

MATH 241, Section 1 FALL 1999

Lectures: MWF 11:30-12:20 in EMS E-159 [Holidays 9/5 and 11/26; Last class 12/13]

Instructor: Allen Bell, EMS E449, 229-4233; e-mail `adbell` (`adbell@uwm.edu`)

Office Hours: MWF 10:30-11:20; other times by appointment.

I will often be available right after class; you can also talk to me any time you can find me in my office.

Course Goals and Format: There will be no textbook; the class will be based on notes that are passed out from time to time. The primary goal of this class is to develop students' abilities to read, write, and understand rigorous mathematics. Successful completion of this course should serve as preparation for the more "theoretical" upper level mathematics courses. In the process, we will touch on some topics that are not typically emphasized in lower level mathematics courses, such as logic, set theory, functions, cardinality, order, and the basic properties of numbers.

The format of the class will be as follows. The notes handed out will contain notation, terminology, and definitions, plus the statements of theorems, examples, and some exercises. I will refer to these theorems, examples, and exercises as "results" below. The goal of the class is for each student to provide proofs of (or counterexamples to) the results, and to be prepared to present these proofs in writing or in class at the blackboard. The standing homework assignment is to prove/solve as many of the results stated in the notes as possible. This method of teaching mathematics is commonly known as the "Moore Method".

This course will be conducted via the active participation of the students. Lectures will not take much of the class time; the great majority of class time will be devoted to the presentation of material by students as outlined in the previous paragraph. At the start of each class, each student will have a chance to "claim" any result in the notes he/she is prepared to present to the class, and during the class some students who have claimed results will present them to the class. The presentation should be clear, and both the instructor and other students are encouraged to ask questions at any time during a presentation. We will move in a linear order through the notes, but if nobody claims a result, it will remain open to be claimed at the next class. Occasionally written solutions for some results will be collected and graded. I will keep a record of "claims" and in-class presentations, as well as your participation (for example, asking questions of presenters).

There will also be one or two examinations during the semester, and a comprehensive final examination on Thursday, December 16, from 12:30-2:30 p.m. The first exam will *probably* cover Sections 0 through 4. I will say more about the dates and nature of the exams at the appropriate time.

Grades: Your grade will be based on your in-class work, written proofs that you occasionally may hand in, and examinations. The grading scale will be determined based on the class performance (i.e., there will be a curve). The in-class grade will be based on both your "claims" of problems and the quality of your in-class presentations and participation. Your in-class work will count for approximately one-third of your final grade, and examinations and collected homework will count for the rest.

More on the Class Format and Goals: A great deal of emphasis will be placed on

developing the ability to write and present organized and rigorously correct proofs. This is a very big job, even for a professional mathematician. You should not be discouraged if it takes several weeks to get the hang of it, or if I or other students ask a lot of questions or make comments or suggestions about your presentations at the board. Asking questions and making comments is part of my job as a teacher and your job as a student when you are trying to understand a presentation. Of course all such comments should be constructive and respectful.

It is inevitable that we will find serious errors in some presentations, errors that make it unlikely the problem can be solved in the manner outlined. In that case, I may ask someone else to present a solution. At times, I may ask several students to write solutions to the same problem. Please do not take comments or switching to another person for a solution personally — this is a part of learning mathematics. Mistakes are a normal thing; however, I hasten to add that one of the goals of the class is to know when a proof (by you or someone else) is correct, so do not claim a result if you are not confident that you are prepared to present it clearly and correctly.

Other: There will be *no* make-up exams. If you cannot come to an exam for a very good reason, we may be able to make some kind of arrangement *if* you let me know in advance: you may call me, send me email, or leave a message at the Mathematics office, 229-4836.

If you have any special requirements or concerns regarding this course, please let me know as soon as possible. Friday, October 29 is the last day to drop the class (with a W on your transcript). You can drop classes using SASI without any signatures until Friday, October 22.