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Calculus I with Pre-Calculus Syllabus

Ying Yu

CUNY College of Staten Island, ying.yu@csi.cuny.edu

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Math 230: Calculus I with Pre-Calculus (8921), Spring 2022

College of Staten Island/CUNY

Instructor: Ying Yu (she/her)

Email: ying.yu@csi.cuny.edu

The math department phone #: (718)982-3600

Lecture time: Mon, Wed & Fri 4:40 PM – 6:20 PM

Location of class meetings: Building 1S (Mathematics department), Room: 102

Class schedule: Jan 28th – May 24th, 2022.

Office Hours: Monday & Wednesday 6:30-7:30 PM in 1S – 214.

Extra Help on Zoom: by appointments

If you have any questions regarding course material, assignments, or/and assessments, please contact me through email, I will respond your request in a timely manner. If you have problems with your online homework login or general information about your academics, you can contact the IT technician Lewis through his email: lewis.carbonaro@csi.cuny.edu providing your student id, your name, and course number/section. He will assist you further.

Credit Hours: 6 hours per week; 6 credits.

Course Description: This course will cover essential topics in both Pre-calculus and Calculus. Pre-calculus material includes functions, inverse functions, identities, theory of equations, and the binomial theorem. Material on calculus and analytic geometry corresponding to MTH 231 includes limits, derivatives, rules of differentiation, trigonometric functions and their derivatives, differentiation, graph sketching, maxima/minima problems, related rates, antiderivatives, exponential and logarithmic functions. (math). This course is **Not** open to students who have completed MTH 130.

Prerequisite: MTH 123 with a grade of B or better or an appropriate math placement or permission of the Department of Mathematics

Corequisite: MTH 229 (STEM)

Learning Outcomes:

- SWBAT understand basics of functions and their graphs, function operations, and function transformation.
- SWBAT recognize various kinds of functions (including polynomial, rational, radical, exponential, and logarithmic functions), analyze their behavior, and use the properties of these functions to solve equations.
- SWBAT define trigonometric functions and evaluate its inverse functions, understand unit circle and apply identities involving trigonometric functions.
- SWBAT find limits of functions graphically, numerically, and algebraically
- SWBAT analyze and apply notions of continuity and differentiability to algebraic and transcendental functions.
- SWBAT interpret the slope of the tangent line in order to demonstrate the differentiation using the limit definition and determine derivatives by a variety of techniques including explicit, implicit, and logarithmic differentiation.
- SWBAT analyze a functions' behavior using the first and second derivatives and then sketch the graph of the function appropriately.
- SWBAT **solve** real world problems using differentiation such as related rates, optimization, and area problems.



- SWBAT approximate the areas and demonstrate the connection between area and the definite integral.
- SWBAT use basic techniques of integration to find particular or general antiderivatives.

Course Material:

- **Textbook:** Calculus – Early Transcendentals Author: Rogawski, Adams & Franzosa, 4th Edition. W.H. Freeman & Co. (2019). ISBN: 9781319411671 (eBook ISBN: 9781319411657)
- **OER Textbook:** Precalculus **Author:** Senior Contributing Author, Jay Abramson, Arizona State University. “Download for free at <https://openstax.org/details/books/precals>.”
- **Graphing Calculator:** TI-83, 84, 89, or 89 plus

Homework Assignment:

The homework for this class is done using the online system WebWork. Homework sets will be assigned after each lecture and will be closed in one week. You’re encouraged to discuss problems together. For your own benefit, you must make sure that you’re not just having other people do your work for you. Doing homework on your own will strengthen your conceptual understanding and problem solving skills, which help you study successfully in this course. Accordingly, it is imperative for the students to keep up-to-date on the homework assignments.

Homework (WebWork) Login information:

https://www.math.csi.cuny.edu/webwork2/Math230_8921_Yu_S22/

To log in, click on the appropriate section to the left, your username is your 1st initial, full last name, and last four digits of your new CUNYFirst student ID.

For example: Jane Smith, CUNY First ID is 12348765,

Her username: jsmith8765

PW: jsmith8765

Naturally, you may change your password after logging in. Please remember to keep it in a safe place.

Extra Credit Quizzes:

There will be three extra-credit quizzes that are given before each midterm exam. The credits you earn on each quiz will be added to each of the three midterm exams.

Exams:

There will be three midterm exams, and one cumulative final exam given during the regular class (lecture) hours. Dates are on course calendar syllabus and on Blackboard. **The midterm and/or final exam for this course are required to conduct in person, on campus at CSI. Under normal circumstances there will be no make-up exams.**

Attendance and Participation:

Attendance is required. A student who misses more than **Five** class days without a legitimate reason may be assigned a grade of WU (withdrew unofficially—counts as F). Two lateness’s equal to one absence. If you miss a class (or a portion thereof), it is your responsibility to get the information.

Intellectual Dishonesty:

College of Staten Island regards acts of academic dishonesty (e.g., plagiarism, cheating on examinations, obtaining unfair advantage, and falsification of records and official documents) as serious offenses against the values of intellectual honesty. It is possible that some of the students will be randomly selected to be examined orally as an additional component to their final examination. The college is committed to enforcing the CUNY Policy on Academic Integrity and will pursue cases of academic dishonesty according to the Hunter College Academic Integrity Procedures.



You must work independently on quizzes and exams. Students who receive any help or google online during a quiz or examination are considered cheating and may receive a grade of “F” for the test or the course.

Policies on missed or late exams and assignments:

If you had any emergency that you could not take the exams, please contact me as soon as possible. You must provide a legitimate proof to be allowed to take a make-up assessment.

If you were late to not have enough time to complete your test with a legitimate emergency, I would allow you to complete your test in my office hours afterward or take a make-up exam according to the situation.

If you missed any homework assignment, you would be allowed to complete it within two days upon reopening the assignment on WebWork. However, your grade will be reduced by **10%** of each day late submission. You will be only allowed to make up **three** missing homework assignments through the semester.

Grading Policy:

Category	Percentage
Homework	10%
Exam 1	20%
Exam 2	20%
Exam 3	20%
Final	30%
Total	100%

Tutoring Services on Campus:

Academic Support’s Center for Academic Student Assistance (CASA)

Free tutoring is offered through Academic Support’s Center for Academic Student Assistance (CASA).

Please take this opportunity to study/review the material with some tutors. They offer seven days a week — both **on campus and online**.

CASA offers free tutoring in a wide variety of subjects both in the Humanities and Social Sciences and in Business, Science, Technology, Engineering, and Mathematics. Tutoring is currently offered both on campus and online, through Blackboard Collaborate; students may access CASA’s tutoring sessions at the following:

<https://www.csi.cuny.edu/students/academic-assistance/tutoring>

The Math Department:

Free math tutoring is also offered by the math department from Monday to Thursday in 1S-214. You do not have to make an appointment to get help on your homework assignments and/or test preparation.

ADA Compliance:

In compliance with the American Disability Act of 1990 (ADA) and with Section 504 of the Rehabilitation Act of 1973, Hunter College is committed to ensuring educational

parity and accommodations for all students with documented disabilities and / or medical conditions. It is recommended that all students with documented disabilities (Emotional, Medical, Physical and / or Learning) consult the Office of Access ABILITY located in Room E1124 to secure necessary academic accommodations. For further information and assistance please call (718)982-2510 or email to the office at csa@csi.cuny.edu

<https://www.csi.cuny.edu/campus-life/student-services/center-student-accessibility>

The Unexpected: Unexpected things happen to everyone. If you believe these policies treat your circumstances unfairly, please see me to discuss it. I encourage you to do so as quickly as possible.



The class will not meet on the highlighted dates in yellow color.

	Monday	Tuesday	Wednesday	Thursday	Friday
January	24	25	26	27	28 First day class. Topic: functions and graphs, linear and quadratic functions
January February	31 Topic: solving quadratic equations, the basic classes of functions	1	2 Topic: trigonometric functions and inverse functions	3 Last day to add a course	4 Topic :exponential and logarithmic functions
February	7 Topic: unit circle, inverse trig functions, solving trigonometric equations	8 Classes follow Friday Schedule Topic:	9 Topic: instantaneous velocity and tangent lines investigating limits	10	11 College closed No classes
February	14 Topic: basic limit laws, limits and continuity	15	16 Topic: indeterminate forms, finding limits algebraically	17	18 Withdrawal period begins with grade of W. Topic: the squeeze theorem and trig limits
February March	21 College closed No classes	22	23 Topic: finding limits algebraically continue, limits at infinity	24	25 Topic: intermediate value theorem
March	28 Quiz one Topic: the formal definition of the limit	1 Last day to file for June 2022 graduation	2 Topic: homework help, Midterm one review	3	4 Topic: Midterm one review
March	7 Midterm one	8	9 Topic: Definition of the derivative, finding the equations of a tangent line	10	11 Topic: Derivative as a function, derivative of basic functions
March	14 Topic: Product and quotient rules, differentiability and continuity and linearization	15	16 Topic: Higher derivatives, derivatives of trig functions	17	18 Topic: The chain rule, logarithmic differentiation
March	21 Topic: Implicit differentiation	22	23 Topic: Implicit differentiation continue, find the equation of the tangent line of an equation	24	25 Topic: Derivatives of exponential and logarithmic functions
March April	28 Quiz Two Topic: Related rates	29	30 Topic: More practice on related rates, chain rule, and implicit differentiation	31	1 Topic: Midterm Two review
April	4 Midterm Two	5	6 Topic: Questions on midterm two, linear approximation	7	8 Topic: Extreme values, the first derivative test
April	11 Topic: Mean value theorem/Monotonicity	12	13 Topic: Second derivative test and concavity	14	15 Spring Recess starts
April	18	19	20	21	22 Spring recess ends
April May	25 Quiz Three Topic: L'Hopital's rule, sketching graphs	26	27 Topic: Applied optimization	28	29 Topic: Midterm one review
May	2 Midterm Three	3	4 Topic: Approximating and computing area, the definite integral	5	6 Topic: The indefinite integral, Fundamental Theorem of Calculus I
May	9 Topics: Fundamental Theorem of Calculus II	10	11 Topic: The substitute method	12	13 Topic: The substitute method
May	16 Topics: Final review	17 Last day of class meetings.	18 Final Exam	19	20

		Last day to drop a class with a grade of W.			
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