Instructor: Penny Long  
Place: Nacogdoches High School  
E-mail address: plong@nacisd.org  
Office Phone: 936.564.2466 ext. 2703  
Class Times: Monday/Wednesdays/Fridays 3rd period or 4th period in room 203 at NHS  
Office Hours: Monday - Friday 7-7:20 am, Tuesdays and Thursdays during class, email is checked daily, after school and Zoom meetings by appointment  

**Required Materials**  

**Course Description**  
We will study the six trigonometric functions and how they are related to one another. Our study will include radian measure of angles, the trig functions and their inverse functions, trig identities, graphs of trig functions, solutions of triangles, complex numbers, and a polar coordinate system for the plane. This course is 3 credit hours.  

**Course Requirements**  
There will be three exams and a comprehensive final that will be proctored on your campus. There are quizzes that must be completed. Homework assignments are made after the lectures and while they are not necessarily graded, practicing homework is how we learn mathematics, so the homework should be completed in preparation for the quizzes. See [http://www2.sfasu.edu/math/docs/syllabi/MATH1316Syllabus.pdf](http://www2.sfasu.edu/math/docs/syllabi/MATH1316Syllabus.pdf) for elements common to all sections.  

**Final Grade Components Grading Scale**  
- 20% Homework/Quizzes  
  90% - 100% A  
- 60% Tests (3 @ 20% each)  
  80% - 89% B  
- 20% Comprehensive Final Exam  
  70% - 79% C  
- 100% Final Course Grade  
  60% - 69% D  

**General Policies and Information**  
- You earn your grade by **communicating** your understanding of the material through showing clearly how the solution was derived on the homework, quizzes, and exams.  
- Clearly communicating mathematics will be essential in this course.  
- Submit homework when asked, scanned as a PDF to my email: plong@nacisd.org  
- If attending online, students should be on time, properly dressed, with video on.  

**Attendance Policy**  
- You are expected to attend class regularly, either through Zoom or face-to-face.  
- Since you have a full semester to arrange any plans, they are not an excuse for missing the final.  
- Students who have 3 or more unexcused absences may have points deducted from their final average.  
- You are expected to take the weekly quiz during the class meeting time, either online or face-to-face.
**Student Learning Outcomes:**

<table>
<thead>
<tr>
<th>Topic</th>
<th>Approximate time spent</th>
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</thead>
<tbody>
<tr>
<td>Angles and definitions of trigonometric functions</td>
<td>15%</td>
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<tr>
<td>- Angles</td>
<td></td>
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<tr>
<td>- Trigonometric functions</td>
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<tr>
<td>Graphs of trigonometric functions</td>
<td>15%</td>
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<tr>
<td>- Basic graphs of the trigonometric functions</td>
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<tr>
<td>- Modified graphs of the trigonometric functions</td>
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<tr>
<td>Inverse Trigonometric Functions and Solving Equations</td>
<td>15%</td>
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<tr>
<td>- Definitions and graphs of inverse trigonometric functions</td>
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<tr>
<td>- Calculations with inverse trigonometric functions</td>
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<tr>
<td>- Solving trigonometric equations</td>
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<tr>
<td>Identities</td>
<td>20%</td>
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<tr>
<td>- Logic and techniques for proving various types of trig identities</td>
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<tr>
<td>Solving Triangles</td>
<td>15%</td>
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<tr>
<td>- Solving right triangles using Law of Cosines and Law of Sines</td>
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<tr>
<td>Vectors, Complex Numbers, and Polar Coordinates</td>
<td>20%</td>
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<tr>
<td>- Vectors</td>
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<tr>
<td>- Complex number system</td>
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<tr>
<td>- Polar coordinate system</td>
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</tbody>
</table>

**University Policies**

- **Academic Integrity (A-9.1)** Academic integrity is a responsibility of all university faculty and students. Faculty members promote academic integrity in multiple ways including instruction on the components of academic honesty, as well as abiding by university policy on penalties for cheating and plagiarism.

**Definition of Academic Dishonesty** Academic dishonesty includes both cheating and plagiarism. Cheating includes but is not limited to (1) using or attempting to use unauthorized materials to aid in achieving a better grade on a component of a class; (2) the falsification or invention of any information, including citations, on an assigned exercise; and/or (3) helping or attempting to help another in an act of cheating or plagiarism. Plagiarism is presenting the words or ideas of another person as if they were your own. Examples of plagiarism are (1) submitting an assignment as if it were one's own work when, in fact, it is at least partly the work of another; (2) submitting a work that has been purchased or otherwise obtained from an Internet source or another source; and (3) incorporating the words or ideas of an author into one's paper without giving the author due credit. Please read the complete policy at [http://www.sfasu.edu/policies/academic_integrity.asp](http://www.sfasu.edu/policies/academic_integrity.asp)

- **Withheld Grades Semester Grades Policy (A-54)** Ordinarily, at the discretion of the instructor of record and with the approval of the academic chair/director, a grade of WH will be assigned only if the student cannot complete the course work because of unavoidable circumstances. Students must complete the work within one calendar year from the end of the semester in which they receive a WH, or the grade automatically becomes an F. If students register for the same course in future terms the WH will automatically become an F and will be counted as a repeated course for the purpose of computing the grade point average. The circumstances precipitating the request must have occurred after the last
day in which a student could withdraw from a course. Students requesting a WH must be passing the course with a minimum projected grade of C.

- **Students with Disabilities** To obtain disability related accommodations, alternate formats and/or auxiliary aids, students with disabilities must contact the Office of Disability Services (ODS), Human Services Building, and Room 325, 468-3004 / 468-1004 (TDD) as early as possible in the semester. Once verified, ODS will notify the course instructor and outline the accommodation and/or auxiliary aids to be provided. Failure to request services in a timely manner may delay your accommodations. For additional information, go to [http://www.sfasu.edu/disabilityservices/](http://www.sfasu.edu/disabilityservices/).

- **Acceptable Student Behavior** Classroom behavior should not interfere with the instructor's ability to conduct the class or the ability of other students to learn from the instructional program (see the Student Conduct Code, policy D-34.1). Unacceptable or disruptive behavior will not be tolerated. Students who disrupt the learning environment may be asked to leave class and may be subject to judicial, academic or other penalties. This prohibition applies to all instructional forums, including electronic, classroom, labs, discussion groups, field trips, etc. The instructor shall have full discretion over what behavior is appropriate/inappropriate in the classroom. Students who do not attend class regularly or who perform poorly on class projects/exams may be referred to the Early Alert Program. This program provides students with recommendations for resources or other assistance that is available to help SFA students succeed.

**Student Learning Outcomes (SLO):** At the end of MTH 133, a student who has studied and learned the material should be able to:

1. State and use the unit circle and ratio definitions of the six trigonometric functions. [EEO: 2, 5]
2. Recall and use exact values of the trigonometric functions at integer multiples of \( \pi/4 \) and \( \pi/6 \) in various contexts, especially in graphing trigonometric functions. [EEO: 2, 5]
3. Graph the trigonometric functions and transformations of trigonometric functions by recognizing amplitude, changes in period, vertical translations, and phase shifts. [EEO: 1, 2, 5, 6]
4. Use appropriate trigonometric identities in solving equations involving trigonometric functions and in calculating trigonometric function values. [EEO: 2, 3, 4, 5]
5. Use logical reasoning and known trigonometric identities to verify that an equation is a trigonometric identity. [EEO: 3]
6. Use inverse trigonometric functions in applications and in solving equations. [EEO: 1, 4, 6, 7]
7. Determine unknown measures of sides and/or angles of triangles for which some specific measures are given. [EEO: 1, 4, 6, 7]
8. Solve application problems using tools such as vectors, right triangle trigonometry, the Law of Sines, and the Law of Cosines. [EEO: 1, 4, 6, 7]
9. Perform arithmetical operations with complex numbers and find powers and roots of complex numbers in trigonometric form. [EEO: 2, 4, 7]
10. Use polar coordinate system, relate it to the rectangular coordinate system, and graph equations using polar coordinates. [EEO: 1, 2, 5, 7]

*There are no specific program learning outcomes for this major addressed in this course. It is a general education core curriculum course and/or a service course.* [http://www.sfasu.edu/assessment/index.asp](http://www.sfasu.edu/assessment/index.asp)

**Exemplary Educational Objectives (EEO):**

1. To apply arithmetic, algebraic, geometric, higher-order thinking, and statistical methods to modeling and solving real-world situations.
2. To represent and evaluate basic mathematical information verbally, numerically, graphically, and symbolically.
3. To expand mathematical reasoning skills and formal logic to develop convincing mathematical arguments.
4. To use appropriate technology to enhance mathematical thinking and understanding and to solve mathematical problems and judge the reasonableness of the results.
5. To interpret mathematical models such as formulas, graphs, tables and schematics, and draw inferences from them.
6. To recognize the limitations of mathematical and statistical models.
7. To develop the view that mathematics is an evolving discipline, interrelated with human culture, and understand its connections to other disciplines.

SFASU values students’ mental health and the role it plays in academic and overall student success. SFA provides a variety of resources to support students’ mental health and wellness. Many of these resources are free, and all of them are confidential.
On-campus Resources:
**SFA Counseling Services**
SFASU Counseling Services  
[www.sfasu.edu/counselingservices](http://www.sfasu.edu/counselingservices)  
3rd Floor Rusk Building  
936-468-2401

SFASU Human Services Counseling Clinic  
[www.sfasu.edu/humanservices/139.asp](http://www.sfasu.edu/humanservices/139.asp)  
Human Services Room 202  
936-468-1041

**Crisis Resources:**
Burke 24-hour crisis line 1(800) 392-8343  
Suicide Prevention Lifeline 1(800) 273-TALK (8255)  
Crisis Text Line: Text HELLO to 741-741
Math 1316 – Plane Trigonometry
Course Syllabus

Course description: Trigonometric functions of angles, radian measure, fundamental identities; addition, product, and half angle formulas, solution of triangles; polar coordinates; inverse trigonometric functions, complex numbers.

Credit hours: 3

The following is an excerpt from SFA Policy 5.4:
The federal definition of a credit hour is an amount of work represented in intended learning outcomes and verified by evidence of student achievement that is an institutionally established equivalency that reasonably approximates:

1. Not less than one hour of classroom or direct faculty instruction and a minimum of two hours out-of-class student work each week for approximately fifteen weeks for one semester or trimester hour of credit, or 10 to 12 weeks for one quarter hour of credit, or the equivalent amount of work over a different amount of time, or;

2. At least an equivalent amount of work as outlined in item 1 above for other academic activities as established by the institution including laboratory work, internships, practica, studio work, and other academic work leading to the award of credit hours.

To this end, all students in courses offered by the Department of Mathematics and Statistics that wish to be successful should plan to spend a minimum of two hours outside of class for every credit hour associated with this course. Expected activities to be completed in the time outside of class include reviewing notes from previous class meetings, reading assigned course resources, completing all assigned exercises and projects, and performing periodic assessment preparation.

Course Prerequisites and Corequisites: See general course prerequisites.

Course outline:

<table>
<thead>
<tr>
<th>Table Cell 1</th>
<th>Approximate time spent</th>
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<tbody>
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<td>o Degree measure of angles</td>
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<td>o Reference angles</td>
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<td>o Radian measure of angles</td>
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<td>o Arc length, angular velocity, linear velocity</td>
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<td>o Trigonometric functions</td>
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<td>o Definition using the unit circle</td>
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<td>o Reciprocal, ratio, and Pythagorean identities</td>
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<td>o Definition using ratios of sides of right triangles</td>
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<td>o Evaluating exact values for special angles</td>
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<td>Graphs of trigonometric functions</td>
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<td>o Amplitude</td>
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<td>o Period</td>
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<td>o Vertical translation</td>
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<td>o Phase shift</td>
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<tr>
<td>o Solving trigonometric equations</td>
<td></td>
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<tr>
<td></td>
<td>o Using factoring, identities, and quadratic formula</td>
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<td></td>
<td>o Arguments with multiple angles</td>
</tr>
<tr>
<td></td>
<td>o Using inverse functions to approximate solutions</td>
</tr>
</tbody>
</table>
• **Identities** 20%
  o Logic and techniques for proving identities
  o Calculations with identities
  o Sum and difference identities
  o Even, odd, and cofunction identities
  o Double and half-angle identities
  o Product-to-sum and sum-to-product identities

• **Solving Triangles** 15%
  o Accuracy and significant digits
  o Solving right triangles
  o Law of Cosines
  o Law of Sines
  o Ambiguous case (SSA)
  o Applications
    ▪ Navigation
    ▪ Surveying
    ▪ Angles of depression/elevation
    ▪ Areas of triangles

• **Vectors, Complex Numbers, and Polar Coordinates** 20%
  o Vectors
    ▪ Definitions
    ▪ Algebraic representations and resolving vectors
    ▪ Resultant vector
    ▪ Angle between vectors
    ▪ Dot product and orthogonality
    ▪ Applications
      ▪ Forces
      ▪ Air speed/ground speed
      ▪ Work
  o Complex number system
    ▪ Definitions
    ▪ Arithmetic and simplification of complex numbers
    ▪ Trigonometric form
    ▪ Products and quotients in trigonometric form
    ▪ De Moivre’s Theorem
    ▪ nth root theorem
  o Polar coordinate system
    ▪ Definitions
    ▪ Various representations for points using polar
    ▪ Conversion between polar and rectangular coordinates
    ▪ Graphs of polar equations
    ▪ Conversion between polar and rectangular
    ▪ Special polar graphs

**Student Learning Outcomes (SLO):** At the end of MTH 1316, a student who has studied and learned the material should be able to:

1. State and use the unit circle and ratio definitions of the six trigonometric functions.
2. Recall and use exact values of the trigonometric functions at integer multiples of \( \pi/4 \) and \( \pi/6 \) in various contexts, especially in graphing trigonometric functions.
3. Graph the trigonometric functions, and graph transformations of trigonometric functions by recognizing amplitude, changes in period, vertical translations, and phase shifts.
4. Use appropriate trigonometric identities in solving equations involving trigonometric functions and in calculating trigonometric function values.

sfasu.edu/math
5. Use logical reasoning and known trigonometric identities to verify that an equation is a trigonometric identity.
6. Use inverse trigonometric functions in applications and in solving equations.
7. Determine unknown measures of sides and/or angles of triangles for which some specific measures are given.
8. Solve application problems using tools such as vectors, right triangle trigonometry, the Law of Sines, and the Law of Cosines.
9. Perform arithmetical operations with complex numbers and find powers and roots of complex numbers in trigonometric form.
10. Use the polar coordinate system, relate it to the rectangular coordinate system, and graph equations using polar coordinates.

There are no specific program learning outcomes for this major addressed in this course. It is a general education core curriculum course and/or a service course.

Academic Integrity

The Code of Student Conduct and Academic Integrity outlines the prohibited conduct by any student enrolled in a course at SFA. It is the responsibility of all members of all faculty, staff, and students to adhere to and uphold this policy.

Articles IV, VI, and VII of the new Code of Student Conduct and Academic Integrity outline the violations and procedures concerning academic conduct, including cheating, plagiarism, collusion, and misrepresentation. Cheating includes, but is not limited to: (1) Copying from the test paper (or other assignment) of another student, (2) Possession and/or use during a test of materials that are not authorized by the person giving the test, (3) Using, obtaining, or attempting to obtain by any means the whole or any part of a non-administered test, test key, homework solution, or computer program, or using a test that has been administered in prior classes or semesters without permission of the Faculty member, (4) Substituting for another person, or permitting another person to substitute for one’s self, to take a test, (5) Falsifying research data, laboratory reports, and/or other records or academic work offered for credit, (6) Using any sort of unauthorized resources or technology in completion of educational activities.

Plagiarism is the appropriation of material that is attributable in whole or in part to another source or the use of one’s own previous work in another context without citing that it was used previously, without any indication of the original source, including words, ideas, illustrations, structure, computer code, and other expression or media, and presenting that material as one’s own academic work being offered for credit or in conjunction with a program course or degree requirements.

Collusion is the unauthorized collaboration with another person in preparing academic assignments offered for credit or collaboration with another person to commit a violation of any provision of the rules on academic dishonesty, including disclosing and/or distributing the contents of an exam.

Misrepresentation is providing false grades or résumés; providing false or misleading information in an effort to receive a postponement or an extension on a test, quiz, or other assignment for the purpose of obtaining an academic or financial benefit for oneself or another individual or to injure another student academically or financially.

Withheld Grades Semester Grades (SFA Policy 5.5)

Ordinarily, at the discretion of the instructor of record and with the approval of the academic chair/director, a grade of WH will be assigned only if the student cannot complete the course work because of unavoidable circumstances. Students must complete the work within one calendar year from the end of the semester in which they receive a WH, or the grade automatically becomes an F. If students register for the same course in future terms the WH will automatically become an F and will be counted as a repeated course for the purpose of computing the grade point average. The circumstances precipitating the request must have occurred after the last day in which a student could withdraw from a course. Students requesting a WH must be passing the course with a minimum projected grade of C. For additional information, go to https://www.sfasu.edu/policies/course-grades-5.5.pdf.

Students with Disabilities

To obtain disability related accommodations, alternate formats and/or auxiliary aids, students with disabilities must contact the Office of Disability Services (ODS), Human Services Building, and Room 325, 468-3004 / 468-1004 (TDD) as early as possible in the semester. Once verified, ODS will notify the course instructor and outline the accommodation and/or auxiliary aids to be sfasu.edu/math
provision of accommodations, Failure to request services in a timely manner may delay your accommodations. For additional information, go to http://www.sfasu.edu/disabilityservices.

Student Wellness and Well-Being
SFA values students’ overall well-being, mental health and the role it plays in academic and overall student success. Students may experience stressors that can impact both their academic experience and their personal well-being. These may include academic pressure and challenges associated with relationships, emotional well-being, alcohol and other drugs, identities, finances, etc.

If you are experiencing concerns, seeking help, SFA provides a variety of resources to support students’ mental health and wellness. Many of these resources are free, and all of them are confidential.

On-campus Resources:
The Dean of Students Office (Rusk Building, 3rd floor lobby)
www.sfasu.edu/deanofstudents
936.468.7249
dos@sfasu.edu

SFA Human Services Counseling Clinic Human Services, Room 202
www.sfasu.edu/humanservices/139.asp
936.468.1041

The Health and Wellness Hub “The Hub”
Location: corner of E. College and Raguet St.

To support the health and well-being of every Lumberjack, the Health and Wellness Hub offers comprehensive services that treat the whole person – mind, body and spirit. Services include:

- Health Services
- Counseling Services
- Student Outreach and Support
- Food Pantry
- Wellness Coaching
- Alcohol and Other Drug Education

www.sfasu.edu/thehub
936.468.4008
thehub@sfasu.edu

Crisis Resources:
- Burke 24-hour crisis line: 1.800.392.8343
- National Suicide Crisis Prevention: 9-8-8
- Suicide Prevention Lifeline: 1.800.273.TALK (8255)
- Crisis Text Line: Text HELLO to 741-741

Acceptable Student Behavior
Classroom behavior should not interfere with the instructor’s ability to conduct the class or the ability of other students to learn from the instructional program (see the Student Conduct Code, policy 10.4). Unacceptable or disruptive behavior will not be tolerated. Students who disrupt the learning environment may be asked to leave class and may be subject to judicial, academic or other penalties. This prohibition applies to all instructional forums, including electronic, classroom, labs, discussion groups, field trips, etc. The instructor shall have full discretion over what behavior is appropriate/inappropriate in the classroom.

Date of document: 08/23/2023