

**18.100A ANALYSIS I, SPRING 2008
TENTATIVE SYLLABUS**

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Lectures. MWF 11–12, Room 2–131.

Office Hours. Tuesdays, 2–3pm, Room 2–230. Or by appointment. Additional office hours held by teaching assistant will be announced.

Textbook. Arthur Mattuck: *Introduction to Analysis*. Prentice-Hall.

Grading. Problem sets every week (except for spring break and weeks with 18.100A midterm), two midterms (one hour each), and a final exam. Each counts about 1/3.

Web page. http://math.mit.edu/~lenzmann/18_100A_Spring2008.html
Problem sets and solutions will be posted here.

Tentative Syllabus. As of 7th of February 2008, the tentative syllabus for 18.100A is as follows. See next page.

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|---|--------|---------------------------|---|
| W | Feb 6 | App. A.0, Chap. 1 | Sets and Numbers. Monotone Sequences. Completeness Property of \mathbb{R} . |
| F | Feb 8 | Chap. 2 | Estimations and Approximations. |
| M | Feb 11 | Chap. 3 | Limit of a Sequence. |
| W | Feb 13 | Chap. 4, 5.1 | Error term. Algebraic Limit Theorems. |
| F | Feb 15 | Chap. 5 | Limit Theorem for Sequences. |
| M | Feb 19 | Chap. 6.1-2 | Nested Intervals. Cluster Points. |
| W | Feb 20 | Chap. 6.3-4 | Bolzano-Weierstrass Theorem. |
| | | | Cauchy Sequences. |
| F | Feb 22 | Chap. 6.5 | Sup and Inf. |
| | | | Completeness Property for Sets in \mathbb{R} . |
| M | Feb 25 | Chap. 7.1-5 | Infinite Series. |
| W | Feb 27 | Chap. 7.6-7 | Infinite Series (cont'd). |
| F | Feb 29 | Chap. 8 | Power Series. |
| M | Mar 3 | First Midterm | Relevant are Chap. 1-8. |
| W | Mar 5 | Chap. 9,10 | Functions. Global and Local Properties. |
| F | Mar 7 | Chap. 11.1-3 | Continuity. |
| M | Mar 10 | Chap. 11.4-5 | Continuity (cont'd). |
| W | Mar 12 | Chap. 12 | Intermediate Value Theorem. |
| F | Mar 14 | Chap. 13.1-3 | Continuity Theorems. |
| M | Mar 17 | Chap. 13.4-5 | Uniform Continuity. |
| W | Mar 19 | Chap. 14 | Differentiation: Local Properties. |
| F | Mar 21 | Chap. 15 | Differentiation: Global Properties. |
| M | Mar 31 | Chap. 16 and 17 (lightly) | Convexity. Taylor's Theorem (without proof). |
| W | Apr 2 | Chap. 18 | Integrability. |
| F | Apr 4 | Chap. 19 | Riemann Integral. |
| M | Apr 7 | Chap. 20.1-4 | Fundamental Theorem of Calculus. |
| W | Apr 9 | Chap. 20.5-6, 21.1-2 | Stirling's Formula. Improper Integrals. |
| F | Apr 11 | Chap. 21.3-4 | Gamma Function. Convergence. |
| M | Apr 14 | Second Midterm | Relevant are Chap. 9-20. |
| W | Apr 16 | Chap. 22.1-2 | Uniform Convergence of Series. |
| F | Apr 18 | Chap. 22.3-4 | Integration Term-by-Term. |
| W | Apr 23 | Chap. 22.5-6 | Differentiation Term-by-Term. Analyticity. |
| F | Apr 25 | App. B | Quantifiers and Negation. |
| M | Apr 28 | Chap. 24.1-5 | Continuous Functions on \mathbb{R}^2 . |
| W | Apr 30 | Chap. 24.6-7, 25.1 | (cont'd). Basic Point-Set Topology in \mathbb{R}^2 . |
| F | May 2 | Chap. 25.2-3 | Compact Sets and Open Sets. |
| M | May 5 | Chap. 26.1-2 | Differentiating Parameter Integrals. |
| W | May 7 | Chap. 26.2-3 | (cont'd). Fubini's Theorem in Rectangular Regions. |
| F | May 9 | Chap. 27.1-3 | Uniform Convergence of Improper Integrals. |
| M | May 12 | Chap. 27.4-5 | Differentiation of Improper Integrals. Applications. |
| W | May 14 | | Comments and Review. |