

## THE COURSE

Math 3283W, Spring '02, Sequences, Series and Foundations - Writing Intensive.

Meets 9:05am-9:55am MWF in 1701 Univ. Ave. 3,  
and at 9:05 or 10:10 for Discussion Sessions on TuTh, locations TBA.

Math 3283W is a “bridge” between “factual” Mathematics courses and proof-oriented ones. The course introduces you to proofs dealing with Sequences and Series and some of their important applications.

The course consists of Lectures, the more formal part, and Discussion Sessions, that are very important, because they allow you to see how important your intuition and your past experience, both mathematical and otherwise, are! They are the “back room,” the “kitchen,” the space behind the Wizard’s curtain! The *material* in the Lectures will always be treated with “high seriousness,” presented with gentle humor, greatly influenced by your questions in Lecture and your answers to the questions I ask in Lecture.

We will begin with Logic, Sets, Functions and the Peano Postulates (for the Natural Numbers), to introduce the Foundations of the subject. You’ll learn about Truth Tables, quantifiers, writing mathematical statements “in logic,” translating them back to mathematical English, and the mechanics of working with denials of mathematical statements. We’ll also see how difficult it is to “suspend belief” in the things mathematical you take for granted, by developing the operations of addition and multiplication of Natural Numbers, and the concept of order there.

When you finally get your copy of Knopp’s book, you’ll find that Chapter 1 outlines how the Real and Complex numbers can be built from the Natural Numbers.

## INSTRUCTOR

Max Jodeit, Jr., Vincent Hall 258, 625-3855,  
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Office Hours – 10:15 – 10:50 MWF, others TBA

## TEXT:

*Infinite Sequences and Series*, by Konrad Knopp. It’s a Dover publication, \$8.95. We don’t need the text right away. Your class notes will do at first, along with the PDF document “The Peano Postulates” available from this site (link below).

In addition, you may want to obtain a copy of the notes by Prof. Wayne Richter used before for Math 3283W and for Math 2283. The notes are available at Alpha Prints on 4th St in Dinkytown, between 14th and 15th Avenues, for \$15.

## MATERIAL COVERED

We’ll begin with some symbolic logic – it gives us our basic language for definitions, for stating theorems, and for analyzing mathematical statements. We will continue with basic ideas about Sets, Set Operations, and Mathematical Logic & Sets, which involves Variables and Quantifiers. We need to study Functions as well.

I’ll present and “discuss” the Peano Postulates (they “really” define  $\mathbb{N}$ ) and how they can be used to define all the others. Since actually doing this takes a long, long time, we’ll rely on your intuitive understanding of these things.

After the digression, we’ll follow the text straightforwardly, beginning with Chapter 2. Be sure you ask questions in class! Let me worry about whether you’re “holding up the class;” I know how to deal with that!

**What does “Writing Intensive” mean?** This course will have some assignments emphasizing writing. In most cases, the *quality* of the writing will be most important, after the mathematics. Succinct is good, prolix bad. You are encouraged to write about the intuitive ideas *behind* your proofs! This can serve as your introduction to a mathematical argument, as a bridge between parts of a mathematical argument, or as the conclusion to a mathematical argument. The writing scores will amount to about 25% of your grade, and the writing scores will have separate gradelines. You must have a grade of C- or better to pass the writing part of the course (this may have to be adjusted later). Approximately 15 pages of writing assignments will be given. You’ll write a first draft, turn it in for critique, then prepare a final draft for grading. Your drafts, both first and final, must be neatly written, with one-inch margins. The assignments will use about 45 of your “good” hours (more if you work on them when you are tired or distracted!).

On tests and quizzes (when you are under time pressure) the important thing is that your answer must be on the paper, not in the scorer's mind. Your *writing* on quizzes or exams won't count against you unless it is mathematically incorrect.

## GRADING

There will be 3 Midterm Tests. **Tentative Test dates: Feb 19, Mar 28, Apr 23.** Your TA will announce, and discuss with you, other grading matters to you early in the semester. More about the "Writing Intensive" component of the course will be discussed with you too.

Each Test may involve material covered in lectures up to the Test. Thus, you are responsible for material covered in the lectures!

**Effect of "writing-intensive" on your grade:** The scores on your *specifically* "writing" assignments will be checked as a unit. To pass the course, you must pass this unit with a grade of C- or better. The "writing" scores remain part of your overall grade basis.

Your overall grade in this course will reflect what you did in it, not your ability or potential. It is very important, then, for you to be able to put your work on paper, under time pressure. If you have problems taking tests, there are people on campus who might be able to help you overcome them. Ask about it at an office hour!

You'll have a GPA grade for each Test, your homework, (perhaps) quizzes, (perhaps) writing assignments, the Special Problems, and the Final. The weighting of the grades, though subject to change, is, at present: 30% for Tests, 20% for homework, 15% for Special Problems, and 35% for the Final. The weights will have to be changed to include writing and perhaps quizzes as separate items. Grades will perhaps amount to 80–85% for A, 65–70% for B, 50–55% for C, 40–45% for D.

Each grading item will have "Gradelines" assigned to it. For example, if the B gradeline is 70, the A gradeline is 85, and your score is 80, then your GPA grade,  $G$ , for that item is  $G := 3 + \frac{80 - 70}{85 - 70} = 3.67$  ( $G$  is rounded to 2 places).

In other words, your GPA grade is B, plus 2/3 of the way between B and A. Your GPA grade,  $G$ , on any grading item is computed using your score on it, and numbers  $g$  (the grade corresponding to the highest gradeline smaller or equal to your score),  $glb$  (the highest gradeline smaller than or equal to your score),  $gla$  (the lowest gradeline greater than your score):

$$G = g + \frac{\text{your score} - glb}{gla - glb}$$

where  $glb$  is the gradeline just below your score,

$gla$  is the next gradeline - above your score,

and  $g$  is the grade number: 5 for a 100% score, 4 for the A gradeline, 3 for B, etc.

If your score falls on a gradeline, then  $G = g$ . If your score is 100% on a Test, your  $G = 5$ .

When the  $G$  are combined, with weights, and added, the result is your GPA grade for the course. If your total is within 0.025 of one of the University of Minnesota's official GPA numbers that define one of the valid letter or letter-plus-or-minus grades, your grade is "borderline." Case-by-case decisions are made then, whether to award the higher or the lower grade. One important factor is the direction your grades have taken at the course's end.

**Be sure to talk to me in advance if you have to miss a Test!** If you do miss a Test, and you don't make arrangements in advance, your  $G$  for that Quiz or Test is zero!

If, for documented reasons beyond your control, you're passing and you can't complete the course, your grade up to that point may "stay with you" as part of an Incomplete; all I's must be issued according to department guidelines.

## SCHOLASTIC CONDUCT

Please read the (appropriate for you) notices in the IT Bulletin, the CLA Bulletin, and so on. You are encouraged to work with others in understanding what problems say, setting up solutions, and so on. If you get ideas from a reference or from someone else, GIVE CREDIT! You must submit as YOUR work only what YOU have written up yourself: DON'T COPY! Graders will be asked to bring answers that look alike to my attention.