Version for 21-22: Effective 09-16-2021

Submissions for the next academic year accepted through November 1.

Application for Core Curriculum Inclusion

Click to enter date of submission.
10/31/2021

TABLE #1	General Information		
Course Title:	MATH 1410: Applied Technical Mathematics I--Enhanced		
Course Description as listed in the current Fairmont State Catalog:	This course is an elementary introduction to fundamental mechanics and techniques for performing operations with algebraic expressions, factoring, solving linear equations and systems of linear equations, graphing functions and relations, as well as using trigonometric functions and applying them to solve triangles and problems involving vectors. The course will provide students with enhanced support to reintroduce and reinforce fundamental concepts from geometry, algebra, arithmetic, and trigonometry.		
Prepared by:	Bob Niichel		Full-time
Preparer email address:	rniichel@fairmontstate.edu		
Course Coordinator:	Bob Niichel		Full-time
Course Coordinator email:	rniichel@fairmontstate.edu		
Core Curriculum Category & Corresponding Outcome:	Category 4 - Mathematics	4. Students will be able to use appropriate symbolic manipulation skills and problem-solving methods to model problems and reach logical conclusions, and correctly use the language of mathematics to communicate conclusions and solutions.	
Enter ALL course outcomes: **Note: If there are multiple outcomes this cell may spread onto another page. If that occurs, move Table #2 (page 7) onto a new page.**	• Outcome 1: (Problem Solving Methods) Use problem solving methods to model and solve real world problems using right triangles, the law of sines, and the law of cosines. • Outcome 2: (Symbolic Manipulation) Demonstrate appropriate symbolic manipulation skills to simplify algebraic expressions. • Outcome 3: (Language of Mathematics) Use the language of mathematics to describe trigonometric relationships or graphs of functions. • Outcome 4: (Interpretation of Mathematical Knowledge) Interpret mathematical knowledge to reach logical conclusions about the solution sets of systems of linear equations. • Outcome 5: Solve problems using vectors.		
Signature of Appropriate Discipline Faculty	Robert Niichel	Discipline Mathematics	10/29/2021
Signature of Unit Chair	Mahmood Hossain	Unit Name Department of Computer Science and Mathematics	10/29/2021
Signature of Unit Dean	Steven Rodi	College of Science & Technology	10/29/2021

Information Required for Creating Assessment Plan in Watermark

- Complete one copy of Table #2 for each course outcome which addresses the Core Curriculum category outcome.
- Copy Table #2 to create a separate table for additional course outcomes as many times as needed. Place only one table per page.
- Cells expand.

Table #2	Course Outcome Information
Course Outcome:	Outcome 1: (Problem Solving Methods) Use problem solving methods to model and solve real world problems using right triangles, the law of sines, and the law of cosines.
Method to Measure Course Outcome	Direct - Exam
Details/ Description:	An in-class quiz
Satisfactory Performance Standard (based on rubric):	Average score based on Arizona Math Rubric of 2.25 or better
Ideal Target (based on rubric):	Average score based on Arizona Math Rubric of 2.75 or better
Implementation Plan (timeline):	Outcome will be assessed every semester
Key/Responsible Personnel:	Bob Niichel
Supporting Attachments: **These attachments are to be placed immediately after the associated Table #2 in the proposal.**	*Attachment 1:* A sample quiz *Attachment 2:* Arizona Math Rubric *Attachment 3:*

M1410 Quiz §§9.5-9.6 (Outcome 1) Name: *Write your name on back!*

Show your work for full credit!

Average Score: _____/4

(1) Suppose the angle of elevation to the sun is 51°. If the shadow of a tree is 20m long, how tall is the tree? As part of your solution, please draw a picture of the situation.

(2) A surveyor measure the angles and sides of a triangle. Two sides of the triangle measure 15m and 25m. The angle opposite the 25m side measures 75.3°. What is the measure of the third side?

(3) Suppose another triangle has two sides which measure 32in and 50in. The angle between these two sides is 28°. What is the length of the third side?

Source: Arizona Department of Education

Arizona Math Rubric

Holistic Scale

4 -- A 4 response represents an effective solution. It shows complete understanding of the problem, thoroughly addresses all points relevant to the solution, shows logical reasoning and valid conclusions, communicates effectively and clearly through writing and/or diagrams, and includes adequate and correct computations and/or setup. It may contain insignificant errors that do not interfere with the completeness or reasonableness of the student's response.

3 -- A 3 response contains minor flaws. Although it shows an understanding of the problem, communicates adequately through writing and/or diagrams, and generally reaches reasonable conclusions, it shows minor flaws in reasoning and/or computation or neglects to address some aspect of the problem.

2 -- A 2 response shows gaps in understanding and/or execution. It shows one or some combination of the following flaws: an incomplete understanding of the problem, failure to address some aspects of the problem, faulty reasoning, weak conclusions, unclear communication in writing and/or diagrams, or a poor understanding of relevant mathematical procedures or concepts.

1 -- A 1 response shows some effort beyond restating the problem or copying given data. It shows some combination of the following flaws: little understanding of the problem, failure to address most aspects of the problem, major flaws in reasoning that lead to invalid conclusions, or a lack of understanding of relevant mathematical procedures or concepts.

0 -- Response shows no mathematical understanding of the problem or the student has failed to respond to the item.

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Table #2	Course Outcome Information
Course Outcome:	Outcome 2: (Symbolic Manipulation) Demonstrate appropriate symbolic manipulation skills to simplify algebraic expressions.
Method to Measure Course Outcome	Direct - Exam
Details/ Description:	An in-class quiz
Satisfactory Performance Standard (based on rubric):	Average score based on Arizona Math Rubric of 2.5 or better
Ideal Target (based on rubric):	Average score based on Arizona Math Rubric of 3.0 or better
Implementation Plan (timeline):	Outcome will be assessed every semester
Key/Responsible Personnel:	Bob Niichel
Supporting Attachments: **These attachments are to be placed immediately after the associated Table #2 in the proposal.**	*Attachment 1:* A sample quiz *Attachment 2:* See Arizona rubric with Outcome 1 *Attachment 3:*

M1410 Quiz §§1.1-1.8 (Outcome 2) Name: *Write your name on back!*

Show your work for full credit!

Average Score: _____/4

(1) Evaluate: $-7(-3) + \dfrac{6}{-3} - |-5|$

(2) Simplify: $\dfrac{2z^3}{(2z)^3}$

(3) Simplify (eliminate the parentheses): $(2s + 7t)(3s + 5t)$

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Table #2	Course Outcome Information
Course Outcome:	Outcome 3: (Language of Mathematics) Use the language of mathematics to describe trigonometric relationships or graphs of functions.
Method to Measure Course Outcome	Direct - Exam
Details/ Description:	An in-class quiz
Satisfactory Performance Standard (based on rubric):	Average score based on Arizona Math Rubric of 2.25 or better
Ideal Target (based on rubric):	Average score based on Arizona Math Rubric of 2.75 or better
Implementation Plan (timeline):	Outcome will be assessed every semester
Key/Responsible Personnel:	Bob Niichel
Supporting Attachments: **These attachments are to be placed immediately after the associated Table #2 in the proposal.**	*Attachment 1:* A sample quiz *Attachment 2:* See Arizona rubric with Outcome 1 *Attachment 3:*

M1410 Quiz §§8.1-8.3 (Outcome 3) Name: *Write your name on back!*

Show your work for full credit!

Average Score: _____/4

(1) What is the geometric interpretation of $\sin(150°)$? Use a picture to help you explain your answer.

(2) What is the geometric interpretation of sine and cosine for negative angles? Again, use a picture to explain your answer.

(3) Explain the relationship between radians and degrees. Provide an equation that can be used to find radians if the angle is given in degrees.

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Table #2	Course Outcome Information
Course Outcome:	Outcome 4: (Interpretation of Mathematical Knowledge) Interpret mathematical knowledge to reach logical conclusions about the solution sets of systems of linear equations.
Method to Measure Course Outcome	Direct - Exam
Details/ Description:	An in-class quiz
Satisfactory Performance Standard (based on rubric):	Average score based on Arizona Math Rubric of 2.25 or better
Ideal Target (based on rubric):	Average score based on Arizona Math Rubric of 2.75 or better
Implementation Plan (timeline):	Outcome will be assessed every semester
Key/Responsible Personnel:	Bob Niichel
Supporting Attachments: **These attachments are to be placed immediately after the associated Table #2 in the proposal.**	*Attachment 1:* A sample quiz *Attachment 2:* See Arizona rubric with Outcome 1 *Attachment 3:*

M1410 Quiz §§5.1-5.4 (Outcome 4) Name: *Write your name on back!*

Show your work for full credit!

Average Score: _____/4

(1) Solve the following system using any method you like:

$$\begin{cases} 2x + y = 5 \\ 5x + 3y = 8 \end{cases}$$

(2) Solve the following system using any method you like:

$$\begin{cases} -2x - 3y = 2 \\ 4y + 2x = 8 \end{cases}$$

(3) What conclusions can be drawn about the geometric interpretations of the solution sets to these systems? Be sure to address both systems.