

Mathematics 444

Winter 2011

Instructor: John Palmieri, PDL C-538, 543-1785, palmieri@math.washington.edu, office hours Tuesday 1:30–2:20, Wednesday 1:30–3:30.

TA: Jim Stark, PDL C-8J, office hours TBA.

Class time and place: MWF 9:30–10:20, SIG 226

Web page: <http://www.math.washington.edu/~palmieri/Math444/> or
<http://faculty.washington.edu/jpalmier/Math444/>

Text books: The main text is a pre-publication version of a book by UW math professor Jack Lee. I will provide more information the first week of class and also on the course web site. For at least the first few weeks of the quarter, you will also need a copy of Euclid's *Elements*. There are several versions of this on-line or available for free download – see the course web site – or you can buy a printed copy. The standard translation is by T. L. Heath, and that's the version you should look for. I've asked for a copy to be put on reserve in the Mathematics Research Library, PDL C-306.

Goals. There are several mathematical goals: to improve your skills at reading and writing proofs, to understand the role of the axiomatic approach in mathematics, and to understand the foundations of geometry. The first of these is almost self-explanatory, but I will point out that high school geometry is traditionally the first course where students write mathematical proofs, so it's important for geometry teachers to be fluent in proofs. The axiomatic approach is perhaps most well known in geometry, but it actually pervades modern mathematics. So understanding how it works is quite important for math educators. Finally, in order to be able to teach any subject, like geometry, you need to understand it really well. This course will provide that understanding.

There is also a meta-mathematical goal: to improve your skills at mathematical communication – reading, writing, listening to, and talking about, mathematics.

Class structure. The classes will be a mix of lecture and small group discussion, along with student presentations, typically on Wednesdays. You must read the text book on your own: the lectures are intended to supplement the reading, not repeat it. By 9:30am each Friday, you should post to the class discussion board (<https://catalyst.uw.edu/gopost/board/jpalmier/19998/>): how much did you understand, where did you get lost, what questions do you have, what issues would you like clarified, etc. You can miss one week of these posts and still get full credit for this portion of the grade.

Homework. I will assign homework regularly; see the course web page for the assignments. There will be two kinds of assignments: first, there will be assignments to be done individually – these will be due in class each Friday. Second, I will assign problems for group work and in-class presentations. These can (and should) be done in groups before each Wednesday's class. During class on Wednesday, I will choose representatives from each group to present solutions to the class.

The best way to learn mathematics is to use it to solve problems. Some of the problems in this class might be hard. Struggling with a problem is perfectly normal; in fact, it's actually helpful, because it will force you to come to grips with the underlying mathematics. When you get stuck, here are some steps to take:

- take a break from the problem – get some exercise, have a snack, listen to music – and come back in a few hours
- bounce ideas off of your classmates
- ask for hints from me or the TA or someone else who knows how to do it

Finally, you might ask for more than a hint; you might extract a solution from me or the TA if you pester us enough, or you might find something helpful on the internet. Use this as a last resort! Being able to follow someone else's reasoning on a problem is not at all the same as solving it yourself. You learn a lot more by solving it yourself.

Having said this, the homework policy for the individual portion of the homework is: you may work with other people on your homework, but you must write your solutions yourself. If you find a solution in a book or some other source, please provide a reference. (But you will learn more if you don't rely too much on your classmates or outside references. I strongly encourage you to try the problems on your own.)

Late homework will not be accepted. I will drop your lowest homework score at the end of the quarter.

TA. This course has a Teaching Assistant, Jim Stark. He will grade your homework, and he will also hold regular office hours. Along with homework questions or other questions about the material, he can also provide suggestions for how to organize a presentation.

Final exam: The final exam is on **Wednesday, March 16, 8:30–10:20am.**

Grading. The various components of the course are weighted as follows:

individual homework	35%
group homework	15%
participation and presentations	10%
posts about reading	5%
final	35%

As noted above, I will drop your lowest individual homework score, and you may miss one week of reading posts and still receive full credit.