

MATH 241, Section 1      WINTER/SPRING 2001

**Class Meetings:** TuTh 9:30-10:45 in EMS E-170  
[Spring Break March 18–25; Last class May 10]

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

**Office Hours:** TuTh 12:30-2:00 (subject to change).

Other times by appointment: don't hesitate to contact me by phone or e-mail. (I teach TuTh 11:05-12:20, so don't count on finding me in my office after class.)

**Web Page:** <http://www.uwm.edu/~adbell/> — then follow the link for Math 241.

**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 your ability to read, write, communicate, and understand logical reasoning and 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 class at the blackboard or in writing. The standing homework assignment is to prove/solve as many of the results stated in the notes as possible. In addition, I will sometimes ask questions of people in the class. This method of teaching mathematics is commonly known as the “Moore Method”. *You will need to read the notes on your own and work on the problems before we have discussed them in class.*

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. I may also assign problems to some students to present at the board, particularly students who have not done many presentations.

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 or answering questions I pose to the class). In order for a claim to be counted, you must be in class and willing to present the problem at the board; otherwise, your claim may be erased. If there is a reason you cannot come to class and you have claimed problems we may do that day, please contact me.

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**Exams:** There will be two or three examinations during the semester, and a comprehensive final examination on Tuesday, May 15, from 10:00 a.m. to noon. The first exam will *probably* cover the notes through the end of Section 2 or 3. 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 personally either comments or switching to another person for a solution — this is a part of learning mathematics. We all make mistakes, and as the old cliché accurately says, “You often learn more from your mistakes than your successes.” I hasten to add, however, 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, March 16 is the last day to drop the class (with a W on your transcript) without special approvals.