

MATH 175: PRE-CALCULUS

Citrus College Course Outline of Record

Heading	Value
Effective Term:	Fall 2024
Credits:	6
Total Contact Hours:	108
Lecture Hours :	108
Lab Hours:	0
Hours Arranged:	0
Outside of Class Hours:	216
Total Student Learning Hours:	324
Prerequisite:	Intermediate algebra or plane trigonometry or higher or direct placement based on multiple measures.
District General Education:	A3. Mathematics
Transferable to CSU:	Yes
Transferable to UC:	Yes - Approved
Grading Method:	Standard Letter

Catalog Course Description

Preparation for calculus; polynomial, rational, exponential, logarithmic, and trigonometric functions; analytic geometry; systems of equations; sequences and series; mathematical induction. 108 lecture hours.

Course Objectives

- Define all six trigonometric functions in terms of a triangle, the coordinate system and the unit circle.
- Compute angles and sides of triangles in terms of degree or radian measure.
- Graph trigonometric functions and their inverse functions, and discuss the domain, range and properties of these functions.
- Prove trigonometric identities and apply trigonometric identities to solve for exact values, simplify expressions and solve equations.
- Calculate vector sum, vector products, dot products, vector magnitudes and vector angles.
- Analyze physical problems and create trigonometric relationships involving triangles, the coordinate system, the unit circle or vectors.
- Analyze linear, quadratic, polynomial, rational, absolute value, exponential, logarithmic and piecewise-defined functions as well as inverse functions from a graphic, numeric and analytic perspective.
- Analyze and solve applied problems from various disciplines and involving a variety of equations including but not limited to: linear, quadratic, polynomial, rational, radical, absolute value, exponential and logarithmic equations as well as systems of equations.
- Apply critical thinking and mathematical reasoning skills necessary in collegiate-level algebraic problem solving in related disciplines such as science, business and engineering.
- Classify conic equations and construct graphs of conic sections.
- Observe, interpret and analyze the behavior of graphs of a wide variety of functions and statistical plots.

- Utilize sequences and series equations to solve theoretical and applied problems from various disciplines such as science, business and engineering.
- Select and apply appropriate technology including but not limited to computer programs and graphing utilities to model, analyze and interpret a collection of data or to solve real-world application problems requiring the use of collegiate-level mathematics.

Major Course Content

1. Linear, quadratic, polynomial, rational, absolute value, exponential, logarithmic, piecewise-defined and trigonometric functions, graphs and inverses
2. Graphic, numeric and analytic methods to solve application problems including linear, quadratic, polynomial, rational, absolute value, exponential, logarithmic, trigonometric equations and systems of equations
3. Polynomial and rational functions and equations including the use of graphing utilities and synthetic division to graph
4. Trigonometric functions developed from the unit circle using radian and degree measure
5. Trigonometric identities
6. Graphic, numeric and analytical methods to solve linear and non-linear systems of equations and inequalities
7. Matrices and determinants
8. Sequences and series
9. Binomial theorem
10. Mathematical induction
11. Conics, parametric equations and polar coordinates
12. Vectors in a plane
13. Historical contributions of number and mathematical theories and concepts from diverse cultures

Suggested Reading Other Than Required Textbook

Reading assignments are required and may include but, are not limited to, the following: I. Assigned chapters in both the algebra and geometry texts covering those topics included in the course content. II. Articles from current journals, such as Math Horizons, and newspapers pertaining to applications of radical, exponential, logarithmic and geometric functions.

Examples of Outside Assignments

Outside assignments may include, but are not limited to, the following: I. Interpreting mathematical principles and using appropriate techniques, such as modeling to solve broader and more difficult problems than those covered in class; II. Solving a variety of application problems, such as exponential growth and decay, requiring the appropriate use of techniques and theorems learned in class. III. Making connections between exponential and logarithmic functions. IV. Reviewing, and where necessary, rewriting class notes; V. Practicing problems from the appropriate sections; VI. Performing computer explorations and tutorials using software and/or the internet VII. Using DVD's or online videos to review topics covered in class. An example of an outside assignment is to expand a binomial by both the binomial theorem and repeated multiplication of binomial factors and then compare the results.

Instruction Type(s)

Lecture, Online Education Lecture

IGETC Area 2: Mathematical Concepts and Quantitative Reasoning

Yes