

Common Course Outline for: Mathematical Foundations 1

A. Course Description

1. Number of credits: 3
2. Lecture hours per week: 3
Lab hours per week: None
3. Prerequisites: MATH 0630 or eligible for MATH 1050
4. Co-requisites: None
5. MnTC Goals : 4

As part of a three-course sequence, this course focuses on counting and numbers, operations, fractions, decimals, percents, ratio and proportion, number theory, and algebra. Emphasis on mathematical reasoning, estimation, and problem solving.

B. Date last reviewed: January 2018

C. Outline of Major Content Areas

1. Counting and numbers
2. Operations
3. Fractions, decimals, and percents
4. Ratio and proportion
5. Number theory

D. Course Learning Outcomes

Upon successful completion of the course, the student will be able to:

1. Apply and adapt a variety of appropriate strategies to solve problems that arise in mathematics and in other contexts (2b,4b,4d)
2. Name features of number systems (e.g. *positional, place value, zero as a placeholder*, etc.) (4a)
3. Compute fluently with rational numbers and make reasonable estimates
4. Perform the four arithmetic operations on whole numbers using a variety of algorithms and make sense of why the algorithms work and how these algorithms represent ways of thinking about numbers (4b)
5. Use appropriate models to justify the way number operations have been defined. (2b,4a,4d)
6. Identify the use of the identity, commutative, associative, closure, and distributive properties (2c,4c)
7. Explain and apply concepts of number theory (e.g. divisibility, factors, multiples, and prime numbers) (2c)
8. Perform the four arithmetic operations with rational numbers expressed as both fractions and decimals (4b)
9. Perform conversions among decimals, fractions, and percents (4b)
10. Represent and solve problems involving rates, ratios, and proportions
11. Identify natural numbers, whole numbers, integers, rational, and real numbers (4b)

12. Demonstrate familiarity with mathematical education resources (journals, websites)
(2a,4b)
13. Use appropriate technology to investigate and demonstrate some of the mathematical concepts in the course
14. Apply and adapt a variety of appropriate strategies to solve problems that arise in mathematics and in other contexts

E. Methods for Assessing Student Learning

The instructor will choose from among various evaluation techniques including, but not limited to, in-class testing, take-home testing, assignments, quizzes, attendance, group or individual projects, and research. The instructor will also choose a method for end-of-the-semester evaluation.

F. Special Information

Instructors may require a scientific calculator.