MATH 0842S - JUST IN TIME SUPPORT FOR MATH 42 BUSINESS CALCULUS

Catalog Description

Formerly known as MATH 842
Corequisite: Concurrent enrollment in Math 42
Hours: 36 lecture
Description: Just in time support option covering the core prerequisite skills, competencies, and concepts for Business Calculus. Intended for students who are concurrently enrolled in Math 42. Topics include numeracy; computational skills; the vocabulary of algebra; simplification, manipulation and evaluation of expressions and functions; solving and graphing linear equations and inequalities in one and two variables; solving and graphing systems of equations in two variables; factoring; algebraic operations on polynomial and rational expressions. Recommended for students taking Math 42 with little or no recent algebra knowledge. (noncredit)

Course Student Learning Outcomes

- CSLO #1: Perform mathematical operations in the context of Business Calculus problems using manipulation and simplification of real numbers.
- CSLO #2: Solve linear equations, inequalities and systems of equations as they relate to more complex and applied Business Calculus problems.
- CSLO #3: Interpret and construct graphs of linear and quadratic equations and build upon this foundation of graphing knowledge to graph rational, root, exponential and logarithmic graphs in Business Calculus.
- CSLO #4: Investigate individual attitudes towards mathematics and develop specific learning strategies, study techniques, and a fluency in mathematical communication.
- CSLO #5: Identify and utilize campus mathematics and general academic services to improve chances for academic success as needed.

Effective Term

Spring 2021

Course Type

Support course – Noncredit

Contact Hours

36

Outside of Class Hours

72

Total Student Learning Hours

108

Course Objectives

A student who successfully completes the course will be able to:
1. Apply properties of real numbers, order of operations and integer exponents to simplify mathematical expressions.
2. Solve basic linear equations, inequalities and systems of equations and extrapolate these skills to understand more complex equations, inequalities and systems in Business Calculus.
3. Set up and solve proportions and basic rational equations.
4. Expand products of polynomials and simplify polynomial expressions and equations by combining like terms.
5. Apply arithmetic, and algebraic factoring techniques to reorganize algebraic expressions and equations.
6. Graph linear and quadratic equations and extrapolate these skills to graph rational, root, exponential and logarithmic functions in Business Calculus.
7. Evaluate linear, polynomial, rational, exponential and logarithmic functions and discuss basic ideas of domain and range.
8. Apply problem solving strategies to a variety of problems and expand these skills to solve applications in Business Calculus.
9. Demonstrate fluency with mathematical vocabulary, terminology, and notation through written and oral presentation.
10. Implement student-specific learning strategies and study techniques.

General Education Information

- Approved College Associate Degree GE Applicability
- CSU GE Applicability (Recommended-requires CSU approval)
- Cal-GETC Applicability (Recommended - Requires External Approval)
- IGETC Applicability (Recommended-requires CSU/UC approval)

Articulation Information

- Not Transferable

Methods of Evaluation

- Classroom Discussions
  - Example: The following is an example of a classroom discussion that would lead into a group project started in class and finished for homework. The final product would be a group report turned in at the completion of the project. Student performance will be evaluated based on the detail provided about the students' specific project, each student's contribution to the group (as observed by the instructor and rated by peers), and the correctness of the solution given. As a class, the instructor will show the students how to graph a simple supply curve and a simple demand curve. The students will then be asked to generate supply and demand curves that are appropriate for two businesses of their choice and graph them. They will then be asked to find the equilibrium points graphically and algebraically and interpret, analyze and compare their answers.
- Objective Examinations
  - Example: The following is an example of a problem from a Math 42S exam which would entail problem solving, written explanations and objective solutions. Student performance would be evaluated based on the correctness of the solutions and on the depth of understanding displayed in written explanations to the questions asked in the problem. To solve this problem, you would need the skills learned in the support course but the problem is a Business Calculus level problem. Using the data given from the last several years of the ever-increasing number of people using social media: a. Identify the independent and

dependent variables. b. Graph the data on a Cartesian coordinate system, labeling axes and intercept(s). Write two sentences describing the meaning of any intercepts and any trends you observe. c. Draw a best-fit line through the data points. d. Determine the slope of the line through the years 2013 and 2016. Describe the slope in context. e. Use the equation you found to predict the number of users of social media in 2020. f. Do you think the trend can/will continue? At the same rate? Justify your answers using college-level writing.

- Problem Solving Examinations
  - Example: The following is an example of a problem from a Math 42S exam which would entail problem solving, written explanations and objective solutions. Student performance would be evaluated based on the correctness of the solutions and on the depth of understanding displayed in written explanations to the questions asked in the problem. To solve this problem, you would need the skills learned in the support course but the problem is a Business Calculus level problem. Using the data given from the last several years of the ever-increasing number of people using social media: a. Identify the independent and dependent variables. b. Graph the data on a Cartesian coordinate system, labeling axes and intercept(s). Write two sentences describing the meaning of any intercepts and any trends you observe. c. Draw a best-fit line through the data points. d. Determine the slope of the line through the years 2013 and 2016. Describe the slope in context. e. Use the equation you found to predict the number of users of social media in 2020. f. Do you think the trend can/will continue? At the same rate? Justify your answers using college-level writing.
- Projects
  - Example: The following is an example of a classroom discussion that would lead into a group project started in class and finished for homework. The final product would be a group report turned in at the completion of the project. Student performance will be evaluated based on the detail provided about the students' specific project, each student's contribution to the group (as observed by the instructor and rated by peers), and the correctness of the solution given. As a class, the instructor will show the students how to graph a simple supply curve and a simple demand curve. The students will then be asked to generate supply and demand curves that are appropriate for two businesses of their choice and graph them. They will then be asked to find the equilibrium points graphically and algebraically and interpret, analyze and compare their answers.

Repeatable

Yes

Methods of Instruction

- Lecture/Discussion
- Distance Learning

Lecture:

1. Using an interactive lecture format, the instructor will develop the idea of market equilibrium (a Business Calculus concept which relies on graphing systems of equations - a support course topic). To motivate the concept and start the discussion, the instructor can talk about a bakery's decisions about how many cakes they should bake each month. The students would be given the following information and asked to write a system of equations to model the situation: Suppose the unit price (in thousands of dollars) at which consumers purchase (demand) x units of a product monthly is D(x)=-(5/144)x^2+10 while the unit price at which producers supply x units of the product monthly is S(x)=(1/48)x^2+
2. At this time the instructor can take the time for "just in time remediation" and spend time discussing how to graph the functions and how to find and interpret any points of intersection. Simpler problems can be given for students who need more basic practice, then ultimately getting back to the original example and discussing market equilibrium. (Objective 2) Collaborative Learning/Distance Learning: Using small group collaborative learning activity, students will discuss parabolas - what their important features are, what they might describe, and how to tell from an equation what the graph will look like. The students will then work together on an activity where they graph data they are given, do their best to fit a parabola to the graph and then use technology to compare their graph to a technology-generated best-fit graph. The instructor will ask clarifying questions as the students complete this task. (Objective 6)

Distance Learning

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Typical Out of Class Assignments

Reading Assignments

1. Find a recent article on a business-related topic accompanied by a graph. Analyze the graph using tools learned in the class to write in words what the graph is illustrating. 2. Read the two most recent company annual reports for your chosen company. Analyze whether profit is increasing, decreasing or neither. Compare with another company. Write a sentence telling why you think the results are the same or different.

Writing, Problem Solving or Performance

1. Solve applied mathematical problems using linear models. Let S(x) represent the quantity of tomatoes, in millions of cartons, the farmers of a region in Arizona produce yearly when their tomatoes sell for x cents

per pound. Suppose that S(x) is a linear function for which S(30)=10 and S(36)=14. Find a formula for S(x). Then use the formula to determine how many cartons of tomatoes the farmers produce yearly when their tomatoes sell for 60 cents per pound. Write your answer in a complete sentence. 2. Solve applied mathematical problems using quadratic models. Example: The inflation rate in an Asian country is presently 6.4 percent. Let I(x) represent the rate x years from now. Economists believe that I(x) will decrease for a while and then begin an upward trend. More specifically, they believe that I(x)=0.06x^2-0.6x+6.4. When will the inflation rate be least during the next 8 years? Write your answer in a complete sentence.

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

Required Materials

- Intermediate Algebra
  - Author: Marecek
  - Publisher: OpenSTAX
  - Publication Date: 2017
  - Text Edition: 1st
  - Classic Textbook?: No
  - OER Link:
  - OER:
- Algebra
  - Author: The Saylor Foundation
  - Publisher: OER Commons
  - Publication Date: 2017
  - Text Edition: 7th
  - Classic Textbook?: No
  - OER Link:
  - OER:

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