MATH 6014 Syllabus

Graph Theory, Section B, 3 credit hours

Fall 2026

Instructor Information

Instructor: Xingxing Yu

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General Course Information

Description

This course covers the fundamentals of graph theory at an advanced level, such as connectivity, matchings, planar graphs, structure and coloring (including perfect graphs), extremal problems, Ramsey theory, and tree-width. Connections to operations research and algorithms may be discussed.

Course Learning Outcomes

- At the end of the semester, students will have advanced understanding of the fundamental concepts and results in graph theory.
- Students will develop the intuition and skills to approach and solve problems in graph theory, such as those at the level of the written comprehensive exams at Georgia Tech in this subject area.
- Students will be able to read research publications in graph theory and potentially start research.

Prerequisites

Undergraduate Graph Theory at the level of MATH 4022 at Georgia Tech. If students have not successfully completed a graph theory class at that level, they are advised to register for MATH 4022 instead.

Required Course Materials

Reinhard Diestel, Graph Theory (5th Edition), Graduate Text in Mathematics, Springer. It is available online: Graph Theory

Grading Policy

- Final course grade = 50 (Homework) + 15 (Midterm 1) + 15 (Midterm 2)+20 (Final Exam).
- Letter grades: $A \geq 90$; $80 \leq B < 90$; $70 \leq C < 80$; $60 \leq D < 70$; $F < 60$.

Assignments, Midterms, and Final Exam

- There will be 5 assignments, each worth 10 points
- There will be 2 midterm exams, each worth 15 points.
- The final exam is worth 20 points.

Description of Graded Components

- Homework will be assigned and collected every two weeks. Students are required to use LaTex for solutions and turn in pdf files for grading. (Practice problems will be provided, but the work on those problems will not be collected for grading.)
- The midterm exams are closed-book and in-class. Midterm 1 covers Chapters 1, 2 and 3, and tentatively scheduled on Wednesday, September 23, 2026. Midterm 2 covers Chapters 4, 5 and 6, and tentatively scheduled on Wednesday, November 4, 2026.
- Final exam is closed-book and in-class. It covers all course material in the semester, weighted more toward the material not covered by the midterms.

Course Policies

Attendance and Participation

Prompt and regular attendance is expected. Students will be responsible for all handouts and information given, and work assigned on days they miss classes with no valid excuse.

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.