Course Information

Course staff	Room	Phone	Email id	Office Hours
Sofya Raskhodnikova	343F IST	x3-0608	sxr48	Tu 4pm–5pm, Th 9:30am–10:30am
Jayanthi Thankamani (TA)	338E IST		jzt175	W 3:45-5:45pm
Mahdy Zolghadr (TA)	3xx IST		moz5067	M (time TBA, see piazza poll)

Webpage: `http://www.cse.psu.edu/~sofya/cmpsc464/`

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: `https://piazza.com/psu/spring2016/cmpsc464`

Angel: We will use Angel for posting solutions and grades.

Prerequisites: discrete math (equivalent to CMPSC 360) and algorithms (equivalent to CMPSC 465). 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 2:30–3:45pm (102 Leonhard).

Recitations: The TAs will run weekly recitation (interactive problem solving sessions) to help with the material.

Textbook: Michael Sipser. *Introduction to the Theory of Computation, 3rd edition,* 2012.

Supplementary textbook: Richard Hammack. *Book of Proof.*
`http://www.people.vcu.edu/~rhammack/BookOfProof/`

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 (4-5 weeks).** Finite automata, regular expressions, push-down automata, context-free grammars, pumping lemmas.

II **Computability Theory (5-6 weeks).** Turing machines, Church-Turing thesis, decidability, halting problem, reducibility, recursion theorem.

III **Complexity Theory (5 weeks).** Time and space measures, hierarchy theorems, complexity classes P, NP, PSPACE, complete problems, P versus NP conjecture, quantifiers and games, provably hard problems, probabilistic computation.

I-clickers: We will use I-clickers during lectures to encourage active participation. You will be able to earn participation points (5% of your final grade) by answering questions with your clicker. Register your clicker at: `http://clickers.psu.edu/`.

We will start counting your clicker points from Lecture 2 and will drop 4 lowest grades. Each lecture you will be able to earn a grade between 0 and 1. All questions during a given lecture are worth the same amount and their scores sum up to 1. The points will be awarded for all answered questions, whether the answers are correct or not.

Homework: There will be an assignment due every Thursday at 2:25pm. Assignments will be posted on the course web page, usually one week in advance. We will post solutions on Angel.

Your solutions to most problems will need to be typed (preferred) or hand-written and turned in to TAs. Assignments will only receive full credit if turned in **strictly before** the lecture on the Thursday they are due. You can hand in your homework with 20% penalty from 4:30pm to 5:30pm the day it is due in Jayanthi's office (338E IST). Homework assignments that are more than 3 hours late will not be accepted. To accommodate extenuating circumstances, your two lowest homework grades will be dropped.

There is going to be a small number of problems that will be graded automatically on Angel or Automatatutor. The automatically graded problems will be accepted without penalty until 5:30pm on the due date. After that, the submission will be closed.

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 Cheating Policy. Please keep one copy of the handout for your records.

Violations of this policy will be dealt with according to University regulations (see Senate Policy 49-20 on Academic Integrity).

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

Homework	weekly	35%
Midterm 1	Wed, Feb 17, 8:15-10:15pm, 101 Chambers	20%
Midterm 2	Wed, March 30, 8:15-10:15pm, 101 Chambers	20%
Final exam	finals week	20%
Class participation	every lecture (clicker points)	5%

Graduate and undergraduate students will be graded on different curves.

Honors Credit: If you want to get honors credit for this course, contact the instructor.

Disability: Penn State welcomes students with disabilities into the University's educational programs. If you have a disability-related need for reasonable academic adjustments in this course, contact the Office for Disability Services (ODS) at 814-863-1807 (V/TTY) and request a letter identifying appropriate adjustments. Please share this letter and discuss the adjustments with the instructor as early as possible. For further information regarding ODS, please visit the Office for Disability Services Web site at `http://equity.psu.edu/ods/`.