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| 1. **Institution and Course Information**
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| Name of Institution | **Navajo Technical University** |
| Department | **Engineering, Mathematics, & Technology** |
| Course Number, Title, Credits | **MTH 123 Trigonometry (4)** |
| Co-requisite Course Number and Title, if any |  |
| Is this application for your system (ENMU, NMSU, & UNM)? |  |
| Name and Title of Contact Person | **Gholam Ehteshami, Department Chairperson** |
| Email and Phone Number of Contact Person | **gehteshami@navajotech.edu; 505-786-4100** |

**Was this course previously part of the general education curriculum?**

[x] Yes [ ] No

**This course will fulfill general education requirements for (check all that apply):**

[x] AA/AS/BA/BS [ ]  **AAS**

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| 1. Content Area and Essential Skills
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**To which content area should this course be added?** *Indicate “Other” if the course is not associated with one of the six NM General Education content areas.*

[ ] Communications [x] Mathematics [ ] Science [ ] Social & Behavioral Sciences

[ ] Humanities [ ] Creative & Fine Arts [ ] Other

**Which essential skills will be addressed?**

[x] Communication [x] Critical Thinking [ ] Information & Digital Literacy

[x] Quantitative Reasoning [ ] Personal & Social Responsibility

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| 1. Learning Outcomes
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**This course follows the CCNS SLOs for**

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| MATH 1230 Trigonometry. A study of plane trigonometry including the definitions of the fundamental trig functions using right angle triangle and unit circle approaches. Trig functions of any real number will be evaluated, and the functions graphed along with their transformations. Trigonometric identities will be developed and demonstrated including multiple angle identities and identities developed from them. Inverse Trigonometric functions will be developed and used to solve trigonometric equations. Trigonometric applications will be solved using right angle trigonometry and the laws of sines and cosines. Trigonometric methods will be applied to complex numbers and the use of 2D vectors and vector dot products.  |

**List all learning outcomes that are shared between course sections at your institution.**

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| **Common Course Student Learning Outcomes (find Common Course SLOs at:** [**http://www.hed.state.nm.us/programs/request-a-change-to-the-nmccns.aspx**](http://www.hed.state.nm.us/programs/request-a-change-to-the-nmccns.aspx)**)**  |
| 1. Students will be able to define and evaluate the trigonometric functions as functions of angle in both degree and radian measure using the definitions in terms of x, y, and r; as the ratio of sides of a right triangle; using the unit circle; using reference angles, commonly used (0 ° , 30 ° , 45 °, 60 °, 90 °) angles and using a calculator. 2. Students will be able to solve right triangles. They will be able to draw a sketch in an applied problem when necessary. 3. Students will be able to solve non-right triangles using the law of sines and the law of cosines. 4. Students will be able to prove trigonometric identities and apply addition and subtraction, double-angle, half-angle and power reduction formulas. 5. Students will be able to graph the six trigonometric functions, their transformations and their inverses. 6. Students will be able to use algebraic methods, including the use of identities and inverses, to solve trigonometric equations and demonstrate connections to graphical and numerical representations of the solutions. 7. Students will be able to add and subtract vectors in two dimensions. They will be able to use the dot product to project one vector onto another and to determine the angle between two vectors. They will be able to solve a variety of word problems using vectors. 8. Students will be able to work with polar coordinates; this includes graphing in polar coordinates and transforming an equation with polar coordinates into one with rectangular coordinates, and vice versa. 9. Students will be to work with the trigonometric form of complex numbers, including using De Moivre’s formula. |

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| **Institution-specific Student Learning Outcomes**  |
| List institution-specific Student Learning Outcomes |

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| 1. Narrative
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**Explain what students are going to do to develop the critical skills** (selected above) **and how you will assess their learning?**

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| **Communication.** *Genre and Medium Awareness, Application and Versatility; Strategies for Understanding and Evaluating Messages; and Evaluation and Production of Arguments.*  |
| In this class, students develop communication skills through a range of listening, speaking, reading, and writing activities. They demonstrate appropriate listening skills through cooperative learning activities in one-on-one and small and large group settings. They develop oral communication skills by presenting information singly and in groups. They also prepare a variety of written documents, including word-processed lab reports and presentations of graphs using TI Connectivity Kit software and Microsoft Excel. On tests, quizzes, and the final exam, students produce short answers and essays in complete sentences and well-written paragraphs or face penalties. They are expected to show all calculations and explain how they arrived at their answers. |

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| **Critical Thinking.** *Problem Setting; Evidence Acquisition; Evidence Evaluation; and Reasoning/Conclusion* |
| Students develop critical thinking skills by successfully completing laboratory activities, projects, quizzes, tests, the final exam, and the final capstone activity. In these activities, students employ processes for analyzing and interpreting data, identifying problems and potential causes, designing solutions using basic research, validating results, and revising strategies as called for by data. When tests, quizzes, and other assessments are returned to the students, they are expected to engage in error analysis to minimize the probability of future errors. |

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| **Quantitative Reasoning.** *Communication/Representation of Quantitative Information; Analysis of Quantitative Arguments; and Application of Quantitative Models*  |
| Students apply mathematical skills that are appropriate to their program of study (e.g., Biology and Life Sciences, Business, Chemistry, Physics, Consumer Economics, and Construction). They analyze and solve mathematical problems taken from the workplace and everyday life. They solve for right angles, and solve for non-right angles using sine and cosine. They prove trigonometric identities, and graph trigonometric functions. They add and subtract vectors, and use dot products to determine angles between vectors. They work with polar coordinates. And, they work with trigonometric form of complex numbers. |

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| **Personal & Social Responsibility***. Intercultural reasoning and intercultural competence; Sustainability and the**natural and human worlds; Ethical reasoning; Collaboration skills, teamwork and value systems; and Civic discourse, civic knowledge and engagement – local and global*  |
| In this box, provide a narrative that explains how the proposed course addresses the outcomes of the third essential skill. 200 – 300 words. |

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| **Information & Digital Literacy.** *Authority and Value of Information; Digital Literacy; Information Structure; and Research as Inquiry* |
| In this box, provide a narrative that explains how the proposed course addresses the outcomes of the third essential skill. 200 – 300 words. |

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| 1. Supporting Documents
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[ ]  **Sample Course Rubric Attached** (recommended)[x]  **Sample Assessment Attached** (required)

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| 1. Assessment Plan (Must be on file with HED by August 1, 2019)
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**Link to Institution’s General Education Assessment Plan** Click here to enter text.

This course meets Navajo Tech's institutional standards for General Education and has been reviewed and approved by our General Education Committee and Assessment Committee. Student learning data will be gathered from the last of the course's project assignments. Data summaries from all sections of the course will be compiled on a semester-by-semester basis by the University's Offices of Assessment and Institutional Research. Departmental faculty will review the data and design course and GenEd program improvements during Assessment Days each semester. An annual summary that includes summaries of program improvement will be prepared by the Assessment Committee and included in the University's Annual Student Learning Report. Curriculum revisions as needed will be designed by the General Education Committee and reviewed and approved by the Faculty Congress.

**This course meets institutional standards for general education.**

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Signature of Chief Academic Officer Date

**HED Internal Use Only**

Presented to NMCC on\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Date

[ ] Approved [ ] Denied

If denied, rationale:

Institution Notified on \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 Date

**Sample Assessment: Quiz**

**Calculator is not allowed**.

**Question One**: Please answer the following questions:

1. Determine the domain of the function defined by:
2. Find the center and radius of the circle that has the general

Form .

1. Evaluate ( ,where and
2. Find the inverse of the function given by the equation , and verify your answer

**Question Two**: Please answer the following questions:

1. State the amplitude, period, and phase shift for the function:
2. Graph the function

**Question Three**: Please answer the following questions:

1. Verify the identity
2. Find the exact value of given that and is in Quadrant II.
3. Solve: where

**Question Four**:

1. Solve the triangle , and find the area.
2. Extra Credit: Find the exact value of the given expression: