Navajo Technical University http://www.navajotech.edu
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Course Title: Pre-Calculus
Course #: MATH 1420

Credit Hours: 4
Semester: Spring 2022
Cap: 15

Faculty: Mohamed Illafe
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Office Hours: (face-to-face, hybrid, or online): online: Email anytime but will respond within 24 hours Monday-Thursday, will respond within 48 hours Friday-Sunday.

Preferred Communication (email and/or text; will respond within 24 hours):

Modality (face-to-face, hybrid, or online): Online - WebAssign
Class Location and Meeting Times (if face-to-face):
Meeting Hours and Online Hours (if hybrid):

Required Materials: **WebAssign Access Code Please get this from the book store ASAP**

Textbooks: Precalculus, 10th Edition
Ron Larson
ISBN-10: 1-337-27107-1
ISBN-13: 978-1-337-27107-3

Tools: Scientific Calculator/Graph calculator

Laptop and Internet Access: Every student is required to own a laptop and have internet access.

Lab Fee (if applicable): None

Prerequisite: "C"or above in MATH 1230 (Trigonometry) or satisfactory Placement score. Each student is required to have a looptop. Students who don't have laptops, the cost of the laptops will be deducted from their Pell grant and then NTU will purchase laptops for them.

Mission, Vision, and Philosophy
Mission: Navajo Technical University honors Diné culture and language, while educating for the future.

Vision: Navajo Technical University provides an excellent educational experience in a supportive, culturally diverse environment, enabling all community members to grow intellectually, culturally, and economically.

Philosophy: Through the teachings of Nitsáhákees (thinking), Nahátá (planning), Íína (implementing), and Siihasin (reflection), students acquire quality education in diverse fields, while preserving cultural values and gaining economic opportunities.

Course Description

A detailed study of the mathematics needed for calculus. Concepts are presented and explored from symbolic, graphical, and numerical perspectives. Basic concepts covered include polynomial, rational, exponential, logarithmic, and trigonometric functions, complex numbers, linear systems, numerical patterns, sequences and series. The required preparation is MTH 121 college algebra.

COURSE OUTCOMES

Students are expected to have a clear understanding of the ideas of Precalculus as a solid foundation for subsequent courses in mathematics and other disciplines as well as for direct application to real life situations. The content of the entire course covers topics from basic mathematics and develop them using practical and theoretical tools, building applications and making a strong support for Calculus classes. A student passing MTH 150 Precalculus course will be able to work with the concepts of functions (functions in general, exponential and logarithmic functions, polynomial and rational functions, trigonometric functions, etc), to solve a system of linear and non-linear equations and inequalities, to make basic operations with matrices, to apply mathematical induction method, to work with trigonometric functions and their properties, and to apply them in problems related to other branches of Science: Calculus, Algebra, Physics, Chemistry, Biology, Pharmacy, Engineering, Statistics, etc.

Major Content Areas:

1. Equations and Inequalities
    a. Linear Equations, Graphs, and Applications
    b. Quadratic Equations and Applications
    c. Complex Numbers
    d. Other Types of Equations
    e. Inequalities

2. Functions and Graphs
    a. Functions
    b. Graphs of Functions
    c. Parent Functions
    d. Transformation of Functions
    e. Composite and Inverse Functions

3. Polynomial Functions
    a. Quadratic Functions
    b. Higher Order Polynomial Functions
    c. Division of Polynomials
    d. Zeros of Polynomials
    e. Applications

4. Rational Functions
    a. Rational Functions and Asymptotes
    b. Graphs of Rational Functions

5. Exponential and Logarithmic Functions
    a. Exponential Functions and Graphs
    b. Logarithmic Functions and Graphs
    c. Properties of Logarithms
    d. Exponential and Logarithmic Equations and Applications

6. Trigonometry
    a. Degree and Radian Measures
    b. Definitions of the Trigonometric Functions
    c. Standard Trigonometric Identities (Recognition, Use, and Proof)
    d. Graphs of Trigonometric Functions
    e. Inverse Trigonometric Functions
    f. Law of Sines
    g. Law of Cosines
    h. Heron's Area Formula
    i. Applications of Trigonometry to Real-Life Problems

7. Systems of Equations and Matrices
    a. Linear and Nonlinear Systems of Equations
    b. Two Variable Linear Systems
    c. Multivariable Linear Systems
    d. Applications of Systems to Real-Life Problems

8. Sequences and Series
    a. Sequence and Series Notation
    b. Factorials
    c. Summations
    d. Arithmetic and Geometric Sequences
    e. Infinite Sums

9. Additional Topics if Time Permits
    a. Matrices
    b. Solving Linear Systems using Matrices
    c. Elementary Matrix Row Operations
    d. Gaussian and Gauss-Jordan Elimination
    e. Determinants and Cramer's Rule
    f. Inverses of Matrices
    g. Vectors
    h. Polar Coordinates
    i. Conic Sections

COURSE MEASUREMENTS

Complete reading assignments, homework assignments.

Grading Plan

Homework	100%	A = 100 - 90%
		B = 89 - 80%
		C = 79 - 70%
		D = 69 - 60%
		F < 60%

Dropping Class: It is the student's responsibility to find out when is the last day of dropping classes.

Grading Policy
Students must do their own work. Cheating and plagiarism are strictly forbidden. Cheating includes (but is not limited to) plagiarism, submission of work that is not one's own, submission or use of falsified data, unauthorized access to exams or assignments, use of unauthorized material during an exam, or supplying or communicating unauthorized information for assignments or exams.

Participation
Students are expected to attend and participate in all class activities. Points will be given to students who actively participate in class activities including guest speakers, field trips, laboratories, and all other classroom events.

Cell phone and headphone use
Please turn cell phones off **before** coming to class. Cell phone courtesy is essential to quality classroom learning. Headphones must be removed before coming to class.

Attendance Policy
Students are expected to attend all class sessions. If more than ten minutes late, students will be counted as absent. A percentage of the student's grade will be based on class attendance and participation. Absence from class, regardless of the reason, does not relieve the student of responsibility to complete all course work by required deadlines. Furthermore, it is the student's responsibility to obtain notes, handouts, and any other information covered when absent from class and to arrange to make up any in-class assignments or tests if permitted by the instructor. Incomplete or missing assignments will necessarily affect the student's grades. Instructors will report excessive and/or unexplained absences to the Counseling Department for investigation and potential intervention. **Instructors may drop students from the class after three (3) absences unless prior arrangements are made with the instructor to make up work and the instructor deems any excuse acceptable.**

Study Time Outside of Class for Face-to-Face Courses
For every credit hour in class, a student is expected to spend two hours outside of class studying course materials.

Study Time for Hybrid or Blended Courses
For a hybrid or blended course of one credit hour, a student is expected to spend three hours per week studying course materials.

Study Time for Online Courses
For an online course of one credit hour, a student is expected to spend four hours per week studying course materials.

Academic Integrity
Integrity (honesty) is expected of every student in all academic work. The guiding principle of academic integrity is that a student's submitted work must be the student's own. Students who engage in academic dishonesty diminish their education and bring discredit to the University community. Avoid situations likely to compromise academic integrity such as: cheating, facilitating academic dishonesty, and plagiarism; modifying academic work to obtain additional credit in the same class unless approved in advance by the instructor, failure to observe rules of academic integrity established by the instructor**. The use of another person's ideas or work claimed as your own without acknowledging the original source is known as plagiarism and is prohibited**.

Diné Philosophy of Education
The Diné Philosophy of Education (DPE) is incorporated into every class for students to become aware of and to understand the significance of the four Diné philosophical elements, including its affiliation with the four directions, four sacred mountains, the four set of thought processes and so forth: Nitsáhákees, Nahát'á, Íína and Siih Hasin which are essential and relevant to self-identity, respect and wisdom to achieve career goals successfully.

At NTU's Zuni Campus, the A:shiwi Philosophy of Education offers essential elements for helping students develop Indigenous and Western understandings. Yam de bena: dap haydoshna: akkya hon detsemak a:wannikwa da: hon de:tsemak a:ts'umme. *Our language and ceremonies allow our people to maintain strength and knowledge.* A:shiwi core values of hon i:yyułashik'yanna:wa (respect), hon delank'oha:willa:wa (kindness and empathy), hon i:yyayumoła:wa (honesty and trustworthiness), and hon kohoł lewuna:wediyahnan, wan hon kela i:tsemanna (think critically) are central to attaining strength and knowledge. They help learners develop positive self-identity, respect, kindness, and critical thinking skills to achieve life goals successfully.

Students with Disabilities
Navajo Technical University is committed to serving all students in a non-discriminatory and accommodating manner. Any student who feels that she or he may need special accommodations should contact the Accommodations Office (http://www.navajotech.edu/student-services#accomodations-services) in accordance with the university's Disability Accommodations Policy (see http://www.navajotech.edu/images/about/policiesDocs/Disability_Exhibit-A_6-26-2018.pdf).

Email Address
Students are required to use NTU's email address for all communications with faculty and staff.

Final Exam Date:

Final exam will be on Monday of the week number sixteen 16.