

Syllabus for SM131 Calculus I

Fall Semester, 2012-2013

TEXT: *CALCULUS, Early Transcendentals*, Seventh Edition, by James Stewart

Chpt	Wk	Lesson	Section	TOPIC	PROBLEMS	
Review 1. Functions and Models 2. Limits and Derivatives	1	1	App B, App C, App D	Coordinate Geometry & Lines, Circles, Trigonometry	p. A15: 1,9,12,18,26,27,29,36,42 p. A23: 1,4 p. A32: 3,10,13,20,23,37,59,67,88, Wave Lab	
		2	1.1	Representing Functions	p. 19: 4,7,9, 21 ,29, 34 ,35,49,50,59,62, 72 ,73	
	2	3	1.2	Math models: essential functns	p. 33: 3,4,8,13,17,19, 20 ,25	
		4	1.3	New functions from old	p. 42: 1 ,3,5,6,9,13,15,17, 20 , 21 , 28 ,35,43,50,51,55	
		5	1.5	Exponential functions	p. 57: 3 , 4 ,9,13, 15 ,20,21, 25 ,30, Parachute Lab	
	3	6	1.6	Inverse functions	p. 69: 1,3,5,6,9,11,18,19,22,29, 30 ,31	
		7	1.6	Logs and inverse trig functions	p. 70: 26,35,37,38,47,51,53,65,70	
	2. Limits and Derivatives	4	8	2.1	Tangent and velocity	p. 86: 1,3,5,7, Tower Lab
			9	2.2	Limit of a function	p. 96: 2,6,7,8,11,13, 17 , 18 ,30,33,38,46
			10	2.3	Limit laws	p. 106: 1,2,5,7,11,15,17,21,29, 39 ,47,48, 60
			11	2.5	Continuity	p. 127: 1 ,4,5,7,10, 21 ,43,46,51, 53 ,63
		5	12	2.6	Limits involving infinity	p. 140: 1 ,2,3,7,12,17,19, 20 ,23,25,44,61
			13		Review	
			14		Review	
		6	15		Test 1	
16			2.7	Derivatives & rates of change	p. 150: 1 ,3,7,11,14, 17 , 18 , 19 , 20 , 21 ,27,29, 32 ,34,37,44,47	
3. Differentiation Rules		6	17	2.8	Derivative as a function	p. 162: 1,3,6,9,10, 16 ,23&27(PROOFS),40,43, Radar Lab
	18		3.1	Derivatives of polynomials	p. 181: 3,6,7,10,13,18,19,23,25,29,31,38,51,71,74	
	7	19	3.2	Product and quotient rules	p. 187: 1,4, 6 ,21,26,33,43,49,50	
		20	3.3	Trig derivatives	p. 197: 1,2,5, 6 ,15,17, 18 , 23 ,25, 34 ,35,39,40, 51	
		21	3.4	Chain Rule	p. 205: 1,5,7, 9 ,13,15,23, 30 , 34 ,40,49,55,61,62,63, 67 , 76,83, 92 (PROOF)	
	8	22	3.5	Implicit differentiation	p. 215: 3,8, 10 , 12 ,21,27,29,47, 50 ,51, 62 ,67,77	
		23	3.6	Derivatives of logs	p. 223: 2,3,7,11,23,26,27, 34 , 39 ,41, 42 ,43,48	
	9	24	3.7	Rates of change	p. 233: 1,8,11,13,15,17,30, 33	
		25	3.9	Related rates	p. 248: 6,11,15,18,20,27,30,31,33,35,40,46, Rates Lab	
		26	3.10	Linear approximations	p. 253: 1,2,5,23, 26 ,32,43	
4. Applications of Differentiation	10	27		Review		
		28		Review		
	11	29		Test 2		
		30	4.1	Max and Min Values	p. 280: 5, 6 ,9, 11 ,22,28,30,38,43,47,49,56	
		31	4.2	Mean Value Theorem	p. 288: 1,7,11,13,15,17, 29 , 34	
	12	32	4.3	Derivatives and Shapes	p. 297: 1,3,6,7,9,16,19,25, 26 ,31, 33 ,45,47, Prove the Increasing Test (p. 290)	
		33	4.4	Indeterminant forms/L'Hospital	p. 307: 1,2,5, 6 , 14 ,17, 21 ,25,33,34,39,45,46, 51 ,53, 55 ,57,61	
		34	4.5	Summary of curve sketching	p. 317: 1,3,9,12,15,22,31, 42 ,49	
		35	4.7	Optimization problems	p. 331: 2 , 4 , 11 ,14,23	
	13	36	4.7	(continued)	p. 332: 32,34,35,46,51,74	

re nti ati on		37	4.9	Antiderivatives	p. 348: 2, 12 ,15, 17 ,25, 30 ,33,45, 49 , 51 , 54 ,61,74
	14	38	5.1	Areas and Distances	p. 369: 2,4,10,13,18, 21 , Deck Lab
		39	5.2	The Definite Integral	p. 382: 1,5,7,10,17,18,34,37,40,48,49
5. Int eg ral s	15	40	5.3	The Fundamental Thm of Calc	p. 395: 3,9,11,17,19, 24 , 26 ,29,30, 31,32,40, 42 ,43,45,57,67, FTC applet
		41	5.4	Indefinite Integrals	p. 403: 1 ,3,10,16,19,25,27,39,52,62, 68
		42		Review	
		43		Review	
	16	44		Test 3	
		45		Review for Final Exam	

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NOTES:

- All students should use the access card information from their individual textbook to enroll in WebAssign. Even if their instructor does not use WebAssign this semester, they should enroll now so that they will be able to use it in future semesters. **Boldface** problems in this syllabus are not available in WebAssign.
- A web site at <http://www.usna.edu/MathDept/website/local/courses/fall2013.html> will have the most up-to-date information about the course, including this syllabus, practice exams, web links, and the online labs which appear in the homework assignments (also at http://www.usna.edu/MathDept/website/local/courses/calc_labs/labs.html).
- Three proofs are assigned in the syllabus. At least one of them will be asked for on the final exam. The goal is for students to participate in the rigorous justification of a few mathematical concepts, thereby gaining a better appreciation of that aspect of mathematics and a better understanding of those concepts. The proofs are:
 - Proving the formula for the derivative of a second-degree polynomial or quadratic root from the definition as in Lesson 17, Section 2.8, exercises 23 or 27.
 - Proving the quotient rule using the product rule and chain rule as in Lesson 21, Section 3.4, exercise 92.
 - Proving the Increasing/Decreasing Test, Lesson 32, Section 4.3, page 290.
- 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** in CH130. It is staffed all six class periods every class day with instructors who should be able to answer your questions. Also see the Midshipmen Group Study Program (MGSP) for group study in the evening led by upper classmen.
- Exercises that ask for verbal explanations should be answered with complete sentences.
- All students in this course are expected to have the TI-Nspire CX CAS calculator with the capability of doing 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. There will also be problems for which no calculator is allowed. An on line handbook for the calculator is available at: <http://education.ti.com/calculators/downloads/>
- Classes on Tuesday, 04 September will follow a Monday schedule. The last day of classes is Friday 07 December. There's a Review & Study day scheduled for Monday 10 December. There are 45 class days in the MWF schedule. The Final Exam period is 11 December – 18 December.
- There will be two “gateway” quizzes: one on precalculus and one on differentiation. For samples and explanation see: <http://www.usna.edu/MathDept/website/local/courses/gateways/gateways.html>