cse303
Introduction to the Theory of Computation

Professor Anita Wasilewska
COURSE SYLLABUS
Course Textbook

Elements of the Theory of Computation
Harry R. Lewis and Christos H. Papadimitriou

Additional Reading

Turing’s Vision - The Birth of Computer Science
Chris Bernhard
cse303 Youtube Chanel
https://www.youtube.com/channel/UCLZp06JC9yit6M_YW3Xuvlw

We also have a **Theory of Computation** Youtube Chanel that contains a set of **Videos** filmed at the Stony Brook TV Studio covering the material included in Chapters 1 - 4 of the course Textbook
The course Web Page contains a large set of very detailed Lectures covering the material from Chapters 1 - 4 of the course Textbook.

The Lectures closely follow the book.

The Lectures contain also many additional carefully written examples and solutions to many of the homework problems. Lectures are designed to help you to study the material presented in the course Textbook.
The course **Webpage** contains two kind of Lectures: **Class Lectures** and **Video Lectures**.

The **Class Lectures** are very detailed lectures slides. They were developed for each **Chapter** of the Textbook.

Usually there are 2 - 5 **Class Lectures** for one **Chapter**.
Course Webpage
www3.cs.stonybrook.edu/~cse303

The Video Lectures are created especially for the Youtube Channel

The Video Lectures correspond, chapter by chapter to the slides used in the Textbook Chapters Videos

You can use the Video Lectures slides to follow the Chapters Videos as they are exactly the same as slides used in the Videos
Course Description

The course is an introduction to the abstract notions encountered in machine computation. Topics include finite automata, regular expressions, and formal languages, with emphasis on regular and context-free grammars. Questions relating to what can and cannot be done by machines are covered by considering various models of computation, including Turing machines, recursive functions, and universal machines.
Workload

There will be four Quizzes, one Midterm, and a Final

The **consistency** of your efforts and work is the most important in this course.

**None of the grades will be curved**

**Records** of students points are kept on BLACKBOARD
Contact **TAs.** for information about grading, grades changes, etc....
Workload

**Tests** and **Quizzes** cover **Class Lectures** and **Book Chapters** only for the **portion** of material that was **covered** before the dates of respective tests.

**Consult** the **Weekly Study Plan** posted on the **Blackboard**
Grading Components

Homework Problems
There are 4 sets of homework problems
Not all of them might be covered
None of Homeworks will be collected or graded
Students will be tested on their work on homework assignments by respective quizzes
Solutions to almost all homework problems are included in posted solutions of past Quizzes and tests and in the posted Lectures
Grading Components

Quizzes - total 100pts

There will **4 quizzes**, 30 -40 minutes each, **25 points** each. Quizzes problems will be taken from, or will be very close to homework assignments. Quizzes will also cover some definitions and examples included in Lectures and in posted solutions to previous Quizzes.

**Posted solutions** of previous Quizzes and Tests contain solutions of majority of your Homework problems.
Grading Components

Attention

Quizzes and Tests are Closed Book tests

A student found using notes in any form, especially electronic during any of the tests will receive 0 pts for the test
Grading Components

**Midterm** (75pts)
Midterm will cover some material needed for Q1, Q2, Hmk 1, 2 (only problems dealing with material actually covered in class)
Midterm will be given on in class
Grading Components

Practice Final  (15 extra pts)
It is a take home test published and due via Blackboard.

Final  (75pts)
It covers material from the Q1, Q2, midterm, and Practice Final with emphasis on the material covered after the midterm.
Final will be given during the FINALS week.
Final grade computation

You can earn up to 250 points + x extra points = 250+x points during the semester.

The grade will be determined in the following way:
# of earned points divided by 2.5 = % grade

None of Grades will be Curved

The % grade is translated into a letter grade in a standard way as described in the course Syllabus is as follows.
Final grade computation

The % grade is translated into a letter grade in a standard way i.e.

100 – 95 % is \(A\)

94 – 90 is \(A–\)

89 – 86% is \(B+\), 85 – 83 % is \(B\), 82 – 80 % is \(B–\)

79 – 76 % is \(C+\), 75 – 73 % is \(C\), 72 – 70 % is \(C–\)

69 – 60 % is \(D\) range and \(F\) is below 60%
The course will follow the book very closely.
In particular we will cover some or all material from the following chapters and subjects:

**Chapter 1**

Sets, Relations, Languages (pp. 1 - 53)
Some of it is review material.
You can use any other book for the review.
Our book is very condensed.
I posted special Lectures 1, 2.
Course Contents and Schedule

Chapter 2 (Part 1)
Deterministic and Non-Deterministic Finite Automata and their equivalence (pp. 55-75)

Chapter 2 (Part 2)
Finite automata and regular languages (pp. 75-102)

Chapter 3 (Part 1)
Context-free grammars and Pushdown automata (pp. 113-140)

Chapter 3 (Part 2)
Languages that are and are not context-free (pp. 141-150)
Course Contents and Schedule

Chapter 4
Turing Machines (pp 179 - 194)

Chapters 5, 6 - Reading
Church- Turing Thesis, Computability
Computational Complexity

General Overview
TESTS SCHEDULE

The **preliminary schedule** is published in Syllabus and on the course webpage

**Changes** and **updates**, if any, will be advertised in the **NEWS** section on the course webpage