

MATH 245-24 Discrete Structures (Fall 2008)

Time and location

- Monday, 6:30-9:00
- Schaumburg Campus, SCH 372

Instructor

Dr. Evgeny Dantsin

- Email: edantsin@roosevelt.edu
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- Office hours:
 - Monday and Tuesday, 5:00-6:30, SCH 600I
 - Thursday, 4:30-6:00, GB 506B

Course description

Logic, mathematical induction, sets, functions, relations, counting, elementary probability, graphs. Emphasis on algorithms.

Textbook

Susanna S. Epp,
Discrete Mathematics with Applications,
3rd edition, Brooks/Cole, 2004. ISBN: 0534359450.

Prerequisites

MATH 121 (College Algebra)

Tentative schedule

Date	Topics	Homework	Textbook
09/08	Syllabus. Introduction to logic. Statements and truth tables. Logical equivalences. Tautologies and contradictions. Implications.		1.1-1.2
09/15	Arguments. Deductions. Introduction to predicates and quantifiers. Quantified statements.	HW-1	1.3, 2.1-2.2
09/22	Elementary number theory. Methods of proofs. Argument by contraposition. Argument by contradiction. Examples of classical theorems.		3.1-3.3, 3.7
09/29	Sequences. Summations and products. Proofs by mathematical induction.	HW-2	4.1-4.3
10/06	Sets: basic definitions and notation. Operations on sets. Set identities. Countable sets. Uncountable sets and the diagonalization method. Application to computability.		5.1-5.2, 7.5
10/13	Introduction to probabilities. Counting: multiplication rule, permutations.	HW-3	6.1-6.2
10/20	Midterm exam (open books).		
10/27	Counting: inclusion/exclusion, subsets, combinations.		6.3-6.4

11/03	Real-valued functions and their graphs. Asymptotic notation. Growth of functions. Application: efficiency of algorithms.	HW-4	9.1-9.2, 9.4
11/10	Functions defined on sets. One-to-one functions. Inverse functions.		7.1-7.2
11/17	Relations on sets. Properties of relations.	HW-5	10.1-10.2
11/24	Graphs. Walks in graphs. Connectedness. Euler and Hamiltonian circuits.	HW-6	11.1-11.2
12/01	Trees. Minimum spanning trees. Algorithms for computing minimum spanning trees.		11.3-11.5
12/08	Review of the course. Preparation for the final exam.		
12/15	Final exam (open books).		

Assignments and grading

Final grades will be based on the total number of points earned on the following assignments:

- homework assignments and in-class quizzes (total maximum: 60 points);
- midterm exam (maximum: 20 points);
- final exam (maximum: 20 points).

No late homework will be accepted; no make-ups will be given. Instances of academic dishonesty will be handled as described in University policies. Grades will be assigned according to the following scale (the plus/minus grading system is not used in this course):

A	B	C	D	F
≥ 90%	≥ 75%	≥ 60%	≥ 45%	< 45%

Lecture notes

Lecture notes, slides, homework assignments, and other course materials will be posted on [Blackboard](#) after every lecture.