

MATH 33: MATH FOR FINANCIAL THRIVING

Foothill College Course Outline of Record

Heading	Value
Effective Term:	Summer 2024
Units:	5
Hours:	5 lecture per week (60 total per quarter)
Prerequisite:	Intermediate Algebra or equivalent.
Corequisite:	For students who do not meet the prerequisite requirement, concurrent enrollment in MATH 233 or NCBS 433 is required.
Advisory:	Demonstrated proficiency in English by placement via multiple measures OR through an equivalent placement process OR completion of ESLL 125 & ESLL 249.
Degree & Credit Status:	Degree-Applicable Credit Course
Foothill GE:	Area V: Communication & Analytical Thinking
Transferable:	CSU/UC
Grade Type:	Letter Grade (Request for Pass/No Pass)
Repeatability:	Not Repeatable

Student Learning Outcomes

- Students will create an earnings, savings, and spending plan by week, month, and year.
- Students will analyze financial aspects of life and societal decisions, applying multiple strategies (including but not limited to investigation, modeling, analysis, multiple representations of numbers and functions, estimation, dimensional analysis, probabilistic reasoning, and computation) and employing helpful tools (such as spreadsheets, graphing utilities, search engines, productivity tools, and artificial intelligence).
- Students will write about and discuss their evaluation of financial options using notation and statements that are correct and complete and which explicitly identify their underlying assumptions and rationale.

Description

This course is designed for any student, in any major, who is interested in exploring the connections between math concepts and aspects of financial thriving. This project-based course focuses on exploration and investigation of both simple and complex financial decisions common in everyday life. Topics include linear and exponential modeling, variables and multivariable relationships, dimensional analysis, descriptive statistics, present and future values, and estimation. Individually and collaboratively, students analyze quantitative information and apply quantitative skills in a variety of contexts related to financial planning and decision making. Students present their findings verbally and in writing.

Course Objectives

The student will be able to:

1. Solve life problems having financial considerations.
2. Evaluate intersections between financial thriving and issues of diversity, equity, inclusion, and social justice.
3. Take the initiative to solve problems using diagrams, measurements, conversions, estimation, probability, and modeling, including exponential functions and multivariable functions.
4. Calculate and interpret quantities important for understanding complex problems, including exponential functions, log scales, multivariable functions, probability, statistics, indices, historical averages.
5. Effectively communicate the reason(s) why solutions are correct or applicable.
6. Describe and discuss different ways to measure and quantify aspects of particular interest that pertain to real life decision making.

Course Content

1. Solve problems that apply to daily living
 - a. Polya's 4-step process for problem solving
 - b. Reflection and budgeting
 - i. Spending and saving money
 - ii. Tracking
 - iii. Projecting
 - c. Analyzing options and making decisions
 - i. Shopping
 - ii. Transportation
 - iii. Insurance
 - iv. Housing
 - v. Education
 - vi. Job and career
 - vii. Retirement
2. Issues of diversity, equity, inclusion, and justice as related to wealth
 - a. Wealth
 - i. Disparities
 - ii. Determinants of
 - iii. Inequities
 - b. Diverse contributors to the field of financial thriving
 - i. Community leaders
 - ii. Mathematicians
 - iii. Economists
3. Create and use spreadsheets, diagrams, modeling, measurements, conversions, estimation, probability, and statistics
 - a. Spreadsheets
 - i. Navigating
 - ii. Creating algebraic formulas
 - iii. Accessing built-in formulas
 - b. Graphs and tables
 - i. Linear functions
 - ii. Exponential functions
 - iii. Logarithmic scales
 - iv. Time value of money
 - c. Modeling

- i. Linear
- ii. Exponential
- iii. Regression
- d. Measurements:
 - i. Areas
 - ii. Volumes
 - iii. Distances
 - iv. Weights
 - v. Time
 - vi. Rates
- e. Conversions
 - i. Dimensional analysis
 - ii. Unit conversion
 - iii. Scaling
 - iv. Cost per unit
- f. Estimation
 - i. Historical indexes
 - ii. Conventional values
 - iii. Accuracy
 - iv. Rounding and mental math
- g. Probability and statistics
 - i. Theoretical and experimental probability
 - ii. Conditional probability and contingency tables
 - iii. Measures of center and variability
 - iv. Indices and historical averages
- 4. Calculate and interpret quantities important for understanding complex problems, including probability, statistics, indices, historical averages
 - a. Exponential functions
 - i. Percent growth
 - b. Log scales
 - c. Functions of multiple variables
 - i. Time values of money
 - d. Relative frequencies: proportions, decimals, percents
 - e. Conditional probabilities and contingency tables
 - f. Historical averages and variability
 - g. Regression
- 5. Communicate the reasons why solutions are correct or applicable
 - a. Discuss assumptions
 - b. Check using multiple representations/approaches
 - c. Check practical reasonableness
 - d. Compare to estimations and expectations
- 6. Students will describe and discuss different ways to measure and quantify aspects of particular interest that pertain to real life decision making
 - a. Underlying estimates
 - b. Underlying beliefs
 - c. Underlying values

Lab Content

Not applicable.

Special Facilities and/or Equipment

For all sections of this course, students will need access to a computer that supports browser-based tools.

Method(s) of Evaluation

Methods of Evaluation may include but are not limited to the following:

Homework
 Quizzes and tests
 Projects
 Proctored comprehensive final examination
 Portfolio

Method(s) of Instruction

Methods of Instruction may include but are not limited to the following:

Lecture
 Discussion
 Collaborative activities

Representative Text(s) and Other Materials

Lovelock, David, Marilou Mendel, and A. Larry Wright. *An Introduction to the Mathematics of Money*. 2007.

Karaali, Gizam, and Lily S. Khadjavi. *Mathematics for Social Justice: Resources for the College Classroom*. 2019.

Bolker, Ethan D., and Maura B. Mast. *Common Sense Mathematics, 2nd ed.* 2021.

This course is designed in response to local student demands and statewide changes in math education, so no textbook has been written to cover all of the topics. We will develop custom materials for our course.

Custom-made department materials: Canvas pages, videos, PDFs.

Types and/or Examples of Required Reading, Writing, and Outside of Class Assignments

1. Deliberate practice: daily homework designed to extend concept and skill development
2. Preparatory homework designed to prepare students for the next lesson
3. Reading about application/context
4. Mini quizzes
5. Portfolio development
6. Review and preparation for quizzes and exams
7. Written or video presentation of analyses

Discipline(s)

Mathematics