Course Description

A. COVER PAGE

Date of Submission (Please include Month, Day and Year)

1. Course Title
Math Analysis AB (Honors)

2. Transcript Title(s) / Abbreviation(s)
Math Anal A/B (H)

3. Transcript Course Code(s) / Number(s)

4. School
Ernest Righetti High School

5. District
Santa Maria Joint Union High School District

6. City
Santa Maria, CA 93455

7. School / District Web Site
http://www.smjuhsd.k12.ca.us

8. School Course List Contact

Name: Jim Armstrong

Title/Position: Asst. Supt. Curric/Instruction

Phone: 922-4573   **Ext.:** 4211

E-mail: jarmstrong@smjuhsd.org

9. Subject Area

- [ ] History/Social Science
- [ ] English
- [x] Mathematics
- [ ] Laboratory Science
- [ ] Language other than English
- [ ] Visual & Performing Arts
  - [ ] Intro   [ ] Advanced
- [ ] College Prep Elective

10. Grade Level(s) for which this course is designed
11th & 12th

11. Seeking "Honors" Distinction?
No

12. Unit Value

- [ ] 0.5 (half year or semester equivalent)
- [x] 1.0 (one year equivalent)
- [ ] 2.0 (two year equivalent)
- [ ] Other: _____

13. Is this an Internet-based course?   No

   If "Yes", who is the provider?   [ ] UCCP [ ] PASS/Cyber High [ ] Other _____

14. Complete outlines are not needed for courses that were previously approved by UC. If course was previously approved, indicate in which category it falls.

- [ ] A course reinstated after removal within 3 years. Year removed from list? _____
  - Same course title?   [ ] Yes   [ ] No
  - If no, previous course title? _____
- [ ] An identical course approved at another school in same district. Which school? _____
  - Same course title?   [ ] Yes   [ ] No
  - If no, course title at other school? _____
- [ ] Year-long VPA course replacing two approved successive semester courses in the same discipline
- [ ] Approved Advanced Placement (AP) or International Baccalaureate (IB) course
- [ ] Approved UC College Prep (UCCP) Online course
- [ ] Approved CDE Agricultural Education course
- [ ] Approved P.A.S.S./Cyber High course
- [ ] Approved ROP/C course. Name of ROP/C? _____
- [ ] Approved A.V.I.D. course
- [ ] Approved C.A.R.T. course
- [ ] Approved Project Lead the Way course
- [ ] Other. Explain: Requesting Honors weight for this course.

15.	Is this course modeled after an UC-approved course from another school <u>outside</u> your district?	☐ Yes	[x] No

    If so, which school(s)? _____

    Course title at other school _____

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16. Pre-Requisites

Completion of Algebra 2 A/B with grade of B- or better

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17. Co-Requisites

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18. Is this course a resubmission? ☐ Yes [x] No

    If yes, date(s) of previous submission? _____

    Title of previous submission? _____

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19. Brief Course Description

This course combines the concepts of trigonometry, geometry, and algebra as preparation for the study of calculus. Topics include polar coordinates and vectors, math induction, conics, complex roots, parametric functions, sequences and series and convergence, matrices, systems of equations and inequalities, exponents and logarithms.

B. COURSE CONTENT
Please refer to instructions

20. Course Goals and/or Major Student Outcomes

21. Course Objectives

22. Course Outline

23. Texts & Supplemental Instructional Materials

24. Key Assignments

25. Instructional Methods and/or Strategies

26. Assessment Methods and/or Tools

C. HONORS COURSES ONLY
Please refer to instructions

27. Indicate how this honors course is different from the standard course.

D. OPTIONAL BACKGROUND INFORMATION
Please refer to instructions

28. Context for Course (optional)

29. History of Course Development (optional)

Math Analysis A/B (Honors)

Course Goals:
- Students know the identity $\sin^2 x \cos^2 x = 1$ and prove other trigonometric identities
- Students compute, by hand, the values of the trigonometric functions and the inverse trigonometric functions at various standard points
- Students demonstrate understanding of the addition formulas for sines and cosines, their proofs, and use them to prove other identities
- Students know the law of sines and the law of cosines, and apply them to problems
- Students are familiar with and can apply polar coordinates and vectors in the plane
- Students can give proofs of various formulas using the technique of mathematical induction
- Students demonstrate an understanding of functions and equations defined parametrically
- Students are familiar with and can apply polar coordinates and vectors in the plane
- Students are familiar with the notion of the limit of a sequence and the limit of a function They can determine if sequences converge or diverge
- Students solve simultaneous linear equations in any number of variables using Gauss-Jordan elimination

Course Outline:
- Graphs and Equations
    - Linear equations x
    - Circles
    - Inequalities
    - Linear curve fitting
- Functions and their Graphs
    - Graphing techniques
    - Operations on functions
    - Composite functions
    - Mathematical models
    - Constructing functions
- Polynomial and Rational Functions
    - Quadratic functions; curve fitting
    - Polynomial and power functions; curve fitting
    - Rational functions
    - Real and complex functions
    - Polynomial and rational inequalities
- Exponential and Logarithmic Functions
    - Inverse functions
    - Properties of logarithms
    - Logarithmic and exponential equations
    - Compound interest
    - Growth and decay
    - Logistic curve fitting
    - Logarithmic scales

Course Outline (continued)

- Trigonometric Functions
    - The unit circle
    - Properties and graphs of the trigonometric functions
    - The inverse trigonometric functions
- Analytic Trigonometry
    - Identities
    - Sum and difference formulas
    - Double-angle and half-angle formulas
    - Product-to-sum and sum-to-product formulas
    - Trigonometric equations
- Applications of Trigonometric Functions
    - The law of sines
    - The law of cosines
    - The area of a triangle
    - Sinusoidal graphs and curve fitting
    - Simple harmonic motion; damped motion
- Polar Coordinates; Vectors
    - Polar equations and graphs
    - The complex plane and demoivres theorem
    - Vectors
    - The dot product
    - Vectors in space
- Analytic Geometry
    - Conics
    - The parabola, ellipse, and hyperbola
    - Rotation of axes
    - Polar equations of conics
    - Plane curves and parametric equations
- Systems of Equations and Inequalities
    - Subtraction and elimination methods
    - Matrices
    - Systems of equations; determinants
    - Matrix algebra
    - Partial fraction decomposition
    - Systems of nonlinear equations
    - Systems of inequalities
    - Linear programming
- Sequences; Induction; Probability
    - Arithmetic and geometric sequences
    - Geometric induction
    - The binomial theorem
    - Permutations and combinations
    - Probability

Course Outline (continued)
- A Preview of Calculus: The Limit and the Derivative of a Funtion:
  - Finding limits using tables and graphs
  - Algebra techniques for finding limits
  - One-sided limits; continuous functions
  - The tangent problem; the derivative

Texts & Supplemental Instructional Materials
Texts currently in use: Pre-calculus, Graphing and Data Analysis, Sullivan, Sullivan III; Prentice Hall (1998)
The text for this course is currently under review
Supplemental materials: Graphing calculators and internet resources, overhead graphing demonstrations with the TI-83 Plus

Instructional Methods and/or Strategies:
- Lecture
- Small group activities
- Overhead demonstrations
- Graphing calculator activities

Assessments Methods and/or Tools
- Quizzes
- Chapter tests
- Daily homework and class work
- Course exit exam
- STAR assessment
- Notebooks

Indicate how this honors course is different from the standard course:
With more rigid pre-requisites to enter this course, the students will be expected to cover more material and do so in much greater depth than that of the standard course. (See course outline)

Submitted to UC 2/28/06
Requesting course be weighted