Instructor: William R. Nico
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Office hours: MWF 9:30–10:00 a.m., MW 3:00–4:00 p.m., or by appointment.

This course will survey the theory of computational complexity and, in particular, of NP-completeness. This material is contained in chapters 7–10 of the Sipser book and in chapters 1–7 of the “classic” Garey and Johnson book. A certain amount of background material and material regarding decidability is in earlier chapters of the Sipser book or the Reiter/Johnson notes, and such material which is not covered in lecture is available there for self-study.

The course will begin with the introduction of basic results about Turing machines and decidability. The heart of the course is the treatment of the concepts of reducibility and of NP-completeness and closely related complexity classes. Additional complexity classes, e.g., the polynomial hierarchy, circuit complexity, random complexity classes, will be covered as time allows. Treatment of approximate solutions of NP-complete problems will receive similar coverage.

Students will be expected to be able to understand and create proofs of complexity results. They will also be expected to write these in a clear and convincing manner. They may on occasion be required to present their results orally to the class.

Grading: The course grade will be computed roughly as follows. (The date of the midterm is subject to change. Any change will be announced in class.)
1. Written homework ................................................................. 15%
2. Midterm (Monday, February 6) .............................................. 35%
3. Final exam (Wednesday, March 15, 2:00–3:50 p.m.) .................. 50%

Late homework will not be accepted. Homework is to be turned in at the beginning of class on the due date. Homework is to represent individual efforts! Any work not your own, e.g., results obtained from reference sources, should receive appropriate bibliographic citations. Plagiarism will be subject to appropriate penalties.

Written work: Any written work submitted for the course, including in-class tests, must be done in ink!

Make-up policy: Make-up tests will be considered only in unusual circumstances, and then only if arrangements have been made in advance.