SANTA ROSA CITY SCHOOLS
Excellence is our Common Ground

Santa Rosa City Schools
Office of Educational Services 7-12
2022-2023 New Course Proposal

(Must be submitted to the Office of Educational Services, 7-12)

(Please type)
Course Title: Precalculus P

School: SRCS Department: Math Grade Level(s): 9-12 Credits: 10

Core subject area (specify):	OR	Elective subject area (specify):
Mathematics		

Length of Course: X year _____ semester

Course Designations: *Check all other designations that apply.*

- ☐ University Pathway
- ☐ Career Pathway *
- ☐ Core Curriculum
- ☒ College Preparatory
- ☐ Non-College Preparatory
- ☐ Regional Occupational Program
- ☐ Advanced (grades 7-8)
- ☐ Honors (grades 9-12)
- ☐ Advanced Placement
- ☐ International Baccalaureate
- ☐ Other: _____
- ☐ Alternative Credit: _____

Assurances			
Does the textbook and proposed course meet District-adopted content and performance standards and State curriculum frameworks?	☒ Yes	☐ No	☐ N/A
Will the scope and sequence of this course adequately prepare students to pass the exit or end-of-course exam?	☒ Yes	☐ No	☐ N/A

Signatures: Originator _____ Date 3/17/23
Dept. Chair/Team Leader _____ Date _____
Vice-Principal _____ Date _____
Principal _____ Date _____

District Content Area Review Committee

Note: *This course must be agendized for Board approval. Return this signed form no later than* _____.

Name/School _____ Date 3/13/23
Name/School Petrina Huffman Montgomery High School Date 3/13/23
Name/School _____ Santa Rosa High School Date 3/13/23
Name/School _____ Maria Carrillo High School Date 3/15/23
Name/School Wendy Valle Piner High School Date 3/15/23

District Office:
Asst. Supt.,(or Designee) Educational Services, 7-12 _____ Date 3/17/23
District Coordinator, Career Pathways (if applicable) _____ Date _____
Board Subcommittee, Career Pathways (if applicable) _____ Date _____

Attach a response to the following issues, referring to the standards (where applicable) and frame-work for this course's subject area. Incomplete proposals will be returned. Be sure to include the appropriate item number and title (if an attachment is being provided).

NEEDS ASSESSMENT STATEMENT: Provide a rationale with specific evidence to support this course's inclusion in SRCS' Master Course Catalogue.

Four of the five comprehensive high schools in SRCS currently offer a Precalculus course. These courses have titles that are based on a historical context that is no longer the case. When the courses was first approved, it was common to teach a semester of Trigonometry and a semester of Precalculus so they were written as semester long courses. They are, and have been for many years, taught as a year-long course designed to help students that have completed Math 3 (and prior to that, Algebra 2) continue their math education towards entrance into a Calculus course either at the college level or in the SRCS AP Calculus course.

The state offers a course code for each of the semester-length courses of Trigonometry and Precalculus, but it also offers a course code for a year-long combined "Precalculus and Trigonometry" course. This year-long course code was used when the Honors level Trig/Precalculus HP course was approved by the SRCS board as it was proposed much more recently than the original courses were approved. That course code and description more accurately match the course offerings for SRCS. Therefore this course proposal is needed to correct this historical situation. There is no change to the content of the course. The current college-prep (P) level semester courses of (1) Trigonometry and (2) Precalculus will be replaced with one semester-long course titled "Precalculus P". All schools currently offering these courses enroll students as though it is a year-long course and they are in agreement with this change.

COURSE DESCRIPTION and *DETAILED* COURSE OUTLINE:

Precalculus builds on foundations established in Math 3. It prepares students to continue their math learning on the Calculus pathway and is the prerequisite knowledge for AP Calculus or the first year of college-level Calculus. This course reviews much of Math 3 content at a higher level of depth and complexity, then also extends that knowledge to new topics.

Contents of the course are:

- Linear functions and transformations of functions
    - Lines in the Plane
    - Functions
    - Graphs of Functions
    - Shifting, Reflecting, and Stretching Graphs
    - Combinations of Functions
    - Inverse Functions
    - Linear Models and Scatter Plots
- Polynomial and Rational Functions
    - Quadratic Functions
    - Polynomial Functions of Higher Degree
    - Real Zeros of Polynomial Functions
    - Complex Numbers

    - The Fundamental Theorem of Algebra
    - Rational Functions and Asymptotes
    - Graphs of Rational Functions
    - Quadratic Models
- Exponential and Logarithmic Functions
    - Exponential Functions and Their Graphs
    - Logarithmic Functions and Their Graphs
    - Properties of Logarithms
    - Solving Exponential and Logarithmic Equations
    - Exponential and Logarithmic Models
    - Nonlinear Models
- Trigonometric Functions
    - Radian and Degree Measure
    - Trigonometric Functions: The Unit Circle
    - Right Triangle Trigonometry
    - Trigonometric Functions of Any Angle
    - Graphs of Sine and Cosine Functions
    - Graphs of Other Trigonometric Functions
    - Inverse Trigonometric Functions
    - Applications and Models
- Analytic Trigonometry (Identities and Formulas)
    - Using Fundamental Identities
    - Verifying Trigonometric Identities
    - Solving Trigonometric Equations
    - Sum and Difference Formulas
    - Multiple-Angle and Product-to-Sum Formulas
- Trigonometric Laws and Introduction to Vectors
    - Law of Sines
    - Law of Cosines
    - Vectors in the Plane
    - Vectors and Dot Products
    - Trigonometric Form of a Complex Number
- Linear Systems and Matrices
    - Solving Systems of Equations
    - Systems of Linear Equations in Two Variables
    - Multivariable Linear Systems
    - Operations with Matrices
    - The Inverse of a Square Matrix
    - The Determinant of a Square Matrix
    - Applications of Matrices and Determinants
- Sequences, Series, and Probability
    - Sequences and Series
    - Arithmetic Sequences and Partial Sums
    - Geometric Sequences and Series
    - The Binomial Theorem

    - Counting Principles
    - Probability
- Analytic Geometry (Conic Sections and Polar Equations)
    - Circles and Parabolas
    - Ellipses
    - Hyperbolas and Rotation of Conics
    - Parametric Equations
    - Polar Coordinates
    - Graphs of Polar Equations
    - Polar Equations of Conics
- Geometry in Three Dimensions (Including Vectors in Space)
    - The Three-Dimensional Coordinate System
    - Vectors in Space
    - The Cross Product of Two Vectors
    - Lines and Planes in Space
- Limits and Introduction to Calculus
    - Introduction to Limits
    - Techniques for Evaluating Limits
    - The Tangent Line Problem
    - Limits at Infinity and Limits of Sequences
    - The Area Problem

STANDARDS-BASED INSTRUCTION: The course has been aligned to meet district-adopted content and performance standards in: (*check one*)

- ☐ English/Language Arts
- ☒ Mathematics
- ☐ Social Science
- ☐ Science

-OR-

The course is not a core class, but supports core curriculum standards by (*explain*):

The standards only address math beyond the third high school year (Math 3 or Algebra 2) in terms of a Probability and Statistics course or a Calculus course. The standards specifically reference the College Board syllabi for these courses. The newly developed College Board AP Precalculus course may influence the content of what many schools have already in place; this course that fills in gap in the standards for students that have completed the third year high school course and are not fully prepared for entry to a Calculus course.

PREREQUISITES: List the prerequisites that must be met for entrance into the course (*must be aligned with district policy relating to prerequisites).*

Students must have passed Math 3 or equivalent with a D- or higher.

DESCRIBE PROGRAM NEEDS:

- Personnel

No new personnel needs beyond existing course needs.

- Facilities

No new facilities needs beyond existing course needs.

- Textbook(s)

  ☐ Yes, a new textbook is needed. Attach the *Textbook Recommendation Form* and a copy of the new textbook.
  ☒ No, the present textbook is adequate. Title: Precalculus with Limits: A Graphing Approach

- Fiscal

  ➢ List all costs needed to implement this course.

No additional costs beyond current course needs.

  ➢ Funding source(s)

    ☐ Existing funding sources at site
    ☐ Additional funding sources required

FUTURE EXPANSION PROGRAM NEEDS: What problems would be encountered in replicating this course at another school?

This proposal is being written to approve the course for all sites. It may not apply at a site that participates in the International Baccalaureate (IB) program. Otherwise, there will be no future expansion needs.

ADVANCED, HONORS, ADVANCED PLACEMENT, or INTERNATIONAL BACCALAUREATE: This item must be completed, if the course is identified with the distinction of Advanced, Honors, AP, or IB.

- How does this course exceed the requirements of a college preparatory course of its kind?

- Describe the end-of-course written assessment.

ADVANCED CAREER PATHWAY COURSES: Please identify the industry certification that students will be preparing to take or describe the culminating experience for the pathway that students will be completing as part of the coursework.