LSU Dual Enrollment Program for Math
Math 1431 Business Calculus COURSE PROFILE 11-20-2024

LA BOARD OF REGENTS COMMON COURSE NUMBER: CMAT 2103 Applied Calculus
ETEXT: ***Calculus for Business, Economics, Life, and Social Sciences, 14e Digital Update, MyLab Math,*** **Barnett, Ziegler, Byleen**
HIGH SCHOOL COURSE CODE: 160504

CHAPTERS
1 – Functions and Graphs
2 – Limits and the Derivative
3 – Additional Derivative Topics
4 – Graphing and Optimization
5 – Integration
6 – Additional Integration

The number in parentheses indicates the number of homework exercises on that topic in MyLab Math.

Chapter 1: Equations, Inequalities, and Applications

Section 1.1 Functions (17)

Use points on a graph to identify input and output values
Evaluate functions
Find the domain of a function
Solve applications involving functions and their graphs

Section 1.3 Linear and Quadratic Equations (15)

Graph linear equations
Work with slope, y-intercept, and the slope- intercept form of a line
Write the equation of a line given two points
Find the intercepts, vertex, range, and maximum or minimum value of a parabola from its graph
Use the vertex form of a quadratic function to find information about its graph

Section 1.5 Exponential Functions (13)

Graph exponential functions
Describe transformations of the graphs of exponential functions
Use properties of exponential functions to solve equations
Solve applications involving exponential functions

Section 1.6 Logarithmic Functions (20)

Evaluate logarithms
Simplify logarithmic expressions
Solve logarithmic and exponential equations
Graph logarithmic functions

Solve applications involving logarithmic functions

Chapter 2: Limits and the Derivative

Section 2.1 Introduction to Limits (25)

Use the graph of a function to estimate limits and function values
Use the properties of limits to find limits algebraically
Sketch the graph of a function using limits and function values
Find the limit of a difference quotient
Solve applications involving limits

Section 2.2 Infinite Limits and Limits at Infinity (27)

Find infinite limits and limits at infinity using a graph
Find limits of rational functions
Find limits of functions at infinity
Describe the behavior of a rational function
Find horizontal and vertical asymptotes
Use the properties of limits to find limits algebraically
Solve applications involving limits and limits at infinity

Section 2.3 Continuity (17)

Sketch the graph of a function using limits and function values
Estimate function values and limits using the graph of the function
Use the continuity properties of functions to determine where a function is continuous
Use continuity properties to solve inequalities
Solve applications involving continuity

Section 2.4 The Derivative (18)

Find average and instantaneous rates of change
Use the four-step process to find the derivative of a function and evaluate the derivative
Use the graph of a function to determine whether the function is differentiable at a given x-value
Solve applications involving derivatives and rate of change

Section 2.5 Basic Differentiation Properties (30)

Use basic differentiation properties to find the derivative of a function
Find equation of tangent lines and values of x for the line tangent to a function is horizontal
Solve applications involving derivatives

Section 2.7 Marginal Analysis in Business and Economics (15)

Find marginal cost, revenue, and profit functions
Solve applications involving cost, revenue, and profit functions

Chapter 3: Additional Derivative Topics

Section 3.1 The Constant e and Continuous Compound Interest (13)

Evaluate and graph continuous compound interest functions
Solve equations and evaluate expressions with the constant e
Graph equations with continuous compounding

Solve applications involving e and continuous compound interest
Determine the future value of a lump sum of money
Solve applied problems involving compound interest
Determine the present value of a lump sum of money

Section 3.2 Derivatives of Exponential and Logarithmic Functions (15)

Find derivatives involving exponential and logarithmic functions
Find equations of lines tangent to graphs at particular values
Solve applications involving derivatives of exponential and logarithmic terms

Section 3.3 Derivatives of Products and Quotients (30)

Find derivatives of products
Find derivatives of quotients
Find the equation of a tangent line to the graph of a product or quotient function
Find the x-value at which the derivative of a function is zero
Solve applications involving derivatives of products and quotients

Section 3.4 The Chain Rule (34)

Work with composite functions
Find derivatives of composition functions
Find tangent lines to the graph of a composition function
Solve applications involving derivatives that require the chain rule

Section 3.7 Elasticity of Demand (10)

Find the elasticity of demand
Determine whether demand is elastic, inelastic, or has unit elasticity
Find values for which demand is elastic and inelastic
Solve applications involving the elasticity of demand

Chapter 4: Graphing and Optimization

Section 4.1 First Derivatives and Graphs (29)

Find intervals on which functions are increasing and decreasing
Find local extrema
Use or create sign charts for graphs of functions
Find critical numbers of functions
Sketch graphs of functions
Solve applications involving the graph of a function's first derivative

Section 4.2 Second Derivatives and Graphs (19)

Identify particular intervals of graphs of functions
Find inflection points
Graph function given descriptions of the first and second derivative of the function
Find the derivative of functions
Find inflection points and determine concavity algebraically
Use curve sketching techniques
Solve applications involving the graph of a function's second derivative

Section 4.5 Absolute Maxima and Minima (18)

Find absolute extrema given the graph of a function

Find absolute extrema of a function

Section 4.6 Optimization (15)

Optimize the product of two numbers
Solve area and perimeter optimization problems
Solve construction cost optimization problems
Solve geometric optimization problems
Solve maximizing revenue and profit problems
Solve inventory control optimization problems

Chapter 5: Integration

Section 5.1 Antiderivatives and Indefinite Integrals (24)

Find indefinite integrals
Find particular antiderivatives
Solve applications involving antiderivatives and indefinite integrals

Section 5.2 Integration by Substitution (21)

Reverse the chain rule to find indefinite integrals
Use the method of substitution to find antiderivatives and indefinite integrals
Find the family of all antiderivatives of a derivative
Solve applications involving antiderivatives that require substitution

Section 5.4 The Definite Integral (14)

Identify rectangles under curves
Graph and identify areas by left and right sums
Calculate Riemann sums
Use properties of the definite integral

Section 5.5 Fundamental Theorem of Calculus (25)

Compare changes in a function with the area under the graph of the function's derivative
Evaluate integrals using the Fundamental Theorem of Calculus
Find average values of functions over intervals
Solve applications involving definite integrals and the Fundamental Theorem of Calculus
Evaluate integrals using the Fundamental Theorem of Calculus
Solve applications involving definite integrals and the Fundamental Theorem of Calculus

Chapter 6: Additional Integration

Section 6.1 Area between Curves (20)

Set up a definite integral to represent a shaded area
Find the area between two curves

Section 6.2 Applications (8)

Solve continuous income stream problems
Find the future value of a continuous income stream
Solve consumers' and producers' surplus problems
Find equilibrium points, the consumer surplus, and the producer surplus