Course Description

A. COVER PAGE

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

1. Course Title
Calculus

2. Transcript Title(s) / Abbreviation(s)
a-g Calculus A & B

3. Transcript Course Code(s) / Number(s)
5E0806 & 7

4. School
Ocean Grove Charter School

5. District
San Lorenzo Valley

6. City
Santa Cruz

7. School / District Web Site
http://www.ogcs.org

8. School Course List Contact

Name: Janelle Brewer

Title/Position: Curriculum Specialist

Phone: (530) 285- 3566 **Ext.:** 46

E-mail: jrucker@ieminc.org

9. Subject Area

- ☐ History/Social Science
- ☐ English
- ☒ 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

☐ 9 ☐ 10 ☒ 11 ☒ 12

11. Seeking "Honors" Distinction?

☐ *Yes* ☒ *No*

12. Unit Value

- ☐ 0.5 (half year or semester equivalent)
- ☒ 1.0 (one year equivalent)
- ☐ 2.0 (two year equivalent)
- ☐ Other: _____

13. Is this an Internet-based course? ☐ Yes ☒ 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:

_____

15. Is this course modeled after an UC-approved course from another school outside your district? ☒ Yes

No

If so, which school(s)? Golden Valley and Connecting Waters Charter Schools

Course title at other school A-G Calculus

16. Pre-Requisites

Algebra 1, Geometry, Algebra 2 and Trigonometry, Math Analysis or Pre-Calculus.

17. Co-Requisites

None.

18. Is this course a resubmission? ☐ Yes ☒ No

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

Title of previous submission? _____

19. Brief Course Description

In this course, students will learn to represent functions in a variety of ways: graphical, numerical, analytical and verbal. They will learn the meaning of the derivative in terms of a rate of change and local approximation and the integral both as a limit of Riemann sums and as the net accumulation of change. Students will understand the Fundamental Theorem of Calculus as the relationship between the derivative and the definite integral and will solve a variety of problems that apply the core concepts of calculus

B. COURSE CONTENT

20. Course Goals and/or Major Student Outcomes

Students will investigate and understand the limits of functions, derivatives, and integrals. Students will also examine the Power series and Taylor series expansions.

Students will understand and demonstrate the value and extreme value theorem.

Students will meet or exceed all of the California State Standards for calculus.

21. Course Objectives

Limits of Functions:

- Definition and graphical interpretation of limit of values of functions
- Intermediate value theorem and extreme value theorem
- Differentiability

Derivatives:

- Definition and graphical interpretation
- Chain rule
- L'Hopiml's rule, mean value theorem, and Rolle's theorem
- Newton's method for approximating the zeros of a function
- Sketch functions and identify maxima, minima, and inflection points

Integrals

- Fundamental Theorem of Calculus and integrals
- Use definite integrals to compute area, volume, velocity, acceleration, curve length
- Approximate integrals numerically using Simpson's Rule and Newton's Method
- Power series and Taylor series expansions
- Power series and Taylor series expansions

22. Course Outline

The students will complete the majority of the text book, demonstrate proficiency of the topics shown in the table of contents, and take cumulative tests. The students will complete a mid-term and final examination. The students will complete all of the key assignments listed below. The student's Education Specialist will review the student's work on a monthly basis and will grade all tests and exams. Samples of student's work will be kept in the student's portfolio.

23. Texts & Supplemental Instructional Materials

CALCULUS - Thomson Learning

Calculus with Applications – Glencoe McGraw Hill

Calculus Premiere Edition- Glencoe McGraw Hill

Calculus of a Single Varaible – Houghton Miflfin

Calculus - Saxon

24. Key Assignments

Student must complete these specific assignments:

1. The student will read introduction of each new topic. The student will review the examples given with their complete solutions shown and will then complete the practice problems for the new topics.
2. The student will complete daily problem sets and will complete review sets of previous topics.
3. The student will take cumulative tests.
4. The student will participate in periodic written assessments, including but not limited to a mid-term and final exam, without outside assistance or use of notes or the text.
5. Education Specialist will review work on a monthly basis, and the student's written samples will be kept in a portfolio.

25. Instructional Methods and/or Strategies

Instructional methods and/or strategies may include, but are not limited, to the following techniques:

- Workbook exercises
- Hands-on mathematical investigation
- Internet research
- Library research
- Lecture

26. Assessment Methods and/or Tools

Evaluation of performance is based on individual abilities, interests, and talents. Methods by which student progress is assessed will be through a variety and/or combination of methods. The methods available include, but are not limited to:

a. Monthly review of work by Education Specialist
b. Portfolios
c. Parent facilitator and Education Specialist observation
d. Student demonstrations
e. Student grades
f. Student work examples
g. Written examination
h. Research projects

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)

Required Texts *CALCULUS* (Thomson Learning), Paperback ISBN: [053439339X], Hardcover ISBN: [053439339X]
Requirements Must complete UCCP online orientation prior to course start. TI-83 (or Plus) Graphing Calculator

Course Outline
Student will complete all requirements of the UCCP course. Student will complete periodic written assessments, including but not limited to a mid-term and final exam, without outside assistance or use of notes or the text. Education Specialist will review work on a monthly basis, and written samples will be kept in a portfolio.

Other Recommended Texts: ????