphs, Graph Coloring.

Trees (chapter 11)

Introduction to Trees, Applications of Trees, Tree Traversal, Spanning Trees, Minimum Spanning Trees.

Boolean Algebra (chapter 12)

Boolean Functions, Representing Boolean Functions, Logic Gates, Minimization of Circuits.

Modeling Computation (chapter 13)

Languages and Grammars, Finite-State Machines, Language Recognition, Turing Machines.

Grading:

	Due date	Total percentage
Quizzes	-	20%
Homework	-	20%
Midterm Exam	3:45-5:00 pm Tues Oct 6	25%
Final Exam	7:45 – 10:00 am Thur. Dec 17	35%

Final Grading Scale:

Scale:	0%	60%	67%	70%	73%	77%	80%	83%	87%	90%	93%
Grade:	F	D	D+	C-	C	C+	B-	B	B+	A-	A
GPA:	0.00	1.00	1.30	1.70	2.00	2.30	2.70	3.00	3.30	3.70	4.00

University Requirements and Announcements:

- **Registration Requirement:** The official registration deadline for this course can be found on the Registrars calendar . University policy requires all students to be officially registered in each class they are attending. Students who are not officially registered for a course by published deadlines should not be attending classes and will not receive credit or a grade for the course. Each student must confirm enrollment by checking his/her class schedule (using Student Tools in FlashFast) prior to the deadline indicated. Registration errors must be corrected prior to the deadline. Every class has its own schedule of deadlines and considerations. To view the add/drop schedule and other important dates for this class, go to the Students Tools and Courses tab in FlashLine and choose either View or Print Student Schedule. To see the deadlines for this course, click on the CRN or choose the Drop or Add a Course link and click on the green clock next to the course under Registration Deadlines.
- University policy 3342-3-01.3 requires that students with disabilities be provided reasonable accommodations to ensure their equal access to course content. If you have a documented disability and require accommodations, please contact the instructor at the beginning of the semester to make arrangements for necessary classroom adjustments. Please note, you must

first verify your eligibility for these through Student Accessibility Services (contact 330-672-3391 or visit www.kent.edu/sas for more information on registration procedures).

- University policy 3342-3-01.8 deals with the problem of academic dishonesty, cheating, and plagiarism. None of these will be tolerated in this class. The sanctions provided in this policy will be used to deal with any violations. If you have any questions, please read the policy or contact the instructor. For the University's complete policy on procedure on cheating and plagiarism go to: www.kent.edu/policyreg/index.cfm and search for policy 3-01.8.