

CS G526 Advanced Algorithms and Complexity

Administrivia

Aniket Basu Roy

BITS Pilani Goa Campus

2026-08-03 Mon

When and Where

Lectures

- ▶ Time: Mon Wed Fri 9:00 AM – 9:50 AM
- ▶ Place: D103

When and Where

Exams

- ▶ Midsem Exam: 07 October Wednesday, 9:30 AM – 11:00 AM
- ▶ Comprehensive Exam: 04 December Friday, 10:00 AM – 1:00 PM

Google Calendar



People

- ▶ Students
 - ▶ M.E. (CSE) 1st year, 1st semester
 - ▶ Ph.D. students
- ▶ Staff
 - ▶ Aniket Basu Roy (Instructor-in-Charge)
 - ▶ Teaching assistants (TBA)

Zulip Chat



Course Webpage



References

1. [KT] Kleinberg, J., & Tardos, E. (2006). **Algorithm Design**. Pearson/Addison-Wesley.
2. [DPV] Dasgupta, S., Papadimitriou, C. H., & Vazirani, U. V. (2006). **Algorithms**. McGraw-Hill.
3. [Vaz] Vazirani, V. V. (2001). **Approximation Algorithms**. Springer.
4. [MR] Motwani, R., & Raghavan, P. (1995). **Randomized Algorithms**. Cambridge University Press.

A Tentative List of Topics

Preliminaries

- ▶ Motivation and Warmup
- ▶ Growth of Functions. Asymptotic Notations
- ▶ Review of Graph Theory Basics

Algorithmic Paradigms

- ▶ Greedy Algorithms
- ▶ Divide and Conquer
- ▶ Dynamic Programming
- ▶ Linear Programming

A Tentative List of Topics [contd.]

Computational Complexity

- ▶ Complexity Classes P, NP, PSPACE
- ▶ Reductions

Advanced Topics

- ▶ Approximation Algorithms
- ▶ Randomized Algorithms
- ▶ Local Search
- ▶ Hardness of Approximation

Evaluation and Grading Policy

Comprehensive Exam	40%
Midsem Exam	25%
Others	35%

Continuous Evaluation Components

- ▶ Problem Sets (4x)
- ▶ Paper Reading, Report Writing, Presenting
- ▶ Scribing

Icebreaking

- ▶ Name
- ▶ Background
- ▶ What would you like to do once you graduate?
- ▶ Anything else you'd like to add