

COURSE OUTLINE

MATH 127

Concepts of Mathematics I

4 Semester Hours

HOWARD COMMUNITY COLLEGE

Course Description

This course is primarily for students in the elementary education and early childhood education programs. Students will study the structural aspects of mathematics and the 'why' of arithmetical computations. Mental Arithmetic is a required component of this course. Topics include sets, functions, logic, numeration systems, algorithms and their historical development, estimation, mental computations, and elementary number theory. Special emphasis is given throughout the course to problem solving techniques. Prerequisite: C or better in MATH 070 or appropriate math placement score.

Overall Course Objectives

Upon completion of this course the student will be able to:

1. Solve a variety of problems using Polya's problem solving techniques.
2. Explain the steps of common arithmetic algorithms
3. Compute in non-decimal number systems.
4. Perform mental calculations and estimations.
5. Occasionally use a calculator to help solve mathematical problems.
6. State examples and proofs from number theory.
7. Apply rules of logic to mathematical and other problems.
8. Use mathematical symbols correctly.

Major Topics

- I. Polya's Problem-Solving Process and Strategies
- II. Sets, Whole Numbers and Numeration
 - A. Set Operations and Their Properties
 - B. Numeration Systems
 - C. Functions
 - D. Whole Number Operations
 - E. Ordering and Exponents
 - F. Algorithms, Mental Math and Estimation
 - G. Other Number Bases
- III. Number Theory
 - A. Prime and Composite Numbers, Divisibility
 - B. Greatest Common Divisor and Least Common Multiple

- IV. Rational Numbers as Fractions and Decimals
 - A. The Set of Fractions
 - B. Addition and Subtraction of Rational Numbers
 - C. Multiplication and Division of Rational Numbers
 - D. Decimals and Decimal Operations
 - E. Ratio, Proportion and Percents
- V. Integers
 - A. Addition and Subtraction of Integers
 - B. Multiplication, Division, and Order of Integers
- VI. Introduction to Algebra
 - A. Rational and Real Numbers
 - B. Functions and Their Graphs
- VII. Elementary Logic

Course requirements

Grading/Exams: Grading procedures will be determined by the individual faculty member within the guidelines of the Mathematics Division and will include several unit exams, projects and a comprehensive departmental final exam.

Technology Requirements: In order to better prepare students for the Praxis I Exam, calculators will not be permitted on any exams. Students will need to purchase course software along with the textbook.

Other Course Information

This course is primarily for elementary education and early childhood education majors. Other education majors may also find it appropriate. This is a college-level mathematics course, not a "methods in teaching" course. This course is a Mathematics core course and an Arts and Science elective.