Course Information

Course staff
Sofya Raskhodnikova
MCS 279 sofya Tu, Th 3:30pm–4:30pm
Ramesh Krishnan Pallavoor (TF) EMA 302 rameshkp W 2:20-4:20pm

Webpage: http://cs-people.bu.edu/sofya/cs332/

Questions and class discussion on Piazza: Rather than emailing questions to the teaching staff, please post them on Piazza. Top participants will get bonus points at the end of the course. Our class page is at: piazza.com/bu/fall2018/cs332

Prerequisites: CS 131 (Combinatoric Structures) and CS 330 (Introduction to the Analysis of Algorithms). You need to be comfortable with mathematical proofs. Most assignments in this course require proving some statement and some creativity in finding the proof will be necessary.

Lectures: TR 2:00–3:15pm (CGS 527).

Discussions: The TF will run weekly discussions (interactive problem solving sessions) to help with the material.


Syllabus: An introduction to the theory of computation. Topics include automata, formal languages, computability, complexity and reducibility among computational problems.

Course outline: I Automata and Language Theory (5 weeks). Finite automata, regular expressions, push-down automata, context-free grammars, pumping lemmas.

II Computability Theory (4-5 weeks). Turing machines, Church-Turing thesis, decidability, halting problem, reducibility, recursion theorem.

III Complexity Theory (3-4 weeks). Time and space measures, hierarchy theorems, complexity classes P, NP, PSPACE, complete problems, P versus NP conjecture, provably hard problems.

Homework: There will be an assignment due every Friday at 11:59am, to be dropped in the course HW box. Assignments will be posted on the course web page, usually one week in advance. No late homework will be accepted. To accommodate extenuating circumstances, your two lowest homework grades will be dropped.

You should be as clear and concise as possible in your write-up of solutions. Understandability of your answer is as desirable as correctness, because communication of technical material is
an important skill. A simple, direct analysis is worth more points than a convoluted one, both because it is simpler and less prone to error and because it is easier to read and understand.

Points might be subtracted for illegible handwriting and for solutions that are too long.

**Optional problems:** Some homework assignments will include optional problems, marked by *. Later, if you ask me for a recommendation or express an interest in working on a research project with me, I will definitely check how well you did on the optional problems.

**Collaboration and Honesty Policy:** Collaboration on homework problems is permitted. *No collaboration whatsoever is permitted on optional problems and exams.* You must read and sign Collaboration and Honesty Policy. Please keep one copy of the handout for your records.

Violations of this policy will be dealt with according to University regulations.

**Exams and Grading:** The grade will be calculated as follows:

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Date</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homework weekly</td>
<td></td>
<td>35%</td>
</tr>
<tr>
<td>Midterm 1</td>
<td>Thursday, Oct 4</td>
<td>15%</td>
</tr>
<tr>
<td>Midterm 2</td>
<td>Thursday, Nov 8</td>
<td>15%</td>
</tr>
<tr>
<td>Final exam</td>
<td>Tuesday, Dec 18, 3-5pm</td>
<td>30%</td>
</tr>
<tr>
<td>Class participation</td>
<td>lectures, discussions, piazza</td>
<td>5%</td>
</tr>
</tbody>
</table>