MATH 562/CSCE 551 SYLLABUS
SPRING 2019

Time:	Monday, Wednesday, Friday 9:40 a.m. to 10:30 a.m.
Place:	LeConte College 303B

Instructor:	George F. McNulty
Office:	LeConte 302
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Office Hours:	11:00 a.m. to 1:00 p.m. Monday, Wednesday, and Friday

Every one of you is welcome to come to my office at anytime. I will generally be in every day from 9 am until 5 pm. While I have other responsibilities, your success is my first priority. Most of the time I will be able to set aside whatever I am doing, so don't hesitate to visit my office.

Text:	Introduction to the Theory of Computation
Author:	Michael Sipser
Edition:	Third
Publisher:	Cengage

We will focus on the material in Chapters 1. 3–5,7, and part of Chapter 8, referring to earlier chapters as needed.

Midterm Exams:	Friday 22 February 2019
	Friday 21 March 2019
	Friday 11 April 2019
Final Exam:	Monday 6 May 2019 at 9:00 a.m.

If you are unable to take an exam at the scheduled time, see me to arrange an alternate time.

The last day to drop a course without the need to provide extenuating circumstances in Monday 4 March 2019.

What our course is about

Today, we are surrounded by devices undertaking computational procedures. All these devices as well as those which will arise in the future rely on a mathematically based theory of computational procedures. Grasping the beginnings of this flourishing and growing understanding of the mathematical theory that supports computation is the task confronting students in this course.

In fact, the theory of computation arose in the first half of the 20^{th} century as an outgrowth of the effort to lay of firm foundation for mathematics itself and the principal findings and directions of the theory of computation were laid out before the earliest programmable computers were devised.

From a formal point of view, computable procedures can be viewed as certain processes that operate on strings of symbols (or as we shall call them,*words* on some finite alphabet). Our course has the development of a basic but powerful part of this branch of mathematical understanding at its heart. Our task is to understand both the astounding reach of computational procedures and profoundly inherent limitations of such procedures.

What you should work to acheive in this course

Understanding the concepts and the proofs of theorems takes precedence in this course over learning how to follow a set of directions to tackle a particular class of problems. Among the results of your efforts in this class should be a deeper understanding of both the power and the limitations of computation as well as an increased ability to discover and convey compuuttional ideas and proofs.

Weekly Problem Sets

Homework is at the heart of our course. Generally, an assignment will be due weekly, usually at the beginning of every Friday class. Frequently, students will be asked to explain their solutions to the class.

I hope you will find our course enjoyable, informative, and useful.

How Course Grades Will be Determined

The goals of this course can be broken into twelve objectives, some of which are essential to the application and further study of computation while the remaining objectives touch on more peripheral or advanced topics.

The mid-term examinations and the final will provide, amongst them, problems that address each objective. Your grade for the course will be determined by how well you display mastery of these problems. For each sort of problem I identify three levels of performance: master level, journeyman level, and apprentice level. The examinations will all be cumulative. The First Midterm will probably have 4 problems, the Second 8 problems (with 4 being variants of the ones occurring on the First Midterm), the Third Midterm as well as the final will probably have 12 problems. I record how well you do on each problem (an M for master level, a J for journeyman level, an A for apprentice level) on each exam. It is also possible to demonstrate mastery of an objective by presenting certain homework problems to the class and by tackling the problems on quizsez. After the Final, I make a record of the highest level of performance you have made on each sort of problem and use this record to determine your course grade. If you have at some point during the semester displayed a mastery of each of the 12 sorts of problems, then your grade will be an A. If you have at some point during the semester displayed a mastery of each of the essential problems, then you will get at least a C. The grade B can be earned by displaying mastery of all the essential problems and mastery of about half of the rest of the problems. The grade D will be assigned to anyone who can master several problems but has not yet displayed a mastery of all the essential problems. In borderline cases, the higher grade will be assigned to those students who turn in their homework regularly.

Students enrolled in this course for graduate credit will be required to complete a term project due at the end of the semester.

This particular way of arriving at the course grade is unusual. It has some advantages. Each of you will get several chances to display mastery of almost all the problems. Once you have displayed mastery of a problem there is no need to do problems like it on later exams. So it can certainly happen that if you do well on the midterms you might only have to do one or two problems on the Final. (It is not unusual that a few students do not even have to take the final.) On the other hand, because earlier weak performances are not averaged in, students who come into the Final on shaky ground can still manage to get a respectable grade for the course.

This method of grading also stresses working out the problems in a completely correct way, since accumulating a lot of journeyman level performances only results in a journeyman level performance. So it pays to do one problem carefully and correctly as opposed to trying get four problems partially correctly. Finally, this method of grading allows you to see easily which parts of the course you are doing well with, and which parts deserve more attention.

The primary disadvantage of this grading scheme is that it is complicated. At any time, if you are uncertain about how you are doing in the class I would be more than glad to clarify the matter.