MATH 4022 Syllabus

Introduction to Graph Theory, Section BU, 3 credit hours

Fall 2026

Instructor Information

Instructor: Tom Kelly

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General Course Information

Description

A *graph* is an abstract representation of a structure with pairwise relations. Graphs can be used to model things like the internet, social networks, and traffic networks, to name only a few. Moreover, graph theory has numerous applications in pure mathematics. This course we will cover the fundamentals in graph theory, including but not limited to trees, matchings, connectivity, planarity, and coloring.

Course Learning Outcomes

Upon successful completion of this course, you should be able to:

- explain and apply fundamental graph-theoretic concepts and theorems;
- distinguish different methodological approaches in graph theory, including classification, extremality, optimization and sharpness, algorithms, and duality;
- construct and communicate rigorous mathematical proofs in core areas of graph theory, both in discussion and in writing.

Required Course Materials

The textbook for this course is *Introduction to Graph Theory* (2nd ed., 2001) by Douglas B. West, ISBN 0-13-014400-2.

Grading Policy

Letter grades are assigned as follows:

A: [85%, 100%] B: [75%, 85%) C: [65%, 75%) D: [50%, 65%) F: [0%, 50%)

These cutoffs *might* be adjusted, but only in the downward direction (to make letter grades higher).

Assignments The components of the class are weighted as follows:

- 30% Homework (five assignments, weighted equally)
- 15% Midterm 1
- 15% Midterm 2
- 40% Final exam

Description of Graded Components

The midterms and exams are in class and closed book and notes. Homework must be typed and submitted online through Gradescope.

Course Policies

Attendance and Participation

Attendence is expected but will not be graded.

Academic Integrity

Georgia Tech aims to cultivate a community based on trust, academic integrity, and honor. Students are expected to act according to the highest ethical standards. Review Georgia Tech's Honor Code and the student Code of Conduct.

Any student suspected of cheating or plagiarism on a quiz, exam, or assignment will be reported to the Office of Student Integrity, who will investigate the incident and identify the appropriate penalty for violations.

Accommodations for Students with Disabilities

If you are a student with learning needs that require special accommodation, contact the Office of Disability Services (404-894-2563) as soon as possible to make an appointment to discuss your special needs and to obtain an accommodations letter. Please also e-mail me as soon as possible in order to set up a time to discuss your learning needs.

Student-Faculty Expectations Agreement

At Georgia Tech, we believe that it is important to strive for an atmosphere of mutual respect, acknowledgement, and responsibility between faculty members and the student body. The Student-Faculty Expectations articulate some basic expectations that you can have of me and that I have of you. In the end, simple respect for knowledge, hard work, and cordial interactions will help build the environment we seek. Therefore, I encourage you to remain committed to the ideals of Georgia Tech while in this class.