MATH 33: MATH FOR FINANCIAL THRIVING

Foothill College Course Outline of Record

Heading	Value
Effective Term:	Summer 2025
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 2: Mathematical Concepts & Quantitative Reasoning
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