MATH 026
Plane Trigonometry
Sample Syllabus

Description

Plane Trigonometry (3) Trigonometric functions; solutions of triangles; trigonometric equations; identities.

Prerequisite

Math 21 or satisfactory performance on the mathematics proficiency examination.

Objectives

Upon successful completion of Math 26, the student should be able to:

- Describe angles
- Use radian measure
- Use degree measure
- Identify a unit circle and describe its relationship to real numbers
- Use special triangle (30-60-90; 45-45-90) ratios to label a given point on the unit circle.
- Evaluate trigonometric functions using the unit circle
- Use the domain and period to evaluate sine and cosine functions
- Evaluate trigonometric functions of acute angles
- Recognize and write the fundamental trigonometric identities
- Use angles and trigonometric functions to model and solve real-life problems
- Find reference angles
- Evaluate trigonometric functions of any angle
- Sketch graphs of basic trigonometric functions
    - Sketch translations of graphs of basic trigonometric functions
- Identify the domain of inverse trigonometric functions
- Evaluate inverse trigonometric functions
- Evaluate compositions involving inverse trigonometric functions
- Sketch graphs of inverse trigonometric functions
- Use fundamental trigonometric identities and formulas
    - Evaluate trigonometric functions
    - Simplify trigonometric expressions
    - Rewrite trigonometric expressions
    - Verify trigonometric identities
    - Solve trigonometric equations
        - Solve using standard algebraic techniques
        - Solve trigonometric equations of quadratic type
        - Solve trigonometric equations involving multiple angles.
- Use non-fundamental identities/formulas to evaluate, simplify, rewrite, and solve trigonometric expressions and equations
    - Double angle
    - Sum and difference
    - Power reducing

    - Product-to-sum and sum-to-product
    - Half-angle
- Use Law of Sines
    - Solve oblique triangles (AAS or ASA)
    - Solve oblique triangles (SSA)
- Find areas of oblique triangles
- Use Law of Cosines to solve oblique triangles (SSS or SAS)
- Use Heron's Area Formula to find the area of a triangle

Textbook

Trigonometry, 2nd Edition by John W. Coburn (McGraw-Hill, 2010).

Course Format

Both algebraic skills and conceptual understanding will be expected and assessed.

Basic Skills

Basic skills will be primarily developed through work on ALEKS. ALEKS is a web-based tutorial system which provides students with ongoing skills based assessments and tracks progress. The final exam will also entail skills based problems.

Conceptual Skills

Conceptual skills will be incorporated in lectures, reading, and quizzes. Lectures will be conducted approximately every other week. A typical lecture will tie skill based ideas together to provide a larger overview of the topics. Lectures will be done via Zoom and activities will be based upon discussion board prompts and/or assigned tasks from the text. The final exam will also incorporate questions which relate to the conceptual tasks.

ALEKS Work

Essentially all of the skills based work will be conducted through ALEKS. The ALEKS system will do ongoing assessments of skills based problems and track student progress. ALEKS is a major component of the course and a typical trigonometry student will need to plan on 4–6 hours of online work each week (50–60 hours for the course). Skills based points will be earned by measuring mastered objective milestones and skills based ALEKS quizzes.

Text-book Reading & Suggested Problems

The text will be primarily used to tie ideas to concepts and skills together. This will be done through assigned readings and suggested problems. Occasionally, a problem may be selected to emphasize a specific skill that ALEKS did not adequately incorporate. Some of the activities will stem from the text. Finally, the text will support the ALEKS work in that explanations within ALEKS will reference specific areas from the text for further reading.

Canvas Work

The course management system is Canvas and most correspondence will be conducted here. Canvas quizzes will be used for conceptual based quizzes, the midterm exams and the final exam.

Class Participation

Zoom is the web-conference utility where the virtual classroom resides. This may also be used for more “face-to-face” group correspondence with students. Canvas discussion boards will be used for more general “open” classroom interaction between students and the instruction team. Students are encouraged to post questions on this advanced bulletin board.

Grading

The total number of points for the course will be 600 points as described below.

Canvas Quizzes	ALEKS Work	Proctored Exams (Canvas)
4 Unit Quizzes (20pts each)	4 Unit Quizzes (20pts each)	Midterm Exam 1 (100pts)
2 Exam Review Quizzes (20pts each)	4 Objective Sets (25pts each)	Midterm Exam 2 (100pts)
		Final Exam (100pts)
120 Total Points	180 Total Points	300 Total Points

Grade Scale

Letter Grade	Minimum Points	% Score
A	558	93-100%
A-	540	90-92%
B+	522	87-89%
B	498	83-86%
B-	480	80-82%
C+	462	77-79%
C	420	70-76%
D	360	60-69%

F	0	< 59%

Examity

In this class you may take your tests remotely and they will be proctored by a service called Examity®. Please log in as soon as possible to set up your profile. You will not be able to schedule exams until your profile is complete. Examity® system requirements are:

- Desktop computer or laptop (tablets, Chromebook and cell phones do not meet our requirements).
- Webcam and microphone (built-in or external).
- Connection to network with sufficient internet speed: at least 2 Mbps download speed and 2 Mbps upload.
- Operating systems: Windows XP–Windows 10, Mac OS X 10.8 (Mountain Lion)–10.11 (El Capitan).
- Browser with pop-up blocker disabled: Google Chrome v39 or later, Mozilla Firefox v34 or later, Internet Explorer v8 or later, Microsoft Edge, Apple Safari v6 or later.

After you create your Examity profile, you will have the option to schedule proctoring times for each of your exams. On the day of your exam, go to your Examity dashboard using the single sign-on link and select the 'Start Exam' button to meet the proctor.

Examity Proctors

Examity's proctors are highly-trained individuals who go through a rigorous process of selection, including background checks and comprehensive training. All proctors have a college degree, advanced technical and communication skills, and have completed online courses.

Proctoring Terms of Service

This course may require you to take exams using certain proctoring software that uses your computer's webcam or other technology to monitor and/or record your activity during exams. The proctoring software may be listening to you, monitoring your computer screen, viewing you and your surroundings, recording and storing any and all activity (including visual and audio recordings) during the proctoring process. By enrolling in this course, you consent to the use of the proctoring software selected by your instructor, including but not limited to any audio and/or visual monitoring which may be recorded. Please contact your instructor with any questions.

This information is provided by Penn State World Campus

If you have any technical questions or concerns, contact Examity's support team 24/7 via email or phone at (855) 392-6489.

Academic Integrity

Academic integrity is the pursuit of scholarly activity in an open, honest and responsible manner. Academic integrity is a basic guiding principle for all academic activity at The Pennsylvania State University, and all members of the University community are expected to act in accordance with this principle. Consistent with this expectation, the University's Code of Conduct states that all students should act with personal integrity, respect other students' dignity, rights and property,

and help create and maintain an environment in which all can succeed through the fruits of their efforts.

Academic integrity includes a commitment by all members of the University community not to engage in or tolerate acts of falsification, misrepresentation or deception. Such acts of dishonesty violate the fundamental ethical principles of the University community and compromise the worth of work completed by others.

Accommodating Disabilities

Penn State welcomes students with disabilities into the University's educational programs. Every Penn State campus has an office for students with disabilities. The Student Disability Resources (SDR) website provides contact information for every Penn State campus . For further information, please visit Student Disability Resources website.

In order to receive consideration for reasonable accommodations, you must contact the appropriate disability services office at the campus where you are officially enrolled, participate in an intake interview, and provide documentation: See documentation guidelines . If the documentation supports your request for reasonable accommodations, your campus disability services office will provide you with an accommodation letter. Please share this letter with your instructors and discuss the accommodations with them as early as possible. You must follow this process for every semester that you request accommodations.

Counseling and Psychological Services

Many students at Penn State face personal challenges or have psychological needs that may interfere with their academic progress, social development, or emotional wellbeing. The university offers a variety of confidential services to help you through difficult times, including individual and group counseling, crisis intervention, consultations, online chats, and mental health screenings. These services are provided by staff who welcome all students and embrace a philosophy respectful of clients' cultural and religious backgrounds, and sensitive to differences in race, ability, gender identity and sexual orientation.

- Counseling and Psychological Services at University Park (CAPS): 814-863-0395
- Counseling and Psychological Services at Commonwealth Campuses
- Penn State Crisis Line (Available 24 hrs, 7 days a week): 877-229-6400
- Crisis Text Line (Available 24 hrs, 7 days a week): Text LIONS to 741741

Educational Equity / Report Bias

Penn State takes great pride to foster a diverse and inclusive environment for students, faculty, and staff. Acts of intolerance, discrimination, or harassment due to age, ancestry, color, disability, gender, gender identity, national origin, race, religious belief, sexual orientation, or veteran status are not tolerated and can be reported through Educational Equity via the Report Bias website.