Washtenaw Community College Comprehensive Report

MTH 148 Functional Math for Elementary Teachers I
Effective Term: Fall 2022

Course Cover

College: Math, Science and Engineering Tech
Division: Math, Science and Engineering Tech
Department: Math & Engineering Studies
Discipline: Mathematics
Course Number: 148
Org Number: 12200
Full Course Title: Functional Math for Elementary Teachers I
Transcript Title: Funct Math for Elem Teach I
Is Consultation with other department(s) required: No
Publish in the Following: College Catalog , Time Schedule , Web Page
Reason for Submission: Course Change
Change Information:
Course description
Outcomes/Assessment
Objectives/Evaluation
Rationale: The State of Michigan changed the teacher education requirements and now require all teacher education courses (including content-based ones, like MTH 148) to incorporate "high leverage core teaching practices" as part of their outcomes.
Proposed Start Semester: Spring/Summer 2022
Course Description: This is the first course in a two-course sequence. In this course, students will learn the mathematical concepts and problem-solving techniques necessary for students pursuing a career in elementary education. It is not a course solely for math teachers; rather it provides a general mathematical background for teachers of all subjects. Topics include problem-solving, sets, numeration systems, number theory, number sense, computations in the real number system, and algebraic reasoning.

Course Credit Hours

Variable hours: No
Credits: 4
Lecture Hours: Instructor: 60 **Student:** 60
Lab: Instructor: 0 **Student:** 0
Clinical: Instructor: 0 **Student:** 0

Total Contact Hours: Instructor: 60 **Student:** 60
Repeatable for Credit: NO
Grading Methods: Letter Grades
Audit
Are lectures, labs, or clinicals offered as separate sections?: NO (same sections)

College-Level Reading and Writing

College-level Reading & Writing

College-Level Math

Level 3

Requisites

General Education

MACRAO

MACRAO Sci & Math Elementary Education

General Education Area 3 - Mathematics

Assoc in Arts - Area 3
for Elementary and Early Childhood

Request Course Transfer

Proposed For:

Eastern Michigan University
Ferris State University
Grand Valley State University
Jackson Community College
Michigan State University
Oakland University
University of Michigan
Wayne State University
Western Michigan University
Central Michigan University

Student Learning Outcomes

1. Use common problem solving techniques from Pre-Kindergarten through sixth grade (PK-6).
   Assessment 1
   Assessment Tool: Outcome-related common test questions on the final exam
   Assessment Date: Spring/Summer 2023
   Assessment Cycle: Every Three Years
   Course section(s)/other population: All sections
   Number students to be assessed: All students
   How the assessment will be scored: The selected set of common questions from the final exam will be scored with a departmentally-developed four-point rubric.
   Standard of success to be used for this assessment: 75% or more of the students score a 3 or a 4 (out of 4 possible points- defined on the rubric).
   Who will score and analyze the data: MTH 148 course leader

2. Investigate number theory and number sense as it applies to grades PK-6 and perform computations in the real number system.
   Assessment 1
   Assessment Tool: Outcome-related common test questions on final exam
   Assessment Date: Spring/Summer 2023
   Assessment Cycle: Every Three Years
   Course section(s)/other population: All sections
   Number students to be assessed: All students
   How the assessment will be scored: The selected set of common questions from the final exam will be scored with a departmentally-developed four-point rubric.
   Standard of success to be used for this assessment: 75% or more of the students score a 3 or a 4 (out of 4 possible points- defined on the rubric).
   Who will score and analyze the data: MTH 148 course leader

3. Use algebra to describe patterns, relations, and functions, and to model and solve problems.
   Assessment 1
   Assessment Tool: Outcome-related common test questions on the final exam

Assessment Date: Spring/Summer 2023
Assessment Cycle: Every Three Years
Course section(s)/other population: All sections
Number students to be assessed: All students
How the assessment will be scored: The selected set of common questions from the final exam will be scored with a departmentally-developed four-point rubric.
Standard of success to be used for this assessment: 75% or more of the students score a 3 or a 4 (out of 4 possible points- defined on the rubric).
Who will score and analyze the data: MTH 148 course leader

4. Practice high leverage core teaching practices and examine how they can be helpful in teaching grades PK-6.

Assessment 1

Assessment Tool: Teaching demonstration project and analysis assignments on Blackboard
Assessment Date: Spring/Summer 2023
Assessment Cycle: Every Three Years
Course section(s)/other population: All sections
Number students to be assessed: All students
How the assessment will be scored: The project and analysis assignments will be graded using a departmentally-developed rubric.
Standard of success to be used for this assessment: 75% or more of the students score a 3 or a 4 (out of 4 possible points- defined on the rubric).
Who will score and analyze the data: MTH 148 course leader

Course Objectives

1. Solve problems using techniques such as (1) guess and test, (2) listing, (3) diagrams/pictures, (4) solve a similar problem, etc.
2. Solve addition problems using (1) the traditional algorithm, (2) drawing a picture with black/red chips, (3) base 10 blocks, (4) compatible numbers, (5) partial sums, and (6) estimation.
3. Given an incorrectly executed algorithmic solution to an arithmetic problem, analyze students' misconceptions using correct terminology and prescribe instructional help.
4. Demonstrate understanding of the concepts of place value and regrouping by representing numbers using base 10 blocks and by using correct rounding techniques.
5. Identify examples of the commutative, associative, identity, distributive and closure properties in the whole, integer, and rational number systems.
6. Solve subtraction problems using (1) the traditional algorithm, (2) drawing a picture using black/red chips, (3) the comparison, take away and missing addend approaches, (4) base 10 blocks, (5) compatible numbers, and (6) estimation.
7. Solve multiplication problems using (1) the traditional algorithm, (2) drawing a picture using groups and/or black/red chips, (3) the lattice method, (4) rectangle arrays, (5) repeated addition, (6) partial products, (7) base 10 blocks, (8) compatible numbers, and (9) estimation.
8. Solve division problems using (1) the traditional algorithm, (2) drawing a picture using groups and/or black/red chips, (3) rectangle arrays, (4) repeated subtraction, (5) base 10 blocks, (6) compatible numbers, and (7)estimation.
9. Graph linear functions and inequalities and interpret graphs to answer questions about the problem.
10. Solve linear equations and inequalities.
11. Write a linear equation when given (1) two points, (2) a point and the slope, (3) a point and the equation of a line parallel or perpendicular to the unknown line, (4) a written description/story problem
12. Use the properties of exponents to simplify algebraic expressions.
13. Use the order of operations to simplify expressions.
14. Use proportions and pictures to solve problems involving percents and ratios.
15. Find the missing numbers in a sequence and determine if the sequence is arithmetic, geometric, or neither.

16. Draw a Venn diagram when given two or three sets and interpret the meaning of each part of the diagram.
17. Perform set operations such as (1) union, (2) intersection, and (3) complement.
18. Lead a group discussion
19. Explain and model content, practices, and strategies from the PK-6 classroom.
20. Elicit and interpret individual students' thinking.

New Resources for Course

Course Textbooks/Resources

Textbooks
Manuals
Periodicals
Software

Equipment/Facilities

Reviewer	Action	Date
Faculty Preparer:		
Nichole Klemmer	*Faculty Preparer*	*Jan 10, 2022*
Department Chair/Area Director:		
Lawrence David	*Recommend Approval*	*Feb 07, 2022*
Dean:		
Victor Vega	*Recommend Approval*	*Feb 08, 2022*
Curriculum Committee Chair:		
Randy Van Wagnen	*Recommend Approval*	*Mar 08, 2022*
Assessment Committee Chair:		
Shawn Deron	*Recommend Approval*	*Mar 09, 2022*
Vice President for Instruction:		
Kimberly Hurns	*Approve*	*Mar 10, 2022*

Washtenaw Community College Comprehensive Report

MTH 148 Functional Math for Elementary Teachers I
Effective Term: Fall 2019

Course Cover

Division: Math, Science and Engineering Tech
Department: Mathematics
Discipline: Mathematics
Course Number: 148
Org Number: 12200
Full Course Title: Functional Math for Elementary Teachers I
Transcript Title: Funct Math for Elem Teach I
Is Consultation with other department(s) required: No
Publish in the Following: College Catalog , Time Schedule , Web Page
Reason for Submission:
Change Information:
Outcomes/Assessment
Rationale: The existing course outcomes and objectives do not include all of the content we currently teach in the course, so I would like to add more outcomes and objectives to reflect what we teach. The language in outcome 3 is ambiguous, so that language needs to be clarified as well.
Proposed Start Semester: Winter 2019
Course Description: This course is the first in a two-course sequence presenting the mathematical concepts and problem-solving techniques necessary for students pursuing a career in elementary education. It is not a course solely for math teachers; rather it provides a general mathematical background for teachers of all subjects. Topics include problem-solving, sets, numeration systems, number theory and the whole, integer and rationale number systems.

Course Credit Hours

Variable hours: No
Credits: 4
Lecture Hours: Instructor: 60 **Student:** 60
Lab: Instructor: 0 **Student:** 0
Clinical: Instructor: 0 **Student:** 0

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Are lectures, labs, or clinicals offered as separate sections?: NO (same sections)

College-Level Reading and Writing

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College-Level Math

Level 3

Requisites

General Education

MACRAO
MACRAO Sci & Math Elementary Education
General Education Area 3 - Mathematics
Assoc in Arts - Area 3
for Elementary and Early Childhood

Request Course Transfer

Proposed For:

Student Learning Outcomes

1. Solve problems by using Polya's 4-step method and by utilizing common techniques from the elementary grades.
   Assessment 1
   Assessment Tool: Common test questions
   Assessment Date: Fall 2020
   Assessment Cycle: Every Three Years
   Course section(s)/other population: All section
   Number students to be assessed: All students
   How the assessment will be scored: Departmentally-created rubric
   Standard of success to be used for this assessment: 75% or more of the students score a 3 or a 4 (out of 4 possible points- defined on the rubric).
   Who will score and analyze the data: MTH 148 course leader

2. Perform calculations and analyze student calculations in the whole, integer and rational number system using traditional and non-traditional algorithms. Apply the concepts of place value and regrouping to these tasks.
   Assessment 1
   Assessment Tool: Common test questions
   Assessment Date: Fall 2020
   Assessment Cycle: Every Three Years
   Course section(s)/other population: All sections
   Number students to be assessed: All students
   How the assessment will be scored: Departmentally-created rubric
   Standard of success to be used for this assessment: 75% or more of the students score a 3 or a 4 (out of 4 possible points- defined on the rubric).
   Who will score and analyze the data: MTH 148 Course Leader

3. Identify properties of the whole, integer, and rational number systems and use those properties to simplify and solve problems.
   Assessment 1
   Assessment Tool: Common test questions
   Assessment Date: Fall 2020
   Assessment Cycle: Every Three Years
   Course section(s)/other population: All sections
   Number students to be assessed: All students
   How the assessment will be scored: Departmentally-created rubric
   Standard of success to be used for this assessment: 75% or more of the students score a 3 or a 4 (out of 4 possible points- defined on the rubric).
   Who will score and analyze the data: MTH 148 Course Leader

4. Use basic algebra skills to solve problems at the elementary and middle school levels.
   Assessment 1
   Assessment Tool: Common test questions

Assessment Date: Fall 2020
Assessment Cycle: Every Three Years
Course section(s)/other population: All sections
Number students to be assessed: All students
How the assessment will be scored: Departmentally-created rubric
Standard of success to be used for this assessment: 75% or more of the students score a 3 or a 4 (out of 4 possible points- defined on the rubric).
Who will score and analyze the data: MTH 148 Course Leader

5. Interpret and draw Venn diagrams and use those diagrams to perform set operations.
   Assessment 1
   Assessment Tool: Common test questions
   Assessment Date: Fall 2020
   Assessment Cycle: Every Three Years
   Course section(s)/other population: All sections
   Number students to be assessed: All students
   How the assessment will be scored: Departmentally-created rubric
   Standard of success to be used for this assessment: 75% or more of the students score a 3 or a 4 (out of 4 possible points- defined on the rubric).
   Who will score and analyze the data: MTH 148 Course Leader

Course Objectives

1. Solve problems using techniques such as (1) guess and test, (2) listing, (3) diagrams/pictures, (4) solve a similar problem, etc.
2. Solve addition problems using (1)the traditional algorithm, (2)drawing a picture with black/red chips, (3)base 10 blocks, (4)compatible numbers, (5)partial sums, and (6) estimation.
3. Given an incorrectly executed algorithmic solution to an arithmetic problem, analyze students' misconceptions using correct terminology and prescribe instructional help.
4. Demonstrate understanding of the concepts of place value and regrouping by representing numbers using base 10 blocks and by using correct rounding techniques.
5. Identify examples of the commutative, associative, identity, distributive and closure properties in the whole, integer, and rational number systems.
6. Solve subtraction problems using (1)the traditional algorithm, (2)drawing a picture using black/red chips (3)the comparison, take away and missing addend approaches,(4)base 10 blocks, (5)compatible numbers, and (6)estimation.
7. Solve multiplication problems using (1)the traditional algorithm, (2)drawing a picture using groups and/or black/red chips, (3) the lattice method, (4)rectangle arrays, (5)repeated addition, (6) partial products, (7) base 10 blocks, (8) compatible numbers, and (9)estimation.
8. Solve division problems using (1)the traditional algorithm, (2)drawing a picture using groups and/or black/red chips, (3)rectangle arrays, (4)repeated subtraction, (5) base 10 blocks, (6) compatible numbers, and (7)estimation.
9. Graph linear functions and inequalities and interpret graphs to answer questions about the problem.
10. Solve linear equations and inequalities.
11. Write a linear equation when given (1) two points, (2) a point and the slope, (3) a point and the equation of a line parallel or perpendicular to the unknown line, (4) a written description/story problem
12. Use the properties of exponents to simplify algebraic expressions.
13. Use the order of operations to simplify expressions.
14. Use proportions and pictures to solve problems involving percents and ratios.
15. Find the missing numbers in a sequence and determine if the sequence is arithmetic, geometric, or neither.
16. Draw a Venn diagram when given two or three sets and interpret the meaning of each part of the diagram.
17. Perform set operations such as (1) union, (2) intersection, and (3) complement.

New Resources for Course

Course Textbooks/Resources

Textbooks
Manuals
Periodicals
Software

Equipment/Facilities

Reviewer	Action	Date
Faculty Preparer:		
Nichole Klemmer	*Faculty Preparer*	*Dec 14, 2018*
Department Chair/Area Director:		
Lisa Manoukian	*Recommend Approval*	*Jan 24, 2019*
Dean:		
Kristin Good	*Recommend Approval*	*Jan 28, 2019*
Curriculum Committee Chair:		
Lisa Veasey	*Recommend Approval*	*Feb 20, 2019*
Assessment Committee Chair:		
Shawn Deron	*Recommend Approval*	*Feb 21, 2019*
Vice President for Instruction:		
Kimberly Hurns	*Approve*	*Feb 25, 2019*