MAT344H1 F

Introduction to Combinatorics, Fall 2024

Syllabus

Instructors:
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Description: Basic counting principles, generating functions, permutations with restrictions, inclusion-exclusion formula, induction. Fundamentals of graph theory with algorithms; applications (including network flows).

Prerequisits: MAT223H1/MATA23H3/MAT223H5/MAT240H1/MAT240H5

Textbook: Applied Combinatorics, by Mitchel T. Keller and William T. Trotter, 2017 available at appliedcombinatorics.org/book/app-comb.html

Lectures

- LEC0101: MO:09:00-11:00, WE: 09:00-10:00 (Sidney Smith, room 2118).
- LEC0201: MO:3:00-5:00 pm (MP 202) , WE: 4:00-5:00 pm (MP 202).
- LEC5101: MO:7:00-8:00 pm, WE: 6:00-8:00 pm (BA 1170).

Tutorials

- TUT0101 Monday 1200-1300 ES 4001
- TUT0201 Monday 1300-1400 EM 302

- TUT0301 Tuesday 1200-1300 ES 4001
- TUT0401 Tuesday 1300-1400 FE 24
- TUT0501 Tuesday 1500-1600 NL 6
- TUT0601 Tuesday 1600-1700 WI 524
- TUT5101 Monday 1700-1800 ES 4001
- TUT5201 Tuesday 1700-1800 ES 4001
- TUT5202 Tuesday 1700-1800 UC 261

Important dates

- September 3: Classes begin in F and Y courses.
- September 12: Waitlists for F and Y courses close at end of day.
- September 16: Last day to enrol in F and Y courses.
- September 17: First day to select a Credit/No-Credit (CR/NCR) option for F and Y courses.
- October 14: No classes - Thanksgiving holiday.
- October 28 - November: No classes - Fall Reading Week.
- November 4: Last day to drop F courses.
- December 3: Official last day of classes. This day will be used to make up for class missed due to the Thanksgiving holiday.
- December 3: Last day to add or remove a CR/NCR option in Fall F courses.
- December 4 - 5: Study days.
- December 6 - 23: Final exams in F courses.

Tentative timetable

week 1	Sections 2.1-2.4
week 2	Sections 2.5-2.8
week 3	Chapter 3
week 4	Sections 4.1, 5.1, 5.2
week 5	Sections 5.3, 5.4
week 6	Sections 5.4, 5.5
week 7	Sections 7, 8.1-8.3
week 8	Sections 8.4-8.7
week 9	Sections 9.1-9.4
week 10	Sections 9.5-9.8
weeks 11	Chapter 12
weeks 12	Chapter 13

Technical requirements

You need internet access to login to Crowdmark once a week to submit your assignments. You also need an access to zoom for the office hours.

Grading scheme

Assignments 25/100
Midterm 35/100
Final 40/100

- There will be 7 assignments, of which the assignment with the lowest score will be dropped. The assignments will be distributed and submitted using Crowdmark.
- There will be two sittings for the midterm (students should only come to one of them, not both). The dates will be announced later. A student whose midterm grade is lower than the final grade will have the final grade substituted in place of the midterm grade (so 35% of the grade is max(midterm,final)). In particular, if a student does not write the midterm, their final grade will comprise 75% of the course grade.
- Final exam will be during the December Final exam period

Course Policies

- There is no attendance requirement for the lectures and tutorials. Students must enroll in their chosen tutorial section at the beginning of the course.
- No late assignments work will be accepted. The only exception is for students registered with Accessibility Services (AS) at the **St George campus**. In this case, students should get their special accommodation needs assessed by AS, after which the AS (**St George**) should contact the instructor with a suggestion on how to accommodate the student.
- **Missed term work policy.** Students who are absent from class for prolonged periods and who require consideration for missed academic work should contact the instructor and verify their absence(s) through either the Absence Declaration Tool, Verification of Illness or Injury (VOI) form, College Registrar Letter, or Letter of Academic Accommodation from Accessibility Services, as appropriate to their situation. https://www.artsci.utoronto.ca/current/academics/student-absences.
- **Re-marking policy**. If you want a remarking of your assignments on Crowdmark, you must sent an email to the instructor, pointing out the exact part of your solution which you think is not marked correctly and why. In this case, the instructor will forward your request to the grader TA. Remarking requests will be accepted no later than two weeks after the release of the grades.
- **Emails policy**. Should you have a question that is not answered on the course syllabus, please note that all communications with the Course Instructors or TA's must be sent from your official utoronto email address, with the course number included in the subject line. If these instructions are not followed, your email may not be responded to. Please write in a professional manner.
- Students are encouraged to use **Piazza** to post questions and initiate discussions. The instructors and/or TAs will monitor and answer questions on Piazza.

Course Outcomes

The course is designed to help students acquire knowledge in combinatorial techniques (basic counting, recursion, generating functions, inclusion-exclusion) and fundamentals of graph theory and graph algorithms.

Institutional Policies and Support

- **Academic Integrity:** All suspected cases of academic dishonesty will be investigated following procedures outlined in the Code of Behaviour on Academic Matters: https://governingcouncil.utoronto.ca/secretariat/policies/codebehaviour-academic-matters-july-1-2019.

  If you have questions or concerns about what constitutes appropriate academic behaviour or appropriate research and citation methods, please reach out to your Course Instructor. Note that you are expected to seek out additional information on academic integrity from an instructor or from other institutional resources (for example, the University of Toronto website on Academic Integrity http://academicintegrity.utoronto.ca/). (Academic Handbook Section 12 Academic Integrity).

- **Equity, Diversity and Inclusion:** The University of Toronto is committed to equity, human rights and respect for diversity. All members of the learning environment in this course should strive to create an atmosphere of mutual respect where all members of our community can express themselves, engage with each other, and respect one another's differences. U of T does not condone discrimination or harassment against any persons or communities.

- **Accessibility:** The University provides academic accommodations for students with disabilities in accordance with the terms of the Ontario Human Rights Code. This occurs through a collaborative process that acknowledges a collective obligation to develop an accessible learning environment that both meets the needs of students and preserves the essential academic requirements of the University's courses and programs. Students with diverse learning styles and needs are welcome in this course. If you have a disability that may require accommodations, please feel free to approach your Course Instructor and/or the Accessibility Services office as soon as possible. The sooner you let us know your needs the quicker we can assist you in achieving your learning goals in this course.