Calculus I MATH 150
Department of Mathematics and Statistics
Hunter College
Fall 2024
4.0 hours, 4.0 credits

Course Description: This is a one semester introduction to differential and integral calculus, suitable for all students majoring in science or mathematics, or any other course of study requiring calculus.

Expected Learning Outcomes:

The student will learn about functions of one variable, including the concepts of limit, continuity and the derivative. The student will be able to compute derivatives of various functions using the definition of the derivative, the power rule, the product and quotient rules, the chain rule, and implicit differentiation. The student will learn the Mean Value Theorem and the Intermediate Value Theorem. These concepts will be applied by the student to various problems involving related rates, curve sketching and optimization, and linear approximation. The student will learn about antidifferentiation and the Riemann integral, and will be able to compute Riemann integrals of some simple functions using a Riemann sum and the Fundamental Theorem of Calculus.

Prerequisites: MATH 12550 with a grade of B– or better or MATH 12400, MATH 12500, or MATH 12550, with a grade of C or better, AND coreq MATH 14000; or appropriate score on Hunter Math Placement Exam.

Required Textbook:

Essential Calculus: Early Transcendentals, 2nd Edition, James Stewart, Cengage Publishing.

Required Online Homework Manager:

LumenOHM

Topics Covered:

Chapter 1: Functions and Limits

1.3 The Limit of a Function

1.4 Calculating Limits

1.5 Continuity

1.6 Limits Involving Infinity

Chapter 2: Derivatives

2.1 Derivatives and Rates of Change

2.2 The Derivative as a Function

2.3 Basic Differentiation Formulas

2.4 The Product and Quotient Rules

2.5 The Chain Rule

2.6 Implicit Differentiation

2.7 Related Rates

2.8 Linear Approximation and Differentials

Chapter 3: Inverse Functions: Exponential, Logarithmic, and Inverse Trigonometric Functions

3.1 Exponential Functions

3.2 Inverse Functions and Logarithms

3.3 Derivatives of Logarithmic and Exponential Functions

3.4 Exponential Growth and Decay

Chapter 4: Applications of Differentiation

4.1 Maximum and Minimum Values

4.2 The Mean Value Theorem

4.3 Derivatives and the Shapes of a Graphs

4.4 Curve Sketching

4.5 Optimization Problems

4.7 Antiderivatives

Chapter 5: Integrals

5.1 Areas and Distances

5.2 The Definite Integral

5.3 Evaluating Definite Integrals

5.4 The Fundamental Theorem of Calculus

5.5 The Substitution Rule

Final Exam: The final exam for each section will be on the final exam day and time scheduled by the College for that particular section, based on the class meeting time.

Homework, Exams, and Grades:

Homework will be assigned on a regular basis and will count for 10% of your grade. We will use Lumen, which is an online homework system. You will soon receive details about how to login to Lumen.

There will be three exams and a *cumulative* final exam. The exams will count for 90% of your grade. The final will be worth two of the other exams.

Your lowest exam grade will be dropped. (If the final is the lowest grade it will be counted as one exam.) If you miss an exam, that will count as your lowest grade, so it will be dropped. If you miss the final exam you will receive a grade of WU. If you miss *two* exams prior to the final then your status in the course will be in serious jeopardy.

If you stop attending the course and do not withdraw, you will receive a grade of WU.

This course is not elegible for Pass/No Credit grading.

Academic Integrity: Hunter College 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. 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.

Disabilities: If you have a disability that you believe requires special accommodations: 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 AccessABILITY located in Room E1214B to secure necessary academic accommodations. For further information and assistance please call (212- 772- 4857)/TTY (212- 650- 3230).

Sexual Misconduct. In compliance with the CUNY Policy on Sexual Misconduct, Hunter College reaffirms the prohibition of any sexual misconduct, which includes sexual violence, sexual harassment, and gender-based harassment retaliation against students, employees, or visitors, as well as certain intimate relationships. Students who have experienced any form of sexual violence on or off campus (including CUNY-sponsored trips and events) are entitled to the rights outlined in the Bill of Rights for Hunter College.

a. Sexual Violence: Students are strongly encouraged to immediately report the incident by calling 911, contacting NYPD Special Victims Division Hotline (646-610-7272) or their local police precinct, or contacting the College's Public Safety Office (212-772-4444).

b. All Other Forms of Sexual Misconduct: Students are also encouraged to contact the College'sTitle IX Campus Coordinator, Dean John Rose (jtrose@hunter.cuny.edu or 212-650-3262) or Colleen Barry (colleen.barry@hunter.cuny.edu or 212-772-4534) and seek complimentaryservices through the Counseling and Wellness Services Office, Hunter East 1123.

Changes:. Except for changes that substantially affect implementation of the evaluation (grading) statement, this syllabus is a guide for the course and is subject to change with advance notice.