Theory of Computation
18.404/6.840
Fall 2020

Michael Sipser

Course Schedule

2020 Schedule for 18.404/6.840

1.	Sep	1	Tu		Introduction, finite automata, regular expressions §1.1
2.		3			Nondeterminism, closure properties, FA → Reg Exprs §1.2–1.3
3.		8	Tu		FA ← Reg Exprs, Regular pumping lemma, CFGs §1.4–2.1
4.		10		hw 1	Pushdown automata, CFG ↔ PDA §2.2
5.		15	Tu		Context-free pumping lemma, Turing machines §2.3,3.1
6.		17			TM variants, Church–Turing thesis §3.2–3.3
7.		22	Tu		Decision problems for automata and grammars §4.1
8.		24		hw 2	Undecidability §4.2
9.		29	Tu		Reducibility §5.1,5.3
10.	Oct	1			Computation history method §5.2
11.		6	Tu		Recursion theorem, logic §6.1–6.2
12.		8		hw 3	Time complexity §7.1
		13	Tu		NO CLASS — Monday schedule due to Indigenous Peoples' Day
13.		15			Midterm Exam
14.		20	Tu		P and NP, SAT, poly-time reducibility §7.2–7.3
15.		22			NP-completeness §7.5
16.		27	Tu		Cook–Levin theorem §7.4
17.		29		hw 4	Space complexity, PSPACE, Savitch's theorem §8.1–8.2
18.	Nov	3	Tu		PSPACE-completeness §8.3
19.		5			Games, Generalized geography §8.3
20.		10	Tu		L and NL, NL=coNL §8.4
21.		12		hw 5	Hierarchy theorems §9.1
22.		17	Tu		Provably intractable problems, oracles §9.2
23.		19			Probabilistic computation, BPP §10.2
		24	Tu		NO CLASS — Thanksgiving week
		26			NO CLASS — Thanksgiving week
24.	Dec	1	Tu		An interesting language in BPP, Arithmetization §10.2
25.		3		hw 6	Interactive proof systems, IP §10.4
26.		8	Tu		coNP ⊆ IP §10.4