ROCHESTER COMMUNITY AND TECHNICAL COLLEGE

COMMON COURSE OUTLINE

Course discipline/number/title: MATH 1060: Foundations of Mathematics-Geometry Emphasis

A. CATALOG DESCRIPTION
1. Credits: 3
2. Hours/Week: 3
3. Prerequisites (Course discipline/number): MATH 0094 or MATH 0099 or MATH 0100
4. Other requirements: College level reading
5. MnTC Goals (if any): Goal 4/Mathematics/Logical Reasoning

B. COURSE DESCRIPTION: This course is one of two general education mathematics courses focusing on concepts and models involved with probability, statistics, geometry, and measurement, with emphasis on estimation, problem solving, and mathematical reasoning. Active and cooperative learning, E-manipulatives, and computer technology are incorporated throughout the course. College level reading.

C. DATE LAST REVISED (Month, year): December, 2022

D. OUTLINE OF MAJOR CONTENT AREAS:
1. Probability
2. Statistics and Data Analysis
3. Geometry
   a) Polygons
   b) Three-dimensional geometry
   c) Networks
   d) Construction
   e) Congruence and similarity
   f) Motion geometry
4. Measurement

E. LEARNING OUTCOMES (GENERAL): The student will be able to:
1. Work in cooperative groups.
2. Calculate probabilities of single and compound events and use them in applications such as game theory and expected value.
   a) Determine experimental probabilities by conducting experiments
   b) Explain the difference between experimental and theoretical probability
   c) Calculate probability and odds
   d) Calculate conditional probabilities
   e) Analyze games of chance
3. Analyze data and make statistical calculations.
   a) Interpret data presented in graphs and tables
   b) Compute the measures of central tendency of a set of data-mean, median, and mode.
   c) Compute the measures of variation of a set of data-range, variance, and standard deviation.
   d) Compute and apply percentiles and quartiles.
   e) Demonstrate an understanding of the normal distribution and its applications.
   f) Use a spreadsheet application, such as Excel, for statistical applications.
4. Apply geometry theorems
   a) Solve application problems
   b) Build 3-dimentional models of the 5 regular polyhedra.
   c) Perform basic constructions using a compass and a straightedge.
   d) Distinguish the difference between congruence and similarity.
   e) Combine algebra and geometry to perform applications in the Cartesian coordinate system.
   f) Calculate the perimeter and area of two-dimensional objects.
   g) Calculate the surface area and volume of three-dimensional objects.
   h) Apply the Pythagorean Theorem to solve problems.
   i) Perform reflections, rotations, translations, glide reflections and half-turns.
   j) Identify line, rotational, and point symmetries.

D. LEARNING OUTCOMES (GENERAL): The student will be able to: Continued. . .

k) Tessellate the plane
l) Use technology for geometry applications

5. Demonstrate an understanding of measurement.
   a) Make conversions between metric measurements
   b) Use dimensional analysis to make conversions between metric and customary measurement system.
   c) Apply knowledge of the metric system to solve problems.

F. LEARNING OUTCOMES (MNTC):
Goal 4/Mathematics/Symbolic Systems: The student will be able to:

1. Illustrate historical and contemporary applications of mathematics/logical systems.
2. Clearly express mathematical/logical ideas in writing.
3. Explain what constitutes a valid mathematical/logical argument (proof).
4. Apply higher-order problem solving and/or modeling strategies.

G. METHODS FOR EVALUATION OF STUDENT LEARNING: Methods may include but are not limited to:

1. Tests
2. Quizzes
3. Homework
4. Cooperative group work
5. Writing assignments
6. Computer assignments
7. Portfolios

H. RCTC CORE OUTCOME(S). This course contributes to meeting the following RCTC Core Outcome(s):
Critical Thinking. Students will think systematically and explore information thoroughly before accepting or formulating a position or conclusion.

I. SPECIAL INFORMATION (if any):
A scientific calculator is required.