



El Camino College
COURSE OUTLINE OF RECORD – Approved

I. GENERAL COURSE INFORMATION

Subject and Number: Mathematics 180S

Descriptive Title: Precalculus Support

Course Disciplines: Mathematics

Division: Mathematical Sciences

Catalog Description:

This course is designed to support students concurrently enrolled in Precalculus (Math 180). As needed, students review core skills and topics necessary to meet the Precalculus student learning outcomes and objectives. Students explore strategies and habits used by successful independent learners. Topics reviewed in this support course may include: a review of the computational skills developed in intermediate algebra; operations on polynomial, rational, radical, exponential and logarithmic expressions; functions and transformations of their graphs; solving equations and inequalities; and solving application problems.

Conditions of Enrollment:

Co-requisite Mathematics 180

Course Length: Full Term Other (Specify number of weeks):

Hours Lecture: 2.00 hours per week

Hours Laboratory: 0.00 hours per week

Course Units: 2.00

Grading Method: Pass/No Pass

Credit Status: Non-Degree Credit

Transfer CSU: No

Transfer UC: No

General Education:

El Camino College:

CSU GE:

IGETC:

II. OUTCOMES AND OBJECTIVES

A. COURSE STUDENT LEARNING OUTCOMES (The course student learning outcomes are listed below, along with a representative assessment method for each. Student learning outcomes are not subject to review, revision or approval by the College Curriculum Committee).

1. Understanding Concepts: Students will explain and demonstrate basic precalculus concepts by solving equations, inequalities and systems involving algebraic, exponential, logarithmic, trigonometric, and absolute value expressions.

2. Solving Problems: Students will use polynomial, rational, exponential, logarithmic, and trigonometric equations and functions to set up and solve application and modeling problems.

3. Graphs: Students will create, interpret and analyze the graphs of polynomial, rational, exponential, logarithmic, trigonometric, parametric, polar and conic equations.

4. Proofs: Students will analyze and construct proofs, including proofs by induction.

The above SLOs were the most recent available SLOs at the time of course review. For the most current SLO statements, visit the El Camino College SLO webpage at <http://www.elcamino.edu/academics/slo/>.

B. COURSE OBJECTIVES (The major learning objective for students enrolled in this course are listed below, along with a representative assessment method for each).

1. Carry out numerical operations and manipulate algebraic expressions, including polynomial, rational, radical, exponential and logarithmic expressions.
(Objective Exams)
2. Recognize functional relations in the form of graphs, data, or symbolic equations.
(Written Homework)
3. Solve equations using algebraic and graphical methods, including polynomial, absolute value, radical, rational, exponential, and logarithmic equations.
(Quizzes)
4. Graph functions using transformations.
(Objective Exams)
5. Solve linear, absolute value, quadratic, and nonlinear inequalities
(Quizzes)
6. Use numerical, symbolic and graphical methods to model application problems and solve them.
(Written Homework)

III. OUTLINE OF SUBJECT MATTER (Topics are detailed enough to enable a qualified instructor to determine the major areas that should be covered as well as ensure consistency from instructor to instructor and semester to semester.)

Lecture or Lab	Approximate Hours	Topic Number	Major Topics
Lecture	8	I	<p>OPERATIONS AND MANIPULATIONS</p> <p>Concepts and skills as needed through just-in-time work to support:</p> <ul style="list-style-type: none"> A. Operations on polynomial, rational, radical, exponential, logarithmic and absolute value expressions B. Factoring polynomial expressions C. Operations on complex numbers D. Rational exponents
Lecture	11	II	<p>FUNCTIONS AND GRAPHING</p> <p>Concepts and skills as needed through just-in-time work to support:</p> <ul style="list-style-type: none"> A. Definition of function, domain and range B. Functions as rules, as sets of ordered pairs, as algebraic equations and as graphs C. Composite, one-to-one, and inverse functions D. Determining a function based on a graph or sufficient data E. Transformations of graphs of functions, including translations, reflections, and scaling F. The equations and graphs of conic sections
Lecture	11	III	<p>EQUATIONS AND INEQUALITIES</p> <p>Concepts and skills as needed through just-in-time work to support:</p> <ul style="list-style-type: none"> A. Algebraic and graphical methods for solving equations B. Solving equations by factoring C. Solving quadratic, rational, radical, exponential, logarithmic, and absolute value equations D. Finding domains by setting up and solving appropriate inequalities E. Using interval notation F. Solving linear and nonlinear inequalities G. Systems of linear equations (2x2 and 3x3 systems)
Lecture	6	IV	<p>APPLICATIONS</p> <p>Concepts and skills as needed through just-in-time work to support:</p> <ul style="list-style-type: none"> A. Modeling verbally expressed problems numerically, symbolically, and graphically B. Solving problems numerically, symbolically and graphically

			C. Pythagorean Theorem D. Pattern recognition strategies E. Solving problems modeled by systems of linear equations
Total Lecture Hours		36	
Total Laboratory Hours			
Total Hours		36	

IV. PRIMARY METHODS OF EVALUATION AND SAMPLE ASSIGNMENTS

A. PRIMARY METHOD OF EVALUATION

Problem solving demonstrations (computational or non-computational)

B. TYPICAL ASSIGNMENT USING PRIMARY METHOD OF EVALUATION

Find the domain of the function $f(x) = \sqrt{x^2 - 7x - 10}$

C. COLLEGE LEVEL CRITICAL THINKING ASSIGNMENTS

1. Consider the function: $f(x) = 4 - \sqrt{x + 9}$

- What transformations of $y = \sqrt{x}$ lead to the graph of $f(x)$?
- What are the y-intercepts, if any?
- What are the x-intercepts, if any?
- What are the domain and range?
- Sketch the graph

2. Find the equation of the parabola in form $y = ax^2 + bx + c$ that contains the points (1,2), (-1,6) and (2,3). You must set up a 3x3 system and solve it using any method.

D. OTHER TYPICAL ASSESSMENT AND EVALUATION METHODS:

Objective Exam
Other Exams
Quizzes
Homework Problems
Written Homework

V. INSTRUCTIONAL METHODS:

Lecture
Group Activities
Discussion
Demonstration

Note: In compliance with Board Policies 1600 and 3410, Title 5 California Code of Regulations, the Rehabilitation Act of 1973, and Sections 504 and 508 of the Americans with Disabilities Act, instructional delivery shall provide access, full inclusion, and effective communication for students with disabilities.

VI. WORK OUTSIDE OF CLASS: Select from this list.

- Study
- Answer questions
- Skill practice
- Required reading
- Problem solving activity
- Written work (such as essay/composition/report/analysis/research)

Estimated Study Hours Per Week: 4.0

VII. TEXTS AND MATERIALS

A. UP-TO-DATE REPRESENTATIVE TEXTBOOKS

Stewart and Connally (Functions Modeling Change, 5th ed, Connally, Hughes-Hallett, Gleason, et al, Wiley) 2014

B. REQUIRED TEXTS (title, author, publisher, year)

C. REQUIRED SUPPLEMENTARY READINGS

D. OTHER REQUIRED MATERIALS

VIII. CONDITIONS OF ENROLLMENT

A. Requisites (Course and Non-Course Prerequisites and Corequisites)

Requisites	Category and Justification
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Math 180	Corequisite
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B. Requisite Skills

Requisite Skills

Solve equations involving polynomial, rational, exponential, logarithmic, trigonometric functions.
Math 170 - EQUATIONS

C. Recommended Preparations (Course and Non-Course)

Recommended Preparation	Category and Justification
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D. Recommended Skills

Recommended Skills

E. Enrollment Limitations

Enrollment Limitations and Category	Enrollment Limitations Impact
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