MCS 441 – Theory of Computation I
Syllabus

Lev Reyzin

Spring 2018

Time and Location: M-W-F, 2:00-2:50pm, Lincoln Hall (TH) 207

Instructor: Lev Reyzin, SEO 418, (312)-413-3745, `lreyzin@math.uic.edu`

Prerequisites: MATH 215. See instructor with any concerns.

Office Hours: to be announced

Website: `http://homepages.math.uic.edu/~lreyzin/s18_mcs441/`

Textbook: M. Sipser. *Introduction to the Theory of Computation*, 3rd ed.

Topics: This course will cover basic computability and complexity theory. We will examine the central questions "What is computable *in principle*?" and "What is *efficiently* computable?" Covered material will likely include, but not be limited to:

- automata, regular languages, and nondeterminism
- context-free languages and pushdown automata
- Turing machines and the Church-Turing thesis
- decidability and the halting problem
- Kolmogorov complexity
- time complexity, P vs. NP, the Cook-Levin theorem, and reductions
- time permitting: PSPACE, L, NL, or other advanced topics

Grading: problem sets: 20%, two in-class midterms: 20%+20% (dates TBD), final exam: 40%. All material covered in lecture, assigned in the readings, or included in the problem sets is "fair game" for the exams. Graduate students may be assigned different problems from undergraduates on some assignments.

Attendance and Participation: In addition to the grading policies outlined above, a student's grade might be adjusted *slightly* upward for positive contributions through class participation or downward for repeated absences. Moreover, students are responsible for all material covered and problem sets and readings assigned in lecture.

Problem Set Collaboration Policy: You may discuss the homework problems with other students, but you must write up your solutions by yourself. If you work on the problem sets with other students, you must put the names of your group at the top of your problem set. However, consulting any online sources, including websites, blogs, forums, mailing lists, etc. to seek answers to the problems is forbidden and constitutes academic dishonesty. If you have questions or need help, please come to office hours.

Late Work Policy: Problem sets are to be turned in by 2pm the day they are due, either in class or via my mailbox (on the 3rd floor of SEO). In general, late work will not be accepted. Exceptions must be asked for in advance of the due date and will be made on a case-by-case basis.

Exam Policy: Exams are to be completed individually by each student, without any assistance of outside materials except for a writing instrument. Violation of this constitute academic dishonesty.

Disability Policy: Students with disabilities who require accommodations for access and participation in this course must be registered with the Office of Disability Services (ODS). Please contact ODS a 312/413/-2183 (voice) or 312/413-0123 (TTY).