MATH 0024 - MODERN BUSINESS MATHEMATICS

Catalog Description

Prerequisite: Two years of high school algebra or MATH D or MATH G with grade(s) of "C" or better, or placement by matriculation assessment process
Hours: 54 lecture
Description: Applications of mathematics in economics and business contexts. Topics include tables and graphs, functions, finance (interest and exponential models), rates of change including applications and optimization, and linear programming. (CSU, UC)

Course Student Learning Outcomes

- CSLO #1: Apply rates of change to marginal analysis and business applications.
- CSLO #2: Logically present clear, complete, accurate, and sufficiently detailed solutions to communicate reasoning and demonstrate the method of solving business problems.
- CSLO #3: Translate, model, and solve applied business problems utilizing derivatives.
- CSLO #4: Construct and interpret graphs of polynomial, exponential, logarithmic, and composite functions; solve linear programming problems graphically.

Effective Term

Fall 2022

Course Type

Credit - Degree-applicable

Contact Hours

54

Outside of Class Hours

108

Total Student Learning Hours

162

Course Objectives

Upon completion of this course, the student will be able to:
1. Analyze formulas, tables, and graphs;
2. Identify and graph linear, quadratic, power, polynomial, exponential, logarithmic and composition functions;
3. Calculate compound interest, present and future values;
4. Apply exponential models in economics;
5. Evaluate rates of change (derivatives) for a variety of elementary functions and apply to marginal analysis;
6. Measure the sensitivity of demand;
7. Find and interpret optimum values related to business applications;
8. Solve linear programming problems by a graphical approach.

General Education Information

- Approved College Associate Degree GE Applicability
  - AA/AS - Comm & Analyt Thinking
  - AA/AS - Mathematical Skills
- CSU GE Applicability (Recommended-requires CSU approval)
  - CSUGE - B4 Math/Quantitative Reasoning
- Cal-GETC Applicability (Recommended - Requires External Approval)
- IGETC Applicability (Recommended-requires CSU/UC approval)

Articulation Information

- CSU Transferable
- UC Transferable

Methods of Evaluation

- Classroom Discussions
  - Example: After instructor lecture on linear programming, students will work in small groups to create a linear programming problem and then solve it. Grade based on participation.
- Problem Solving Examinations
  - Example: 1. Calculate the derivative of a rational function using the quotient rule. This problem is graded based on the completeness and correctness of the quotient rule, the algebra used in simplifying, and of the derivative found. 2. Analyze the meaning of the derivative of a profit function. This question is graded based on the correctness of the derivative found, and a clear, concise and correct analysis.
- Projects
  - Example: 1. Take home project involving research of current interest rates and calculating the amount of time it will take to save up for a major purchase using compound interest formulas. Satisfactory performance measured if students find current data on interest rates and pricing, correctly calculate the results, and communicate their solution mathematically and in writing.

Repeatable

No

Methods of Instruction

- Lecture/Discussion
- Distance Learning

Lecture:

1. Interactive lecture format to develop the concept of what a function is, and analyze the properties of the different types of functions (linear, quadratic, power, polynomial, exponential, and logarithmic). To help students see the commonalities and differences between each type of function, instructor will incorporate algebraic analysis through equations, visual analysis through graphing, and numerical analysis through evaluation. Students will participate verbally and by working various examples. (Objective 4)
2. In class small group collaborative learning activity focusing on applied business math problems involving economic models, interest, marginal cost. Following an instructor lecture on economic models, students will practice reading problems, interpreting the problems, and developing solution with peers. (Objective 1)

Distance Learning

1. In class or online discussion of problems worked by students independently (such as homework problems). For example, students and instructor will discuss methods to evaluate rates of change (derivatives) for a variety of elementary functions, and apply to marginal analysis. (Objective 1)

Typical Out of Class Assignments
Reading Assignments

1. Read the applied examples on amortization and sinking funds and be prepared to discuss in class. 2. Go online and read about the Credit Card Act of 2009 and be prepared to discuss in class.

Writing, Problem Solving or Performance

1. After reading about the Credit Card Act of 2009, create a list of the 5 major changes that you found to be most beneficial to consumers. 2. Solve applied mathematical problems in economics that use exponential models. Example: Assume that on the day you were born, your grandmother put $5000 into an account that grew at a rate of 4.5% compounded continuously. How much money would you have in the account on your 18th birthday?

Other (Term projects, research papers, portfolios, etc.)
Required Materials

- Applied Mathematics for the Managerial, Life, and Social Sciences
    - Author: Tan
    - Publisher: Cengage Learning
    - Publication Date: 2016
    - Text Edition: 7th
    - Classic Textbook?: No
    - OER Link:
    - OER:
- Mathematics with Applications in the Management, Natural and Social Sciences
    - Author: Lial, Hungerford, Holcomb, Mullins
    - Publisher: Pearson
    - Publication Date: 2019
    - Text Edition: 12th
    - Classic Textbook?: No
    - OER Link:
    - OER:

Other materials and-or supplies required of students that contribute to the cost of the course.