Instructor: Dr. Andrew Phillips
e-mail: andrew.phillips@nm.edu
Office: Weir 246
Office hours: MWF 10:45-11:30, 1:15-2:15
Class time and location: MWF 8:40-9:30 in Cramer 101

Text: Precalculus: Mathematics for Calculus, 7th edition, by Stewart, Redlin, and Watson. We will cover parts of Chapters 5-9.

Course description: 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.

Prerequisites: MATH 1220 passed with a grade of C- or better, or ACT Math score of at least 25.

Place in curriculum: This course is a prerequisite for MATH 1510, a New Mexico general education and institute requirement.

Homework: There will be written homework assigned every Wednesday and due the following Wednesday in class. Homework assignments and grades will be posted on the Canvas site for this course. No late homework will be accepted for any reason. Your lowest homework grade will be dropped. Each assignment must be submitted with a cover page stapled to the top, only including your name and assignment number.

Exams: There will be four in-class exams and a cumulative final exam. Calculators and online computing programs (such as Wolfram Alpha) are allowed on homework assignments, but calculators may not be used during exams. If you are forced to miss an exam for a legitimate reason, please inform me before the scheduled date if this is at all possible. Unnecessary delay will diminish your chances of being allowed a make-up.

Lab: MATH 1230L is a corequisite for this class. You may register for any section of lab. It will begin the second week of classes.

Grading: Your grade will be determined as follows: homework 10%, lab 20%, each in-class exam 10%, final exam 30%.

Academic honesty: New Mexico Tech’s academic honesty policy for undergraduate students is found starting on page 64 of the NMT undergraduate catalog. You are responsible for knowing, understanding, and following this policy.

Reasonable accommodations: New Mexico Tech is committed to protecting the rights of individuals with disabilities. Qualified individuals who require reasonable accommodations are invited to make their needs known to the Office of Counseling and Disability Services (OCDS) as soon as possible. In addition, New Mexico Tech offers mental health and substance abuse counseling through the Office of Counseling and Disability Services. The confidential services are provided free of charge by licensed professionals. To schedule an appointment, please call 575-835-6619.
Respect statement: New Mexico Tech supports freedom of expression within the parameters of a respectful learning environment. As stated in the New Mexico Tech Guide to Conduct and Citizenship: “New Mexico Tech’s primary purpose is education, which includes teaching, research, discussion, learning, and service. An atmosphere of free and open inquiry is essential to the pursuit of education. Tech seeks to protect academic freedom and build on individual responsibility to create and maintain an academic atmosphere that is a purposeful, just, open, disciplined, and caring community.”

Title IX reporting: Sexual misconduct, sexual violence, and other forms of sexual misconduct and gender-based discrimination are contrary to the University’s mission and core values, violate university policies, and may also violate state and federal law (Title IX). Faculty members are considered “Responsible Employees” and are required to report incidents of these prohibited behaviors. Any such reports should be directed to Tech’s Title IX Coordinator (Dr. Peter Phaiah, 20D Brown Hall, 575-835-5187, titleixcoordinator@nmt.edu). Please visit Tech’s Title IX Website (www.nmt.edu/titleix) for additional information and resources.

Student learning outcomes: Upon completion of this course, students should be able to:

1. 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 \( (0^\circ, 30^\circ, 45^\circ, 60^\circ, 90^\circ) \) angles and using a calculator;
2. Solve right triangles, and draw a sketch in an applied problem when necessary;
3. Solve non-right triangles using the law of sines and the law of cosines;
4. Prove trigonometric identities and apply addition and subtraction, double-angle, half-angle and power reduction formulas;
5. Graph the six trigonometric functions, their transformations and their inverses;
6. 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. Add and subtract vectors in two dimensions, use the dot product to project one vector onto another and to determine the angle between two vectors, and solve a variety of word problems using vectors;
8. 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. Work with the trigonometric form of complex numbers, including using De Moivre’s formula.