cse303
Introduction to the Theory of Computation

Professor Anita Wasilewska

CSE 303 Spring 2026

COURSE SYLLABUS

Course Text Book

Course Textbook

Elements of the Theory of Computation

Harry R. Lewis and Christos H. Papadimitriou

Prentice Hall, Second Edition,1998

Additional Reading

Turing's Vision - The Birth of Computer Science

Chris Bernhard

The MIT Press, Cambridge, Massachusettts, London England (2016)

cse303 Youtube Chanel
https://www.youtube.com/channel/UCLZp06JC9yit6M_YW3XuvIw

We also have a **Theory of Computation** Youtube Chanel that contains a set of Videos filmed at the Stony Brook TV Studio and a special set of slides covering the material included in Chapters 1 - 4 of the course Textbook

Course Web Page
www3.cs.stonybrook.edu/∼ cse303

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

Course Webpage
www3.cs.stonybrook.edu/~ cse303

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
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The Video Lectures are created especially for the course **Youtube Channel**

The Video Lectures correspond, chapter by chapter to the slides used in the Texbook 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 two classes of formal languages.

Regular Languages defined by the egular expressions and **Context -Free Languages** defined by the class of 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.

Testing

There will be **three tests:** Midterm 1, Midterm 2, and Final

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

Tests will include some extra credit **Problems**

Students can earn up to 20 extra credits points during
the semester

Tests Preliminary Schedule

MIDTERM 1 Tuesday, March 10

Spring Break March 16 - 21

MIDTERM 2 Tuesday, April 21

Last Day of classes May 8

FINAL during Final Period May 12- 20

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 **tests**

Solutions to almost all homework problems are included in **posted solutions** of past tests, practice tests and quizzes, and problems and exercises included in course **Lectures**

Tests PRINCIPLES

TESTS are ”closed book” - no cell phones, no computers, clean desks, no extra papers, no any form of communication with other students.

Professor supervises all TESTS together with the course TAs

Anybody violating these rules will have to immediately **submit** the TEST to the **Professor** and leave the class

Student then will get **0pts** for the TEST and will be reported, if needed, to the **Academic Judiciary** as stated and explained the the University Academic Integrity Statement included in the Syllabus

Make -up Exams Policy

The Course Policy on **make-up exams**, is consistent with university policy as defined in the Undregraduate Bulletin https://www.stonybrook.edu/sb/bulletin/current/

Make-up exams will be given only in extenuating circumstances. For example doctor's note stating that student is ill and unfit to take the exam

Specific arrangements will be made on a case-by-case basis

Grading Components

Midterm 1 - 100pts

Midterm 2 - 100pts

Final - 100pts

Each Test will include an extra credit **Problem**

None of grades will be curved

Final grade computation

During the semester you can earnup to 300 +x pts

The **% grade** will be determine in the following way:

# of earned points divided by 3 = **% grade**

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%

Course Contents and Schedule

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 a review of Discrete Mathematics 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