

Syllabus for Calculus II

Spring 2024, Howard University

Course & Section #: Math 157 - 03 (Honors)
Class time: Mon-Wed-Thur-Fri, 10:10-11:00am
Classroom: Academic Support Building B - #100
Website: <http://www.samuelhopkins.com/classes/157.html>

Instructor: Sam Hopkins
Email: sam.hopkins@howard.edu
Office: Annex III (Graduate School) - #220
Office Hours: Thur 9-10am (or by appointment)

Course content: This is a continuation of Calculus I. We will continue to study differentiation and integration of functions of a single real variable, with a new focus on: applications of integration; techniques for integration; polar coordinates and parametric curves; sequences, series, and power series.

Prerequisites: Math 156 (Calculus I)
Textbook: *Calculus, Early Transcendentals*, 9th Edition, by J. Stewart et al.

Grading: 35% Quizzes • Each of three Midterms 15% • Final 20%

In-class **quizzes** will happen every Thursday, except for weeks when midterms take place. There will be 11 total quizzes and your lowest 2 scores will be dropped (so 9 of the 11 quizzes will count). Additional problems for practice may be assigned but not collected.

There will be three in-class **midterms** in the semester. They will take place on Thursdays and be announced 1-2 weeks in advance. The **final** will happen after the end of classes, during finals week.

You will not receive full credit if you only write only the answers. Please always explain your work and present solutions step by step. Collaboration on graded assignments is not permitted. The use of calculators, outside notes, or other tools from the Internet, is not permitted. Don't use your phone during class, especially not during tests. **Our course is in-person: assessments MUST BE TAKEN IN-PERSON.**

Grades will be posted to the Canvas site. I may consider other factors, like class participation, when determining final letter grades, especially in borderline cases.

Detailed outline: We will cover material from Chapters 6, 7, 8, 10, and 11 of the textbook. The topics we will discuss include:

Chapter 6: Applications of Integration

- 6.1 Areas Between Curves
- 6.2 Volumes
- 6.3 Volumes by Cylindrical Shells
- 6.4 Work
- 6.5 Average Value of a Function

Chapter 7: Techniques of Integration

- 7.1 Integration by Parts
- 7.2 Trigonometric Integrals
- 7.3 Trigonometric Substitution
- 7.4 Integration of Rational Functions by Partial Fractions
- 7.5 Strategy for Integration
- 7.7 Approximate Integration
- 7.8 Improper Integrals

Chapter 8: Further Applications of Integration

- 8.1 Arc Length
- 8.2 Area of a Surface of Revolution
- 8.3 Applications to Physics and Engineering
- 8.4 Applications to Economics and Biology
- 8.5 Probability

Chapter 10: Parametric Equations and Polar Coordinates

- 10.1 Curves Defined by Parametric Equations
- 10.2 Calculus with Parametric Curves
- 10.3 Polar Coordinates
- 10.4 Calculus in Polar Coordinates
- 10.5 Conic Sections
- 10.6 Conic Sections in Polar Coordinates

Chapter 11: Sequences, Series, and Power Series

- 11.1 Sequences
- 11.2 Series
- 11.3 The Integral Test and Estimates of Sums
- 11.4 The Comparison Tests
- 11.5 Alternating Series and Absolute Convergence
- 11.6 The Ratio and Root Tests
- 11.7 Strategy for Testing Series
- 11.8 Power Series
- 11.9 Representations of Functions as Power Series
- 11.10 Taylor and Maclaurin Series
- 11.11 Applications of Taylor Polynomials

Reproduced below this line are various department- and school-wide policy statements.

Academic Code of Student Conduct (*please see Howard University handbook*): No copying, unauthorized use of calculators, books, or other materials, or changing of answers or other academic dishonesty will be tolerated. Cheating will not be tolerated. Anyone caught cheating will receive an F for the course and may be expelled from the university.

Grievance Procedure: If you have any problems with the policies or rules of this course, discuss your concerns with your instructor. If you are still unable to come to a satisfactory arrangement, you may contact (depending on your status) the Director of Undergraduate Studies, Dr. Jill McGowan, jmcgowan@howard.edu, or the Director of Graduate Studies, Dr. Henok Mawi, henok.mawi@howard.edu, and then, finally, the Chair of the Department, Dr. Bourama Toni, bourama.toni@howard.edu.

Americans with Disabilities Act: Howard University is committed to providing an educational environment that is accessible to all students. In accordance with this policy, students in need of accommodations due to a disability should contact the Office of Student Services (202-238-2420, oss.disabilityservices@howard.edu) for verification and determination of reasonable accommodations as soon as possible after admission and at the beginning of each semester as needed.

Statement on Sex and Gender-Based Discrimination, Harassment and Violence: Howard University's Policy Prohibiting Sex and Gender-Based Discrimination, Sexual Misconduct and Retaliation (aka, the Title IX Policy) prohibits discrimination, harassment, and violence based on sex, gender, gender expression, gender identity, sexual orientation, pregnancy, or marital status. With the exception of certain employees designated as confidential, note that all Howard University employees – including all faculty members – are required to report any information they receive regarding known or suspected prohibited conduct under the Title IX Policy to the Title IX Office (TitleIX@howard.edu or 202-806-2550), regardless of how they learn of it. For confidential support and assistance, you may contact the Interpersonal Violence Prevention Program (202-836-1401) or the University Counseling Service (202-806-7540). To learn more about your rights, resources, and options for reporting and/or seeking confidential support services (including additional confidential resources, both on and off campus), visit <https://howard.edu/title-ix>.