Syllabus: 18.01A/2A Calculus - ESG Fall 2007

Texts: Simmons: Calculus and Analytic Geometry, (same as regular curriculum).
18.01A Supplementary Notes (sold by Copy Tech, Basement Bldg. 11).

Instructor: Dennis V. Perepelitsa, (dvp)

Class times: MWTR 10, 24-621 (ESG)
For ESG to work properly you need to come to all the scheduled classes.

Class website: http://web.mit.edu/dvp/18.01A/

TA and tutorial hours: Stephanie Cheng (T7-9) Mary-Jane Tsang (M6-8)

Schedule: This is just an outline. Detailed reading assignments will be given in the weekly problem sets.

18.01A: Single Variable Calculus

1.	W	Sep. 5	Linear and quadratic approximations.	
2.	R	Sep. 6	Higher order approximations, Taylor series, Mean-value theorem.	
3.	M	Sep. 10	Indeterminate forms, L'Hospital's rule, growth rate of functions.	
4.	T	Sep. 11	Definite integral; summation notation, first fund. theorem, properties.	
	W	Sep. 12	Discussion, review and catch up.	
5.	R	Sep. 13	Second fundamental theorem, $\ln x$ as an integral.	**Problem Set 1 due**
6.	M	Sep. 17	Geometric applications: volumes, area, arclength.	
7.	T	Sep. 18	More applications: work, average value.	
	W	Sep. 19	Discussion, review and catch up.	
	R	Sep. 20	**Exam 1: covering 1-7**	
8.	T	Sep. 25	Integration: substitution, trigonometric integrals, completing the square.	
9.	W	Sep. 26	Integration: partial fractions.	
10.	R	Sep. 27	Integration by parts, numerical integration.	**Problem Set 2 due**
11.	M	Oct. 1	Improper integrals.	
12.	T	Oct. 2	Infinite series, harmonic series convergence tests.	
	W	Oct. 3	Discussion, review and catch up.	
	R	Oct. 4	**Exam 2: covering 8-12**	
13.	W	Oct. 10	Geometric series, power series, ratio test.	
14.	R	Oct. 11	Introduction to probability, discrete random variables.	**Problem Set 3 due**
15.	M	Oct. 15	Continuous random variables, standard deviation.	
16.	T	Oct. 16	Normal distributions.	
	W	Oct. 17	Discussion, review and catch up.	**Problem Set 4 due**
	R	Oct. 18	**Exam 3: covering 13-16**	

(continued)

18.02A (first half): Multivariable Calculus

17.	M	Oct. 22	Vectors, dot product.	
18.	T	Oct. 23	Determinants, cross-product.	
19.	W	Oct. 24	Matrices, inverses.	
	R	Oct. 25	Discussion, review and catch up.	
20.	M	Oct. 29	Square matrices/systems, Cramer's rule, planes.	
21.	T	Oct. 30	Parametric equations.	
	W	Oct. 31	Discussion, review and catch up.	
22.	R	Nov. 1	Vector derivatives: velocity, curvature (2 hours).	**Problem Set 5 due**
	M	Nov. 5	Continuation.	
23.	T	Nov. 6	Continuation, Kepler's second law.	
	W	Nov. 7	Discussion, review and catch up.	
	R	Nov. 8	**Exam 4: covering 17-23**	
24.	T	Nov. 13	Functions of several variables, partial derivatives.	
25.	W	Nov. 14	Tangent plane, level curves, contour surfaces.	
26.	R	Nov. 15	Tangent plane approximation, directional derivatives.	**Problem Set 6 due**
27.	M	Nov. 19	Chain rule.	
28.	T	Nov. 20	Max-min problems, least squares.	
	W	Nov. 21	No class	
29.	M	Nov. 26	Second derivative test, Lagrange multipliers.	
30.	T	Nov. 27	Non-independent variables, chain rule.	
	W	Nov. 28	Discussion, review and catch up.	
31.	R	Nov. 29	Double and iterated integrals.	**Problem Set 7 due**
32.	M	Dec. 3	Polar coordinates, double integrals in polar coordinates.	
33.	T	Dec. 4	Change of variable.	
34.	W	Dec. 5	Applications of double integration.	
	R	Dec. 6	Discussion, review and catch up.	**Problem Set 8 due**
35.	M	Dec. 10	Topic to be decided.	
	T	Dec. 11	Discussion, review and catch up.	
	W	Dec. 12	Discussion, review and catch up.	

18.02A midterm: During finals week (Dec 17-21). Day and time TBA.