

College of Staten Island, City University of New York (CUNY)

## Math 231 (Section 3036 ): Spring 2012 Syllabus

### Analytic Geometry and Calculus I

Instructor: **Joseph Maher**

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Office hours: M 2:30-4:25 W 2:30-3:20

Course location: M 10:10 - 12:05 3S-111

W 10:10 - 12:05 1S-102

Textbook: Rogawski, *Calculus, Early Transcendentals*, ET edition, W.H. Freeman  
ISBN: 14292-95031

Grading policy: 20% Homework and attendance

50% Midterms

30% Final

Additional info:

Disability policy: Qualified students with disabilities will be provided reasonable academic accommodations if determined eligible by the Office for Disability Services. Prior to granting disability accommodations in this course, the instructor must receive written verification of student's eligibility from the Office of Disability Services, which is located in 1P-101. It is the student's responsibility to initiate contact with the Office for Disability Services staff and to follow the established procedures for having the accommodation notice sent to the instructor.

Integrity policy: CUNY's Academic Integrity Policy is available online at  
<http://www.cuny.edu/about/info/policies/academic-integrity.pdf>

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  
ISBN-10: 1-4292-1073-7

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

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

## ROLE IN CURRICULUM

### LEARNING GOALS AND ASSESSMENT PLAN

Learning Goal	Assessment
Compute by hand limits, derivatives and integrals of simple combinations of algebraic and transcendental functions.	NA
Understand the geometric meaning of derivatives and anti-derivatives	NA
Solve applied optimization problems.	NA
	NA

When assessment activities are done, the results will be summarized in memorandum form and filed with the department chairperson for record keeping purposes.

Information obtained from assessment will be used to assess and self-reflect on the success of the course and to make any necessary changes to improve teaching and learning effectiveness.

## Undergraduate Catalog Course Description

### College of Staten Island

Course prefix:	MTH
Course number:	231
Course title:	Analytic Geometry and Calculus I
Subject	Mathematics
Minimum credits:	3.0
Maximum credits:	3.0
Hours per week:	4.0
Course description:	The first of a three-semester sequence in calculus. Topics include limits, derivatives, rules of differentiation, trigonometric functions and their derivatives, differentials, graph sketching, maximum and minimum problems, related rates, antiderivatives, areas, exponential and logarithmic functions.
Prerequisite:	MTH 123 with a grade of A or MTH 130 or an appropriate score on the CUNY Mathematics Assessment Test or permission of the Department of Mathematics.
Comments:	MTH 229.