

Instructor

Dr. Kenneth W. Regan 326 Davis Hall

645-4738 regan@buffalo.edu**Lectures**

(LEC) MWF 2:00pm–2:50pm in Norton 218

Reading—notes to be given in class, no textbook purchase

1. Sanjeev Arora and Boaz Barak, *Computational Complexity: A Modern Approach*, chapter 1 on computability theory and some further selections.
2. Chapters 27 and 28 of the *CRC Handbook on Algorithms and Theory of Computing*, co-authored by me with Professors Eric W. Allender and Michael C. Loui. These are for the second half of the course and will be given out in class.
3. Some optional components (discussion forum, other readings) are yet to be determined. The weblog “Gödel’s Lost Letter and P=NP” may be used for assigned readings.

Optional Alternate Sources

1. Steven Homer and Alan Selman, *Computability and Complexity Theory*. The previous textbook.
2. M. Sipser, *Introduction to the Theory of Computation*, 3rd. ed., Thompson SW International, 2012. The popular text used in the undergraduate course, CSE396.
3. J. Hopcroft and J. Ullman, *Introduction to Languages, Automata Theory, and Computation*, Addison-Wesley, 1979. The classic text. This course will mostly parallel the material in chapters 7–13 of this text; all assumed background and much more is in chapters 1–6.
4. H. Lewis and C. Papadimitriou, *Elements of the Theory of Computation*, Prentice-Hall, 1981. Has more examples and illustrations and neat little tidbits than Hopcroft-Ullman, but some messier notation.
5. N. Cutland, *Computability*, Cambridge University Press, 1980. A short-but-comprehensive and crystal-clear treatment of computability theory, the main topic of the first part of the course.

Examinations:

- Two prelim exams held in class period.
- One *cumulative* 3-hr. final.

Organization: The course will be graded on a total-points system. Letter grades will also be given for individual exams and possibly some assignments, as a help in telling you where you stand, but only the point totals will have official significance. The weighting of grades in this course shall be:

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| Homework: | 30% |
| Prelims: | 30% |
| Final: | 40% |

I reserve the right to 5% leeway in weighting while assigning the final letter grade—this is most typically done for students who do markedly well on the final exam, when it may be treated as if it were worth 45% for that student. This will only be done to an individual student's advantage, and will have no effect on others' grades.

The homework will consist of weekly problem sets. All submissions will be in hardcopy. Some problems may be regarded as non-graded exercises.

Problem set submissions must be *your own individual work*. No joint submissions will be accepted. In an early lecture I will explain the purpose of individual work, academic integrity, and the “qualitative” nature of exercises in this course. I will give guidelines on how work can be done and what can be discussed among you. Cheating will be punished as per department policy at <http://www.cse.buffalo.edu/shared/policies/academic.php>

My (KWR) general policy is that *late work is not acceptable*. In return, you get an answer key shortly afterward, and a quick turnaround of graded work before the next problem set is due. In an exceptional situation, you may contact me beforehand. All submissions must have your *name and recitation number*. Hardcopy submissions with more than one sheet *must be stapled together*.