

Course Calendar

Future lecture and lab topics and guided problem set/homework deadlines are subject to change. **Exam dates are fixed.**

Semester progress: 4/15 weeks complete

MT1

MT2

Final

Jump to past weeks

Week 5

Tue Feb 17	Lecture: Turing machines — [scribbles , video]
Wed Feb 18	Lab 5: More language transformations — [solutions]
Thu Feb 19	No lecture: <i>Optional review for Midterm 1</i> — [practice 1 , practice 1 answer booklet , practice 1 solutions , video part i , video part ii]
Fri Feb 20	No lab: <i>Optional review for Midterm 1</i> — [practice 2 , practice 2 answer booklet]
Sat Feb 21	Optional review party for Midterm 1 — [practice 3 , practice 3 answer booklet]
Mon Feb 23	Midterm 1 : 7pm–9pm — [solutions]
Tue Feb 24	Conflict Midterm 1 : (time TBA) — [solutions]

Week 6

Tue Feb 24	Lecture: Recursion: Hanoi, mergesort — [scribbles]
Wed Feb 25	Lab 6a: Hint: Binary search — [solutions]
Thu Feb 26	Lecture: Divide and conquer: linear-time selection, multiplication — [scribbles]
Fri Feb 27	Lab 6b: Fun with Karatsuba — [solutions]
Mon Mar 02	Guided problem set 5 due at 9pm
Tue Mar 03	Homework 5 due at 9pm — [solutions]

Week 7

Tue Mar 03	Lecture: Backtracking: independent set, longest increasing subsequence — [scribbles]
Wed Mar 04	Lab 7a: Backtracking — [solutions]
Thu Mar 05	Lecture: Dynamic programming: splitting strings, longest common subsequence — [scribbles]
Fri Mar 06	Lab 7b: Dynamic programming — [solutions]
Mon Mar 09	Guided problem set 6 due at 9pm
Tue Mar 10	Homework 6 due at 9pm — [solutions]

Week 8

Tue Mar 10	Lecture: More dynamic programming: edit distance, subset sum — [scribbles]
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Wed Mar 11	Lab 8a: More dynamic programming — [solutions]
Thu Mar 12	Lecture: Dynamic programming: MIS in trees, memoization and edit distance — [scribbles]
Fri Mar 13	Lab 8b: Dynamic programming: fire and ash — [solutions]
Fri Mar 13	⚠️ Drop deadline (11:59pm)
Mar 14–22	Spring break — GPS and HW 7 due one week later than usual
Mon Mar 23	Guided problem set 7 due at 9pm
Tue Mar 24	Homework 7 due at 9pm — [solutions]

Mar 14–22 — Spring Break 🌸

Week 9

Tue Mar 24	Lecture: Graphs, basic search — [scribbles]
Wed Mar 25	Lab 9a: Graph modeling — [solutions, graph layering notes]
Thu Mar 26	Lecture: DFS, topological sort, and strong connected components — [scribbles]
Fri Mar 27	Lab 9b: More graph modeling — [solutions]
Mon Mar 30	Guided problem set 8 due at 9pm
Tue Mar 31	Homework 8 due at 9pm — [solutions]

Week 10

Tue Mar 31	Lecture: BFS and shortest paths — [scribbles]
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Wed Apr 01	Lab 10a: Shortest paths — [solutions]
Thu Apr 02	Lecture: Shortest paths with negative lengths via DP; All-pairs shortest paths via DP — [scribbles]
Fri Apr 03	Lab 10b: More shortest paths — [solutions]
Mon Apr 06	Guided problem set 9 due at 9pm
Tue Apr 07	Homework 9 due at 9pm — [solutions]

Week 11

Tue Apr 07	Lecture: Greedy algorithms; minimum spanning trees — [scribbles]
Wed Apr 08	Lab 11: Greedy algorithms and/or minimum spanning trees — [solutions]
Thu Apr 09	No lecture: <i>Optional review for Midterm 2</i>
Fri Apr 10	No lab: <i>Optional review for Midterm 2</i>
Mon Apr 13	Midterm 2: 7pm–9pm — [solutions]
Tue Apr 14	Conflict Midterm 2: (time TBA) — [solutions]

Week 12

Tue Apr 14	Lecture: Polynomial time reductions: cliques and friends — [scribbles]
Wed Apr 15	Lab 12a: Reductions — [solutions]
Thu Apr 16	Lecture: P vs NP, NP-hardness, 3SAT, reduction to max independent set — [scribbles]
Fri Apr 17	Lab 12b: NP-hardness proofs — [solutions]

Mon Apr 20	Guided problem set 10 due at 9pm
Tue Apr 21	Homework 10 due at 9pm — [solutions]

Week 13

Tue Apr 21	Lecture: NP-hardness: 3SAT to 3Color, 3SAT to HamiltonianCycle — [scribbles]
Wed Apr 22	Lab 13a: The NP-hardness proofs strike back — [solutions]
Thu Apr 23	Lecture: NP-hardness: VertexCover to SubsetSum, why bother, choosing which problem to reduce from — [scribbles]
Fri Apr 24	Lab 13b: The return of the NP-hardness proofs — [solutions]
Mon Apr 27	No guided problem set this week
Tue Apr 28	Homework 11 due at 9pm — [solutions]

Week 14

Tue Apr 28	Lecture: Undecidability: code is data, the halting problem — [scribbles]
Wed Apr 29	Lab 14a: Undecidability via diagonalization — [solutions]
Thu Apr 30	Lecture: Undecidability: reductions and Rice's theorem — [scribbles]
Fri May 01	Lab 14b: Undecidability via reductions and Rice's theorem — [solutions]

Mon May 04	Guided problem set 11 due at 9pm
Tue May 05	Homework 12 due at 9pm — [solutions]

Week 15

Tue May 05	Lecture: Wrap-up and optional final exam review — [scribbles]
Wed May 06	No lab: <i>Optional review for final exam</i>
Thu May 07	Reading day; FLEX feedback due
Wed May 13	Conflict Final Exam: (date tentative ; time TBA) — [solutions]
Thu May 14	Final Exam: 7pm–10pm — [solutions]

Past weeks

Week 1

Tue Jan 20	Lecture: Course goals and administrivia ; strings and induction — [scribbles] , video , induction notes , helpful advice on writing proofs
Wed Jan 21	Lab 1a: String induction — [solutions] , induction notes , helpful advice on writing proofs
Thu Jan 22	Lecture: Languages and regular expressions — [scribbles] , video
Fri Jan 23	Lab 1b: Regular expressions — [solutions]

Mon Jan 26 | **Guided problem set 1** due at 9pm

Tue Jan 27 | **Homework 1** due at 9pm — [\[solutions\]](#)

Week 2

Tue Jan 27 | Lecture: **DFAs: intuition, definitions, examples** — [\[scribbles\]](#), [video](#)

Wed Jan 28 | **Lab 2a: DFAs** — [\[solutions\]](#)

Thu Jan 29 | Lecture: **DFAs: product construction, closure, automatic=regular** — [\[scribbles\]](#), [video](#)

Fri Jan 30 | **Lab 2b: DFA product construction** — [\[solutions\]](#)

Mon Feb 02 | **Guided problem set 2** due at 9pm

Tue Feb 03 | **Homework 2** due at 9pm — [\[solutions\]](#)

Week 3

Mon Feb 02 | **⚠ Registration deadline (11:59pm)**

Tue Feb 03 | Lecture: **Proving nonregularity via fooling sets; NFAs: intuition and examples** — [\[scribbles\]](#), [video](#), [extra fooling set notes by Eric Huber](#)

Wed Feb 04 | **Lab 3a: Proving nonregularity** — [\[solutions\]](#)

Thu Feb 05 | Lecture: **NFAs: ϵ -transitions, equivalence with DFAs and regular expressions** — [\[scribbles\]](#), [video](#)

Fri Feb 06 | **Lab 3b: NFA design** — [\[solutions\]](#)

Mon Feb 09 | **Guided problem set 3** due at 9pm

Tue Feb 10

Homework 3 due at 9pm — [\[solutions\]](#)

Week 4

Tue Feb 10	Lecture: Language transformations — [scribbles, video, extra language transformation notes by Pranay Midha]
Wed Feb 11	Lab 4a: Language transformations — [solutions]
Thu Feb 12	Lecture: Context-free grammars and languages — [scribbles, video]
Fri Feb 13	Lab 4b: Context-free grammars — [solutions]
Mon Feb 16	Guided problem set 4 due at 9pm
Tue Feb 17	Homework 4 due at 9pm — [solutions]