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

Math 231 (Section 28604): Fall 2024 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: MW 4:40-6:20 1S-115

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

Grading policy: 10% Homework and attendance

50% Midterms

40% 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`

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THE COLLEGE OF STATEN ISLAND, CUNY
DEPARTMENT OF MATHEMATICS

MATH 231 – CALCULUS I
COURSE OUTLINE

Text: Rogawski, Adams & Franzosa, Calculus – Early Transcendentals, 4th Edition.
W. H. Freeman & Co. (2019).
ISBN: 9781319411671 (e-book ISBN: 9781319411657)
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	**13**, **14**, **18**, 21, **25, 33**, **37, 41, 43** **3,** 7, **13**, **15**, **19, 21**, 47
2	1.5 1.6	Review: Inverse functions Review: Exponential and log functions	**3, 4, 28, 30, 35**, **38, 39, 49, 51, 55** **5,** 7, **20, 26**, **27**, **29, 31, 32, 40**
3	2.1 2.2	Instantaneous velocity and tangent lines Investigating limits	**1, 4, 18, 21,** 26, **29** **1**, 7, **9, 21, 23**, 25, 30, **34, 36**, 57, 61
4	2.3	Basic limit laws	**4**, 5, 9, 18, **19, 21, 29, 31**, 33
5	2.4	Limits and continuity	1**, 17, 19, 22**, **27,** 57, **65**, 73, **79, 85**
6	2.5	Indeterminate forms	**5, 7**, 9, **17**, **21, 27, 29**, **35, 45**, **51, 53**, 54
7	2.6	The squeeze theorem and trig limits	**6, 12**, 17, **21, 25, 29**, **33, 34**, **36**, **44**, **49**
8	2.7	Limits at infinity	**7, 8,10,14,19, 22, 34, 42**
9	2.8	Intermediate Value Theorem	3, 5, 7, 9, 15
10	3.1	Definition of the derivative	6, **9**, 13, **17, 18**, **22, 26,** 29**, 57, 59, 61**
11	3.2	Derivative as a function	**9, 11, 17, 23**, **32, 35**, **37, 43**, 45, **56, 57**, **65**, 70, 72
12	3.3	Product and quotient rules	**6, 8, 9, 21, 23, 32, 33, 37, 41, 47**, 51, 61
13	3.3	Product and quotient rules	
14	3.4	Rates of change	**2**, 7, 9, 10, 22, **29, 30, 43**
15		Review	
16		**Exam 1**	
17		**Exam 1**	
18	3.5	Higher derivatives	**5, 9, 11, 19**, **21, 27**, 39, 41, **42**

19	3.6	Derivatives of trig functions	**1, 7, 10, 17, 18**, 23, 29, **43**
20	3.7	The chain rule	**5, 7, 13, 15, 29, 37, 38, 45, 49**, 57, 93
21	3.7	The chain rule	
22	3.8	Implicit differentiation	**3, 5, 13, 19, 25, 30, 35, 43, 56, 87**
23	3.9	Derivatives of exponentials and logs	**1, 3, 7, 9,** 17, **45,** 47
24	3.10	Related rates	**3**, **5**, **9, 13**, 15, **16**, 19, **21**, **25**, **29**
25	3.10	Related rates	
26	4.1	Linear approximation	**5**, **7, 9**, **13, 15, 17, 19,** 23, **28**, 29, **33,** 45, **48**
27	4.2	Extreme values	**4**, **9**, **17**, **21**, **41, 49**, **57**, 67
28	4.2	Extreme values	
29	4.3	The Mean Value Theorem and mono-tonicity	**1**, 15, **16**, 17, 25, **26**, **34**, **38**, **39**, **46, 55**, **59**
30	4.3	Monotonicity	
31	4.4	The second derivative and concavity	**1**, 2, 9, **11, 15, 20**, **22**, **29,** 43, 54, **57**, 65
32	4.4	The second derivative and concavity	
33	4.5	L'Hôpital's Rule	**8, 12**, **16**, **19, 22**, **23**, **31**, **40**, **43, 46,** 67
34	4.6	Sketching graphs	1, 13, **19, 28**, **31**, **34**, 38, 45, **54**, 57
35	4.6	Sketching graphs	
36	4.7	Applied optimization	**1**, 8, 13, **15**, **16**, **24**, 28, 29, **32**, **35**, **45**, **59**
37	4.7	Applied optimization	
38		Review	
39		**Exam 2**	
40		**Exam 2**	
41	5.1	Approximating and computing area	**3**, **19, 21, 26,** 47, 79
42	5.2	The definite integral	**8**, 9, **13**, **18**, **22,** 25, **31**, 43, **47**, **58**
43	5.2	The definite integral	
44	5.3	The indefinite integral	**3**, **5**, **7**, **14**, **16**, **17**, **19, 22**, **24**, **27**, 32**, 38**, **47**, **51, 66**
45	5.3	The indefinite integral	
46	5.4	The fundamental Theorem of Calculus I	**10, 11**, **13**, 25, **33,** 35, 37, 40, **45, 47**, **53**, 55, 62

47	5.5	The fundamental Theorem of Calculus II	**14**, **15**, **19**, **21**, **22**, **25**, **27**, **28**, **33**, **34**, **37**, 39, 41, 43, 47
48	5.7	The substitution method	**29, 30, 35, 38, 48, 53, 63, 67, 73, 87, 97**
49	5.7	The substitution method	
50	5.8	Further integral formulas	**3, 9,** 17, 20**, 47, 48, 50,** 57
51	5.8	Further integral formulas	
52		Review	
53		**Exam 3**	
54		**Exam 3**	
55 56		Final review Final review	

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
Maximum credits:	3
Hours per week:	4
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.