Calculus for Business & Social Sciences (Business Calculus)

Class
MATH 1325
Limits and continuity, derivatives, graphing and optimization, exponential and logarithmic functions, antiderivatives, integration, applications to management, economics, and business.

Competencies

1. To demonstrate competency in limits and continuity, the student should be able to:
    i. Find the limit of a function graphically and algebraically.
    ii. Find the limit of a difference quotient.
    iii. Find limits of a function at infinity.
    iv. Determine if a limit is infinite.
    v. Find vertical and horizontal asymptotes of a function.
    vi. Determine whether a function is continuous or discontinuous at a point.
    vii. Determine the intervals where a function is continuous.
    viii. Use continuity to solve inequalities.
2. To demonstrate competency in derivatives, the student should be able to:
    i. Find average rates of change.
    ii. Use the definition of the derivative to find derivatives of functions.
    iii. Use the derivative to find slopes of tangents to curves.
    iv. Find derivatives of powers of x, constants, sums, and differences of functions.
    v. Use the Product and Quotient Rules to find derivatives.
    vi. Use the Chain Rule and the Power Rule to find derivatives.
    vii. Find the marginal cost, marginal revenue, and marginal profit at different levels of production.
3. To demonstrate competency in exponential and logarithmic functions, the student should be able to:
    i. Evaluate exponential and logarithmic functions.
    ii. Graph exponential and logarithmic functions.
    iii. Convert equations for logarithmic functions from logarithmic form to exponential form and vice versa.
    iv. Use properties of logarithms to simplify expressions involving logarithms.
    v. Use the change of base formula.
    vi. Solve exponential equations.
    vii. Solve application problems using exponential functions.
    viii. Find derivatives of exponential and logarithmic functions.
4. To demonstrate competency in applications of derivatives, the student should be able to:
    i. Find and apply derivatives using implicit differentiation.
    ii. Solve problems that involve related rates.
    iii. Find elasticity of demand.
    iv. Determine the intervals where a function is increasing and where a function is decreasing.
    v. Find relative maxima and minima using the first-derivative test.
    vi. Determine the intervals where a function is concave upward and where a function is concave downward.
    vii. Find points of inflection.
    viii. Use the second-derivative test.
    ix. Sketch the graph of a function using information about extrema and points of inflection.
    x. Find absolute minima and maxima.
    xi. Apply the procedures for finding maxima and minima to solve problems from business and economics.
5. To demonstrate competency in indefinite integrals, the student should be able to:
    i. Evaluate indefinite integrals of basic functions.
    ii. Evaluate indefinite integrals using substitution.
    iii. Use integration to to solve problems from business and economics.

Campus Resources for Students

Weatherford:
The Academic Support Center is a free public tutoring service provided by the college, offered in LART- LL Room 2, 817-598-6278

Video tapes

Computer assisted instruction

Instructor's office hours

Course Learning Objectives

After completing the course, the student should be able to demonstrate competency in:

1. Limits and continuity.
2. Derivatives.
3. Exponential and logarithmic functions.
4. Applications of derivatives.
5. Indefinite integrals.

Required Textbooks
Mathematics with Applications in Management, Natural and Social Sciences. Lial, Hungerford, Holcomb and Mullins - Pearson 2019 (12th Ed.) MyLabsPlus access code.
Evaluation Standards

These course learning outcomes and course competencies will be assessed through the administration of a minimum of 3 in-class exams (65%), quizzes and/or homework (15%), and a comprehensive final exam (20%).

Only departmental formula sheets supplied by the instructor will be used on the exams and the final exam.

Notes, textbooks, note cards, formula sheets, or any other additional materials will NOT be approve for use on exams.

Any use will be an academic integrity violation.

Disabilities

ADA Statement:

Any student with a documented disability (e.g. learning, psychiatric, vision, hearing, etc.) may contact the Office on the Weatherford College Weatherford Campus to request reasonable accommodations. *Phone:* 817-598-6350 *Office Location:* Office Number 118 in the Student Services Building, upper floor. *Physical Address:* Weatherford College 225 College Park Drive Weatherford, TX.

Academic Integrity
Academic Integrity is fundamental to the educational mission of Weatherford College, and the College expects its students to maintain high standards of personal and scholarly conduct. Academic dishonesty of any kind will not be tolerated. Academic dishonesty includes, but is not limited to, cheating on an examination or other academic work, plagiarism, collusion, and the abuse of resource materials including unauthorized use of Generative AI. Departments may adopt discipline specific guidelines on Generative AI usage approved by the instructional dean. Any student who is demonstrated to have engaged in any of these activities will be subject to immediate disciplinary action in accordance with institutional procedures.