

Course Outline

Course Title: Mathematics in Context

Common Course Title: COURSE_DEFINITION-3-13381

Effective Term: Fall 2024 (Aug 9, 2024)

Credit Hours: 3 Units

Next Review : Aug 9, 2029

Contact Hour Breakdown: *(Per 16 week Term)*

Total: 48

Lecture:

Lab:

Clinic:

Other:

Requirements

This course does not have any pre-requisites or co-requisites.

Course Description:

This general education course will include topics in Finance, Counting, Probability, and Statistics. Through this course, students will experience the practicality of Mathematics in a global society. Students will engage in the application of tools and techniques of Mathematics in a variety of contextual situations from everyday life. This course will also emphasize applications to real-world situations by including projects and the integration of topics from other academic disciplines including, but not limited to, business and the physical and social sciences.

Course Outline

Alignment of General Education Competencies with General Outcomes of this Course (for general education assessment purposes)

1. Critical Thinking

1.0, 2.0, 3.0, 4.0

2. Effective Communication

1.0, 2.0, 3.0, 4.0

3. Ethical Reasoning

4. Global Awareness

5. Information Literacy

6. Mathematical and Scientific Reasoning

1.0, 2.0, 3.0, 4.0

Course Outline UNITS

Unit 1: Finance

General Outcome

1.0 Students will apply mathematical models to various areas of Finance.

Specific Learning Outcomes

- 1.1 Understand and evaluate expressions within contexts of real-life scenarios such as price, tax, and real-life examples of percentages, proportions, and discounts.
- 1.2 Demonstrate an understanding of simple and compound interest applications to real-life financial models.
- 1.3 With the appropriate use of technology analyze various money application problems including, but not limited to, future and present values, unearned interest, and payoff amounts.
- 1.4 Analyze consumer loan application problems including, but not limited to, credit loans, payments, and finance charges.
- 1.5 Understand fixed rate mortgages and use appropriate technology and/or amortization tables to analyze the effect of various variables such as interest, principal and term on regular monthly payments and total payoff amounts.
- 1.6 Understand PITI and Escrow accounts and how closing costs and other expenses associated with buying a house are calculated.
- 1.7 Demonstrate a basic understanding of investing and personal finance including, but not limited to, stocks, bonds, ETFs, mutual funds, and commodities.
- 1.8 Understand the pros and cons of various retirement accounts such as traditional IRAs and Roth IRAs.

Unit 2: Counting and Probability

General Outcome

- 2.0 Students will analyze various real-life scenarios to find sample sizes and calculate probabilities using concepts of ratios, proportions, and counting principles.

Specific Learning Outcomes

- 2.1 Find, describe, and use sample spaces within the context of real-life applications.
- 2.2 Use the fundamental counting principle, factorials, combinations, and permutations to calculate the probability of various real-life events.
- 2.3 Compute simple probabilities, compound probabilities, and conditional probabilities within the context of real-life applications.
- 2.4 Calculate empirical probabilities based on the outcome of real-life experiments.
- 2.5 Compute and apply odds within the context of real-life applications.
- 2.6 Relate odds to probability within the context of real-life applications.

Unit 3: Visual Displays of Statistics

General Outcome

- 3.0 Students will organize, visualize and interpret data in meaningful ways.

Specific Learning Outcomes

- 3.1 Organize real-life data using frequency tables and stem-and-leaf displays.

- 3.2 Using real-life data, create appropriate graphs such as bar graphs, time series and pie charts.
- 3.3 Interpret data presented in graphs, charts, and tables.
- 3.4 Understand various ways misleading graphs are used to manipulate the reader.
- 3.5 Determine if data is normally distributed by using tables, graphs, and/or appropriate software.

Unit 4: Statistical Inference

General Outcome

- 4.0 Use statistical inference and appropriate statistical software and/or calculators to analyze real-life data.

Specific Learning Outcomes

- 4.1 Understand representative sampling techniques and use techniques such as random, stratified, cluster, convenience, and systematic sampling to gather real and meaningful data.
- 4.2 Use appropriate technology to find various measures of central tendency and interpret their meanings within the context of real-life applications.
- 4.3 Use appropriate technology to find various measures of dispersion and interpret their meanings within the context of real-life applications.
- 4.4 Use appropriate technology to find various measures of position and interpret their meanings within the context of real-life applications.
- 4.5 Interpret, draw conclusions, and make predictions about data within the context of real-life applications.
- 4.6 Identify the properties of a Normal distribution.
- 4.7 Understand and use the Empirical rule to find probabilities and percentages related to a Normal distribution, then use the results to solve problems in context.
- 4.8 Use appropriate technology to find probabilities and percentages related to a Normal distribution, then use the results to solve problems in context.