CSE303  Introduction to the Theory of Computation  
Fall 2013  
Professor Anita Wasilewska  
http://www.cs.stonybrook.edu/~cse303/  

Time and Place  
Tuesday, Thursday  4:00-5:20pm,  
2120 Teaching Lab, CS Building  

Professor  
Anita Wasilewska  

e-mail  
anita@cs.stonybrook.edu  

Office Hours  
Tuesday, Thursday  11:30 am - 12:30 pm and by appointment.  

TA  
TBA  

e-mail  
TBA  

TA Office Hours  
TBA  

Textbook  

Course Objectives  
Introduce abstract models of computation such as finite and push-down automata, and analyze their relative expressive power.  

Explore the connection between abstract machine models and formal languages, as specified by grammars.  

Enhance students awareness of both the power and inherent limitations of algorithmic computation via the study of Turing machines and/or other abstract computational models.  

Course Description  
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.  

Prerequisites: CSE 214 and 215  

Grading General Principles and Workload  
Workload: there will be 4 homework assignments, 4 quizzes covering respective homework assignments, 1 midterm and a final examination.
There will be some extra credit problems as a part of quizzes and Tests.

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

**None of the grades will be curved.**

**Records** of students grades are being kept by the course TA. Contact the TA for information.

**Homework assignments:** there will be four (4) homework assignments. Look below for the homework assignment and schedule, **None of them will be collected or graded.** Students are responsible for solving the problems.

Students will be **tested** on their work on homework assignments by respective quizzes.

Students are strongly encouraged to discuss the intellectual aspect of the problems, but are responsible for formulating solutions in their own words.

**Quizzes** (total 100pts) there will be **4 quizzes**, 25 minutes each, 25 points each.

Quizzes problems will be taken from, or very close to Homework assignments and posted previous Quizzes

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

Each quiz will also contain some SHORT questions that test your knowledge of basic facts and definitions from material covered.

The format of Quizzes is similar to the SAMPLE, PRACTICE and REAL Quizzes posted (with solutions) on the course Webpage.

**Quizzes** will be given given at the end of class on TUESDAYS:

- Q1 - September 17
- Q2 - October 15
- Q3 - November 12
- Q4 - December 3

Quizzes and Tests are **closed book** examinations.

**Midterm** (100pts) Midterm will cover material from Q1, Q2, and Homework 1 and Homework 2 (only problems dealing with material actually covered in class).

It will also contain some SHORT questions that test your knowledge of basic facts and definitions from material covered. Short questions are similar to those of Quizzes and Practice Midterm.

**Midterm TEST** will be given on **Tuesday, October 22** in class.
Practice Midterm I will give you a practice Midterm (15 extra points) on Thursday, October 17

Final (200pts)  Final test will cover some material from the midterm, but mainly (70%) the material covered after the midterm, i.e. material covered by Q3, Q4 and Homework 3 and Homework 4 (only problems dealing with material actually covered in class).

It will also contain some SHORT questions that test your knowledge of basic facts and definitions from material covered. Short questions are similar to those of Quizzes and Midterm.

Previous TESTS and Quizzes  Posted a collection of past Quizzes and Tests on the course Webpage.

They are designed to help you to learn what you have learned and what you still don’t understand from the material covered by the test. You can take them for your own practice (don’t need to submit it)

Practice tests policy  Practice quizzes and tests are designed to help you to learn what and how much you have learned and what you still don’t understand from the material covered by the test.

Final grade computation  You can earn up to 400 points + 20 extra points = 420 points during the semester. None of the grades will be curved.

The grade will be determined in the following way:

- # of earned points divided by 4 = % 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%.

Quizzes and Tests Schedule  (can be changed- changes will be advertised on the course web Page)

QUIZ 1  Covers Homework 1  September 17

QUIZ 2  Covers Homework 2  Q2 - October 15

Midterm  T Tuesday, October 22

Practice Midterm I will give you a practice Midterm (15 extra points) on Thursday, October 17

QUIZ 3  Covers Homework 3  Tuesday, November 12

Thanksgiving Break  November 27 -29
QUIZ 4  Covers Homework 4  Tuesday, December 3

Final  The final will be given during the University assigned place and time
during the FINALS period December 10-16

Course Content and Schedule

The course will follow the book very closely and in particular we will cover
the following chapters and subjects.

Chapter 1  Sets, Relations, Languages. (pp. 1 - 53)
Some of it a review material, languages part is new. You can use any other
book for the review. Our book is very condensed.

I posted OLD handwritten lecture notes and NEW Lectures. Use BOTH.

QUIZ 1  Covers Homework 1 part covered in class before the day of the quiz
and is given
Tuesday, September 17 at the end of class.

Extra Material  to STUDY is posted on the course webpage
Print and solve Sample Q1, Practice Quiz 1, and Real Q1 and ably after it
check your solutions with posted solutions

Chapter 2  Deterministic and Non-Deterministic Finite Automata. Their
equivalence. (pp.55- 75)

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

QUIZ 2  Covers Homework 2  Tuesday, October 15 at the end of the class.

Chapter 3  Part 1.  Context-free grammars. Pushdown automata. (pp. 113 -
130)

Practice Midterm  covers Hmk 1 and 2  Tuesday, October 17

MIDTERM  Covers homework material on Q1 and Q2  Tuesday, October
22 in class

Chapter 3  Part 2.  Context-free grammars. Pushdown automata. (pp. 113 -
130)

QUIZ 3  Covers Homework 3 (part covered in class)  Tuesday, November
12

Chapters 3, 4  Properties of CF Languages, Turing Machines
QUIZ 4  Covers Homework 4  Tuesday, December 3

Chapter 4, 5, 6  OVERVIEW: Church- Turing Thesis, Computability. Computational Complexity

FINAL TEST  during the FINALS week December 10-16, the exact date and place to be posted.

HOMEWORK ASSIGNMENTS

Homework 1 = Quiz 1  Covers book pages 1-52.
Problems:  Pages 8-9: 1.1.1, 1.1.2, 1.1.4  Page 13: 1.2.1, 1.2.2,  Page 18: 1.3.5, 1.3.6-1.3.8, 1.3.11  Page 23: 1.4.1, 1.4.3  Page 29: 1.5.4, 1.5.8, 1.5.11  Page 40: 1.6.1, 1.6.2, 1.6.4,  Page 46: 1.7.2, 1.7.4, 1.7.5, 1.7.6  Page 51: 1.8.2, 1.8.3, 1.8.5, 1.8.6.

Homework 2 = Quiz 2  Covers book pages 55 - 83.
Problems:  Pages 60-63: 2.1.1, 2.1.2, 2.1.3, 2.1.4, 2.1.7.  Pages 73-75: 2.2.1, 2.2.2, 2.2.3, 2.2.6, 2.2.9, 2.2.10.  Pages 83-85: 2.3.3, 2.3.4, 2.3.6, 2.3.7a, 2.3.11 (extra credit).

Homework 3 = Quiz 3  Covers book pages 86 - 120.
Problems  Pages 90-91: 2.4.5, 2.4.8.  Pages 120-122: 2.5.1, 2.5.2, 2.5.3, 3.1.3, 3.1.7, 3.1.9, 3.1.10a, c d.

Homework 4 = Quiz 4  Covers book pages 122- 194.
Problems:  Page 129: 3.2.1, 3.2.2,  Page 135: 3.3.1, 3.3.2,  Page 148: 3.5.1, 3.5.2 a,b (extra credits).  Pages 191-193: 4.1.1 4.1.3, 4.1.4, 4.1.6, 4.1.7,  Page 200: 4.2.2.

Academic Integrity Statement  Each student must pursue his or her academic goals honestly and be personally accountable for all submitted work. Representing another person’s work as your own is always wrong. Any suspected instance of academic dishonesty will be reported to the Academic Judiciary. For more comprehensive information on academic integrity, including categories of academic dishonesty, please refer to the academic judiciary website at http://www.stonybrook.edu/uaa/academicjudiciary/

Stony Brook University Syllabus Statement  If you have a physical, psychological, medical, or learning disability that may impact your course work, please contact Disability Support Services at (631) 632-6748 or http://http://studentaffairs.stonybrook.edu/dss They will determine with you what accommodations are necessary and appropriate. All information and documentation is confidential.
Students who require assistance during emergency evacuation are encouraged to discuss their needs with their professors and Disability Support Services. For procedures and information go to the following website:
http://www.sunysb.edu/ehs/fire/disabilities.shtml