1. **COURSE ID:** MATH 851   **TITLE:** Just in time support for Calculus I
   Units: 2.0 units **Hours/Semester:** 32.0-36.0 Lecture hours; 64.0-72.0 Homework hours; 96.0-108.0 Total
   Student Learning hours
   Method of Grading: Pass/No Pass Only
   Corequisite: MATH 251

2. **COURSE DESIGNATION:**
   Non-Degree Credit
   Transfer credit: none

3. **COURSE DESCRIPTIONS:**
   Catalog Description:
   This a support course for Calculus I, which includes a review of the core prerequisite skills, competencies,
   and concepts needed in calculus. Intended for majors in science, technology, engineering, and mathematics
   who are concurrently enrolled in MATH 251, Calculus 1, at College of San Mateo. Topics include: a
   review of computational skills developed in intermediate algebra, trigonometry, and precalculus, factoring,
   operations on rational and radical expressions, absolute value equations and inequalities, exponential and
   logarithmic expressions and equations, unit circle, basic trig identities, and trigonometric equations,
   functions including composition and inverses, an in-depth focus on quadratic, radical, exponential,
   logarithmic, trigonometric functions, and a review of topics from geometry.

4. **STUDENT LEARNING OUTCOME(S) (SLO'S):**
   Upon successful completion of this course, a student will meet the following outcomes:
   1. Simplify or reorganize algebraic expressions
   2. Solve equations and inequalities using multiple representations
   3. Solve systems of equations
   4. Graph a function and identify its defining elements (including domain and range)
   5. Develop and improve learning strategies for mathematics

5. **SPECIFIC INSTRUCTIONAL OBJECTIVES:**
   Upon successful completion of this course, a student will be able to:
   1. Simplify or reorganize expressions by: a. Performing operations on rational expressions b. Performing
      operations on radical expressions c. Applying properties of rational exponents d. Applying properties of
      logarithms. e. Performing operations on trigonometric expressions. f. Utilizing trigonometric identities.
   2. Solve each of the following: a. Absolute value equations b. Quadratic equations 1. By extracting roots 2.
      By completing the square 3. Using the quadratic formula c. Rational equations d. Radical equations e.
      Exponential equations f. Logarithmic equations g. Trigonometric equations.
   3. Solve systems of equations a. Algebraically b. Graphically.
   4. Solve and interpret the solutions of application problems
   5. Simplify or reorganize functions given a: a. Sum b. Difference c. Product d. Quotient e. Composition of
      two functions.
   6. Inspect and analyze a graph in order to: a. Determine whether the graph represents a function or is a 1-to-1
      function b. Evaluate the function c. Determine the domain and range of a function d. Determine the max or
      min of functions
   7. Find the domain and range of the following functions: a. Rational functions b. Polynomial functions c.
      Functions involving radicals d. Trigonometric functions e. Inverse functions

6. **COURSE CONTENT:**
   Lecture Content:
   - Graphing of linear, absolute value, quadratic, exponential, logarithmic, and trigonometric functions.
   - Writing equations from the graphs of algebraic and trigonometric functions
   - Using graphic, numeric and analytic methods to solve linear, absolute value, quadratic, exponential,
     logarithmic, and trigonometric equations
   - Solving application problems
   - Linear systems of equations
   - Functions, their graphs, their domain and range, their inverse relationship and applications

- Essential vocabulary, properties, and characteristics of geometric objects
- Applying formulas to evaluate perimeter, area, surface area and volume of geometric objects
- Unit Circle and basic trigonometric identeties
  Topics related to Developing Effective Learning Skills
- Study skills: for example, organization and time management, test preparation and test-taking skills
- Self-assessment: for example, using performance criteria to judge and improve one's own work, analyzing and correcting errors on one's test
- Use of resources: for example, strategies for identifying, utilizing, and evaluating the effectiveness of resources in improving one's own learning, e.g. peer study groups, computer resources, lab services

7. **REPRESENTATIVE METHODS OF INSTRUCTION:**
   Typical methods of instruction may include:
   A. Lecture
   B. Activity
   C. Discussion

8. **REPRESENTATIVE ASSIGNMENTS**
   Representative assignments in this course may include, but are not limited to the following:
   Writing Assignments:
   Students work on 1-2 written exercises a week, includong in-class active learning worksheets and assignments on study skills and reflections.

   Reading Assignments:
   Students to read 1-2 sections a week, including reading articles about affective domain topics.
   Other Outside Assignments:
   Watch videos, discuss the content, and reflect on it.

9. **REPRESENTATIVE METHODS OF EVALUATION**
   Representative methods of evaluation may include:
   A. Class Participation
   B. Class Work
   C. Exams/Tests
   D. Group Projects
   E. Homework
   F. Quizzes

10. **REPRESENTATIVE TEXT(S):**
    Possible textbooks include:
    A. Stewart. *Single Variable Calculus: Early Transcendentals*, 9th ed. Cengage, 2020

Origination Date: October 2023
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Effective Term: Fall 2024
Course Originator: Yelena Feinman