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

Math 230 (Section 6991): Fall 2011 Syllabus

Caluculus I with Precalculus

Instructor: **Joseph Maher**

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Course location: MWTh 4:40 - 6:20 1S-112/1S-219/1S218

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 230 – CALCULUS I WITH PRECALCULUS
COURSE OUTLINE

Text: Rogawski, <u>Calculus – Early Transcendentals</u>,
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, <u>Single Variable
Calculus: Early Transcendentals</u>.

Note: Below, each lesson corresponds to a two-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	1.1/ **13,15,49,51,67**
2	1.2	Linear and Quadratic Graphs	1.2/ 21, **25**, 29, **31, 33, 37, 39**
3	1.3	Basic Functions: Polynomials, Rational Functions, Composition of Functions	1.3/ 6,7,8,11, **19**, **25**, 27,28,30
4	1.4	Trigonometric Functions: sin(x), cos(x), tan(x). Definitions of sec(x), csc(x), cot(x)	1.4/ **3**, 7, **19, 21**
5	1.4	Trigonometric Identities: Pythagorean identity, addition formula, double-angle. Law of cosines	1.4/ **23, 24, 27**,38, 41, 45
6	1.5	Inverse Functions	1.5/ **3**, 17, **31, 33, 39, 43, 49**
7	1.6	Exponential and Logarithmic Functions	1.6/ 1, **3, 7**, 9, **25, 27, 29, 35**
8	2.1	Limits and rates of change	2.1/ **1,3, 7,8, 15, 23, 29**
	2.2	Limits: Numerical and graphical	2.2/ 5,8,**21, 23, 25, 27, 31, 37**, 38
9	2.3	Limit laws	**2.3/ 13,15,17, 19, 21, 25, 27**
	2.4	Continuity	**2.4/1,3,** 5, 7, **19, 23, 25, 27, 67, 73,** 77
10	2.5	Evaluating limits algebraically	2.5/ 1,**9, 15, 19, 25, 27, 39, 47, 49, 51**
	2.6	Trigonometric limits	2.6/ **7, 9, 13, 23, 24,25, 27, 35,41**
11	2.7	Intermediate Value Theorem	2.7/ 1, 3, 5
	2.8	Formal definition of a limit	2.8/ 1, 3, 5
12		Review	
13		**Exam 1**	
14	3.1	Definition of the derivative	3.1/ 1,3,5, **7, 11, 13, 53, 55, 57**
15	3.2	Derivative as a function	3.2/ 1,3,**11, 12, 24, 27, 39, 55, 57**
16	3.3	Product and quotient rules	3.3/ 13,14, **23, 31, 35, 53**
17	3.4	Rates of change	3.4/ **5, 7**, 9, 11, **13,15, 20,31,33,35**
18	3.5	Higher derivatives	**3.5/ 17, 19, 29, 53**
	3.6	Trigonometric functions	**3.6/ 9, 15, 17, 21, 33,43**

19	3.7	Chain rule	3.7/ 3,**5, 6, 7, 19, 35, 39, 77**
20	3.8	Implicit differentiation	3.8/ 1,2,**5, 11, 17,** 31, **41,43**
21	3.9 3.10	Derivatives of inverse functions Derivatives of exponentials and logs	3.9/ 3, 7, **9, 11, 13, 15, 23, 27** 3.10/ 1, **7, 9, 17, 27,35,** 37
22	3.11	Related rates	3.11/ 3, **5, 9, 15, 17, 21, 25, 27,** 29, **31**
23		Review	
24		**Exam 2**	
25	4.1	Linear approximation	4.1/ **9, 13, 15, 19, 25, 41, 45, 49**
26	4.2	Extreme values	4.2/ 1, **7, 11, 15, 39, 47, 53,** 65
27	4.3	First derivative test	4.3/ **1, 13, 15, 16, 21, 29, 33, 35, 39, 51**
28	4.4	Second derivative test	4.4/ 1, 2, 4, **5, 9, 13, 17, 29, 33, 43, 45**
29	4.5	Graph sketching and asymptotes	4.5/ **1, 5,**11, 15, 21, 29, 49, **53, 57, 63, 65, 67, 73,** 75, 77
30	4.6	Optimization	4.6/ 1, **5, 9, 11, 13, 15,** 19, 21, 22, 41, 43, **47**
31	4.7 4.8	L'Hopital's Rule Newton's method (optional)	4.7/ 11,13, **27, 31, 33, 35, 43, 45, 47,** 61 Matlab Project
32		Review	
33		**Exam 3**	
34	4.9	Antiderivatives	**4.9/ 7,8,25, 27, 33, 43, 45, 47, 65, 67,** 69, 75
35	5.1	Approximating area	**5.1/ 2,3, 13, 15, 17, 21, 23**, 27, 57
36	5.2	Definite integral	5.2/3,7, 9, **13**, 17, **29, 37, 57**, 83
37	5.3	Fundamental Theorem of Calculus I	**5.3/ 9, 17, 23, 27, 37, 43, 45, 51,** 55, 57
38	5.4	Fundamental Theorem of Calculus II	**5.4/ 5, 15, 21,** 23, 25, **31, 33, 37,** 39, 43
39	5.5	Net change (optional)	**5.5/ 1, 3, 5, 7, 11, 13, 17**
40	5.6	Integration by substitution	**5.6/ 33, 35, 37, 39, 43, 47, 51, 67, 69,** 73, 75, 85, **91**
41	5.7 5.8	Integration of transcendental functions Exponential growth & decay (optional)	**5.7/ 3, 7, 13, 17, 27, 33,43,47,57** **5.8/ 1, 5, 9, 11, 17, 23, 33,** 41
42		Review	

ROLE IN CURRICULUM

MTH 230 is the first course of a three-semester sequence in calculus. Students may instead take both MTH 130 and MTH 231

LEARNING GOALS AND ASSESSMENT PLAN

Learning Goal	Assessment
Solve equations and manipulate expressions with trigonometric, inverse trigonometric, polynomial and rational functions.	NA
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

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:	230
Course title:	Calculus I with Pre-Calculus
Subject	Mathematics
Minimum credits:	6.0
Maximum credits:	6.0
Hours per week:	6.0
Course description:	Pre-Calculus material including functions, inverse functions, identities, theory of equations, and the binomial theorem. Material on calculus and analytic geometry corresponding to MTH 231 including limits, derivatives, rules of differentiation, trigonometric functions and their derivatives, differentiation, graph sketching, maxima/minima problems, related rates, antiderivatives, exponential and logarithmic functions.
Prerequisite:	MTH 123 with a grade of B or better or an appropriate score On the CUNY math proficiency/placement exam or permission of the Department of Mathematics.
Comments:	MTH 229.