BRIEF SYLLABUS FOR MATH 315

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The textbook is Stephen Abbott, *Understanding Analysis*, Springer-Verlag, New York, 2001.

The forces of this course is, acceding to the UO catalog,

A rigorous treatment of certain topics introduced in calculus including: continuity, differentiation and integration, power series, sequences and series, uniform convergence and continuity.

Since I'm scheduled to teach this course in Winter term and this is a new textbook for me, I'm copying below the Syllabus by Chris Phillips:

There are at least two possible goals:

- Get through proving that continuous functions are Riemann integrable and proving the Fundamental Theorem of Calculus.
- Get through enough about power series to provide rigorous definitions of the trigonometric and exponential functions, and prove something about their properties, for example, $\exp'(x) = \exp(x)$.

The syllabus below is written for the second choice. We can switch to the first choice if the class prefers; the decision can be made as late as the 4th week of classes. (The last time I taught this course, I made the second choice. I gave a proof of one version of L'Hospital's Rule, but then didn't quite prove everything needed for differentiation of power series.)

The division into weeks is only approximate.

- Week 1: Introduction; Sections 1.1–1.3.
- Week 2: Sections 1.4 and 2.1; Quiz 1. In Section 1.4, omit serious discussion of countable sets.
- Week 3: Sections 2.2 and 2.3; start Section 2.4; Quiz 2.
- Week 4: Finish Section 2.4; Section 2.5; Midterm 1.
- Week 5: Sections 2.6, 2.7, and 3.1; start Section 3.2.
- Week 6: Finish Section 3.2; Section 3.3; Quiz 3. In Section 3.3, omit serious discussion of compactness in terms of the Heine-Borel property (open covers have finite subcovers).
- Week 7: Section 3.4; Sections 4.1–4.3. In Section 3.4, omit perfect sets entirely.
- Week 8: Sections 4.4 and 4.5; Midterm 2. (Omit uniform continuity and the fact that continuous functions on compact sets are uniformly continuous.)
- Week 9: Sections 5.1–5.3; start Section 6.2. (In Section 5.3, go only through the corollary to the Mean Value Theorem.)
- Week 10: Finish Section 6.2; Sections 6.3 and 6.4.

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