# COLLIN COLLEGE EXPANDED GENERIC COURSE SYLLABUS

## COURSE INFORMATION

**Course Number:** MATH 1332
**Course Title:** Contemporary Mathematics (Quantitative Reasoning)
**Credit Hours:** 3
**Lecture Hours:** 3
**Lab Hours:** 0

### Prerequisite
MATH 0314 with a grade of C or better, or MATH 0324 with a grade of C or better, or MATH 0332 with a grade of C or better, or MATH 0305, or MATH 0406, or meet TSI college-readiness standard for Mathematics; or equivalent.

### Course Description
Intended for Non-STEM (Science, Technology, Engineering, and Mathematics) majors. Topics include introductory treatments of sets and logic, financial mathematics, probability and statistics with appropriate applications. Number sense, proportional reasoning, estimation, technology, and communication should be embedded throughout the course. Additional topics may be covered. Additionally, this course is NOT intended to prepare students for calculus, business, or engineering courses.

### Textbook/Supplies
*Thinking Mathematically*, 8th Edition by Robert Blitzer, Pearson.

Supplies: Graphing calculator required.

## STUDENT LEARNING OUTCOMES (SLO)

Upon completion of this course the students should be able to do the following:

1. Apply the language and notation of sets. (Communication Skills)
2. Determine the validity of an argument or statement and provide mathematical evidence. (Critical Thinking)
3. Solve problems in mathematics of finance. (Empirical/Quantitative Skills)
4. Demonstrate fundamental probability/counting techniques and apply those techniques to solve problems. (Empirical/Quantitative Skills)
5. Interpret and analyze various representations of data. (Communication Skills, Critical Thinking)
6. Demonstrate the ability to choose and analyze mathematical models to solve problems from real-world settings, including, but not limited to, personal finance, health literacy, and civic engagement. (Critical Thinking, Empirical/Quantitative Skills)

## REQUIRED CORE OBJECTIVES FOR MATHEMATICS

As per the Texas Higher Education Coordinating Board, mathematics students must develop and demonstrate the following three required core objectives:

- Critical Thinking Skills - creative thinking, innovation, inquiry, and analysis, evaluation and synthesis of information.
- Communication Skills - effective development, interpretation and expression of ideas through written, oral and visual communication.
- Empirical and Quantitative Skills - manipulation and analysis of numerical data or observable facts resulting in informed conclusions.

## METHOD OF EVALUATION

### Course requirements

Attending class**,** completing homework assignments**,** and completing required exams.

### Course format

Lecture and guided practice.

A minimum of four proctored exams, three core assessments, and online homework are required. A cumulative final exam is NOT necessary. The specific weight of each of these components will be specified in the individual instructor's syllabus. Credit for all out-of-class coursework—including homework assignments, service-learning projects, take-home tests, and learning activities—may not exceed 30% of the total course grade. At least 70% of a student's grade must consist of proctored work. No student may retake any exams.

### Core Assessment Statement

Core assessments consist of problems or tasks that measure student achievement of state required core objectives – Critical Thinking Skills, Communication Skills, and Empirical and Quantitative Skills. These assessments are designed to be meaningful and require students to extend and apply course concepts. Students should be able to clearly see how these assessments reflect both the skills they are developing and the outcomes of the course.

## COURSE POLICIES

*College-wide policies are pre-loaded into the Concourse Syllabi and are not duplicated in the Expanded Generic Syllabi for each course.*

*Instructor specific policies should be added to the Concourse Syllabus.*

COURSE CONTENT

## Module: Logic

The student will be able to:

1. Express word statements and their negations using logic symbols. SLO 2
2. Form negations of conditional and compound statements. SLO 2
3. Construct truth tables for negation, conditional, biconditional, disjunction, and conjunction statements and use them to analyze arguments. SLO 2
4. Decide if two statements are equivalent. SLO 2
5. Given a conditional statement, construct its contrapositive, inverse, and converse. SLO 2

## Module: Probability

The student will be able to:

1. Compute the probability of a single event. SLO 4
2. Construct the sample space for a probability experiment. SLO 4
3. Use a variety of methods, including Venn Diagrams and counting methods, to compute probabilities. SLO 4
4. Compute the probability of the complement of an event. SLO 1
5. Compute the probability of the union and intersection of events. SLO 1
6. Compute conditional probability. SLO 4
7. Compute expected value. SLO 6

## Module: Statistics

The student will be able to:

1. Construct and interpret visual displays of given data. SLO 5
2. Find measures of central tendency for given data. SLO 5
3. Find measures of dispersion for given data. SLO 5
4. Make and interpret a scatterplot. SLO 5

## Module: Mathematics of Finance

The student will be able to:

1. Solve problems involving working students and taxes. SLO 3
2. Solve problems using simple and compound interest. SLO 3
3. Understand terms and formulas used in calculating repayments for installment loans, revolving loans and mortgages. SLO 3
4. Compute the regular payments and interest for car and home loans. SLO 3
5. Understand the pros and cons of leasing versus buying a home or car. SLO 3
6. Create an amortization schedule. SLO 3
7. Use the average daily balance method to compute finance charges for revolving credit. SLO 3
8. Understand the pros and cons of using credit cards and debit cards. SLO 3
9. Understand the different methods of saving money. SLO 3

**Instructor's Choice of at least one of the following modules:**

Module: Measurement and Geometry

The student will be able to:

1. Use dimensional analysis to change units of measurement. SLO 6
2. Convert units within the metric system. SLO 6
3. Find perimeter and area of polygons. SLO 6
4. Find the circumference and area of a circle. SLO 6
5. Solve problems involving similar triangles. SLO 6
6. Find the missing length of a side of a right triangle. SLO 6
7. Find volume and surface area of three-dimensional figures. SLO 6

Module: Voting and Apportionment

The student will be able to:

1. Understand and use preference tables. SLO 6
2. Use a variety of methods to determine an election's winner. SLO 6
3. Use the four fairness criteria to determine a voting system's fairness. SLO 6
4. Find standard divisors and standard quotas. SLO 6
5. Understand the apportionment problem. SLO 6
6. Use a variety of methods to solve the apportionment problem. SLO 6
7. Understand and illustrate various apportionment paradoxes. SLO 6

Module: Set Theory

The student will be able to:

1. Use and identify notation and terminology of sets. SLO 1
2. Classify numbers as counting, whole, integer, rational, irrational, and real. SLO 1
3. Determine the cardinality of a set. SLO 1
4. Determine the complement of a set. SLO 1
5. Use Venn Diagrams and symbols to display set operations. SLO 1
6. Use set operations to analyze data. SLO 1

Module: Graph Theory

The student will be able to:

1. Understand and use the vocabulary of graph theory. SLO 6
2. Understand the definition of an Euler and Hamilton paths and circuits. SLO 6
3. Solve problem's using Euler's Theorem. SLO 6
4. Use Fleury's Algorithm to find possible Euler paths and Euler circuits. SLO 6
5. Understand and use weighted graphs. SLO 6
6. Find approximate solutions to traveling salesperson problems. SLO 6