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): Minimum grade of C in MATH 0099, MATH 0100, MATH 1113 or higher, and college level reading.
4. Co-requisites (Course discipline/number): None
5. MnTC Goals (if any): Goal 2/Critical Thinking, Goal 4/Mathematics/Logical Reasoning

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. Completion of Math 1050 is NOT a prerequisite.

B. DATE LAST REVISED (Month, year): February, 2014

C. 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

D. 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-man, 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-dimensional 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 Geometer’s Sketchpad 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.

E. LEARNING OUTCOMES (MNTC):
   Goal 2/ Critical Thinking: Students will be able to:
   1. Gather factual information and apply it to a given problem in a manner that is relevant, clear, comprehensive, and conscious of possible bias in the information selected.
   2. Imagine and seek out a variety of possible goals, assumptions, interpretations, or perspectives, which can give alternative meanings or solutions to given situations or problems.
   3. Analyze the logical connections among the facts, goals, and implicit assumptions relevant to a problem or claim; generate and evaluate implications that follow from them.
   4. Recognize and articulate the value assumptions, which underlie and affect decisions, interpretations, analyses, and evaluations made by ourselves and others.

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.

F. METHODS FOR EVALUATION OF STUDENT LEARNING:
   1. Tests
   2. Quizzes
   3. Homework
   4. Cooperative group work
   5. Writing assignments
   6. Computer assignments
   7. Portfolios

G. RTC CORE OUTCOME(S) ADDRESSED:
   ☒ Communication
   ☒ Critical Thinking
   ☒ Global Awareness/Diversity
   ☐ Civic Responsibility
   ☐ Personal/Professional Accountability
   ☐ Aesthetic Response

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