

CS 1502 — Formal Methods in Computer Science

Department of Computer Science
University of Pittsburgh
Fall 2017

Catalog Description

The course is an introduction to the theory of information and computation as a physical phenomenon. The course covers standard formalizations of computational concepts and proofs of noteworthy implications of these formalizations. Typical topics include: finite automata, computability, reducibility, and complexity.

Instructor Information

Name: Dr. Thumrongsak Kosiyatrakul (Tan)
Email: tkosiyat@cs.pitt.edu (Subject: [CS1502] ...)
Office: 6215 SENSQ
Office Hours: (MW) 9:00 am – 12:00 pm and whenever my office door is open

Teaching Assistant Information

Name: Jeong Min Lee
Email: jel158@pitt.edu
Office: TBA
Office Hours: TBA
Note: **Check CourseWeb for updated information**

Meeting Time and Location

Lecture: (TH) 1:00 pm – 2:15 pm; 203 LAWRN
Recitation: (W) 2:00 pm – 2:50 pm; 5313 SENSQ
Recitation: (H) 9:00 am – 9:50 am; 5313 SENSQ

Course Web Address

We will use CourseWeb for announcements, lecture slides, examples, projects, labs/recitations, assessment tests, and quizzes. Make sure you are able to access the CourseWeb via my.pitt.edu or courseweb.pitt.edu.

Textbook

Michael Sipser. *Introduction to the Theory of Computation* Cengage Learning, third edition (ISBN-13: 978-1-133-18779-0 or ISBN-10: 1-133-18779-X)

Course Objective

Study of various models of computation; capabilities and properties of the models and their limitations.

- Definition of models (machine, computation, language)
- Examples (programs) for models

- Characterization of capabilities (language)
- Limitation (proof tools)

Prerequisites

Completed CS 0441 (Discrete Structures for Computer Science) and CS 0445 (Intermediate Programming using Java).

Outcome Measurement

Your final grade is based on the following:

- **Exam 1** (24% of final grade)
- **Exam 2** (24% of final grade)
- **Exam 3** (24% of final grade)
- **Labs/Recitations** (23% of final grade): Labs/recitations are mandatory. If you do not attain a lab but submit the homework for that lab, your score will be reduced by 50%. In each recitation, your TA will show you how to solve questions. After that a small homework will be assigned. Total possible points for each homework is 10 points. Homework assignment will be collected during your next recitation. **No late submission will be accepted.**
- **Take Home Quizzes** (3% of final grade): Roughly an hour after each lecture, a short quiz will be posted on the CourseWeb. Each quizzes allow you to demonstrate what you have learned during each lecture. These are open book and open note quizzes and you must submit the quiz the next day (by the end of day) after each lecture. You are not allowed to take the quiz after the due date has past. **Note** that not every lecture will have a quiz. It is **your responsibility** to check for announcements in CourseWeb to see whether a quiz is available. These announcements generally posted before the end of the lecture.
- **Assessment Tests** (2% of final grade): On the first/second week and the second to last week of class, you are required to take assessment tests during your recitations. Each assessment test counts as 1% of your final grade regardless of your score of each test. **Note** that the score of your assessment tests will not be used to determine your letter grade.

Note that the above weight may be changed during the semester. The scale for the term is shown below:

| | | | | | | | | | | |
|--------------|------|------|------|------|------|------|------|------|------|------|
| Percentage | ≥ 90 | ≥ 89 | ≥ 88 | ≥ 80 | ≥ 79 | ≥ 78 | ≥ 70 | ≥ 69 | ≥ 60 | < 60 |
| Letter Grade | A | A- | B+ | B | B- | C+ | C | C- | D | F |

Term Schedule

The daily topics are subject to change depending on our pace. The are there to assist you in the readings so you can focus on those concepts prior to class.

- **September – Mid October:** *Textbook*
 - Chapter 0: Introduction
 - Chapter 1: Regular Languages
 - Exam 1
- **Mid October – Mid November:** *Textbook*
 - Chapter 3: The Church-Turing Thesis
 - Chapter 4: Decidability
 - Exam 2
- **Mid November – Mid December:** *Textbook*
 - Chapter 5: Reducibility
 - Chapter 7: Time Complexity
 - Exam 3

Other Information

Academic Integrity

All students are expected to adhere to the standards of academic honesty. Any student engaged in cheating, plagiarism, or other acts of academic dishonesty would be subject to disciplinary action. Any student suspected of violating this obligation for any reason during the semester will be required to participate in the procedural process, initiated at the instructor level, as outlined in the University Guidelines on Academic Integrity <http://www.pitt.edu/provost/ail.html>. This may include, but is not limited to the confiscation of the examination of any individual suspected of violating the University Policy.

Disability Services

If you have disability, contact both your instructor and the Office of Disability Resources and Services (DRS), 216 William Pitt Union, 412-648-7890/412-383-7355 (TTY) as early as possible in the term. DRS will verify your disability and determine reasonable accommodations for this course.

Statement on Classroom Recording

To ensure the free and open discussion of ideas, students may not record classroom lectures, discussion and/or activities without the advance written permission of the instructor, and any such recording properly approved in advance can be used solely for the student's own private use.