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| 1. **Institution and Course Information** | |
| Name of Institution | **Navajo Technical University** |
| Department | **Mathematics** |
| Course Number, Title, Credits | **MTH 121 College Algebra 4 credits** |
| Co-requisite Course Number and Title, if any |  |
| Is this application for your system (ENMU, NMSU, & UNM)? | **NA** |
| Name and Title of Contact Person | **Carlos Paez-Paez** |
| Email and Phone Number of Contact Person | **cpaez@navajotech.edu; (505) 786-4100** |

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

Yes No

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

AA/AS/BA/BS  **AAS**

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| 1. Content Area and Essential Skills |

**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 Mathematics Science Social & Behavioral Sciences

Humanities Creative & Fine Arts Other

**Which essential skills will be addressed?**

Communication Critical Thinking Information & Digital Literacy

Quantitative Reasoning Personal & Social Responsibility

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| 1. Learning Outcomes |

**This course follows the CCNS SLOs for**

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| MTH 1220 College Algebra. The study of equations, functions and graphs, reviewing linear and quadratic functions, and concentrating on polynomial, rational, exponential and logarithmic functions. Emphasizes algebraic problem solving skills and graphical representation of functions. |

**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. Use function notation; perform function arithmetic, including composition; find inverse functions. 2. Identify functions and their transformations given in algebraic, graphical, numerical, and verbal representations, and explain the connections between these representations. 3. Graph and interpret key feature of functions, e.g., intercepts, leading term, end behavior, asymptotes. 4. Solve equations algebraically to answer questions about graphs, and use graphs to estimate solutions to equations. 5. Solve contextual problems by identifying the appropriate type of function given the context and creating a formula based on the information given. 6. Communicate mathematical information using proper notation and verbal explanations. |

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

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| 1. Narrative |

**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.* |
| Oral and written communication are stressed throughout MTH 121. For every class students are expected to take notes from explanations provided by the instructor. Students are challenged to pay attention and ask questions. There is at least one real-life problem per week that students need to read, analyze, interpret, and solve. In addition, students communicate in various genres and mediums:  • Written communication: Students have assignments every week in which they need to solve different algebraic exercises and real-life problems. Students have to write the process to solve the exercises step-by-step.  • Oral communication: There are group classroom activities every two weeks. Students must share their ideas with other classmates. Later, they are asked to analyze and evaluate arguments in groups and finally to determine correct solutions for the exercises.  • Digital communication: There is also a project at the end of the semester. In this assignment, students partner up with a fellow student. They choose a project idea (e.g. determining bacteria growth, computing compound interest of an investment account, determining cooking recipes), and they represent quantitative information using appropriate equations to solve problems. The project must be presented to the class using presentation software (e.g. Powerpoint, Prezi, or Adobe Flash). |

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| **Critical Thinking.** *Problem Setting; Evidence Acquisition; Evidence Evaluation; and Reasoning/Conclusion* |
| This course provides students with tools to explain, analyze, and evaluate information, and to convey that information algebraically. Solving algebraic exercises within the context of real-life problems on a weekly basis, doing group activities every two weeks, and conducting final projects at the end of the semester, students must understand problems, compare and contrast algebraic techniques, and identify data necessary to solve contextual problems. After they solve the problem students are asked to write interpretations for the solution. They must determine if the solution makes sense. Finally, students have to develop conclusions based on data gathered from estimations and computations. |

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| **Quantitative Reasoning.** *Communication/Representation of Quantitative Information; Analysis of Quantitative Arguments; and Application of Quantitative Models* |
| College Algebra offers students a college level academic experience that accentuates the use of algebra and functions in problem-solving and modeling, supplies the algebra and other mathematics needed in partner disciplines, provides a foundation in quantitative literacy, and helps meet quantitative needs in, and outside of, academia. Students address problems presented as real-world situations by creating and interpreting mathematical models. Solutions to the problems are formulated, validated, and analyzed using mental, paper and pencil, algebraic, and technology-based techniques as appropriate. In weekly assignments, students express quantitative information symbolically using equations and formulas (e.g. compound interest, inflation, population growth, depreciation, cost-revenue-profit), graphs (e.g. linear functions, quadratic functions, cubic functions, polynomial functions, rational functions, circle equation), and written language (e.g. add, subtract, multiply and divide functions, find inverse functions, solve real-life problems). In addition, students complete quizzes and exams in which they analyze the effects of changes (amounts borrowed, saved, or invested; interest rates; frequency of compounding; length of time) made to investments, savings plans and mortgages. They use formulas and graphs to analyze various scenarios, make estimations and predictions, interpret results, and state conclusions that they can apply to their own financial decision making. |

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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 |

**Sample Course Rubric Attached** (recommended) **Sample Assessment Attached** (required)

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| 1. Assessment Plan (Must be on file with HED by August 1, 2019) |

**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 from the course's skills rubric 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

**MTH 121 College Algebra**

**Course Assessment: Assignment-with-Rubric**

**Assignment Steps**

1 Partner up with a fellow student in MTH 121.

2 Review our textbook (specific chapters and pages are indicated here). Choose one project idea (e.g., determining bacteria growth, computing compound interest for a car loan, determining cooking recipes).

3 Explain why you and your partner chose this particular project.

4 Represent quantitative information using appropriate equations. Solve the problem.

5 Develop presentation in Powerpoint. Ensure that your presentation has a) title page, b) introduction, c) context, d) quantitative representation, e) results, f) interpretation of results, and g) significance.

6 Present the Powerpoint slides with partner in class. Ensure that you and your partner are equally involved in discussing each slide.

**Rubric**

**Quantitative Reasoning Rubric**

**Adapted from NMHED Quantitative Reasoning rubric • Navajo Technical University**

Student: Assignment: Date:

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| Criteria | SCALE | | | Scores & comments |
| Emerging (1) | Developing (2) | Proficient (3) |
| *Express quantitative information* | Student explains the meaning of graphics, numbers, or algebraic symbols within a given context. | Emerging skill descriptions plus: Translates mathematical graphics and symbolism into written or oral language; translates written or oral language into mathematical symbols and graphics. | Developing skill descriptions plus: Integrates written and symbolic mathematical constructs in describing particular contexts. |  |
| *Evaluate a quantitative argument* | Student summarizes quantitative arguments presented by others. | Emerging skill descriptions plus: Differentiates and describes the parts of a quantitative argument presented by others; compares the conclusions of a quantitative argument with conclusions from other reliable sources. | Developing skill descriptions plus: Uses appropriate techniques of mathematical proof or statistical analysis, evaluates each component of a quantitative argument for mathematical validity and demonstrates whether an overall quantitative argument is valid, invalid, or questionable. |  |
| *Interpret results to solve a problem* | Student identifies, describes, and classifies quantitative information needed to address contextual problems. | Emerging skill descriptions plus: Identifies appropriate mathematical or statistical models to represent quantitative information in contextual problems; applies those models to generate numeric predictions. | Developing skill descriptions plus: Assesses the validity of numeric predictions and correct unreasonable findings; analyzes and interprets results; uses them in a quantitative argument to support a position or line of reasoning or solve a contextual problem. |  |
| Overall comments | | | | |