C-ID Descriptor
Precalculus & Trigonometry

Descriptor Details

- **Descriptor Title**: Precalculus & Trigonometry
- **C-ID Number**: 955
- **Units**: 6.0
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General Description

Preparation for calculus: the study of polynomial, absolute value, radical, rational, exponential, and logarithmic functions, analytic geometry, and polar coordinates. The study of trigonometric functions, their inverses and their graphs, identities and proofs related to trigonometric expressions, trigonometric equations, solving right triangles, solving triangles using the Law of Cosines and the Law of Sines, and introduction to vectors.

Prerequisites

Intermediate Algebra

Corequisites

None

Advisories

No information provided

Content

1. Functions including linear, polynomial, rational, radical, exponential, absolute value, logarithmic, trigonometric; definitions, evaluation, domain and range;
2. Inverses of functions;
3. Algebra of functions;
4. Graphs of functions including asymptotic behavior, intercepts, and vertices;
5. Transformations of quadratic, absolute value, radical, rational, logarithmic, and exponential functions;
6. Equations including rational, linear, radical, polynomial, exponential, trigonometric, logarithmic, and absolute value;
7. Linear, nonlinear, and absolute value inequalities;
8. Systems of equations and inequalities;
9. Characterization of real and complex zeros of polynomials;
10. Rectangular coordinates, angles and circular/radian measure;
11. Definitions of the six trigonometric functions according to the right triangle, the unit circle, and the rectangular coordinate system;
12. Applications of the right triangle;
13. Simplification of trigonometric expressions;
14. Proofs of trigonometric identities;
15. Graphs of trigonometric functions: period, amplitude, phase shift, and asymptotes;
16. Inverse trigonometric functions, identities, and graphs;
17. Solving Triangles: Law of Sines and Law of Cosines;
18. Polar coordinates and equations;
19. DeMoivre’s Theorem and applications; and
20. Introduction to vectors.

Lab Activities

No information provided

Objectives

Upon successful completion of the course, students will be able to:

1. Graph functions and relations in rectangular coordinates and polar coordinates;
2. Synthesize results from the graphs and/or equations of functions and relations;

3. Apply transformations to the graphs of functions and relations;
4. Recognize the relationship between functions and their inverses graphically and algebraically;
5. Solve and apply equations including rational, linear, polynomial, exponential, absolute value, radical, and logarithmic, and solve linear, nonlinear, and absolute value inequalities;
6. Solve systems of equations and inequalities;
7. Apply functions to model real world applications;
8. Prove trigonometric identities;
9. Identify special triangles and their related angle and side measures;
10. Evaluate the trigonometric function at an angle whose measure is given in degrees and radians;
11. Manipulate and simplify a trigonometric expression;
12. Solve trigonometric equations, triangles, and applications;
13. Graph the basic trigonometric functions and apply changes in period, phase and amplitude to generate new graphs;
14. Evaluate and graph inverse trigonometric functions;
15. Convert between polar and rectangular coordinates;
16. Calculate powers and roots of complex numbers using DeMoivre's Theorem; and
17. Represent a vector (a quantity with magnitude and direction) in the form <*a,b*> and $a\mathbf{i}+b\mathbf{j}$.

Evaluation Methods

Tests, examinations, homework or projects where students demonstrate their mastery of the learning objectives and their ability to devise, organize and present complete solutions to problems.

Textbooks

A college level text designed for science, technology, engineering and math majors, and supporting the learning objectives of this course.