THE COLLEGE OF STATEN ISLAND, CUNY
DEPARTMENT OF MATHEMATICS

MATH 231 – CALCULUS I
COURSE OUTLINE

Text: Rogawski, Calculus – Early Transcendentals,
        W. H. Freeman & Co. (2008)
        ISBN-13:   978-1-4292-1073-7
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Note: The above textbook includes multi-variable calculus. If you do NOT intend to
        take MTH 232, 233, you may instead purchase Rogawski, Single Variable
        Calculus: Early Transcendentals.

Note: Below, each lesson corresponds to a one-hour class. Homework problems in **bold**
        correspond to similar WeBWorK problems, which must be submitted online.

Lesson	Section	Topic	Homework Problems
1	1.1	Functions and graphs	**17, 49, 51,** 63, **67,** 70
2	1.2	Linear and quadratic functions	1.2/ 21, **25, 29, 37, 39**
	1.3	Basic classes of functions	1.3/ 23, **29, 31**
3	1.4	Trigonometric functions	**3,** 7, **19, 21, 23,** 41
4	1.5	Inverse functions	**3,** 17, **31, 33, 39, 43, 49**
5	1.6	Exponential and logarithmic functions	1, **7,** 9, **25, 27, 29, 35**
6	2.1	Limits and rates of change	**1, 7, 15, 23, 29**
7	2.2	Limits: Numerical and graphical	**21, 23, 25, 27, 31, 37,** 39, 45, 47
8	2.3	Limit laws	**17, 19, 21, 25, 27,** 29
9	2.4	Continuity	**1,** 5, **19, 23, 25, 27,** 55, **67, 73,** 79
10	2.5	Evaluating limits algebraically	**9, 15, 19, 25, 27, 39, 47, 49, 51**
11	2.6	Trigonometric limits	**7, 9, 13, 23, 25, 27, 35**
12	2.7	Intermediate Value Theorem	2.7/ 3, 5, 7, 9, 15
	2.8	Formal definition of a limit	2.8/ 1, 3, 5, 13
13		Review	
14		Review	
15		**Exam 1**	
16	3.1	Definition of the derivative	**7, 11, 13,** 21, 23, **53, 55, 57**
17	3.2	Derivative as a function	**11, 27, 39,** 47, 49, **55, 57,** 71
18	3.3	Product and quotient rules	**23, 31, 33, 35,** 45, 51, **53**
19	3.4	Rates of change	**5, 7,** 9, 11, **13**
20	3.5	Higher derivatives	**13, 17, 19, 27, 29,** 39, 41, **53**
21	3.6	Trigonometric functions	**9, 13, 15, 17, 21,** 37, **43**
22	3.7	Chain rule	**5, 7,** 11, **13, 19, 35, 39,** 51, **77,** 79, 93
23	3.8	Implicit differentiation	**5, 11, 17, 25,** 31, **41**
24	3.9	Derivatives of inverse functions	3.9/ 3, **9, 11, 13, 15,** 19
	3.10	Derivatives of exponentials and logs	3.10/ 1, **7, 9, 17, 35,** 43

25	3.11	Related rates	**5, 9, 15, 17, 21, 25, 27,** 29, **31**
26	3.11 cont'd	Related rates	
27		Review	
28		Review	
29		**Exam 2**	
30	4.1	Linear approximation	**9, 13, 15, 19,** 31, 33, **41, 45, 49**
31	4.2	Extreme values	1, **7, 11, 15, 39, 47, 53,** 61
32	4.2 cont'd	Extreme values	
33	4.3	First derivative test	**1, 13, 21,** 23, **29, 33, 35, 39,** 45, **51**
34	4.3 cont'd	First derivative test	
35	4.4	Second derivative test	1, 2, **5, 9, 13, 17, 29, 33, 43, 45,** 57
36	4.5	Graph sketching and asymptotes	**1,** 11, 21, 29, 49, **53, 57,**
37	4.5 cont'd	Graph sketching and asymptotes	**63, 65, 67, 73,** 75, 77
38	4.6	Optimization	**3, 5, 9, 11, 13, 15,** 19, 21, 43, **47**
39	4.6 cont'd	Optimization	
40	4.7 4.8	L'Hopital's Rule Newton's method (optional)	4.7/ **27, 31, 33, 35, 43, 45, 47,** 61
41		Review	
42		Review	
43		**Exam 3**	
44	4.9	Antiderivatives	**25, 27, 33, 43, 45, 65, 67,** 69, 75
45	4.9 cont'd	Antiderivatives	
46	5.1	Approximating area	**13, 15, 17, 21, 23,** 27, 57
47	5.2	Definite integral	9, **13,** 17, **29, 37, 57,** 83
48	5.3	Fundamental Theorem of Calculus I	**9, 17, 23, 27, 37, 43, 45, 51,** 55, 57
49	5.3 cont'd	Fundamental Theorem of Calculus I	
50	5.4	Fundamental Theorem of Calculus II	**5, 15, 21,** 23, 25, **31, 33, 37,** 39, 43
51	5.5	Net change (optional)	**1, 3, 5, 7, 11, 13, 17**
52	5.6	Integration by substitution	**33, 35, 37, 39, 43, 47, 51, 67, 69,** 73, 75, 85, **91**
53	5.7	Integration of transcendental functions	**3, 7, 13, 17, 43**
54	5.8	Exponential growth and decay (optional)	**1, 5, 9, 11, 17, 23, 33,** 41
55		Review	
56		Review	