



Sierra College

[Previous Page](#)



SECTION A

- 1. **Division:** Sciences & Mathematics
- 2. **Course Discipline:** MATH
- 3. **Course Number:** 0024
- 4. **Course Title:** MODERN BUSINESS MATHEMATICS
- 5. **First semester this new version/new course will be offered:** Fall 2013

SECTION B

General Course Information

- 1. **Units:** 3.0 **Variable units** N/A
- 2. **This Course is:**
Degree-Applicable Credit - Transferable

- 3A. **Cross-List:**
- 3B. **Formerly:**

Course Format and Duration

4. Standard Term Hrs per Wk		5. Standard Term Total Semester Hrs	
Lecture/Discussion:	3	Lecture/Discussion:	54
Lab:		Lab:	

Activity:		Activity:	
By Arrangement:		By Arrangement:	
Total Hrs per Wk	3	Total Hrs	54

6. Minimum hours per week of independent work done outside of class: 6

Course Preparation – (Supplemental form B required)

7a. Prerequisite(s): (Course and/or other preparation/experience that is REQUIRED to be completed previous to enrollment in this course.)

Two years of high school algebra or MATH D with grade(s) of "C" or better, or placement by matriculation assessment process

7b. Co-requisite(s): (Courses and/or other preparation that is REQUIRED to be taken concurrently with this course.)

7c. Advisory: (Minimum preparation RECOMMENDED in order to be successful in this course. Also known as "Course Advisory".)

Catalog Description And Other Catalog Information

8. Repeatability:

Not Repeatable

Please Note: 8. (Repeatability) does not refer to repeating courses because of substandard grades or a lapse of time since the student took the course. A course may be repeated only if the course content differs each time it is offered and the student who repeats it is gaining an expanded educational experience as stipulated in *Title 5*.

- Skills or proficiencies are enhanced by supervised repetition and practice within class periods.
- Active participatory experience in individual study or group assignments is the basic means by which learning objectives are attained.

Course content differs each time it is offered.

Explanation for above repeatability selection:

9a. Grading Option:

Standard Grade

9b. Catalog 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.

Course Outline Information

10. Student Performance Objectives: (Performance objectives for **all** credit courses must indicate that students will learn critical thinking and will be able to apply concepts at college level. Performance objectives must be related to items listed in Section 11.)

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.

11. Course Content Outline: (Provides a comprehensive,

sequential outline of the course content, including all major subject matter and the specific body of knowledge covered.)

Functions: (Examples include cost, revenue, and profit functions, depreciation functions, budget constraints)

1. Formulas, tables, and graphs
 - a. Discrete and continuous
 - b. Increasing and decreasing
2. Proportionality and linear functions
3. Quadratic functions, power functions, and polynomials
4. Exponential and logarithmic functions
5. Combining functions
 - a. Sums and differences
 - b. Products
 - c. Composition of functions

Finance:

1. Compound interest
 - a. Finite geometric series
 - b. Exponential functions and limits (continuous compounding)
2. Present and future value
3. Exponential models in economics
 - a. Polynomial growth
 - b. Exponential growth
4. Compound Interest Formulas - dependence on P , r , and t

Rates of Change:

1. Average rate of change
2. Marginal cost from a discrete point of view
3. Evaluating rates of change for a variety of elementary functions
 - a. Graphical interpretation and evaluation
 - b. Numerical evaluation
 - c. Algebraic evaluation
 - d. Utilize limits and definition of derivative
4. Rates of change for more complicated functions
 - a. Sums and differences
 - b. Products and quotients

- c. Power Rule
- d. Exponential and logarithmic functions
- 5. Applications
 - a. Marginal analysis
 - b. Elasticity of demand
- 6. Optimization
 - a. Extreme points and points of inflection
 - b. Profit maximization
 - c. Cost minimization (inventory)
 - d. Revenue maximization
 - e. Break even

Linear Programming

1. Examples of Linear Programming problems (product mix, allocation)
2. Necessity of Linear Programming
3. Geometrical or graphical solution of Linear Programming problems
 - a. Graphic linear equations and inequalities
 - b. Graphing the region of feasibility
 - c. Finding corner points and solving the Linear Programming problem

12. Typical Out-of-Class Assignments: (Credit courses **require** two hours of independent work outside of class per unit of credit for each lecture hour, less for lab/activity classes. List types of assignments, including library assignments.)

a. Reading Assignments: (Submit at least 2 examples)

1. Read the applied examples on amortization and sinking funds and write a summary of what you have learned.
2. Go online and read about the Credit Card Act of 2009.

b. Writing, Problem Solving or Performance: (Submit at least 2 examples)

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?

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

13. Required Materials:

a. All Textbooks, resources and other materials used in this course are College Level?

Yes

No

b. Representative college-level textbooks (for degree-applicable courses) or other print materials.

Book 1:

Author: Tan
Title: Applied Mathematics for the Managerial,
Life, and Social Sciences
Publisher: Brooks/Cole
Date of Publication: 2010
Edition: 5

Book 2:

Author: Lial, Hungerford, Holcomb
Title: Mathematics with Applications

Publisher: [Pearson](#)

Date of Publication: [2011](#)

Edition: [10](#)

Book 3:

Author:

Title:

Publisher:

Date of Publication:

Edition:

Book 4:

Author:

Title:

Publisher:

Date of Publication:

Edition:

Book 5:

Author:

Title:

Publisher:

Date of Publication:

Edition:

c. Other materials and/or supplies required of students:

[Scientific Calculator](#)

Methods of Instruction

14. Check all instructional methods used to present course content.

- | | |
|---|--|
| <input checked="" type="checkbox"/> Lecture | <input type="checkbox"/> Activity |
| <input type="checkbox"/> Discussion Seminar | <input checked="" type="checkbox"/> Distance Ed (requires supplemental form) |
| <input type="checkbox"/> Lab | <input type="checkbox"/> Work Experience |
| <input type="checkbox"/> Directed Study | <input type="checkbox"/> Tutoring |

Other:

Give detailed examples of teaching methodology that relate to the course performance objectives:

Example 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.

Example 2: In class small group collaborative learning activity focusing on applied business math problems involving economic models, interest, marginal cost. Students will practice reading problems, interpreting the problems, and developing solution with peers.

Example 3: In class or online discussion of problems worked by students independently (such as homework problems). For example, students and teacher will discuss methods to evaluate rates of change (derivatives) for a variety of elementary functions, and apply to marginal analysis.

15. Methods of Assessing Student Learning

15a. Methods of Evaluation:

- | | |
|--|--|
| <input type="checkbox"/> Essay Exam | <input type="checkbox"/> Reports |
| <input type="checkbox"/> Objective Exam | <input checked="" type="checkbox"/> Problem Solving Exam |
| <input checked="" type="checkbox"/> Projects | <input checked="" type="checkbox"/> Skill Demonstration |
| <input checked="" type="checkbox"/> Classroom Discussion | <input type="checkbox"/> Other |

15b. (All courses must provide for measurement of student performance in terms of stated student performance objectives, Area 10, and culminate in a formal recorded grade based on uniform standards. Submit at least 2 examples.)

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.

Example 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.

Example 3: 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.