University of Toronto

Department of Computer & Mathematical Sciences

MATC32:Graph theory and applications

Syllabus

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Warning:

The following is a very tentative schedule for the coming 12 weeks. As this is the first time I am teaching MATC32, the schedule involves quite some guesswork..For more accurate information, please refer to the lecture summaries on the course website

The information in this syllabus is subject to change

Week	Section Number	Summary
1	§1.1	Course information. What can we do with graphs: solving the party- / Köningsberg problems. An overview of some interesting graph thy. questions
2-3	§1.1-1.2,	Basic definitions: morphisms, subgraphs, decompositions
3-4	§4.3, extra notes	networks and their flow. The min-cut/max flow. Some real life applications
4-5	§3.1, extra notes	Bipartite graphs. The problem of matching in bipartite graphs. Applying the min-cat/max-flow theorem: the Köning-Egervary theorem. Application
5-6	§4.2, extra notes	Connectivity of graphs. Applying the min-cut/max flow theorem: Menger's duality. Applications. A review of the material for the midterm
6-8	§2.1	Trees: spanning trees. Minimal distance between vertices: Dijkstra's algorithm
8-9	§7.3	Planarity of graphs: Planarity conditions: Kuratowski's algorithm, Euler's formula. Applications
9-10	§7.2	Hamiltonian cycles: Hamilton's original game. Planarity and the existence of Hamiltonian cycles. Other necessary and sufficient conditions
10-12	§8.1,§8.3 extra notes	. Selected topics including perfect graphs, Ramsey theory. Tying the course together and Q& A session in preparation of the final.