

CIS/MTH 465 Automata and Theory of Computation – Fall 2011

Course Description

Introduction to basic mathematical models of computation and the finite representation of infinite objects. Finite automata, regular languages, non-determinism, pushdown automata, context-free languages, Turing machines and variants, halting problem, time complexity of algorithms, and NP-complete problems.

Course Web Page

Students are responsible for all readings and assignments posted on the course web page:
<http://www.cis.gvsu.edu/~kalafuta/cis465>

Instructor

Dr. Andrew Kalafut
Office: C-2-210 MAK
Office Hours: MWF 1:00 PM - 2:00 PM or by appointment
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Prerequisites

CIS 465: MTH 325, CIS 162, and CIS major standing.
MTH 465: CIS 162 and either MTH 325 or MTH 345.

Required Text

Sipser, Michael, Introduction to the Theory of Computation (2nd Edition) - Course Technology, 2005.

Course Objectives

1. Understand finite automata
2. Understand classes of languages
3. Understand models of computation such as turing machines
4. Understand decidability
5. Understand computing complexity
6. Ability to apply computing theory to practical problems

Grading

The course grade will consist of 3 exams (15% each), homework assignments (45%), and class participation (10%). All homework assignments will be weighted equally. The course will be graded according to the following scale:

A	A-	B+	B	B-	C+	C	C-	D+	D
93%	90%	87%	83%	80%	77%	73%	70%	67%	63%

Topics

The course will be structured roughly as follows, but is subject to change depending on how quickly we are able to cover the material. The schedule of readings and homework assignments is available on the course web site and also subject to change throughout the semester. Students are expected to keep up with the schedule posted on the course web page.

Week of	topic
8/29	Intro and Review
9/5	Regular languages and finite automata
9/12	Nonregular languages
9/19	Push-down Automata
9/26	Exam 1, turing machiens
10/3	Models of computation
10/10	Decidability
10/17	Reducibility
10/24	Recursion Theorm
10/31	Exam 2, time complexity
11/7	P and NP complexity classes
11/14	NP completeness
11/21	Thanksgiving break
11/28	Space complexity
12/5	Cryptography
	Final Exam: Wednesday, December 14th 2:00 - 3:50 PM

Policies

Homework: All homework assignments are due in class at the beginning of class on the specified due date. You are encouraged to type your assignments when possible.

Academic Honesty: All exams and homework assignments are to be completed individually. Lab assignments may allow group work as specified in the assignment. All outside resources used, including Internet sources, must be cited. It is never acceptable to post any part of the homework or project questions online asking for help. No academic dishonesty will be tolerated. Consequences will include the most severe penalty allowed by GVSU policy. Please read the CIS honesty policy at <http://www.cis.gvsu.edu/Academics/Honesty>

Late work: No points will be awarded for work turned in late.

Grade disputes: Grades will be posted on blackboard. Any questions regarding posted grades must be raised within 7 days of the grade posting date.

Attendance: Attendance is expected. Non-attendance at lecture will be detrimental to your understanding of the course material. Frequent non-attendance may be reflected in your participation grade.

Special Needs: If you need academic accommodations because of a learning, physical, or other disability, please contact Disability Support Services (DSS) at 331-2490. Furthermore, if you have a physical disability and think you will need assistance evacuating this classroom and/or building in an emergency situation, please make me aware so I can develop a plan to assist you.