Apostol, Mathematical Analysis, 2nd ed.

Reading Guide:

Write your chapter notes in your notebook using some kind of navigation system to keep track of where in the book your notes pertain (e.g. page and section number, or page and paragraph number, or page and theorem number etc.)

These chapter notes MUST contain the items below as a subset, and you will be expected to discuss your reflections intelligently in class.

♦ indicates an item I will be specifically looking for when I review your notebook. Please write these items up especially carefully and make sure they are easy for me to find by marking the upper right hand corner of the page with a ♦ and a label such as ‘alternative proof of theorem 2.3’.

Chapter 1.

There are possibly one or two new ideas in here, such as sup and inf, and the extension of the Reals and Complexes to include infinity, and some different ways of looking at things, but basically this is a ‘review and foundations’ chapter. We will go through it quite quickly. Folks who have had any of Number Theory, Abstract, or Complex should share their backgrounds with anyone who has not.

1.2. Where have you seen something like this before (be specific—e.g. give the text and chapter/theorems)? What was the context? Are there any differences?

1.3. Make sure Theorem 1.1 makes sense—we will be doing a lot of stuff with this flavor, so this first easy example needs to be solid.

1.7. Again, where have you seen something like this before? Are the proofs the same or different?

1.9 Rewrite Theorem 1.10 as if you were proving it yourself to get the hang of the proof technique.

♦ For Theorem 1.11, find that expression for exp(x) in your Calc book, and prove that it is true, including determining the interval of convergence.

1.10 Think of at least two additional examples.

1.12 Formulate the supremum properties as infimum properties. Be prepared to discuss Theorem 1.15 on the board. The proof of Theorem 1.16 is 1.20 in the exercises.

1.14 Explain how the geometric statement in the second sentence follows from Theorem 1.19.

1.19 Theorem 1.23 is important and the proof will be helpful in the homework exercises. Use your calculus book and the vector form of the Cauchy-Schwarz inequality to give an alternative proof of Theorem 1.23.