Sequences, series, and multivariable calculus
M408D AP Honors: lecture schedule

T. Perutz

University of Texas at Austin, Fall Semester 2014

This is an approximate schedule, and I expect to deviate from it a bit both in terms of content and timing.

Note: this is a revised schedule, dated September 21. The revisions are needed because it has emerged that the Quest problems on differential equations have not been previously tested and are not ready for class use.

Day	Date	Topic	Section
		Techniques of integration	**7**
W	Aug 27	Introduction to the class. Review of differential calculus.	
F	Aug 29	Review of integration by substitution. Integration by parts.	5.5, 7.1
M	Sep 1	Labor day holiday.	
W	Sep 3	Trigonometric integrals.	7.2
F	Sep 5	Inverse trigonometric substitutions.	7.3
M	Sep 8	Inverse hyperbolic substitutions	7.3
W	Sep 8	Integration of rational functions: examples, long division;	7.4
F	Sep 12	Integration of rational functions: partial fractions	7.4
M	Sep 15	Elementary functions. Tangent half-integral substitutions.	Wikipedia, 7.4-5
W	Sep 17	Improper integrals (infinite limits of integration).	7.8
F	Sep 19	Improper integrals (discontinuous functions, principal values).	7.8
M	Sep 22	First midterm test.	chapter 7

		Sequences and series	**11**
W	Sep 24	Sequences. Comparison, bounded monotonic convergence.	11.1
F	Sep 26	Series.	11.2
M	Sep 29	The integral test and estimates of sums.	11.3
W	Oct 1	Comparison tests.	11.4
F	Oct 3	Alternating series. Absolute convergence.	11.5-6
M	Oct 6	Ratio and root tests.	11.6
W	Oct 8	Strategies for testing series. Introduction to power series.	11.7-8.
F	Oct 10	Power series.	11.8-9.
M	Oct 13	More on representing functions as power series.	11.9
W	Oct 15	Taylor series.	11.10
F	Oct 17	Second midterm test.	7.8, 11.1-9
M	Oct 20	More on Taylor series.	11.10
W	Oct 22	Applications of Taylor polynomials	11.11
		Differential equations	**9**
F	Oct 24	Modeling with differential equations.	9.1
M	Oct 27	Direction fields and Euler's method.	9.2
W	Oct 29	Separable equations.	9.3
F	Oct 31	Models for population growth.	9.4
M	Nov 3	Linear equations and integrating factors.	9.5
W	Nov 5	Linear equations and integrating factors.	9.5
		Parametric equations and polar coordinates	**10**
F	Nov 7	Curves defined by parametric equations.	10.1
M	Nov 10	Calculus with parametric curves.	10.2
W	Nov 12	Polar coordinates. Conic sections	10.4-5
		Partial derivatives	**14**
F	Nov 12	Functions of several variables. Limits and continuity.	14.1-2
M	Nov 17	Third midterm test.	ch. 11.10-11, 9, 10
W	Nov 19	Partial derivatives.	14.2-3.
F	Nov 21	The chain rules.	14.5
		Double integrals	**11**
M	Nov 24	Double integrals over rectangles; iterated integrals.	15.1-2
W	Nov 26	Pre-Thanksgiving Review.	
F	Nov 28	Thanksgiving holiday.	
M	Dec 1	Double integrals over general regions.	15.3
W	Dec 3	Double integrals in polar coordinates.	15.4
F	Dec 5	Change of variable in double integrals.	15.10