

Math 443, 2024WT1

Overview

From the calendar:

Introductory course in mostly non-algorithmic topics including: planarity and Kuratowski's theorem, graph colouring, graph minors, random graphs, cycles in graphs, Ramsey theory, extremal graph theory. Proofs emphasized. Intended for Honours students.

Credits: 3

Pre-reqs: A score of 68% or higher in one of MATH 220, MATH 223, MATH 226, CPSC 121. (And 6 credits of MATH numbered 300 or above.)

Textbook

A first course in graph theory, by Chartrand and Zhang

Content

- o Basic definitions
- o Connected graphs
- o Common classes of graphs
- o Graph degree
- o Walks and closed walks
- o Regular graphs
- o Degree sequences
- o Trees
- o Vertex- and edge connectivity
- o Eulerian circuits
- o Hamiltonicity
- o Planarity
- o Discharging
- o Colouring (vertex and edge)
- o Time permitting: Ramsey theory, Turan's theorem, modified Ramsey numbers, random graphs, crossing number

Grading

- o 50% homework (take-home, students may work in groups)
- o 20% midterm (in class, closed book, individual)
- o 30% final project (scaffolded group project including assignments meant to help students learn to read math research papers, culminating in group presentations in a conference-like environment)