Syllabus for SM121A
Calculus I
Spring Semester, 2005-2006

TEXT: *CALCULUS, Early Transcendentals*, Edition 5e by James Stewart

LESSON	SECTION	TOPIC	PROBLEMS
1	1.1	Representing functions	p. 22: 1,2,3,5,6,7,9,13,15,17,19,21,32,33,39,47, 53
2	1.2	A catalogue of essential functions	p. 35: 1,2,3,9,13,15,16,19,21
3	1.3	New functions from old	p. 45: 3,5,9,11,13,23,29
4	1.3	(continued)	p. 45: 31,35,37,45,46,55
5	App D	Trig functions	p. A32: 1,7,13,17,19,23,24,29,35,37
6	1.5	Exponential functions	p. 61: 3,5,7,13,15,23, (PARACHUTE LAB)
7	1.6	Inverse functions, logs	p. 74: 3,5,7,11,23,27,35,38,41,59,63,65,69
8		Review	
9	2.2	Limit of a function	p. 102: 1,5,7,9,13,14,15,17
10	2.3	Limit laws	p. 111: 1,2,11,13,17,25,33
11	2.3	(continued)	p. 111: 23,25,33,39,41,49
12	2.5	Continuity	p. 133: 3,5,7,15,17,37
13		Review	
14		Test 1	
15		Test 1 debrief	
16	2.6	Limits involving infinity	p. 146: 1,2,3,5,711,13,15,26,33
17	2.6	(continued)	p. 146: 39,40,53
18	2.1	Tangent	p. 91: 1,3,5,7,8 (TOWER LAB)
19	2.7	Velocity	p. 155: 3,5,12,15,17,25
20	2.8	Derivative	p. 163: 3,5,11,13,15,19,20
21	2.8	(continued)	p. 163: 21,22,23,31,33
22	2.9	Derivative as a function	p. 173: 4-10,16,21,23,37
23	3.1	Derivatives of polynomials	p. 191: 3 – 22, 41, 45,47
24	3.2	Product and quotient rules	p. 197: 3 – 18,25,31,33,35
25		Review	
26	3.3	Rate of change	p. 208: 1,7,10,13,19,21,25
27	3.4	Trig derivatives	p. 216: 3 – 12, 15
28	3.4	(continued)	p. 216: 21,25,29,31
29	3.5	Chain rule	p. 224: 1 – 13,18,21,23,41,43
30	3.5	(continued)	p. 224: 55,57,61,65,69
31		Review	
32		Test 2	
33		Test 2 debrief	p. 224: 47,55,57,61,65,67,69,71
34	3.6	Implicit differentiation	p. 233: 5,7,11,13,15

35	3.6	(continued)	p. 233: 25,27,41,43,51
36	3.7	Higher derivatives	p. 240: 1, 5,7,9,11,13,15,17,35,49
37	3.8	Derivatives of logs	p. 249: 3,5,7,9,11,13
38	3.8	(continued)	p. 249: 21,29,31,39,41
39	3.10	Related rates	p.260: 7,8,9,11,14,16,19
40	3.10	(continued)	p.260: 21,23,31,33,34
41		Review	
42	4.1	Max and min values	p. 285:1,3,5,31-36
43	4.1	(continued)	p. 285: 41,47-51,57,59
44	4.3	Derivatives and shapes	p. 304: 1,7,11,17,27,29
45	4.3	(continued)	p.304: 33,43,45,53,60
46		Review	
47		Test 3	
48		Test 3 debrief	
49	4.7	Optimization problems	p. 336: 7,9,11,13
50	4.7	(continued)	p. 336: 15,17,19,25
51	4.4	Indeterminate forms	p. 313: 1,5,9,11,17,21
52	4.4	(continued)	p. 313:41,49,59,61
53	4.5	Summary of graph sketching	p.323: 3,15,25,31,36
54	4.5	(continued)	p.323: 45,49,54,59
55	4.6	Graphing with calculators	p.330: 1,5,7,17,19
56		Review	
57	3.11	Linear approximations	p. 267: 1,11,12,13,14,17,43,49
58	Notes	Taylor polynomials	Notes
59	Notes	(continued)	Notes
60	11.2	Series (defn, harmonic series, test for div)	p. 720: 3,4,9b,22
61	11.2	(continued) (geom. Series)	p. 720: 11,13,15,17,25,27,57
62	11.6	Ratio test (just conv or div)	p. 745: 3,4,5,13
63		Review	
64	11.8	Power series	p. 753: 3,7,9,11 (no endpts)
65	11.8	(continued)	p. 753: 15,23,25
66	11.10	Taylor and Maclaurin Series	p. 770: 2,3,5,7,11,13
67	11.10	(continued)	p. 770: 23,26,27
68		Review	
69		Test 4	
70		Test 4 debrief	
71 - 74		Review for final	

NOTES

1. A web site at http://www.usna.edu/MathDept/website/local/courses/spring2006.html will have the most up to date information about the course,

including this syllabus, practice exams, web links, and especially the online labs which appear in the homework assignments (also at the site http://www.usna.edu/MathDept/website/local/courses/calc_labs/labs.html). If the Java applets don't work on your computer, try installing the newest Windows version of the Java VM, available free at http://www.java.com/en/download/manual.jsp.

2. All students in this course are expected to have a calculator like the VOYAGE 200 with the capabilities to do symbolic calculations. There will be assignments that use such a calculator as well as questions on the common final exam on which it is expected that the student has such a calculator. The above web site also has a link to a file with a list of the minimal competences expected of all students.
3. If you would like help in the course, you should contact your instructor for extra-instruction. If your instructor is not available, try the **Math Lab**. It is staffed all six class periods every class day with instructors who should be able to answer your questions. Also, hard copies of web page information will be kept there (syllabi, practice tests, etc.). There is also peer tutoring available in the evenings provided by upper classmen.
4. Exercises that ask for verbal explanations should be answered with complete sentences.

CALCULATOR NOTES

The latest version of the VOYAGE 200 guidebook in PDF format is at http://education.ti.com/us/product/tech/89ti/guide/guidesgsVoy.html

Appendix C: Note, for example, that tExpand(sin(x+y)) gives the sum formula. One way to change from degrees to radians is to enter 2nd D (for degrees) in radian mode. One way to reverse is to use 2nd Y D D (decimal degrees).

1.1 Be sure you can define your own functions on the calculator, either by define or store. (Piecewise functions are hard to enter - beyond the course expectations.)

1.4 Using Y=, GRAPH, TABLE gives a function algebraically, visually, and numerically. If a graph is taking too long to draw, the ON key interrupts.
Zoomdec (F2 4) gives correct aspect ratio - makes circles circular.
To get roughly Figure 6, change the xmin/xmax window to plus or minus a)15, b)12.5, c)11.25, d)7.5.
To get Figure 11, try x^(1/3.) - note decimal point

1.4 Use the calculator to compose functions. Sometimes g(f(x))will give an error. It can be avoided by defining f and g using a variable other than x (say t) but then using x for the composition. Try drawing shifted and stretched graphs with the calculator. In the Y= screen, F4 unchecks/checks a function to not draw/draw it and F3 may be needed to edit (change) a function or clear and re-enter it.

1.7 The MODE key allows one to change Graph-parametric. Under Y= menu, F1 toolkit, 9 Format, Graph order 2 simultaneous, allows checking for simultaneous collision. Lead cursor ON to see cos(3t) sin(3t) 3 times.

2.1 All the many points in a problem like number 9 can be done quickly by defining a secant slope function on the calculator. For example, define f(x) then use ((f(x)-f(1))/(x-1))|x={2,1.5,1.4,1.3,1.2,1.1}. Old assigned variables can cause errors - recommend using single letter variable names and then erasing with F6.

2.2 The VOYAGE 200 takes limits! For example define g(x)=x/x. Then g(0) is undefined. But limit(g(x),x,0)=1. And it does one sided limits, e.g. limit(abs(x)/x,x,0,-7) = -1 (where -7 can be any negative) for limit from the negative side.

2.3 Graph the floor and ceiling functions and understand in what way the calculator graphs are wrong.

2.4 Graph functions with infinite limits and understand how the calculator graphs can be wrong (drawing vertical asymptotes). The VOYAGE 200 can use (2nd J) in both ways.

2.5 The VOYAGE 200 will draw tangent lines and give the equation (graph and then use F5 math A).

Created by Profs T. J. Sanders and W. D. Withers, wdw@usna.edu.
Modified by Prof J. Lockhart jml@usna.edu