Hello, Trigonometry students! My name is Dr. Colin Lawson (you can call me “Dr. Lawson” or “Dr. L”), and I am so excited to begin the semester and explore the wonderful world of trigonometry with you. Math 1316 is a 3-credit course where we will study the relationship between length and angles. In this class, we will explore angles and how to measure them, trigonometric functions, identities, and equations, and also how to use trigonometry to solve real-world problems.

Primary course website: Access course announcements, syllabus, schedule, and grades on D2L: https://d2l.sfasu.edu/

Student Drop-In Hours with Dr. Lawson: I am available to meet in my office at the days/times listed below.

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For the times in the table above, no appointment is needed; simply attend by showing up to my office. Appointments (in person or via Zoom) at other times may also be scheduled by emailing me in advance.


Materials: For exams, students may choose to use only a basic, non-programmable, non-graphing calculator.

Assessments: There will be weekly in-class mini exams, three in-class midterm exams, and a comprehensive final exam. Your grade is determined by scores on mini exams, midterm exams, and the final exam. Details follow:

*Weekly In-Class Mini Exam (19%):* Expect to have an in-class quiz every Friday of non-exam weeks. Your lowest mini exam score will be dropped at the end of the semester.

*Three In-Class Midterm Exams (57%):* Please note that the dates below for our midterm exams are tentative and are subject to change. If you must miss an exam due to an excused absence, arrangements must be made prior to the date of the exam.

- Exam 1 on Wednesday, September 20, 2023
- Exam 2 on Wednesday, October 11, 2023
- Exam 3 on Wednesday, November 8, 2023

Each of your exam scores will be worth 19% of your overall grade for the course.

*A Comprehensive Final Exam (24%):* The final is university-scheduled and cannot be taken at a different time without permission of the Dean of the College of Sciences and Mathematics. The final exam is on Monday, December 11, 2023 from 1:00 – 3:00pm.

*Homework:* Exercises from the textbook will be assigned but will not be taken for a grade. While homework will not be taken for a grade, completing the homework exercises, checking your answers with the answers in the textbook, and then comparing solutions with classmates during the homework review sessions is your source of feedback. See “Homework Review Session Procedure” page below.

Participation: While participation is not taken as a grade, students are expected to attend all class meetings, arrive on time, and be prepared (and excited) to learn. In addition, students are expected to work together on short in-class practice problems.

**Grading Policy:**

<table>
<thead>
<tr>
<th></th>
<th>Weekly In-Class Mini Exams</th>
<th>Three Midterm Exams (19% each)</th>
<th>Comprehensive Final Exam</th>
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**Grade Scale:**

- 90% - 100%: A
- 80% - 90%: B
- 70% - 80%: C
- 60% - 70%: D
- Below 60%: F

**Math 1316 Syllabus:**

- Angles and definition of trig functions: 15%
- Graphs of trig functions: 15%
- Inverse trig functions and solving equations: 15%
- Identities: 20%
- Solving triangles: 15%
- Vectors, complex numbers, polar coordinates: 20%
Homework Review Session Procedure

Exercises from the textbook will be assigned each week, generally on Fridays. Your job is to write up solutions to every problem that you can by the following Wednesday. You should put a check mark ✔ next to any of the problems that you could not solve.

**How it works:** As you enter class on Wednesday, list on the board the page and problem number of the problem you could not solve. If the problem(s) already appear in the list, place a check mark ✔ next to it. Once the class start time has passed, no more problem numbers may be added to the list on the board.

Students who were successful in solving a problem listed may immediately indicate which problem they would like to solve and work it out on the board with all the details. The student should sign their name on the board next to the completed solution.

**Rules:** A student may only indicate and work on one problem at a time, and once a problem has been indicated, no other student can write their solution for it on the board. If a student has a question about a solution, the student who wrote it will need to defend their solution. If there is a problem that no one could solve, I will provide a few details about the problem.

While solutions are being written on the board, other students should be checking/comparing the solutions with theirs, or if they could not solve it, they should be writing the solution down for themselves.

**Upshot:** No penalty will be given to any student for listing problems on the board. Instead, I will record those who solve a problem with a plus sign (+) on a grade sheet. For every four (4) plus signs a student receives, they will earn at least one (1) bonus point on a future exam. Some problems on weekly mini exam will be pulled directly from the homework.

Reviewing homework should take up no more than the first ten (10) minutes of class.

**Notes to the Student:** In order for students to be success in mathematics, they must practice, practice, practice. We practice examples in class, and you’ll practice problems on your own in the homework. Be sure you can work problems independently by exam time.

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**HOMEWORK SCHEDULE**

<table>
<thead>
<tr>
<th>Topics</th>
<th>Precalculus by Edward Burger Version 3.0</th>
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<tbody>
<tr>
<td>5.1 Angles and Their Measure</td>
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<td>5.2 Right Triangle Trigonometry</td>
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<td>5.3 The Trigonometric Functions in the Coordinate Plane</td>
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<td>5.4 Unit Circle Trigonometry</td>
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<td>5.5 Graphing Sine and Cosine</td>
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<td>5.6 Graphing the Other Trigonometric Functions</td>
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<td>5.7 Inverse Trigonometric Functions</td>
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<td>5.8 Applications of Trigonometric Functions</td>
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<td>6.1 Fundamental Trigonometric Identities</td>
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<td>6.2 Solving Trigonometric Equations</td>
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<td>6.3 The Sum and Difference Formulas</td>
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<tr>
<td>6.4 Double-Angle, Half-Angle, and Product-Sum Formulas</td>
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<tr>
<td>7.1 Law of Sines</td>
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<td>7.2 Law of Cosines</td>
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<td>7.3 Vectors</td>
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<td>7.4 The Dot Product</td>
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<td>7.5 Trigonometric Form and Roots of Complex Numbers</td>
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<td>W Nov 15</td>
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<td>F Nov 17</td>
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<td>Finals week</td>
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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:

- Angles and definitions of trigonometric functions
  - Angles
    - Degree measure of angles
    - Reference angles
    - Radian measure of angles
    - Arc length, angular velocity, linear velocity
  - Trigonometric functions
    - Definition using the unit circle
    - Reciprocal, ratio, and Pythagorean identities
    - Definition using ratios of sides of right triangles
    - Evaluating exact values for special angles
- Graphs of trigonometric functions
  - Basic graphs of the trigonometric functions
  - Modified graphs of the trigonometric functions
    - Amplitude
    - Period
    - Vertical translation
    - Phase shift
- Inverse Trigonometric Functions and Solving Equations
  - Definitions and graphs of inverse trigonometric functions
  - Calculations with inverse trigonometric functions
  - Solving trigonometric equations
    - Using factoring, identities, and quadratic formula
    - Arguments with multiple angles
    - Using inverse functions to approximate solutions
• **Identities**
  - Logic and techniques for proving identities
  - Calculations with identities
  - Sum and difference identities
  - Even, odd, and cofunction identities
  - Double and half-angle identities
  - Product-to-sum and sum-to-product identities

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

• **Vectors, Complex Numbers, and Polar Coordinates**
  - Vectors
    - Definitions
    - Algebraic representations and resolving vectors
    - Resultant vector
    - Angle between vectors
    - Dot product and orthogonality
    - Applications
      - Forces
      - Air speed/ground speed
      - Work
  - 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
  - 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

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**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.
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
provided. 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

sfasu.edu/math