Schedule.
Introduction to Graduate Algorithms.
Fall 2022.

- WEEK 1 (Aug 22-26) (Chapter 6 on the book) Dynamic Programming.
  LIS, LCS (DP1 lecture video)
  Knapsack (DP2 lecture video)
  HW0 released(∗).
  Logistic Quizzes released.
  Meet your Team: Wednesday, August 24, 8PM-9PM EST.

- WEEK 2 (Aug 29-Sep 2) (Chapter 6 on the book) Dynamic Programming.
  Chain Multiply (DP2 lecture video)
  Shortest paths (DP3 lecture video)
  HW1 released.

- WEEK 3 (Sep 5-9) (Chapter 2) Divide and conquer I
  Multiplication (DC1 lecture video, see also Lecture DC3 on Solving Recurrences)
  Complex Numbers (DC4 lecture video)
  HW2 released. Coding Project I released.
  Class Communication and Logistics is due.

- WEEK 4 (Sep 12-16) (Chapter 2) Divide and conquer II
  FFT (DC5 lecture video)
  Median (DC2 lecture video)
  HW3 released.
  Academic Integrity Quiz is due.

- WEEK 5 (Sep 19-23) (Chapter 1) Modular arithmetic and RSA.
  Modular arithmetic (RA1 lecture video)
  RSA cryptosystem, primality testing (RA2 lecture video).
  EXAM 1**Thursday, Sep 22 10am ET-Monday, Sep 26 8am ET.** *Will cover content from week 1 to 4.*

- WEEK 6 (Sep 26-30) Graph algorithm I (Chapter 3 and 4)
  Strongly Connected Components (GR1 lecture video)
  2-SAT (GR2 lecture video)
  HW4 released.

- WEEK 7 (Oct 3-7) Graph algorithm II and Max Flow I (Chapters 3, 5 and 7)
  MST (GR3 lecture video)
  Ford-Fulkerson algorithm for Max-flow (MF1 lecture video)
  HW5 released.

- WEEK 8 (Oct 10-14) Max Flow II (Chapter 7)
  Max-flow=min-cut (MF2 lecture video)
  Image segmentation (MF3 lecture video)
  Flow variant: demands (MF5 lecture video)
  Coding Project II released.
  HW6-RSA Quiz released.

- WEEK 9 (Oct 17-21) Max Flow III (Chapter 7)
  Edmonds-Karp algorithm for max-flow (MF4 lecture video)
  EXAM 2 **Thursday, Oct 20 10am ET-Monday, Oct 24 8am ET.** *Will cover content from week 5 to 9.*

- WEEK 10 (Oct 24-28) NP completeness (Chapter 8)
  NP, Reductions (NP1 lecture video)
  3-SAT (NP2 lecture video)
  Graph problems (NP3 lecture video)
  HW7 released.

- WEEK 11 (Oct 31-Nov 4) Linear programming (Chapter 7)
  LP introduction (LP1 lecture video)
  Duality and Geometry (LP2 lecture video and LP3 lecture video)
  HW8 released.

- WEEK 12 (Nov 7-11) NP and LP
  Max-SAT approximation algorithm. (LP4 lecture video)
  Knapsack (NP4 lecture video)
  Coding Project III released.

- WEEK 13 (Nov 14-18) More on complexity (Chapter 8)
  Halting problem (NP5 lecture video)
  EXAM 3 **Thursday, Nov 17 10am ET-Monday, Nov 21 8am ET.** *Will cover content from week 10 to 13.*

- WEEK 14 (Nov 23-25)
  Thanksgiving break.

- WEEK 15 (Nov 28-Dec 2) Final week.
  Markov Chains ($*$).

- WEEK 15 (Dec 5-Dec 9).
  Final exam **Thursday, December 8 - Monday, December 12.** *Cumulative.*

Material and assignments marked with ($*$) are optional and won't be graded. Please do not submit.