

Math/AMath 514: Networks and Combinatorial Optimization

Autumn 2024

Lecture: Monday, Wednesday 9:00-10:20am in LOW 216

Instructor: Cynthia Vinzant (vinzant@uw.edu, PDL C-439)

Instructor Office Hours (tentative): M 1:30-2:30pm, W 10:30-11:30am in PDL C-439

Teaching Assistant: Natasha Crepeau (ncrepeau@uw.edu, PDL C-446)

TA Office Hours: Tuesday 2-3pm (PDL C-446)

Textbook: There is no official textbook for the class. The lectures will follow notes written by Alexander Schrijver that you can find [here](#).

Course website: <https://sites.math.washington.edu/~vinzant/teaching/514/>

Prerequisites: Either MATH 208 or AMATH 352; and any 400-level MATH course.

Course Description: This is a graduate class on the fundamentals of network optimization (aka combinatorial optimization). The majority of these problems involve finding the "best" candidate among a set of objects associated with a network/directed graph. Many of these problems come from real-world applications and as such it is important to solve large instances of these problems in practice. Therefore, along with understanding the mathematical structure of the problems, we will also be interested in algorithms for solving them and the complexity/difficulty of these algorithms from a computer science point of view. This is a rigorous mathematical introduction to network optimization with proofs. Students are expected to solve both theoretical and practical problems in homework, and write mathematical proofs.

Grading: Your grade will be based on class participation and homework assignments. It is crucial that homeworks are done by yourself. Homeworks are due weekly on (most) Thursdays via Gradescope. There will be no exams for this course.

Late homework submission: For homeworks 5-9, Gradescope will accept submissions until the end of Sunday. Every student is allowed 5 late days (120 hours) in total for these homeworks without any prior approval. Submissions turned in late after this total has been reached will not receive credit. Except in extraordinary circumstances, no other late homework will be accepted.

Academic Integrity: The University takes academic integrity very seriously. Behaving with integrity is part of our responsibility to our shared learning community. If you are uncertain about if something is academic misconduct, ask me. Acts of academic misconduct may include but are not limited to cheating (working collaboratively on assignments/exams and discussion submissions, sharing answers and previewing exams) plagiarism (representing the work of others as your own without giving appropriate credit) and unauthorized collaboration (working with each other on assignments). Concerns about these or other behaviors

prohibited by the Student Conduct Code will be referred for investigation and adjudication by (include information for specific campus office). Students found to have engaged in academic misconduct may receive a zero on the assignment (or other possible outcome).

Access and Accommodations: Your experience in this class is important to me. If you have already established accommodations with Disability Resources for Students (DRS), please communicate your approved accommodations to me at your earliest convenience so we can discuss your needs in this course.

If you have not yet established services through DRS, but have a temporary health condition or permanent disability that requires accommodations (conditions include but not limited to; mental health, attention-related, learning, vision, hearing, physical or health impacts), you are welcome to contact DRS at 206-543-8924 or uwdrs@uw.edu or disability.uw.edu. DRS offers resources and coordinates reasonable accommodations for students with disabilities and/or temporary health conditions. Reasonable accommodations are established through an interactive process between you, your instructor(s) and DRS. It is the policy and practice of the University of Washington to create inclusive and accessible learning environments consistent with federal and state law.

Religious Accommodations: Washington state law requires that UW develop a policy for accommodation of student absences or significant hardship due to reasons of faith or conscience, or for organized religious activities. The UW's policy, including more information about how to request an accommodation, is available at [Religious Accommodations Policy](#). Accommodations must be requested within the first two weeks of this course using the [Religious Accommodations Request form](#).