

CSC 8510 – Theory of Computability**Syllabus**

Instructor	Dr. Thomas Way Mendel Science Center 160A thomas.way@villanova.edu
Prerequisites	BS or BA in Computer Science or equivalent
Textbook	Sipser, Michael, "Introduction to the Theory of Computation" (2nd edition), Thomson Course Technology, 2006. ISBN 0-534-95097-3

Course Description & Goal

This course is about what computers can and cannot do. It approaches this question in a strict mathematical fashion. The goal of the course is to expand your mind and give you conceptual tools for solving theoretical and practical problems.

This semester the course is being offered in a unique configuration, as a guided study. The student is expected to conduct a significant amount of self-guided learning. Regular meetings with the instructor will be scheduled, both in person and electronically using desktop sharing software, instant messaging, voice over IP, and other current digital communication technology.

There is an online course schedule with reading and problem set assignments that will be updated periodically, so be sure to check it regularly. Grading will be based on problem sets and a final, comprehensive problem set that will serve as a final examination.

Topics and Schedule (tentative, approximate, subject to change)

1. Regular Languages (1 week)
2. Context-free Languages (1 week)
3. The Church-Turing Thesis (1 week)
4. Decidability (1 week)
5. Reducibility (1 week)
6. Time Complexity (4 weeks)
7. Space Complexity (3 weeks)
8. Advanced topics (2 weeks)

Tentative Grading Procedure

Weekly problem sets	75%
Final comprehensive problem set	25%

Academic Integrity

The student is responsible for and will be expected to follow standard industry, academic and University guidelines for academic integrity. Any deviation from these policies will be dealt with accordingly.