

MATH 280: GRAPH THEORY

Fall 2024

Instructor:	David Zureick-Brown (“DZB”)	Office:	502 Seeley Mudd
Email:	dzureickbrown@amherst.edu		
Time:	TuTh 1 – 2:15	Office	Mon 2:00-3:30
Place:	204 Seeley Mudd	Hours:	Wed 1:30-3:50

Textbook: “Combinatorics and Graph Theory” 2nd ed., by John Harris, Jeffry Hirst, Michael Mossinghoff

Course website: <https://dmzb.github.io/teaching/2024Fall280/>

Math Fellow(s):	Claire Callon	ccallon25@amherst.edu	TBA	TBA	TBA	TBA
			TBA	TBA	TBA	TBA

Prerequisites: Math 271 or 272 or instructor consent. Math 220 or other prior experience with mathematical proofs is recommended.

Course content: We will cover some subset of the following topics: graphs, paths and cycles, independent sets, cliques, trees, spanning trees, cycle structure of graphs, Euler tours, Hamilton cycles, matchings, Hall’s theorem, Konig theorem, Tutte’s theorem, stable matchings, colorings, chromatic number, planar and plane graphs, Euler’s formula, 5-color theorem, Thomassen’s theorem on list coloring of planar graphs, graph minors, extremal graph theory, network flows and connectivity

Getting help

Office Hours: Please stop by to see me (in Seeley Mudd 502) during my scheduled office hours; you can stop by unannounced during these times! If you have scheduling conflicts with my office hours then you are also welcome to make appointments to see me (outside of my regularly scheduled office hours) at a time which is mutually convenient. To schedule an appointment simply send me an email! (In which case, please include your availability in your message.)

Math Fellows: Visit our TAs’ office hours, too (see above).

Peer tutoring: If you need regular one-on-one help from a tutor, we can (probably) help to set up a (free) peer tutor. To do so, please send me an email.

Homework is due Thursdays at 11:25am, via Gradescope. The assignment should be submitted as a single file. Please be kind to our dear graders and take care to make the assignment legible.

See the document here

<https://dmzb.github.io/teaching/2024Fall280/assignments-F24-280.pdf>

for a list of all assigned work and a weekly breakdown of the course content.

Grading: Your grade will consist of the following. Your lowest weekly assignment will be dropped.

Weekly Homework Assignments	30%
2 midterms and a comprehensive final exam	70% =
Best exam	30%+
Second best exam	25%+
Third best exam	15%+

Grade scale: A lower bound on your final grade is given by the following table.

A = 93-100	B+ = 87-90	C+ = 77-80	D+ = 67-70	F = 0-63
A- = 90-93	B = 83-87	C = 73-77	D = 63-67	
	B- = 80-83	C- = 70-73		

Typical rubric: Proofs will typically be graded on the following rubric (out of 10 points).

10	Flawless
9	Basically correct, but not literally 100% correct
7	Mostly correct, but with at least one error
5	Numerous errors
2	Proof contains a fundamental misunderstanding
0	No part of the proof was correct

Assignment and exam dates:

Weekly Assignments	Generally due Thursdays at 11:25pm via Gradescope.
Midterm 1	Thursday?, October ?? (TBA)
Midterm 2	Tuesday?, November ?? (TBA)
Final Exam	Day December ???, ???

Exam problems will be extremely similar to the (easier and medium difficulty) homework problems.

If you have any conflict with these test dates, PLEASE let me know at least two weeks in advance.

Rewrites will be allowed (and encouraged) on weekly graded assignments; and students can recover up to half of the missed points. Rewrites are to be submitted through Gradescope. You may rewrite a problem multiple times, and you may resubmit a rewrite as late as you like (including right before the final exam).

When you submit a rewrite, please make it clear which problems you are rewriting.

Late submissions. Any assignment submitted after the due date will be treated as a “rewrite” (you can receive up to half credit for the assignment).

Honor Code: Remember that copying another student’s work is a violation of the Honor Code and will be treated as such. Please review Amherst College’s Honor Code, available [here](#).

You are free to consult any sources (animate or inanimate) while doing your homework; working in groups is encouraged! On the other hand, you are expected to make an honest attempt to do

every problem on your own before consulting other sources. Learning and retaining knowledge is a back and forth process of trying problems on your own and asking for help or for a small hint.

Plagiarism: a good rule of thumb to avoid plagiarism is the following – when doing the final write up of a problem, do not have any textbooks, web pages, or classmate's write up open in front of you. If you get stuck when writing up an assignment, go back and look again; just make sure that you organize the mathematics in your head before writing a proof rather than copying a solution from some source. **This is a generous homework policy. Please do not abuse it.**

Calculators, notes, and textbooks are not allowed during exams. If you must leave class during an exam for **any reason**, please leave all of your belongings (**including your handheld supercomputer phone!**).

Inclusivity: I put great value in welcoming each and every student into the classroom, regardless of their sex, race, nationality, gender identity, socioeconomic status, ability (intellectual or physical), religious beliefs, or sexual orientation. Each student brings with them to the classroom a unique set of experiences and I expect everyone to contribute to providing an inclusive environment. If, at any time, you experience a situation within this course that you feel challenges your sense of inclusion or accurate assessment of achievement, then please notify me as soon as possible.

Accessibility and accommodations. Amherst College complies with the regulations of the Americans with Disabilities Act of 1990 and offers accommodations to students with disabilities. Please do not hesitate to ask for accommodations or to contact me about accommodations. (Please also do so as soon as possible.) For more information, please go [here](#).

Attendance policy. Attendance is always optional (except for exams). If you are sick, I would prefer that you stay home from class and get notes from a classmate.