

MATH 225 Course Outline as of Fall 2023**CATALOG INFORMATION**

Dept and Nbr: MATH 225 Title: PRECALC ALG SUPPORT
 Full Title: Precalculus Algebra Concurrent Support
 Last Reviewed: 12/4/2023

Units	Course Hours per Week		Nbr of Weeks	Course Hours Total		
Maximum	4.00	Lecture Scheduled	4.00	17.5	Lecture Scheduled	70.00
Minimum	4.00	Lab Scheduled	0	14.5	Lab Scheduled	0
		Contact DHR	0		Contact DHR	0
		Contact Total	4.00		Contact Total	70.00
		Non-contact DHR	0		Non-contact DHR	0

Total Out of Class Hours: 140.00

Total Student Learning Hours: 210.00

Title 5 Category: AA Degree Applicable

Grading: P/NP Only

Repeatability: 00 - Two Repeats if Grade was D, F, NC, or NP

Also Listed As:

Formerly:

Catalog Description:

In this course, students will review the core prerequisite skills, competencies, and concepts needed to succeed in precalculus algebra. Intended for students who are concurrently enrolled in Precalculus Algebra (MATH 25). Topics include concepts from elementary and intermediate algebra that are needed to understand the basics of precalculus algebra.

Prerequisites/Corequisites:

Concurrent Enrollment in MATH 25

Recommended Preparation:

Course Completion of CSKLS 372 (or CSKL 372) and CSKLS 373

Limits on Enrollment:**Schedule of Classes Information:**

Description: In this course, students will review the core prerequisite skills, competencies, and concepts needed to succeed in precalculus algebra. Intended for students who are concurrently enrolled in Precalculus Algebra (MATH 25). Topics include concepts from elementary and intermediate algebra that are needed to understand the basics of precalculus algebra. (P/NP Only)

Prerequisites/Corequisites: Concurrent Enrollment in MATH 25

Recommended: Course Completion of CSKLS 372 (or CSKL 372) and CSKLS 373

Limits on Enrollment:

Transfer Credit:

Repeatability: Two Repeats if Grade was D, F, NC, or NP

ARTICULATION, MAJOR, and CERTIFICATION INFORMATION:

AS Degree:	Area	Effective:	Inactive:
CSU GE:	Transfer Area	Effective:	Inactive:
IGETC:	Transfer Area	Effective:	Inactive:
CSU Transfer:		Effective:	Inactive:
UC Transfer:		Effective:	Inactive:

CID:

Certificate/Major Applicable:

Both Certificate and Major Applicable

COURSE CONTENT

Student Learning Outcomes:

At the conclusion of this course, the student should be able to:

1. Apply effective learning strategies for success in college.
2. Simplify and perform operations on expressions involving radicals, exponents, and polynomials.
3. Graph and formulate linear equations in two variables.
4. Solve linear, polynomial and radical equations and linear inequalities in one variable.
5. Analyze functions and solve equations and inequalities using graphing technology and algebraic methods.
6. Solve systems of linear equations and inequalities in two variables.
7. Create mathematical models and solve applications of linear and nonlinear functions.
8. Simplify, operate, graph and solve equations and applied problems involving rational, exponential, logarithmic, and absolute value functions at the intermediate algebra level.

Objectives:

At the conclusion of this course, the student should be able to:

1. Apply effective learning strategies for transfer level mathematics.
2. Solve linear equations and inequalities in one variable.
3. Evaluate and solve literal equations.
4. Graph linear equations and inequalities in two variables.
5. Find an equation for a line given information about the line.
6. Perform the operations of addition, subtraction, multiplication, division, and factoring of polynomials.
7. Use the laws of exponents to simplify expressions involving rational exponents.
8. Solve linear systems of equations in two variables using the methods of substitution, addition, and graphing and find graphical solutions to systems of linear inequalities.
9. Solve application and modeling problems that require the use of a system of linear equations.

10. Simplify, add, subtract, multiply and divide radical expressions.
11. Define function, domain, and range, and use function notation.
13. Identify basic features of the graphs of linear, polynomial, and radical functions.
14. Use graphing technology to construct graphs and use to solve nonlinear equations and inequalities in one variable, as well as to locate roots, intersection points, and extrema.
15. Use algebraic methods to solve equations that involve polynomial and radical expressions.
16. Apply algebraic or graphical methods, as appropriate, to solve application problems involving linear, polynomial, and radical functions.
17. Simplify and operate on rational, exponential, logarithmic, and absolute value expressions at the intermediate algebra level.
18. Graph rational, exponential, logarithmic, and absolute value functions at the intermediate algebra level.
19. Solve equations and applied problems involving rational, exponential, logarithmic, and absolute value functions at the intermediate algebra level.

Topics and Scope:

I. Effective Learning Skills

A. Study skills

1. Organization and time management
2. Test preparation
3. Test-taking skills

B. Self-assessment: using performance criteria to judge and improve work, analyzing and correcting test errors

C. Use of resources: strategies identifying, utilizing, and evaluating the effectiveness of resources in improving learning (for example, peer study groups, computer resources, lab resources, tutoring resources)

II. Linear Equations and Inequalities in One Variable

A. Linear equations

B. Applications of linear equations

C. Linear inequalities

D. Formulas

III. Linear Equations and Inequalities in Two Variables

A. Cartesian coordinate system

B. Graphing linear equations, including the slope-intercept method

C. Finding the equation of a line

D. Graphing linear inequalities in two variables

E. Systems of equations in two variables

1. Solving by graphing
2. Solving by elimination (addition)
3. Solving by substitution
4. Applications

IV. Integer Exponents and Laws of Exponents

V. Polynomials

A. Definition

B. Operations

C. Factoring

1. Common factors
2. Grouping
3. Trinomials
4. Difference of squares
5. Sum and difference of cubes

- D. Solving polynomial equations by factoring
- E. Solving quadratic equations
 - 1. Factoring
 - 2. The quadratic formula
 - 3. The square root principle
 - 4. Completing the square
- F. Applications
- VI. Radicals
 - A. Square roots
 - B. Simplification
 - C. Sums and products of radicals
 - D. Rationalizing denominators of square roots
 - E. Higher-index radicals
 - F. Pythagorean Theorem
 - G. Radical equations
 - H. Rational exponents
 - I. Applications
- VII. Use of Technology
 - A. Evaluate and graph functions
 - B. Solve equations and inequalities graphically
- VIII. Functions
 - A. Definition of relation, function, domain, and range
 - B. Function notation and evaluation
 - C. Interval notation, intersection, and union
 - D. Analyze graphs of linear, polynomial, and radical functions with and without graphing technology
 - E. Mathematical models and other applications of linear and nonlinear functions
- IX. Equations and Inequalities
 - A. Equations
 - 1. Solutions of literal equations
 - 2. Algebraic and graphical solutions of linear, quadratic, and radical equations
 - B. Inequalities
 - 1. Algebraic solutions to linear inequalities
 - 2. Graphical solutions of linear and nonlinear inequalities using graphing technology
- X. Quadratic Functions
 - A. Vertex and general forms
 - B. Discriminant
 - C. Solutions to quadratic equations using factoring, quadratic formula, and completing the square
 - D. Applications and modeling
- XI. Systems of Equations and Inequalities
 - A. Linear and nonlinear systems of equations
 - B. Systems of linear inequalities
 - C. Applications and modeling
- XII. Rational Functions
 - A. Domain and range
 - B. Graphs, including asymptotes and holes
 - C. Operations
 - D. Equations
 - E. Applications
- XIII. Absolute Value Functions
 - A. Domain and range

- B. Graphs
 - C. Properties
 - D. Equations and inequalities
 - E. Applications
- XIV. Exponential Functions
- A. Domain and range
 - B. Graphs
 - C. Properties
 - D. Equations
 - E. Applications
- XV. Logarithmic Functions
- A. Domain and range
 - B. Graphs
 - C. Properties
 - D. Expand and condense
 - E. Equations
 - F. Applications

Assignment:

1. Reading outside of class (0-60 pages per week)
2. Problem set(s) (1-8 per week)
3. Quiz(zes) (0-4 per week)
4. Project(s) (0-10)
5. Exam(s) (1-8)
6. Final exam

Methods of Evaluation/Basis of Grade:

Writing: Assessment tools that demonstrate writing skills and/or require students to select, organize and explain ideas in writing.

None, This is a degree applicable course but assessment tools based on writing are not included because problem solving assessments are more appropriate for this course.

Writing
0 - 0%

Problem Solving: Assessment tools, other than exams, that demonstrate competence in computational or non-computational problem solving skills.

Problem set(s)

Problem solving
5 - 80%

Skill Demonstrations: All skill-based and physical demonstrations used for assessment purposes including skill performance exams.

None

Skill Demonstrations
0 - 0%

Exams: All forms of formal testing, other than skill performance exams.

Quiz(zes); exam(s); final exam

Exams
20 - 95%

Other: Includes any assessment tools that do not logically fit into the above categories.

Project(s)

Other Category
0 - 10%

Representative Textbooks and Materials:

Beginning and Intermediate Algebra. 6th ed. Miller, Julie and O'Neill, Molly and Hyde, Nancy. McGraw-Hill. 2022.

Beginning and Intermediate Algebra. 7th ed. Martin-Gay, Elayn. Pearson. 2023.

Instructor prepared materials