

MATH 115: GRAPH THEORY

Fall 2025

General Info:

- **Lectures:** TuTh: 9:50-11:25am, Engineering 2 194
- **Sections:** Mo 9:20-10:25am and 10:40-11:45pm (McHenry 1270); begin on TBA;
- **Instructor:** Viktor Ginzburg
 - **Email:** ginzburg@ucsc.edu
 - **Office Hours:** Tu 12:00–1:00pm, Th 12:45am-1:30pm or by appointment; Location: McHenry 4124
- **TA:** TBA
 - **Office Hours:** TBA

Course Description: Graph theory, trees, vertex and edge colorings, Hamilton cycles, Eulerian circuits, decompositions into isomorphic subgraphs, extremal problems, cages, Ramsey theory, Cayley's spanning tree formula, planar graphs, Euler's formula, crossing numbers, thickness, splitting numbers, magic graphs, graceful trees, rotations, and genus of graphs.

Prerequisites: MATH 21 or AM 10 and either MATH 100 or CSE 101.

Textbook (Required): Gary Chartrand and Ping Zhang, *A First Course in Graph Theory*, 2012; [Library Reserve](#)

Supplementary Reading: Jonathan L. Gross, Jay Yellen and Mark Anderson, *Graph Theory and Its Applications*, 3d edition

Coursework: There will be weekly homework assignments from the textbook, posted separately (not to be graded) and reading assignments; graded homework assignments collected in Discussion Sections, approximately twice a month; quizzes on Canvas, approximately twice a month; one midterm scheduled on **TBA**, in class; and the final on **12/11; 12–2pm**.

Grading Policy:

- Graded Homeworks: 15%
- Quizzes: 15%
- Midterm: 30%
- Final: 40%

Fine print: No late work will be accepted and no make up exams offered.

Tentative Schedule: Lectures (Subject to change):

- Week 1: Introduction; Degrees (Chap. 1, 2)
- Week 2: Degrees, Isomorphic Graphs (Chap. 2, 3)
- Week 3: Trees (Chap. 4)
- Weeks 4: Connectivity (Chap. 5)
- Weeks 6–7: Traversability, Digraphs (Chap. 6, 7)
- Week 8: Digraphs, Planarity (Chap. 7, 9)
- Weeks 9–10: Planarity, Coloring, Review (Chap. 9, 10)

Enrollment questions and permission codes: The instructor does **not** give permission codes. Upon the instructor's approval, to obtain a permission code you should fill out the [Enrollment Request Form](#). You may contact Math Advising at mathadvising@ucsc.edu; consult the [Math Department Enrollment Web Page](#) for further information.

DRC Accommodations: The Disability Resources Center reduces barriers to inclusion and full participation for students with disabilities by providing support to individually determine reasonable academic accommodations. If you have questions or concerns about exam accommodations or any other disability-related matter, email the DRC Schedulers at drc@ucsc.edu for an appointment. To receive DRC authorized accommodations, contact PBSci Testing testing.pbsci@ucsc.edu two weeks prior to the exam; see [Science Testing Support](#) for more information. (**Important:** In this class we use Testing Accommodations arranged through the PBSci division, linked above, but not the DRC own testing center.)

Academic Integrity: Academic integrity is the cornerstone of a university education. Academic dishonesty diminishes the university as an institution and all members of the university community. It tarnishes the value of a UCSC degree. All members of the UCSC community have an explicit responsibility to foster an environment of trust, honesty, fairness, respect, and responsibility. All members of the university community are expected to present as their original work only that which is truly their own. All members of the community are expected to report observed instances of cheating, plagiarism, and other forms of academic dishonesty in order to ensure that the integrity of scholarship is valued and preserved at UCSC.

In the event a student is found in violation of the UCSC Academic Integrity policy, he or she may face both academic sanctions imposed by the instructor of record and disciplinary sanctions imposed either by the provost of his or her college or the Academic Tribunal convened to hear the case. Violations of the Academic Integrity policy can result in dismissal from the university and a permanent notation on a student?

For the full policy and disciplinary procedures on academic dishonesty, students and instructors should refer to the [Academic Integrity Page](#) at the Division of Undergraduate Education.

Title IX: The university cherishes the free and open exchange of ideas and enlargement of knowledge. To maintain this freedom and openness requires objectivity, mutual trust, and confidence; it requires the absence of coercion, intimidation, or exploitation. The principal responsibility for maintaining these conditions must rest upon those members of the university community who exercise most authority and leadership: faculty, managers, and supervisors. The university has therefore instituted a number of measures designed to protect its community from sex discrimination, sexual harassment, sexual violence, and other related prohibited conduct. Information about the Title IX Office, the online reporting link, applicable campus resources, reporting responsibilities, the UC Policy on Sexual Violence and Sexual Harassment and the UC Santa Cruz Procedures for Reporting and Responding to Reports of Sexual Violence and Sexual Harassment can be found at titleix.ucsc.edu. The Title IX/Sexual Harassment Office is located at 105 Kerr Hall. In addition to the online reporting option, you can contact the Title IX Office by calling 831-459-2462.