CSUS
COLLEGE OF ENGINEERING AND COMPUTER SCIENCE
Department of Computer Science

CSc 135
Fall 2017
Radimsky

COMPUTING THEORY and PROGRAMMING LANGUAGES
Course Syllabus

Instructor Anne-Louise Radimsky

Office: RVR 5001
Office Hours: Tuesday, Thursday 3:00- 3:30 pm, 5:30pm by appointment. Note if you need extended time it has to be in the evening with prior request. I will try to accommodate other schedule but I am not on campus MWF.
Telephone: 278-7950 not very reliable
E-mail: radimsky@csus.edu this is the best way to reach me
I will use SacCT to distribute my notes and other materials

Note: portable phones and pagers can be very disruptive please make sure they are turned off during class time. No electronic equipment allowed during lectures.

Text

None. Given the cost of textbooks I am no longer requiring textbooks (there would be at least to at least two needed). However, for those who wish to acquire a textbook, here are several that I have used before. You can obtain older editions which are much cheaper and would be adequate.

For the Automata Theory part:

Peter Linz
An Introduction to Formal Languages and Automata, Sixth Edition
Jones & Bartlett, 2017.

My notes reflect his approach.

Two other good books on the same subject are:

Daniel I.A. Cohen
Computer Theory, Second Edition
John Wiley & Sons, Inc., 1997

This is less formal and may help those of you who struggle with abstract concepts but it uses a highly non-standard notation. There seems to be plenty of copies on line.

Michael Sipser
Introduction to the Theory of Computation, Third Edition
Cengage, 2013

Much more theoretical. I like the figures but only about the first 150 pages are relevant.

For the Programming Languages part:

Kenneth C. Louden
Programming Languages, Third Edition
Cengage, 2011

He also has a compiler book which is more detailed:

Kenneth C. Louden
Compiler Construction, Principles and Practice
PWS Publishing Company, 1997

In addition to the textbook, I will give you a set of notes and other material as necessary. All material will be distributed via SacCT. It is your responsibility to print the notes before they are used in class.

Course Description

The purpose of this course is to lay some of the theoretical foundations of computer science related to languages and associated machines and systems. It will also include two new programming paradigms: functional and logical.

Prerequisites

CSc 28, CSC 35, CSc 130. I will verify that you have the proper pre-requisites according to the following:.

- Undergraduates, who are still pre-majors need to produce a full transcript and explain why they can't apply to the major.
- Undergraduates, who are already major need to demonstrate that they have completed CSc 130.
- Graduate students need to provide a copy of their admission letter and proof that they have completed all the pre-requisites listed in that letter.

Class Etiquette (read carefully)

After turning off your cell phone keep it in your bag so that you are not distracted by it. It is very disruptive to have one ring in the middle of a lecture. Unless absolutely necessary, **do not leave the room in the middle of my lectures.** During an exam you will have to turn in your exam before you leave the room and you will get a blank exam to finish when you come back. IPad, computers and other electronic equipment should all be turned off.

Your Responsibilities

I expect you to think rather than learn by rote and to ask lots of questions (there are no "dumb" questions, only dumb silences). Print the notes in advance so that you can write comments or answers during the lecture. Copying what is on the screen during lecture is a total waste of your time. Instead, try to understand the materials and do the exercises which there will be a lot. Be an active participant in the learning process and keep up with the course material on a regular basis.

It is vitally important that you attend all classes, that you be there on time, and that you submit your work on time. The importance of timeliness will also be reflected in grade penalties. I certainly will try to help you if major and unforeseen circumstances keep you away from class, but you must understand that, unless you are willing to commit yourself seriously to this class both by participating and by working on it regularly, you might as well not take it. The benefits you get from this class will be in direct proportion to the quality of your effort.

Again don't hesitate to ask questions, most likely several other students have the same question and you will help them. Participating actively in classroom discussions also means that at times you will sometimes say things which, on further notice, you may feel embarrassed about. Please don't, we all on occasion go through such experiences. I hope you will never make fun of your classmates (or me for that matter), and that we will operate in an atmosphere of mutual respect. I much rather that you ask a question which reveals a gross misunderstanding, than see you bottle up major misconceptions. You are not expected to know everything, not even a lot of things but you are expected to be here to learn and think. By definition this means that you will make mistakes along the way. I will on occasion call on you although you have not volunteer, it is not to embarrass you but to encourage you to participate and help me detect lack of understanding, if any. On occasion, I may appear tired of answering a question on something I have already answered five minutes ago. It shows I am only human...

Assignments and Class Exercises

The best way to learn the materials in this class is to do the exercises in both the handouts and the notes. You should expect to have some tasks to complete every week. Given the plethora of solutions available on line exercises will not be graded. However, I expect you to come with the solutions you have developed and questions you may have so that we can have some discussion in class. The only graded assignments will be

three programming assignments. They will be graded on a scale of 50 points each. Each homework is weighted equally, contributing to a total of 15% of your final grade. Thus each homework is worth 5% of the overall grade. They should be **turned in in SacCT** by the given deadline. **Note that 11:59 pm means 11:59:00, not 11:59:59.** You have one more day after the deadline to turn it a late assignment with a penalty of 10% (i.e. 5 points).

Collaboration, Cheating

I encourage you to discuss the assignments but copying code is cheating. Cheating will be severely penalized.

Exams

There will be several quizzes as indicated in the course outline. However, **I reserve the right to have pop-up quizzes designed to encourage you to attend lecture and keep up with the material.** The exercises questions in the handouts, the exercises done in class, and, when appropriate the assignments will be the basis for the quizzes and the final hence it is very important that you do as many of these as you can. You will find the dates of the quizzes in the course outline (generally on Thursday).

Note: There will be no make-up exams except in cases where prior arrangements have been made for good reasons (prior to the scheduled exam date, that is), and, even then, only with a letter from your doctor or boss or some similar evidence of overwhelming need to miss the exam.

No electronic equipment allowed. No leaving the room in the middle of an exam.

Exam Contents

The quizzes will be based on lectures, handouts, and exercises. (Note that the reading material for a given week in the schedule should be done prior to the first lecture of that week.).

Final Exam Schedule

The official final times are:

Section 1 Thursday December 14, 12:45 pm – 2:45 pm

Section 2 Thursday december 14, 3:00 pm – 5:00 pm.

Section 4 Thursday December 14, 10:15 am – 12:15 pm

However, I will try to move both to Wednesday December 13, 5:15 pm-7:15 pm (this is for classes which are on Wednesday only.and start between 5:00 pm and 6:59 pm. Let me know as soon as possible if you take one of these classes.

Grading

General Policy (I always reserve the right to make changes if something unusual occurs, such changes are usually in the students favor)

The expected grading policy is:

Quizzes	approx. 40%
Final	approx. 30%
Assignments	approx. 15%
Attendance & Participation	approx. 15%

Discrepancies in grade recording

It will be the responsibility of each student to keep track of his/her points on all quizzes, assignments, etc.

I will provide a tally of exam grades at various times during the semester. If there is any discrepancy, you should bring it to my attention immediately. For this reason, it is STRONGLY advised that you retain all graded exams, etc., as proof in case of discrepancies. Furthermore, **you should not erase any programming assignment until the end of the semester.**

Incompletes

Incompletes will be given ONLY to students who have a passing grade at the time that an **OVERWHELMING and UNCONTROLLABLE** problem, which is entirely out of their control, causes them to discontinue the course. Computer Science department policy governs the assigning of Incompletes, and they are not given lightly. I will follow department policy to the letter. Please do not ask me to do otherwise.

Adds

The deadline for adds is the fourth week of the semester, after that date no add are allowed. As a general practice it is recommended that you check your enrollment status on MySacState prior to the beginning of the fourth week.

Drops

The policy on dropping courses is established by the department and the campus, and it will be adhered to in this class. Unrestricted drops will be allowed only during the first six weeks of the semester. After that time, a drop will be allowed only for serious and compelling non-academic reasons, and supporting documentation will be required. After the first six weeks, no one will be allowed to drop unless they have a passing grade at the time. Toward the end of the semester, the rules get even more restrictive. During the last three weeks of the semester, absolutely no drops are allowed for any reason.

Grade of 'WU' (Unofficial withdraw):

I will give a 'WU' to anyone who fails to drop this course and stops attending before the first midterm. If you take the first midterm and then stop attending without dropping the course, you will be given an 'F' for your final grade. A 'WU' grade is averaged into your GPA the same as an 'F'.

Grade replacement

If you are re-taking this course to replace a grade, you MUST file a repeat petition very early in the semester (third week). Second and subsequent repeats may not be allowed. If they are, the grade you obtain will be averaged with earlier grades (except the first).

Course Outline

A course outline is available on line and should give you an idea of the topics covered, the dates of the exams and final. Because I want to build solid foundations I may go more slowly than I plan, I will keep you up to date regularly.

General Advice

I strongly encourage you to study in groups. If done intelligently (meaning that everybody contributes and participates) this is very useful in understanding the material. The point is that you need to ask questions. The other members of the group may ask questions you did not think of and which will clarify your ideas on the subject. Copying other people's ideas without thinking is, of course, self-defeating.

Course Outcomes

Thorough understanding of:

- Finite automata (deterministic and non-deterministic) and regular expressions
- CFG and BNF/EBNF grammars for context-free languages
- Parse trees and syntax diagrams
- Recursive-descent parsing
- Functional programming techniques, including higher-order and lambda functions
- Logic programming techniques, including resolution and unification

Basic understanding of:

- Lexical scanning and the principle of longest substring
- Parameter passing mechanisms

- Turing machines and the halting problem
- Tail recursion and its importance
- Pushdown automata
- The pumping lemma

Exposure to:

- Chomsky hierarchy