EICC COURSE DEVELOPMENT MODEL (CDM)

CATALOG COURSE NUMBER: MAT-734
COURSE TITLE: Math for Technologies B
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 B is part two 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 fundamentals of algebra, fundamentals of plane geometry, and right triangle trigonometry. All of the course contents are verified, supported, and reviewed repeatedly through real-world applications.

RECOMMENDED ENTRY LEVEL SKILLS/KNOWLEDGE:

PRE-REQUISITE COURSES

CCN#	COURSE TITLE
MAT 733	Math for Technologies A

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:

Solve for cutting time, cutting speed, length of cut, tool feed per revolution, work piece diameter, and rpm by using formulas requiring single variable algebra.
Apply one or more geometric principles to locate position and determine distance in planes comprised of parallelograms, triangles, and circles.
Determine angles, and lengths in complex practical machine applications using right triangle trigonometry.

TOPICAL OUTLINE

1. Formulas and Equations
   a. Introduction to equations
   b. Solving equations by the subtraction, addition, and division principles of equality
   c. Solving equations by the multiplication, root, and power principles of equality
   d. Rearranging formulas and solving equations consisting of combined operations
   e. Apply formulas to cutting speed, revolutions per minute, and cutting time
2. Geometric shapes
   a. Lines and angular measure
   b. Protractors; semicircular and vernier
   c. Types of angles and angular geometric principles
   d. Introduction to triangles
   e. Geometric principles of triangles and other common polygons
   f. Introduction to circles
   g. Arc and angles of circles
   h. Tangent circles
3. Triangles
   a. Introduction to trigonometric functions (emphasizing SINE, COSINE, and TANGENT)
   b. Basic calculations of angles and sides of right triangles
   c. Simple practical machine applications
   d. Complex practical machine applications

COURSE OBJECTIVES

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

1. Introduction to equations
   a. Express word problems as equations.
   b. Express problems given in graphic form as equations.
   c. Solve simple equations using logical reasoning.
2. Solving equations by the subtraction, addition, and division principles of equality
   a. Solve equations using the subtraction principle of equality.
   b. Solve equations using the addition principle of equality.
   c. Solve equations using the division principle of equality.
   d. Solve equations using transposition.
3. Solving equations by the multiplication, root, and power principles of equality
   a. Solve equations using the multiplication principle of equality.
   b. Solve equations using the root principle of equality.
   c. Solve equations using the power principle of equality.
4. Rearranging formulas and solving equations consisting of combined operations
   a. Solve equations involving several operations.
   b. Rearrange formulas in terms of any letter value.
   c. Substitute values in formulas and solve for unknowns.
   d. Solve for the unknown term of a proportion.
5. Apply formulas to cutting speed, revolutions per minute, and cutting time
   a. Solve cutting speed, revolutions per minute, and cutting time problems by substitution in given formulas.
   b. Solve production time and cutting feed problems by rearranging and combining formulas.
6. Lines and angular measure
   a. Add, subtract, multiply, and divide angles in terms of degrees, minutes, and seconds.
   b. Express decimal degrees as degrees, minutes, and seconds.
   c. Express degrees, minutes, and seconds as decimal degrees.

7. Protractors; semicircular and vernier
   a. Measure angles with a simple protractor.
   b. Lay out angles with a simple protractor.
   c. Read settings on a venier bevel protractor.
   d. Compute complements and supplements of angles.
8. Types of angles and angular geometric principles
   a. Identify different types of angles.
   b. Determine unknown angles in geometric figures using the principles of opposite, alternate interior, corresponding, parallel, and perpendicular angles.
9. Introduction to triangles
   a. Identify different types of triangles.
   b. Determine unknown angles based on the principle that all triangles contain 180°.
   c. Identify corresponding parts of triangles.
10. Geometric principles of triangles and other common polygons
   a. Identify similar triangles and compute unknown angles and sides.
   b. Compute angles and sides of isosceles, equilateral, and right triangles.
   c. Determine interior angles of any polygon.
11. Introduction to circles
   a. Identify parts of a circle.
   b. Solve problems by using geometric principles that involve chords, arcs, central angles, perpendiculars, and tangents.
12. Arc and angles of circles
   a. Solve problems by using geometric principles that involve angles formed inside, on, and outside a circle.
13. Tangent circles
   a. Solve problems by using geometric principles that involve internally and externally tangent circles.
14. Introduction to trigonometric functions (emphasizing SINE, COSINE, and TANGENT)
   a. Identify the sides of a right triangle with reference to any angle.
   b. State the ratios of three trigonometric functions in relation to given triangles.
   c. Find functions of angles given in decimal degrees and degrees, minutes, and seconds.
   d. Find angles in decimal degrees and degrees, minutes, and seconds of given functions.
15. Basic calculations of angles and sides of right triangles
   a. Compute an unknown angle of a right triangle when two sides are known.
   b. Compute an unknown side of a right triangle when an angle and a side are known.
16. Simple practical machine applications
   a. Solve simple machine technology problems that require the projection of auxiliary lines and the use of geometric principles and trigonometric functions.
17. Complex practical machine applications
   a. Solve complex applied machine technology problems that require forming two or more right triangles by the projection of auxiliary lines.

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:	