Tompkins Cortland Community College
Master Course Syllabus

Course Discipline and Number: MATH 110   **Year: 2023-2024**

Course Title: Topics in Mathematics   **Credit Hours: 3**

I. Course Description: This course covers topics in mathematics related to everyday life applications. Such topics include proportions, customary units of measure, ratios and conversions, consumer mathematics, algebraic expressions and equations, introduction to quadratic and exponential functions with rates of change, regression analysis, probability, and statistics. These topics are studied through practical and quantitative reasoning applications as well as the use of technology. MATH 110 fulfills the SUNY General Education Mathematics requirement. Prerequisites: Prior completion of, or concurrent enrollment in, ENGL100 or ESL 120, 121, and 122 if required by placement. 3 Cr. (3 Lec.) Fall and spring semesters.

II. Additional Course Information:

1.	MATH 110 fulfils the SUNY General Education Mathematics requirement.
2.	MATH 110 includes an applied learning project that requires use of technology and spreadsheets software.
3.	MATH 110 is the recommended mathematics elective for the HRMG, CULI, and WINE programs. Students in other programs may be able to use MATH 110 to satisfy requirements and should consult with their advisor before registering for the course.

III. Student Learning Outcomes
Upon successful completion of this course, students will be able to:

1.	Use conversion ratios and formulas to perform cost analysis; research a quantitative problem and synthesize information to conduct cost and performance analysis.
2.	Solve linear equations and algebraic applications using ratios, proportions, or percentages; estimate using percentages.
3.	Read, interpret, and construct frequency and relative-frequency distributions; evaluate probabilities and empirical probabilities; find expected values and make predictions based on quantitative evidence.
4.	Recognize linear, polynomial, and exponential relations and compare their growth rates; interpret linear models.
5.	Use spreadsheets, and other technology, to perform numerical and statistical computations.

IV. Tompkins Cortland Institutional Learning Outcomes; Program Learning Outcomes; SUNY General Education Outcomes

Tompkins Cortland ILOs

Complete this section for "service" courses only (e.g. courses that are required of all students; courses that are not program specific but satisfy liberal arts requirements; or commonly used in multiple academic programs to meet non-program-specific requirements). Check only Institutional Learning Outcomes (ILOs) that are meaningfully developed and assessed in this course. For each ILO chosen, include the SLO to which it aligns.

Students will:

☐ Communicate effectively, in oral and written forms, taking into consideration audience and purpose.

☒ Apply principles and methods of scientific inquiry and quantitative reasoning appropriate to their discipline.

SLOs:
1. Use conversion ratios and formulas to perform cost analysis; research a quantitative problem and synthesize information to conduct cost and performance analysis.
2. Solve linear equations and algebraic applications using ratios, proportions, or percentages; estimate using percentages.
3. Read, interpret, and construct frequency and relative-frequency distributions; evaluate probabilities and empirical probabilities; find expected values and make predictions based on quantitative evidence.
4. Recognize linear, polynomial, and exponential relations and compare their growth rates; interpret linear models.

☒ Use information, critical thinking, and the creative process to solve problems and reach conclusions.

SLOs:
1. Use conversion ratios and formulas to perform cost analysis; research a quantitative problem and synthesize information to conduct cost and performance analysis.
2. Solve linear equations and algebraic applications using ratios, proportions, or percentages; estimate using percentages.
3. Read, interpret, and construct frequency and relative-frequency distributions; evaluate probabilities and empirical probabilities; find expected values and make predictions based on quantitative evidence.
4. Recognize linear, polynomial, and exponential relations and compare their growth rates; interpret linear models.

☒ Use technology appropriate to their discipline.

SLO:
5. Use spreadsheets, and other technology, to perform numerical and statistical computations.

☐ Describe the ways in which social, economic, or environmental sustainability depends on their own and the collective contributions of a diversity of ideas and people.

Program Learning Outcomes N/A

Complete this section for program-specific courses (e.g. those that share the same 4 letter designation as the academic program or satisfy requirements in related programs).   List the academic program(s) here and note which Student Learning Outcomes align to specific Programmatic Learning Outcomes. Please see the MCS Instructions for more details.

SUNY General Education Outcomes

If this course **assesses** a SUNY GEN ED Outcome, check all that apply and indicate which course outcome(s) address each checked item:

☒ CRITICAL THINKING - Students will:
    a. identify, analyze, and evaluate arguments as they occur in their own or others' work; and
    b. develop well-reasoned arguments.

SLOs:
1. Use conversion ratios and formulas to perform cost analysis; research a quantitative problem and synthesize information to conduct cost and performance analysis.
2. Solve linear equations and algebraic applications using ratios, proportions, or percentages; estimate using percentages.

3. Read, interpret, and construct frequency and relative-frequency distributions; evaluate probabilities and empirical probabilities; find expected values and make predictions based on quantitative evidence.
4. Recognize linear, polynomial, and exponential relations and compare their growth rates; interpret linear models.

☒ INFORMATION MANAGEMENT - Students will:
    a. perform the basic operations of personal computer use;
    b. understand and use basic research techniques; and
    c. locate, evaluate and synthesize information from a variety of sources.

SLOs:
1. Use conversion ratios and formulas to perform cost analysis; research a quantitative problem and synthesize information to conduct cost and performance analysis.
3. Read, interpret, and construct frequency and relative-frequency distributions; evaluate probabilities and empirical probabilities; find expected values and make predictions based on quantitative evidence.
4. Recognize linear, polynomial, and exponential relations and compare their growth rates; interpret linear models.
5. Use spreadsheets, and other technology, to perform numerical and statistical computations.

☒ GENERAL EDUCATION CATEGORY - Area(s):
For courses that are approved to meet one (or more) of the ten SUNY General Education categories, indicate which category the course fulfills, and which outcome(s) are aligned with the SUNY outcomes for that category:

SUNY General Education Category 1 – Mathematics

GE SLO 1. Interpret and draw inferences from mathematical models such as formulas, graphs, tables and schematics.

SLOs:
2. Solve linear equations and algebraic applications using ratios, proportions, or percentages; estimate using percentages.
3. Read, interpret, and construct frequency and relative-frequency distributions; evaluate probabilities and empirical probabilities; find expected values and make predictions based on quantitative evidence.
4. Recognize linear, polynomial, and exponential relations and compare their growth rates; interpret linear models.

GE SLO 2. Represent mathematical information symbolically, visually, numerically and verbally.

SLOs:
1. Use conversion ratios and formulas to perform cost analysis; research a quantitative problem and synthesize information to conduct cost and performance analysis.
2. Solve linear equations and algebraic applications using ratios, proportions, or percentages; estimate using percentages.
3. Read, interpret, and construct frequency and relative-frequency distributions; evaluate probabilities and empirical probabilities; find expected values and make predictions based on quantitative evidence.
4. Recognize linear, polynomial, and exponential relations and compare their growth rates; interpret linear models.
5. Use spreadsheets, and other technology, to perform numerical and statistical computations.

GE SLO 3. Employ quantitative methods such as, arithmetic, algebra, geometry, or statistics to solve problems.

SLOs:
1. Use conversion ratios and formulas to perform cost analysis; research a quantitative problem and synthesize information to conduct cost and performance analysis.
2. Solve linear equations and algebraic applications using ratios, proportions, or percentages; estimate using percentages.
3. Read, interpret, and construct frequency and relative-frequency distributions; evaluate probabilities and empirical probabilities; find expected values and make predictions based on quantitative evidence.
4. Recognize linear, polynomial, and exponential relations and compare their growth rates; interpret linear models.

GE SLO 4. Estimate and check mathematical results for reasonableness.

     SLOs:
1. Use conversion ratios and formulas to perform cost analysis; research a quantitative problem and synthesize information to conduct cost and performance analysis
.2. Solve linear equations and algebraic applications using ratios, proportions, or percentages; estimate using percentages.
3. Read, interpret, and construct frequency and relative-frequency distributions; evaluate probabilities and empirical probabilities; find expected values and make predictions based on quantitative evidence
4. Recognize linear, polynomial, and exponential relations and compare their growth rates; interpret linear models.

GE SLO 5. Recognize the limits of mathematical and statistical methods.

     SLOs:
1. Use conversion ratios and formulas to perform cost analysis; research a quantitative problem and synthesize information to conduct cost and performance analysis.
3. Read, interpret, and construct frequency and relative-frequency distributions; evaluate probabilities and empirical probabilities; find expected values and make predictions based on quantitative evidence.
4. Recognize linear, polynomial, and exponential relations and compare their growth rates; interpret linear models.

☐ This course does not address any of the above Tompkins Cortland ILOs, PLOs, or SUNY General Education Outcomes.

V. Essential Topics/Themes

1.	Measurements and Conversions
2.	Proportions and Proportion Applications
3.	Percentages and Percent Applications (Interest, Markup, Markdown); Estimation with Percentages
4.	Topics in Algebra (Distribution, Like Terms, Evaluation, Solving Equations for a Variable)
5.	Cost and Performance Analysis
6.	Linear Equations, Linear Models and their Interpretation, Applications (Equilibrium, Break Even Point)
7.	Linear Regression and Regression Analysis
8.	Rates of Change and Growth; Polynomial and Exponential Models
9.	Probability (Simple, Compound, Conditional, Empirical) and Expected Value
10.	Descriptive Statistics (Measures of Center, Variance, and Position)
11.	Presentation of Data; Uniform and Bell-Shaped Distributions
12.	Use of Technology and Spreadsheets within All Topics

VI. Methods of Assessment/Evaluation

Method	% Course Grade
1. Unit Quizzes	40-70%
2. Homework	10-40%

3. Written Paper / Technology Project	20-30%
4. Group Presentation	0-20%

VII. Texts – ☒ Required   ☐ Recommended   ☐ Used for more than one course (list courses)

1. Georgiakaki, Sophia. *Topics in Mathematics Workbook*. 2ⁿᵈ Ed., Thales Books.

Editions listed are current as of date of syllabus. More recent editions may be used.

VIII. Bibliography of Supplemental Materials

1. *Culinary Math*. 4ᵗʰ Edition, Linda Blocker & Julie Hill
2. *Mathematics in Our World*. 1ˢᵗ Edition, Allan B. Bluman, McGraw Hill
3. *Excursions in Modern Mathematics*. 7ᵗʰ Edition, Peter Tannenbaum, Prentice Hall
4. *Using and Understanding Mathematics: A Quantitative Reasoning Approach*. 4ᵗʰ Edition, Jeffrey Bennet & William Briggs, Pearson / Addison Wesley
5. *Fundamentals of Mathematics*. 11ᵗʰ Edition, William Setek Jr & Michael Gallo, Prentice Hall
6. *Pre-Algebra*. 2ⁿᵈ Edition, Sophia Georgiakaki, Thales Books
7. *Mathematical Ideas*. 12ᵗʰ Edition, Miller, Heron & Hornsby, Pearson Education
8. *Mathematics All Around*. Thomas Pirnot, Pearson Education
9. *Mathematics for the Liberal Arts Student*. Richman, Walker, Wisner, Brewer, Prentice Hall
10. *The Book of Yields*. Lynch, Francis Talyn, John Wiley

Editions listed are current as of date of syllabus. More recent editions may be used.

IX. Other Learning Resources

Audiovisual: None specified
Electronic: None specified
Other: Excel, Scientific Calculator

Attendance Policy: *To maintain good grades, regular attendance in class is necessary. Absence from class is considered a serious matter and absence never excuses a student from class work. It is the responsibility of all instructors to distribute reasonable attendance policies in writing during the first week of class. Students are required to comply with the attendance policy set by each of their instructors. Students are not penalized if they are unable to attend classes or participate in exams on particular days because of religious beliefs, in accordance with Chapter 161, Section 224-a of the Education Law of the State of New York. Students who plan to be absent from classroom activity for religious reasons should discuss the absence in advance with their instructors. See college catalog for more information.*

Services for Students with Disabilities: *It is the College's policy to provide, on an individual basis, appropriate academic adjustments for students with disabilities, which may affect their ability to fully participate in program or course activities or to meet course requirements. Students with disabilities should contact the Coordinator of Access and Equity Services, to discuss their particular need for academic adjustments. All course materials are available in alternate formats upon request.*

Academic Integrity: *Every student at Tompkins Cortland Community College is expected to act in an academically honest fashion in all aspects of his or her academic work: in writing papers and reports, in taking examinations, in*

performing laboratory experiments and reporting the results, in clinical and cooperative learning experiences, and in attending to paperwork such as registration forms.

Any written work submitted by a student must be his or her own. If the student uses the words or ideas of someone else, he or she must cite the source by such means as a footnote. Our guiding principle is that any honest evaluation of a student's performance must be based on that student's work. Any action taken by a student that would result in misrepresentation of someone else's work or actions as the student's own — such as cheating on a test, submitting for credit a paper written by another person, or forging an advisor's signature — is intellectually dishonest and deserving of censure.

Several degree programs offer student learning opportunities (such as internships, field work, and clinical experiences) outside the standard classroom setting. As part of the learning process, students must understand and engage in conduct that adheres to principles guiding employment within the professional workplace. These behaviors include, but are not limited to, academic integrity, accountability, reliability, respect, use of appropriate language and dress, civility, professional ethics, honesty, and trustworthiness. Disciplinary action may be initiated for inappropriate conduct occurring while participating in any course-related project or event.