18.100B Spring Semester, 2002

General Information

Class meetings: Monday, Wednesday, and Friday 2:00–3:00, in 4-163.

Text: Walter Rudin, *Principles of Mathematical Analysis*, third edition. You should try to read the text *before* class as well as after. Both your own understanding and your chance of catching the lecturer in a *faux pas* will be greatly increased.

Lecturer: David Vogan, 2-284. Telephone: 253-4991. E-mail: dav@math.mit.edu. My office hours are Wednesday 3–4, Thursday 3–4, or by appointment.

Homework will be assigned in most classes. Problems assigned during each week will be collected at the beginning of the first class of the following week. One of the goals of the course is for you to learn to write clear, complete, and elegant proofs (in that order, perhaps). The problem sets are the best place to show your accomplishments without time pressure.

Exams: There will be three one-hour exams during the lecture hour, on March 4, March 22, and April 19. There will be a three-hour final exam during finals week. The exams will all be closed book.

Grading: Each hour exam will be worth 100 points, the final exam will be worth 200 points, and the graded problem sets will be worth 20 points each.

Schedule

Wed 2/6	Lecture 1	1–8	Ordered fields
Fri 2/8	Lecture 2	8–15	Real and complex fields
Mon 2/11	Lecture 3	16–17	Euclidean spaces
Wed 2/13	Lecture 4	24–30	Functions and infinite sets
Fri 2/15	Lecture 5	30–34	Metric spaces
Tues 2/19	Lecture 6	34–36	Metric spaces
Wed 2/20	Lecture 7	36–38	Compact sets
Fri 2/22	Lecture 8	38–40	Heine-Borel theorem
Mon 2/25	Lecture 9	40–42	Sequences and compact sets
Wed 2/27	Lecture 10	42–43	Connected sets
Fri 3/1	Lecture 11	1–43	Review
Mon 3/4	Lecture 12		**Exam 1 on Chapters 1–2**
Wed 3/6	Lecture 13	47–52	Convergent sequences
Fri 3/8	Lecture 14	52–57	Cauchy sequences
Mon 3/11	Lecture 15	57–65	Series, comparison test
Wed 3/13	Lecture 16	65–72	Root and ratio tests
Fri 3/15	Lecture 17	83–89	Continuous functions
Mon 3/18	Lecture 18	89–93	Continuity and compactness
Wed 3/20	Lecture 19	93–97	Continuity and connectedness
Fri 3/22	Lecture 20		**Exam 2 on Chapters 3–4**
3/25–3/29	Spring Vacation		

Mon 4/1	Lecture 21	103–106	Differentiable functions
Wed 4/3	Lecture 22	107–110	Mean value theorems, L'Hôpital's rule
Fri 4/5	Lecture 23	110–113	Taylor's theorem
Mon 4/8	Lecture 24	120–125	Riemann integrals
Wed 4/10	Lecture 25	125–129	Integrability criteria
Fri 4/12	Lecture 26	132–136	Integration and differentiation
Mon 4/15	Holiday		
Wed 4/17	Lecture 27	1–136	Review
Fri 4/19	Lecture 28		**Exam on chapters 5–6**
Mon 4/22	Lecture 29	143–147	Sequences and series of functions
Wed 4/24	Lecture 30	147–148	Uniform convergence
Fri 4/26	Lecture 31	149–151	Uniform convergence and continuity
Mon 4/29	Lecture 32	151–154	Uniform convergence and calculus
Wed 5/1	Lecture 33	159–161	Stone-Weierstrass theorem
Fri 5/3	Lecture 34	161–165	Stone-Weierstrass theorem
Mon 5/6	Lecture 35	172–178	Power series
Wed 5/8	Lecture 36	178–184	Exponential and trig functions
Fri 5/10	Lecture 37	185–192	Fourier series
Mon 5/13	Lecture 38		Uniform distribution of fractional parts
Wed 5/15	Lecture 39	1–192	Review
week of 5/20–5/24			**Final Exam on chapters 1–8**