

MATH 277/CSCI 277 Fall 2017

Discrete Mathematics

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Office Hours: Monday 3:15-5:00; Wednesday 3:30-5:00 Thurs: 10:15-11:15

Course Goals: The goal of this course is to lay many of the mathematical foundations for the mathematics and computer science courses you need for a major or honours degree in these subjects. Key to these foundations are the abilities:

- to understand and properly use mathematical notation, common concepts, terminology and definitions;
- to think logically, and understand and write simple proofs

In this course we will first concentrate on developing skills in these areas and then use this to develop proficiency in the remainder of the topics covered in this course. Throughout we will use real world applications as examples to understand the role and value of the techniques and theory learned. The following was taken from Epp, page xiv:

Discrete mathematics concerns processes that consist of a sequence of individual steps. This distinguishes it from calculus, which studies continuously changing processes. While the ideas of calculus were fundamental to the science and technology of the industrial revolution, the ideas of discrete mathematics underlie the science and technology specific to the computer age.

Textbook: (Required) Suzanna Epp, Discrete Mathematics with Applications, 4th edition, Brooks/Cole.

Website: <http://moodle.stfx.ca> Once you log in, if you are enrolled in the course you should see the course name on your list.

Grading Scheme:	Assignments	15%	(Due dates on schedule)
	Midterms	35%	(Oct. 12 and Nov. 16)
	Final Exam (Comprehensive)	50%	(Date TBA)

Assignments: Assignments will be posted on the course moodle page (see above). Assignments are **due at the beginning of class on the due date**. If you miss this deadline, you may turn in your assignment before the solutions are posted, but with a 25% deduction from the grade per day or part thereof. Assignments will be not be accepted once the solutions are posted.

If a student needs to miss an assignment, quiz or midterm due to medical or other extenuating circumstances he or she should contact me as soon as possible, where we can discuss alternative arrangements. If a student has 3 or more unexplained class absences, a note will be sent to the Dean.

Doing assignments is an essential part of the learning process, and will help keep you “paced” and ready for the topics that follow. Discussions with other students regarding assignments is allowable (and beneficial) to a point that does not violate the authorship of the work and cross over into plagiarism. In particular, you may discuss problems with other students but you must write up your own solutions without reference to a classmate’s written work. Please also see Section 3.8 of the 2017-2018 Academic Calendar as well as the StFX policy on academic integrity, found at http://www.sites.stfx.ca/registrars_office/academic_integrity.

For best results, begin each assignment several days before it is due; it is better to work on an assignment several times for a shorter period than to attempt to do it all at one sitting. It also gives you time to ask me questions regarding problems you have. I am available for extra help during office hours and at other times by appointment. I cannot give help via e-mail. Quick questions before or after class – or during class if the question is relevant to the lecture - will often solve your problems and answer questions for your classmates too. In an emergency, please phone my office and leave a voice mail if I am not there.

More Help:

- The text offers many worked examples; in addition, solutions for many of the exercises at the end of each section are fully written out in the back of the text. Make a habit of reading the material from the text after each lecture and practice problems from the text before attempting to do the homework assignments
- The Mathematics and Statistics Learning Centre: http://sites.stfx.ca/mscs/learning_centre
- Tutor list: http://sites.stfx.ca/mscs/mscs_tutors
- Meeting regularly with fellow students

Syllabus/Schedule for MATH 277/CSCI 277 (Tentative)

WEEK	TEXT	TOPIC
1 (Sept 4)	1.1 - 1.3	Introduction to Discrete Mathematics and a review of mathematical language (sets, functions, relations)
2 (Sept 11)	2.1 - 2.4	The logic of compound statements; logical form and logical equivalence, conditional statements, valid arguments and applications
3 (Sept 18)	3.1 - 3.4	The logic of quantified statements; predicates and quantified statements, multiple quantifiers, arguments with quantified statements Assignment 1 (Due Sept. 21)
4 (Sept 25)	Selections from Chapter 4	Elementary number theory and methods of proof Assignment 2 (Due Sept. 28);
5 (Oct 2)	Selections from Chapter 5	Sequences, mathematical induction and recursion; strong induction, and applications; Solving recurrence relations by iteration, Assignment 3 (Due Oct. 5)
6 (Oct 9)	6.1	Set Theory: definitions and element method of proof, Monday October 9 is Thanksgiving Day Holiday (no class!) 1st Midterm: Thursday October 12
7 (Oct 16)	6.2 - 6.4	Set theory: properties of sets, disproofs, algebraic proofs, boolean algebras, Russell's paradox and the Halting Problem; Assignment 4 (Due Oct. 19)
8 (Oct 23)	7.1 - 7.4	Functions: terminology; well defined; one to one; onto; inverse; composition; cardinality; Assignment 5 (Due Oct. 26)
9 (Oct 30)	8.1 - 8.5	Relations: properties of relations, reflexive, symmetric, transitive, antisymmetric; equivalence relation, equivalence class, partial order relation, partition Assignment 6 (Due Nov. 2)
10 (Nov 6)	9.1 - 9.6	Counting Assignment 7 (Due Nov. 9)
11 (Nov 13)	12.2	Introduction to Finite State Automata Monday November 13 is Remembrance Day Holiday (no class!) 2nd Midterm Thursday November 16
12 (Nov 20)	12.1-12.2	Strings, regular language, combinatorial circuits, sequential circuits finite state automata and regular expression; Assignment 8 (Due Nov. 23)
13 (Nov 27)	10.1-10.2	Graphs: definitions and basic properties, walks, trails, circuits, Euler circuits, Hamiltonian circuits Assignment 9 (Due Nov. 30) Review for Final

Everyone learns more effectively in a respectful, safe, and equitable learning environment free from discrimination or harassment. I invite you to work with me to create a classroom space—both real and virtual—that fosters and promotes values of human dignity, equity, non-discrimination and respect for diversity. Please feel free to discuss with me any questions or concerns you have about equity in our classroom or in the StFX community. If I cannot answer your questions or help you address your concerns, I encourage you to talk to the Chair/Coordinator of a Department/Program or the Human Rights and Equity Advisor. Please note that a Human Rights and Equity Advisor will soon be appointed. In the meantime, students may contact the Director of Human Resources at hr@stfx.ca or the office of the AVP&P.