CoSM Class Syllabus/Policy
MTH 133: Plane Trigonometry, Spring 2020

Name: Clint Richardson
Email: crichardson@sfasu.edu
Phone: Office—936-468-1736
Office: Math 306
Office Hours: MR 11–11:50, MTW 2:30–3:20
Department: Mathematics and Statistics
Class meeting time/place: MWF 10–10:50, Math 216

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 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.

In addition, students may also use a non-programmable, non-graphing calculator with no permanent memory.

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.
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.

**Course Requirements:** Homework will be regularly assigned, but not collected; students are responsible for completing the homework and understanding the material. Students will be expected to come to class prepared—most notably, to have read the section(s) under discussion and attempted any assigned homework. Assessments will likely consist of in-class quizzes and exams, though other types of assessments (take-home assignments, etc.) may be added at the instructor’s discretion. Quizzes will occur approximately every week; exams about every fourth week. The final exam will be comprehensive and is scheduled for Mo, 4 May, 10:45–1:15.

**Course calendar/outline:** (Topics may be presented in a different order than given here)

- **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** 15%
  - 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** 20%
  - 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** 15%
  - 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** 20%
  - Vectors
    - Definitions
    - Algebraic representations and resolving vectors
    - Resultant vector
    - Angle between vectors
    - Dot product and orthogonality
    - Applications: Forces, Air/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

**Grading Policy:** Grades will be based on the total points accumulated on assessments. If you miss a regularly scheduled quiz/exam, the next grade of the same type will count double. *There will be no extra credit (other than, perhaps, bonus questions on exams).*

**Attendance Policy:** Attendance is expected and roll will be checked every day. Students who miss no more than three class days may receive special consideration in determining their grade.

**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.

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/

**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.

Please be respectful of your fellow students and your instructor. Cell phone use and texting are not allowed in class. Remember to turn your cell phone off or place it in quiet mode before entering the classroom.