MATH 300 Section 01
Spring 2020

Time:	Monday, Wednesday, and Friday 10:50 a.m. to 11:40 a.m.
Place:	LeConte College 115

Instructor:	George F. McNulty
Office:	LeConte 302
Phone:	777-7469 (Office)
	781-9509 (Home)
e-mail:	mcnulty@math.sc.edu
Office Hours:	11:45 a.m. to 1:00 p.m. Monday, Wednesday, and Friday

Text:	Journey into Mathematics
Author:	Joseph Rotman

Text:	Euclid's Element, Book I
Author:	Euclid

Last day to drop a course without extenuating circumstances: 28 March 2020.

Semester Projects:

Team Project I	Friday 14 February
Team Project II	Friday 20 March
Individual Project	Monday 27 April

Midterm Exams:	Friday 21 February
	Friday 20 March
	Monday 20 April

Final Exam:	Monday 4 May at 9:00 a.m.

Please inform me as soon as possible if any of these times is a problem. Alternatives can be arranged.

The main outcome of your work in our course should be an increased ability to read and understand mathemtical definitions, theorems, and proofs. Along the way, you should also acquire a deeper understanding of the nature of mathematics and of your own mathematical thinking.

By the end of the course, each diligent student should be in a position to use various methods of proof: proof by cases, proof by contradiction, and proofs using mathematical induction. By your efforts, you should also be able to grasp how to frame the definition of a mathematical concept, whether the definition is direct or by recursion.

While I plan to give a few lectures, some of our time in class will be spent in discussion, working in small groups, and giving individual presentations. For this reason, active personal participation is a key to the course. Your attendance and efforts will be needed during every meeting of the class.

Working through mathematical proofs is at the heart of our course. Generally, you should come to each class prepared to discuss a piece of mathematics. This work will be collaborative. The class will be divided into small teams for this purposes.

Every one of you is welcome to come to my office at anytime. I will generally be in every day from 10 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.

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

How Course Grades Will be Determined

The objectives of this course can be broken down into several categories:

(a) Proofs by contradiction (**essential**);
(b) Proofs by induction (**essential**);
(c) Proofs by cases (**essential**);
(d) Geometric proofs;
(e) Proofs about sets and relations;
(f) Proofs about functions (**essential**);
(g) Proofs about cardinality;

The mid-term examinations and the final will provide problems that address each objective. Your grade for the course will be determined by how well you display mastery of these problems and on your individual project (**essential**). 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 have 3 problems, the Second 6 problems (with 3 being variants of the ones occurring on the First Midterm), the Third Midterm as well as the final will probably have 8 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. 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, along with your individual projhect, to determine your course grade. If you have at some point during the semester displayed a mastery of each of the 8 sorts of problems, and your project is solid, 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, and your project is reasonable, 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.

From time to time, we will also have in-class quizzes. Each quiz will have only one problem. If you master it on a quiz, it is mastered forever. Also, you can request out-of-class quzzes.

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.