

SU DEPARTMENT OF MATHEMATICS & COMPUTER SCIENCE
SYLLABUS (Tentative)
COSC/MATH 362 *Mathematical Foundations of Computer Science*

- Objectives:** To introduce the mathematical underpinnings of theoretical computer science and the theory of computation.
- Description:** Applications of discrete mathematics to computer science and introduction to the theory of computation. Topics include automata and formal languages, computability by Turing machines and recursive functions, undecidability, and computational complexity. **Three hours per week.** COSC 362 and MATH 362 are cross-listed.
- Intended for:** Computer science majors (required) and mathematics majors with an interest in computer science (upper-level elective).
- Prerequisite:** “C” or better in MATH 210 (Introduction to Discrete Mathematics) and in COSC 120 (Computer Programming).
- Text:** “Theory of Computing: A Gentle Introduction,” by Kinber & Smith; Prentice Hall, 2001.

	<i>Weeks</i>
<i>Preliminaries</i>	2
Sets, Relations, closures and algorithms, alphabets and languages, finite representations of languages.	
<i>Finite Automata</i>	4
Deterministic and Nondeterministic finite automata, Regular expressions, Languages that are not regular, State Minimization.	
<i>Context-free Languages</i>	2
Context free grammars, pushdown automata, parse trees	
<i>Computational Theory</i>	4
Turing machines, Church-Turing Thesis, Halting problem, Unsolvability Problems	
<i>Computational Complexity</i>	1
The class P, the class NP, NP Completeness	
<i>Tests</i>	$\frac{1}{14}$

EVALUATION

<i>Homework, Quizzes and Class Participation</i>	30 - 50%
<i>Tests and Comprehensive Final Exam</i>	70 - 30%