Naugatuck Valley Community College
STEM Division
Science, Technology, Engineering and Mathematics

Common Course Syllabus
Math for Elementary Education: Geometry, Data MAT*H144

COURSE TITLE: Math for Elementary Education: Geometry, Data, MAT*144

COURSE DESCRIPTION: This course is designed for students planning to become certified in early childhood, elementary or middle school level education. Problem solving strategies will be developed and integrated throughout, in accordance with the NCTM *Principles and Standards for School Mathematics*. Topics include probability, statistics, and geometry concepts presented through a problem-solving approach, and incorporating an extensive use of manipulatives and geometric software. Mathematical discourse is encouraged through cooperative learning and written communication.

NUMBER OF CREDITS: 3 credit hours

PREREQUISITE: Grade of "C" or better in MAT*H137 (Intermediate Algebra) or an appropriate score on a college placement exam.

TECHNOLOGY: Computer component required; TI-83 (Plus) or TI-84 (Plus) highly recommended.

COURSE OBJECTIVES:
1. Extend/enhance core mathematical knowledge of measurement, geometry, and probability and statistics.
2. Use technology and manipulatives to explore concepts and make connections.
3. Use problem solving as an integral part of mathematics.
4. Develop oral and written skills necessary to communicate mathematically with your future students.
5. Develop a positive attitude towards mathematics.

LEARNING OUTCOMES: At the end of this course the student will be able to do the following:
1. Interpret data represented by statistical graphs and tables and create his or her own representations of statistical data.
2. Define measures of central tendency: mean, median, mode.
3. Define and demonstrate an understanding of standard deviation by working simple examples.
4. Define the terms sample and random sample, and compute a population mean and standard deviation.
5. Interpret the information contained in a normal distribution.
6. Define empirical probability and theoretical probability.
7. Calculate some theoretical probabilities using the properties of counting and the ideas of independent events, dependent events, complementary events, and mutually exclusive events.
8. Define inductive and deductive reasoning, hypothesis and conclusion, and tell the difference between truth and validity.

9. Describe point, line, plane; define parallel lines, perpendicular lines, line segment, endpoint, midpoint, distance, length, congruence.
10. Define angle, vertex, sides, measure, acute, right, obtuse, straight, supplementary, and complementary.
11. Define polygon and identify polygons by their specific names.
12. Explain the differences between and similarities among parallelograms, trapezoids, rectangles, rhombuses and squares.
13. Define the interior and exterior of a circle; tangent to a circle, secant, chord, diameter and use circle theorems to compute the measures of secant segments, tangent segments, and parts of chords.
14. Measure angles.
15. Prove theorems involving vertical angles and angle measure of polygons.
16. Identify regular polyhedra, cones, and cylinders.
17. Accurately measure objects.
18. Compute areas, perimeters, surface areas and volumes.
19. State and use the Pythagorean Theorem.
20. Use tessellations to tile the plane.
21. Use similarity transformations to transform geometric figures.
22. Use the ideas and techniques of self-similarity to create fractals.
23. Establish congruence of triangles.
24. Perform the basic constructions: bisection of a line segment, bisection of an angle, perpendicular to a line from a point on the line and from a point off the line, construction of an angle congruent to a given angle, construction of a line parallel to a given line through a point off the line.
25. Establish the similarity of triangles.

INSTRUCTIONAL METHODS: Lecture, large and small group discussions and activities, individual work, group and individual problem-solving projects, computer labs.

INSTRUCTIONAL UNITS:

A. Statistics
  1. The Graphical Representation of Data
  2. Measures of the Center
     • Mean
     • Median
     • Mode
  3. Variability
     • Standard Deviation
  4. Statistical Inference
     • Populations and Samples
     • Random Samples
     • Population Mean and Standard Deviation

B. Probability
  1. Experimental and Theoretical Probability
     • Experimenting
     • Mutually Exclusive Events
     • Independent Events
     • Geometric Probability
  2. Counting
     • Addition Principle
     • Multiplication Principle
     • Combinations and Permutations
  3. Theoretical Probability

C. Geometry
  1. Inductive and Deductive Reasoning
  2. Figures, Curves, and Polygons in the Plane
  3. Figures in Space
  4. Measurement
     • Units of Measure
     • Unit Analysis
  5. Area and Perimeter
  6. The Pythagorean Theorem
  7. Surface Area and Volume
  8. Transformational Geometry
     • Similarity Transformations
     • Patterns and Symmetry
     • Self-similarity and Fractals
     • Tilings
  9. Congruence of Triangles
  10. Constructing Geometric Figures
  11. Similar Triangles

GRADING SYSTEM: For the purpose of computing numerical credit point averages, grades are evaluated as follows for each semester hour of credit. Grades on exams, papers, and quizzes, will be based on this grading system.

Numeric Grade	Acceptable Letter Grade Range to be used by the instructor	Description
90 –100	A– to A	Excellent
80 – 89	B–, B, B+	Above Average
70 – 79	C–, C, C+	Average
60 – 69	D–, D, D+	Below Average
Below 60	F	Failing

CLASS CANCELLATION PROCEDURE: *If the instructor is late, the class is expected to wait 15 minutes before leaving or until informed of a cancellation by a college official. Information on weather related closings/late openings concerning Naugatuck Valley Community College can be obtained through local radio and television stations, or via the college website (http://www.nvcc.commnet.edu).* **NOTE:** *An alternative assignment may be given if classes are canceled due to weather.*

ACADEMIC HONESTY STATEMENT: *At NVCC we expect the highest standards of academic honesty. Academic dishonesty is prohibited in accordance with the Board of Trustee's Proscribed Conduct Policy in Section 5.2.1 of the BOT Policy Manual. This policy prohibits cheating on examinations, unauthorized collaboration on assignments, unauthorized access to examinations or course materials, plagiarism, and other proscribed activities. Plagiarism is defined as the use of another's idea(s) or phrase(s) and representing that/those idea(s) as your own, either intentionally or unintentionally. Anyone who is caught cheating on exams, plagiarizing another's work or published material will fail the course regardless of progress made in the course.*

CHILDREN ON CAMPUS: *With permission of the instructor only – Children must be attended at all times by a responsible adult. The student must notify the instructor or supervisor prior to the beginning of the class or activity that a child is present. Instructors and/or supervisors are authorized to ask the student or program participants to leave should the presence of a child be disruptive.*

CELL PHONE/PAGER USE POLICY: *Students are hereby notified that cellular phones and beepers are allowed in class only if they are turned off or turned to a silent mode. Under no circumstances are telephones to be answered in class. Students who ignore this policy may be asked to leave class. When there are extenuating circumstances that require that a student be available by phone or beeper, the student should speak to the instructor prior to class, so that together they can arrive at an agreement concerning the device.*

STUDENTS WITH SPECIAL NEEDS: *Students who may require accommodations on the basis of a learning disability are encouraged to contact the Coordinator of Learning Disabilities. Students who may require accommodations on the basis of all other disabilities should contact the Coordinator of Disability Services. After providing documentation and completing the disability disclosure process, students are then encouraged to meet with their instructor(s) to discuss the accommodations approved by the appropriate Coordinator and to complete the Accommodations Agreement form. Accommodations are not retroactive, students are therefore encouraged to meet with their instructor(s) at the beginning of each semester. Instructors, in conjunction with appropriate college personnel, will provide assistance and/or accommodations only to those students who have completed the disability disclosure and accommodations process.*

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