MATH 231 Departmental Syllabus

MATH 231 Course Description (As posted in the Fall 2023 description on UDSIS) Calculus topics of limits, continuity, derivatives, and applications of derivatives are developed in the context of polynomial, rational, exponential, and logarithmic function classes. First semester of a two-semester course, partial coverage of Math 241 topics.

PREREQUISITE: Requires a grade of C- or better in MATH010, or a score of 65 or better in the Math Placement Exam in accordance with current standards determined by the Department of Mathematical Sciences. See https://www.mathsci.udel.edu/courses-placement/ud-math-placement for more information.

RESTRICTIONS: Students who received credit in MATH241, MATH242, or MATH243 are not eligible to take this course without permission.

TEXTBOOKS: WebAssign Access for Larson's Calculus I with Precalculus (A One Year Course), 3rd Edition: *ISBN 9780840068330*; WebAssign Access for Stewart's Calculus: Early Transcendentals, 9th Edition: *ISBN 9781337613927.*

OTHER REQUIRED MATERIALS: WebAssign and scientific calculator.

TEXTBOOK SECTIONS AND/OR TOPICS

Each "unit" below is a 55-minute class meeting with the primary instructor. A typical semester has 59.5-61.5 units. Below is the number of units per topic for a 61.5-unit semester (58.5 units of content and 3 review days):

Title (Textbook sections)	Number of units
An Introduction to Calculus (Section 3.1)	1.5
Functions and Their Properties (1.1 & 1.2)	1.5
Limits – A Graphical Approach (3.2)	1.5
Limits – A Numerical Approach (3.2)	1
Limits – Direct Substitution (3.3)	1
Continuity (3.4)	1
Linear Functions (1.2)	1
Piecewise-Linear Functions (1.2)	1
Limits of Linear and Piecewise-Linear Functions (3.3)	1
Absolute Value Functions (1.3)	1

Title (Textbook sections)	**Number of units**
Transformations of Functions (1.3)	1
Quadratic Functions (2.1)	1
The Tangent Line Problem (4.1)	2
The Definition of the Derivative of a Function (4.1)	2
Basic Differentiation Rules (4.2)	1.5
Application – Position, Velocity, & Acceleration (4.2)	2
Power Functions (2.2)	1
Polynomial Functions (2.2)	2.5
The Intermediate Value Theorem (3.4)	1
Limits of Polynomial Function and Piecewise-Polynomial Functions	0.5
Derivatives of Polynomial Functions (4.2 & 4.3)	0.5
The Product Rule (4.3)	1.5
Composition of Functions and the Chain Rule (1.4 & 4.4)	2
Rational Functions – Introduction and Key Properties (2.6)	2
Limits at Infinity and Horizontal Asymptotes (2.6 & 5.5)	3
Graphs of Rational Functions	1
Limits of Rational Functions (3.3 & 3.5)	2
Derivatives of Rational Functions (4.1 & 4.2)	1
The Quotient Rule (4.3)	1
Extrema on an Interval (5.1)	2.5
Rolle's Theorem & the Mean Value Theorem (5.2)	2
Increasing/Decreasing & First Derivative Test (5.3)	2
Concavity & the Second Derivative Test (5.4)	3
Exponential Functions (7.1)	2
Inverse Functions (1.5)	1.5
Logarithmic Functions (7.2)	2.5
Properties of Logarithms (7.3)	1
Solving Exponential & Logarithmic Equations (7.4)	1
Limits Involving Exponential and Logarithmic Functions	1
Total	**58.5**

GRADING SCALE:

A ≥89.5%, A-≥86.5%, B+≥83.5%, B≥79.5%, B-≥76.5%, C+≥73.5%, C≥69.5%, C-≥66.5%, D+≥63.5%, D≥59.5%, D-≥56.5%, F<56.5%.

ASSESSMENT COURSE GRADE WEIGHT: Total Exams 65 – 70% (Final Exam = 20 – 25%, Two to Four Exams = 40 – 48%), Quizzes, attendance, and other class activities = 12 – 20%, Web Assign (Homework) = 12 – 15%.

Notes: Completed by Diego Penta, October 2023. Referenced Math 231 syllabi (Newark campus) from Fall 2023, Fall 2022, Fall 2021. Approved by the Foundational Math Committee.