

**SOUTHEAST COMMUNITY COLLEGE
DIVISION OF ARTS AND SCIENCES**

Mathematics

Revision Date: 07-01-23

[Syllabus Statements](#)

I. CATALOG DESCRIPTION

Course Number: MATH1050
Course Title: Thinking Mathematically
Prerequisite(s): A grade of "C" or higher in MATH0900 or a grade of "B" or higher in MATH0903 or appropriate score on math placement test.
Catalog Description: This course is designed to help student think mathematically. It will cover various topics including critical thinking, logic, geometry, advanced algebra skills, basic trigonometry, statistics and other contemporary topics.
Credit Hours: 3.0
Class Hours: 45
Lab Hours: 0
Total Contact Hours: 45

II. COURSE OBJECTIVES: *Course will:*

- A. Meet program requirements for students enrolled in specific areas.
- B. Maximize understanding of students desirous of a general education course in algebra, geometry, basic trigonometry, critical thinking, logic and other contemporary topics.

III. STUDENT LEARNING OUTCOMES AND GENERAL EDUCATION LEARNING OUTCOMES

- A. Student Learning Outcomes: *Student will be able to:*
 - 1. Identify and use inductive and deductive reasoning.
 - 2. Identify statements and convert those statements using symbolic notation and vice versa.
 - 3. Use order of operations to evaluate expressions.
 - 4. Understand and perform steps needed to graph functions.
 - 5. Use algebraic properties to transpose formulas.
 - 6. Use geometry concepts to solve polygons for angles, perimeter, area, circumference and volume.
 - 7. Apply basic trigonometry concepts to solve problems.
 - 8. Solve systems of linear equations.
 - 9. Use basic statistics concepts to evaluate data.
- B. General Education Learning Outcomes
 - 1. GELO #5: Analytical, Quantitative, and Scientific Reasoning
 - Outcome: Apply mathematical and scientific methods to solve problems from an array of contexts and everyday situations.
 - Outcome: Effectively develop strategies, algorithms, or experiments (or perform experiments) to better describe the systems or solve problems.

IV. CONTENT/TOPICAL OUTLINE (*course outline may provide more detailed information*)

- A. Critical Thinking
 - 1. Inductive reasoning—conjectures, hypotheses, counterexamples, arguments.
 - 2. Number patterns; visual patterns; ambiguous figures.
 - 3. Deductive reasoning—conclusions, expressing patterns with a variable n .
 - 4. Estimating real-life situations.
 - 5. Describe the relationship between variables as shown by a graph.
 - 6. Investigate: Fibonacci numbers, figurate numbers, Pascal's triangle, map coloring, magic squares, Sudoku, bridge problem, etc.

- B. Logic
 1. Statements—identify, translate, express using symbols.
 2. Negations—translate, express using symbols.
 3. Quantified statements—express two ways, write negations.
 4. Compound statements—use connectives: and, or, if-then, if.
 5. Truth tables
 6. Arguments—valid and invalid.
- C. Algebra
 1. Expressions—evaluate, simplify.
 2. Formulas—solve for one variable, substitute data and solve.
 3. Functions—notation, graphs, vertical line test.
 4. Systems of equations—determine if a point is a solution, solve by graphing or substitution or addition, identify if there is no solution or if there are infinitely many solutions.
 5. Applications—revenue, cost, and profit functions; break-even point.
- D. Geometry
 1. Angle measures—complementary, supplementary, vertical, parallel lines with transversal, angles in a triangle.
 2. Pythagorean Theorem.
 3. Similar triangles with applications.
 4. Perimeter and area of composite figures—squares, rectangles, triangles, parallelograms, trapezoids, circles.
 5. Surface area and volume of 3-dimensional figures—cubes, rectangular solids, prisms, pyramids, cylinders, cones, spheres, composite figures.
- E. Trigonometry
 1. Trig ratios—sine, cosine, tangent.
 2. Find missing sides using trig ratios.
 3. Find missing angles using trig ratios.
 4. Trig applications.
- F. Statistics
 1. Populations and samples.
 2. Select an appropriate sampling technique.
 3. Organize and present data—frequency distributions, histograms, frequency polygons, stem-and-leaf plots.
 4. Deception in visual displays of data.
 5. Measures of central tendency—mean, median, mode, midrange.
 6. Measures of dispersion—range, standard deviation.
 7. Normal distribution—the 68-95-99.7 rule, z-scores, percentiles, quartiles.
 8. Calculate percentages above, below and between two z-scores.
 9. Skewed distributions
- G. Other Topics

Each instructor will present one unit of contemporary math topics which may include (but is not limited to) set theory, number bases, tessellations, topology, probability, clock arithmetic, voting methods, graph theory, etc.

 1. Outline and objectives to be determined by each instructor.

V. INSTRUCTIONAL MATERIALS

- A. Required Text(s):
 1. Blitzer, Robert F. *Thinking Mathematically (plus NEW MyMathLab with Pearson eText – Access Card Package)*, 7th edition, Pearson, 2019. ISBN-10: 0134683714, ISBN-13: 9780134683713.
- B. Other resources: Scientific calculator, graph paper, other as determined by instructor.

VI METHOD OF PRESENTATION/INSTRUCTION

- A. Methods of presentation typically include a combination of the following:
 - 1. Class lecture
 - 2. Text readings and associated student discussions.
 - 3. Problem sets based upon student text readings and/or discussions.
 - 4. Individual student assistance as needed.
 - 5. Group activities and email.

VII. METHODS OF EVALUATION

- A. Methods of evaluation typically include a combination of the following:
 - 1. Homework (varies with instructor)
 - 2. Quizzes (varies with instructor)
 - 3. Unit exams (minimum of four)
 - 4. Investigations/Activities/Reports (varies with instructor)
 - 5. Comprehensive final exam (required—counts 10-25% of grade)

B. SCC GRADING SCALE

A+	95-100	C+	75-79	F	59 or less
A	90-94	C	70-74		
B+	85-89	D+	65-69		
B	80-84	D	60-64		

VIII. SPECIFIC COURSE REQUIREMENTS

- A. None.