

BRIEF SYLLABUS FOR MATH 315 AS TAUGHT FALL 2009

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The textbook was Stephen Abbott, *Understanding Analysis*, Springer-Verlag, New York, 2001. There is a posted list of misprint corrections, at:

<http://community.middlebury.edu/~abbott/UA/UACorrections.html>

The book is written for a 15 week (semester) course. By omitting various things (some of them slightly tangential), I got as far as the discussion of convergence and term by term differentiation of power series (Section 6.5), but not into integration. (Feel free to make different choices—I might make different choices myself the next time.)

The division into weeks is only approximate, but the material covered is described fairly accurately.

- Week 1: Introduction; Sections 1.1–1.3.
- Week 2: Section 1.4 and 2.1. In Section 1.4, omit serious discussion of countable sets.
- Week 3: Sections 2.2 and 2.3; start Section 2.4.
- Week 4: Finish Section 2.4; Midterm 1; Section 2.5.
- Week 5: Sections 2.6, 2.7 and 3.1; start Section 3.2; second version of Midterm 1.
- Week 6: Finish Section 3.2; Section 3.3. In Section 3.3, omit serious discussion of compactness in terms of the Heine-Borel property (open covers have finite subcovers). In Section 3.4, omit perfect sets entirely.
- Week 7: Section 3.4; Midterm 2; Sections 4.1 and 4.2.
- Week 8: Sections 4.3–4.5. (Omit uniform continuity and the fact that continuous functions on compact sets are uniformly continuous.)
- Week 9: Sections 5.1–5.3.
- Week 10: Sections 6.2–6.4. (Omit the proofs in Section 6.3, for lack of time. I gave a brief description of how to prove a sufficient but weaker result using integration, although integration had not been formally defined.)

Comment on exams: I did not give quizzes. If I had, I might have been able to avoid having to give a second version of Midterm 1. If quizzes are not given, a second version of Midterm 1 will be needed, but I suggest not advertising this until after returning the first version to the students.