GAVILAN COLLEGE
5055 Santa Teresa Blvd
Gilroy, CA 95023

Course Outline

COURSE: MATH 25 DIVISION: 20 ALSO LISTED AS:

TERM EFFECTIVE: Fall 2025 CURRICULUM APPROVAL DATE: 03/11/2025

SHORT TITLE: PATHWAYS TO CALC

LONG TITLE: Pathways to Calculus

Units	Number of Weeks	Type	Contact Hours/Week	Total Contact Hours
4	18	Lecture:	4	72
		Lab:	0	0
		Other:	0	0
		Total:	4	72

Out of Class Hrs:	144.00
Total Learning Hrs:	216.00

COURSE DESCRIPTION:

This course includes essentials of college algebra and trigonometry for STEM students who want to prepare for success in Calculus I. Topics include basic algebraic concepts, inequalities, systems of equations, functions and graphs, linear and quadratic functions, polynomial functions of higher degree, rational functions, exponential and logarithmic functions, trigonometric functions, and analytical trigonometry.

CREDIT STATUS: D - Credit - Degree Applicable

GRADING MODES

L - Standard Letter Grade

REPEATABILITY: N - Course may not be repeated

SCHEDULE TYPES:

02 - Lecture and/or discussion
05 - Hybrid
71 - Dist. Ed Internet Simultaneous
72 - Dist. Ed Internet Delayed

STUDENT LEARNING OUTCOMES:

By the end of this course, a student should:

1. Demonstrate math literacy and computational fluency including use of correct mathematical notation by simplifying expressions and solving equations and

inequalities.

2. Demonstrate knowledge of functions (including polynomial, absolute value, radical, rational, exponential, logarithmic, and trigonometric) by making connections

between graphs, tables, equations, and contextual interpretations.

3. Interpret and effectively communicate mathematical concepts through collaborative activities, project-based learning, and technology-enhanced explorations.

COURSE OBJECTIVES:

By the end of this course, a student should:

1. Review key algebra topics including factoring, slope, equations of lines, linear and quadratic functions, laws of exponents, and exponential/ radical form.

2. Analyze and identify the features of the graphs and/or the equations of functions and relations.

3. Recognize the relationship between functions and their inverses graphically and algebraically.

4. Perform operations on functions, including composition.

5. Analyze functions and graphs including polynomial, absolute value, radical, rational, exponential, logarithmic, and trigonometric.

6. Solve a wide variety of equations and inequalities including polynomial, absolute value, radical, rational, exponential, logarithmic, and trigonometric, and interpret

the results.

7. Evaluate the rate of change and behavior of any function between two points and simplify difference quotient expressions.

8. Apply functions to model real world applications.

9. Identify special triangles and their related angle and side measures.

10. Evaluate the trigonometric and inverse trigonometric functions at an angle whose measure is given in degrees and radians.

11. Prove trigonometric identities and simplify trigonometric expressions.

COURSE CONTENT:

Curriculum Approval Date: 03/11/2025

FUNCTIONS AND THEIR GRAPHS

1. Functions: domain, range, functional notation, difference quotients, one-to-one, inverses, basic even/odd properties (with graphical interpretation)
2. Graphs of basic functions, along with translations, reflections, stretches, and compressions
3. Zeros of functions, including introduction to complex zeros
4. Algebra of functions, including composition
5. Piecewise-defined functions
6. Analysis of linear functions

POLYNOMIAL FUNCTIONS

1. Models using quadratic functions
2. Factors of nth-degree polynomials: basic factoring methods, rational root theorem, and/or technology
3. Polynomial graphs: leading coefficient, degree of the polynomial, symmetry tests, behavior at the intercepts, and end behavior
4. Solutions to polynomial inequalities using both graphs and sign charts

RATIONAL FUNCTIONS

1. Graphs of rational functions: intercepts, vertical and horizontal asymptotes, slant asymptotes, and holes
2. Solutions to rational inequalities using both graphs and sign charts

EXPONENTIAL AND LOGARITHMIC FUNCTIONS

1. Exponential change vs linear change
2. Graphs of exponential and logarithmic functions
3. Exponential and logarithmic equations
4. Properties of logarithmic expressions
5. Exponential growth/decay models

TRIGONOMETRY

1. Angular measure in degrees and radians
2. Reference angles
3. Trigonometric functional values of special angles or any real number
4. Graphs of trigonometric functions along with changes in amplitude, period, and phase shifts
5. Trigonometric identities
6. Inverse trigonometric functions including range restrictions
7. Trigonometric equations
8. Application problems using right triangle trigonometry, the Law of Sines, and the Law of Cosines

ALGEBRA SKILLS

1. Factoring expressions: fractional and negative exponents
2. Completing the square in various contexts
3. Solving absolute value equations by using piecewise functions
4. Solving absolute value inequalities by using sign charts
5. Solving radical equations with a single radical term
6. Simplifying complex rational expressions
7. Survey of conic sections
8. Solving systems of two equations in two variables
9. Laws of Exponents and conversion between exponential and radical form

MATHEMATICAL COMMUNICATION AND SELF-REFLECTION

1. Strategies for studying mathematics
2. Qualities of a well-presented mathematical problem or concept
3. Self-reflection and evaluation of mathematical progress and study habits

METHODS OF INSTRUCTION:

Instruction will follow a standard lecture/discussion format. Extensive homework will be assigned in order to assure mastery of the concepts covered in class. Students will also be required to utilize technology to enhance their understanding of the material. Students will be given opportunities to work together on problems given in class and group projects.

OUT OF CLASS ASSIGNMENTS:

Required Outside Hours 144

Assignment Description

1. Regularly assigned homework that requires students to analyze and study pertinent text material, solved examples and lecture notes.

2. Regularly assigned homework that requires students to apply the principles and skills covered in class by solving related problems.

3. Projects which require students to explain, apply, and explore concepts taught in class.

METHODS OF EVALUATION:

Objective examinations

Evaluation Percent 60

Evaluation Description

Written Exams

Problem-solving assignments

Evaluation Percent 20

Evaluation Description

Homework; Class Work; Quizzes

Writing assignments

Evaluation Percent 20

Evaluation Description

Reports; Projects; Research Papers; Discussions; Presentations

REPRESENTATIVE TEXTBOOKS:

Precalculus: Concepts Through Functions, A Right Triangle Approach to Trigonometry, 5th edition, Sullivan & Sullivan, Pearson, 2022 or a comparable textbook/material.

ISBN: ISBN-13: 9780137978083

12 Grade Verified by: Microsoft Word

RECOMMENDED MATERIALS:

Mathematics in Action: Algebraic, Graphical, and Trigonometric Problem Solving, 6th edition, Consortium for Foundation Mathematics, Pearson, 2020.

ISBN: ISBN-13: 9780135115619

12 Grade Verified by: Microsoft Word

ARTICULATION and CERTIFICATE INFORMATION

Associate Degree:

GAV B4, effective 202570

GAV Area 2 = Math Con & Q Reas, effective 202570

CSU GE:

CSU B4, effective 202570

IGETC:

IGETC 2A, effective 202570

CSU TRANSFER:

Transferable CSU, effective 202570

UC TRANSFER:

Transferable UC, effective 202570

SUPPLEMENTAL DATA:

Basic Skills: N
Classification: Y
Noncredit Category: Y
Cooperative Education: N
Program Status: 1 Program Applicable
Special Class Status: N
CAN:
CAN Sequence:
CSU Crosswalk Course Department:
CSU Crosswalk Course Number:
Prior to College Level:
Non Credit Enhanced Funding: N
Funding Agency Code: Y
In-Service: N
Occupational Course: E
Course Control Number: CCC000650934
Sports/Physical Education Course: N
Taxonomy of Program: 170100