EICC COURSE DEVELOPMENT MODEL (CDM)

CATALOG COURSE NUMBER: MAT-733
COURSE TITLE: Math for Technologies A
Originating College: ☐CCC ☐MCC ☑SCC Effective Term/Year: Spring 2014
Initiating Faculty Member: Kenneth Darmody Initiating Department Coordinator:

Reason for submission: Check all that apply
☐New Course If yes, type of course:
☐**A&S**
To be considered for General Education? ☐ Yes ☐ No Category:
To be part of an A & S Concentration? ☐ Yes ☐ No Concentration:
☐**CTE** Program Title: ☐Required ☑Elective
☑General Education or Program Review ☐Reactivation of an inactive course ☐Making course inactive
☐Changing course; please explain:
☑Other; please explain: Expanded objectives to clarify student learning

Contact Hours/Distribution of Contact Hours

Lecture Hours		Lab Hours		Clinical Hours		Coop Hours	
Hours per Week:	3.10	Hours per Week:	0	Hours per Week:	0	Hours per Week:	0
Number of Weeks:	8.00	Number of Weeks:	8.00	Number of Weeks:	8.00	Number of Weeks:	8.00
***Note: If offering a course for the full fall or spring semester, the number of weeks is 16.5*							
Total Lecture Hrs:	29.76	Total Lab Hrs:	0	Total Clinical Hrs:	0	Total Coop Hrs:	0

Semester Hours Credit: 1.50 if variable credit, give range:
Allow repeat* for credit: ☐Yes ☑No
If yes, total course repeats allowed: If yes, total credits:
*Note that repeat for credit means a student can pass the course and then repeat it for additional credit. An internship course is an example of a course that could be set up as repeatable for additional credit

Course or courses this CDM replaces, if any:

CATALOG COURSE DESCRIPTION: Math for Technologies A is part one of two courses designed to teach vocational students the math skills necessary to locate and produce part features in three dimensions when combined with machine training. This course contains common and decimal fractions, ratios and proportions, percentage problems, and algebraic expressions of addition, subtraction, multiplication, division, powers, and roots. All of the math concepts are verified, supported, and reviewed repeatedly through real-world applications.

RECOMMENDED ENTRY LEVEL SKILLS/KNOWLEDGE:

PRE-REQUISITE COURSES

CCN#	COURSE TITLE

CO-REQUISITE COURSES

CCN#	COURSE TITLE

PUBLISHED MATERIAL(S) USED FOR CDM DEVELOPMENT: Smith, Robert, and John Peterson. Mathematics for Machine Technology 6e. Clifton Park: Delmar. 2009.

In general it is expected that source material will be dated within 5 years of this CDM date. If all materials/ textbooks cited above are older than this, please explain:

GENERAL COURSE GOALS

Upon successful completion of this course the student should be able to:

Compute common and decimal fractions as they translate thread features, geometric shapes, and blueprints into dimensions used for specific machining and measurement processes.
Formulate percentage equations as they are used to predict metallurgical recipes, production comparisons, and payroll taxes.
Distinguish between inverse and direct proportions as well as generate missing quantities in gear ratios and linear tapers.
Arrange a problem into a form usable by a scientific calculator including modifying radicals and entering them as fractional exponents.
Recall and apply the correct order of operations as they apply to combined algebraic expressions.

TOPICAL OUTLINE

1. Common Fractions and Decimal Fractions
   a. Introduction to common fractions and mixed numbers
   b. Addition, subtraction, multiplication and division of common fractions and mixed numbers
   c. Combined operations of common fractions and mixed numbers
   d. Introduction to decimal fractions
   e. Rounding decimal fractions and equivalent decimal and common fractions
   f. Addition, subtraction, multiplication, and division of decimal fractions
   g. Powers
   h. Roots
2. Ratio, Proportion, and Percentage
   a. Ratio and proportion
   b. Direct and inverse proportions
   c. Introduction to percents
   d. Distinguish percent, percentage, and base by basic
   e. Practical applications
3. Fundamentals of Algebra
   a. Symbolism
   b. Signed numbers
   c. Algebraic operations of addition, subtraction, and multiplication
   d. Algebraic operations of division, powers, and roots

COURSE OBJECTIVES

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

1. Introduction to common fractions and mixed numbers
   a. Express fractions in lowest terms.
   b. Express fractions as equivalent fractions.
   c. Express mixed numbers as improper fractions.
   d. Express improper fractions as mixed numbers.
2. Addition, subtraction, multiplication and division of common fractions and mixed numbers
   a. Determine lowest common denominators.
   b. Express fractions as equivalent fractions having lowest common denominators.
   c. Perform addition of fractions and mixed numbers.
   d. Perform subtraction of fractions and mixed numbers.
   e. Perform multiplication of fractions and mixed numbers.
   f. Recognize common factors and perform cancellation.
   g. Perform division of fractions, and mixed numbers.
3. Combined operations of common fractions and mixed numbers
   a. Solve problems that involve combined operations of fractions and mixed numbers.
   b. Solve complex fractions.
   c. Perform combinations of operations with fractions using a calculator.
4. Introduction to decimal fractions
   a. Locate decimal fractions on a number line.
   b. Translate decimal numbers to word form.
   c. Translate numbers expressed in word form to decimal fractions.

5. Rounding decimal fractions and equivalent decimal and common fractions
   a. State decimal fractions to any number of places (rounding).
   b. Express common fractions as decimal fractions.
   c. Express decimal fractions as common fractions.
6. Addition, subtraction, multiplication, and division of decimal fractions
   a. Perform addition of decimal fractions.
   b. Perform addition of combinations; decimals, mixed numbers, and whole numbers.
   c. Perform subtraction of decimal fractions.
   d. Perform subtraction of combinations; decimals, mixed decimals, and whole numbers.
   e. Perform multiplication of decimal fractions.
   f. Perform multiplication of combinations; decimals, mixed numbers, and whole numbers.
   g. Perform division of decimal fractions.
   h. Perform division of decimal fractions with whole numbers.
   i. Perform division of decimal fractions with mixed decimals.
7. Powers
   a. Raise numbers to indicated powers.
   b. Solve problems that involve combinations of powers and other basic operations.
8. Roots
   a. Extract whole number roots.
   b. Determine the root of any positive number using a calculator.
   c. Rearrange radicals to fractional exponent form.
   d. Solve problems that involve combinations of roots with other basic arithmetic operations.
9. Ratio and Proportion
   a. Write comparisons as ratios.
   b. Express ratios in lowest terms.
   c. Solve for the unknown term of a proportion.
   d. Substitute given numerical values for symbols in a proportion and solve for the unknown.
10. Direct and Inverse Proportions
   a. Analyze problems to determine whether quantities are directly or inversely proportional.
   b. Arrange and solve direct and inverse proportions.
11. Introduction to Percents
   a. Express decimal fractions and common fractions as percents.
   b. Express percents as decimal fractions and common fractions.
12. Distinguish percent, percentage, and base by basic examples.
   a. Determine the percentage, given the base and rate.
   b. Determine the percent (rate), given the percentage and base.
   c. Determine the base, given the rate and percentage.
13. Assemble practical applications to find the percentage, percent, and base as required.
   a. Solve simple percentage practical applications in which two of the three parts are given.
   b. Solve more complex percentage practical applications in which two of the three parts are not directly given.
14. Symbolism
   a. Express word statements as algebraic expressions.
   b. Express diagram dimensions as algebraic expressions.
   c. Evaluate algebraic expressions by substituting numbers for symbols.
15. Signed numbers
   a. Compare signed numbers according to size and direction using the number scale.
   b. Determine absolute values of signed numbers.
   c. Perform basic operations of addition, subtraction, multiplication, division, powers, and roots using signed numbers.
   d. Solve expressions that involve combined operations or signed numbers.
16. Algebraic operations of addition, subtraction, multiplication, division, roots, and powers.
   a. Perform the basic algebraic operations of addition, subtraction, and multiplication.
17. Algebraic operations of division, powers, and roots
   a. Perform the basic algebraic operations of division, powers, and roots.
   b. Remove parentheses that are preceded by a plus or minus sign.
   c. Simplify algebraic expressions that involve combined operations.

RECOMMENDED METHODS OF INSTRUCTION: *Check all appropriate methods of instruction to facilitate student learning of course objectives.*

❑ Case Studies	☑ Class Discussions
❑ Computer lab work	❑ Computer-assisted tools

❑Computer-assisted writing	❑Conducting experiments
☑Demonstration or modeling	❑Electronic interaction
❑Field observation	❑Field trips
❑Guest speaker	☑Guided practice
❑In-class writing or editing workshops	❑Journals
❑Lecture	❑Library instruction and resources
❑Model building	☑Peer review
☑Readings	❑Role play
❑Service learning	❑Simulation
☑Student and instructor conferences	❑Student collaborative learning
❑Student presentation	❑Student projects
☑Tests or quizzes	☑Worksheets/surveys
❑Writing assignments/exercises (graded or not)	
❑Other (please list specifics):	

RECOMMENDED EVALUATION METHODS: *Check all appropriate methods of evaluation to assess student achievement of course objectives.*

❑Class workshops	❑Classroom discussions/participation
❑Collaborative work	❑Demonstration of skill(s)
❑Individual conferences	❑Journals
❑Laboratory reports	❑Oral presentations
❑Portfolios	❑Pretest/Posttest
❑Quizzes	❑Reading responses
❑Student presentations	❑Student projects
☑Tests	❑Writing Assignments
☑Other (please list specifics): Homework Assignments	

ATTENDANCE: Policies on attendance will be formulated by the instructor and communicated to the students on the course syllabus.

ACADEMIC DISHONESTY: Policies on academic dishonesty can be found in the EICC student code of conduct published in the student handbook.

CDM CREATION/REVIEW/REVISION INFORMATION	
Originally Written by:	Date:
Department Chair, Comments, & Date:	
Does similar curriculum exist at other EICC Colleges? ❑CCC ❑MCC ❑SCC ❑No	
If yes, Counterparts Consulted, College, Comments & Date:	
CDM Review or Revision Date:	
Faculty member(s) & College:	
Does similar curriculum exist at other EICC Colleges? ❑CCC ❑MCC ❑SCC ❑No	
Changes made to course which will require further review steps:	

❑ Making course inactive ❑ Credit hours ❑ Contact hours ❑ Course Description
❑ 25% or more of course objectives ❑ Other minor revisions or no revisions
Dean Review, Comments & Date:
If changes made require further review and approval:
College Curriculum Committee Sign-off & Date:
IC Review Subcommittee Sign-off & Date:
Instructional Council Approval: