

Columbus State Community College
Mathematics Department

Course and Number: Conceptual Mathematics for Teachers I - MATH 1125

CREDITS: 5 **CLASS HOURS PER WEEK:** 5

PREREQUISITES: MATH 1075 with a grade of "C" or higher, MATH 1099 (MATH 1075 modules), or placement by COMPASS

DESCRIPTION OF COURSE (AS IT APPEARS IN THE COLLEGE CATALOG):

This course is designed as an in-depth study of the basic concepts of number systems, binary operations, number theory, algebraic thinking, and problem solving as appropriate for primary and middle school teachers. Development of these concepts will be based on the current Ohio Learning Standards for Mathematics. Instruction will focus on the development of these concepts through demonstration, exploration, and discussion using hands-on manipulatives and appropriate technology.

GOALS OF THE COURSE:

To introduce the student to a deeper understanding of the concepts, methods and applications of arithmetic, number theory, algebraic thinking in the context of a primary and middle school teacher. Students should learn and develop an appreciation for mathematical constructs and algorithms and be familiar with a variety of ways to approach and illustrate arithmetic, number theory, and algebra problems.

LEARNING OUTCOMES:

- Persevere in problem solving while using a variety of problem-solving strategies.
- Construct viable arguments, express them orally and in writing, and critique the reasoning of others.
- Attend to precision in vocabulary, computation, and symbolization.
- Analyze standard algorithms for basic computation and justify why they work by comparing them to a variety of models.
- Explore the constructs of number theory and use these to solve word problems.
- Translate contexts into appropriate expressions, formulas, and equations and use these translations to solve problems.
- Identify a variety of sequences and use them to solve problems.

OUTCOMES BASED ASSESSMENT OF STUDENT LEARNING:

For this course, students are expected to demonstrate the skills associated with the Institutional Learning Goals (ILG) identified below:

- Critical Thinking
- Communication Competence
- Quantitative Skills

In class students are assessed on their achievement of these outcomes. Names will not be used when reporting results. Outcomes-based assessment is used to improve instructional planning and design and the quality of student learning throughout the college.

TEXTBOOK, MANUALS, REFERENCES, AND OTHER READINGS:

Beckmann, S. (2022). Mathematics for Elementary and Middle School Teachers with Activities (6th ed.), Boston: Pearson.

Ohio Department of Education (2017). Ohio's Learning Standards: Mathematics.

Retrieved August 7, 2017, from

<http://education.ohio.gov/getattachment/Topics/Learning-in-Ohio/Mathematics/Ohio-s-Learning-Standards-in-Mathematics/MATH-Standards-2017.pdf.aspx>

Although not required, students may find the following to be useful:

Colored pencils

Calculator

UNITS OF INSTRUCTION:

- Number (the Decimal System) (Chapter 1)
- Number (Fractions) (Chapter 2)
- Addition and Subtraction (Chapter 3)
- Multiplication (Chapters 4 and 5)
- Division (Chapter 6)
- Number Theory (Chapter 8)
- Algebra (Chapter 9, section 9.1 – 9.5)

GENERAL INSTRUCTIONAL METHODS:

This course relies heavily on classroom activities and small and large group discussion. A minimal amount of lecture may also be used.

STANDARDS AND METHODS FOR EVALUATION:

Final Exam and Midterm Combined = 60% of course grade (midterm and final exam are 100% departmental)

Group Work = 15% of the final grade (graded with a predetermined rubric)

Weekly Learning Products = 15% of the final grade

Homework and Discussion = 10% of the final grade

Eliminate extra credit assignments or limit them to no more than 2% of the overall grade for the course.

GRADING SCALE:

Letter grades for the course will be awarded using the following scale:

≥ 90% - A 80-89% - B 70-79% - C 60-69% - D < 60% - E/EN

Course grades are NOT to be curved, skewed, or otherwise inflated.