COURSE OUTLINE OF RECORD

Number: MATH A185H **TITLE:** Calculus 2 Honors

ORIGINATOR: Instructor Placeholder AAA **EFF TERM:** Fall 2010

FORMERLY KNOWN AS: **DATE OF OUTLINE/REVIEW:** 03-04-2016

CROSS LISTED COURSE: **TOP NO:** 1701.00

CID: MATH 220

SEMESTER UNITS: 4.0

HRS LEC: 90.0 **HRS LAB:** 0.0 **HRS OTHER:** 0.0

CONTACT HRS TOTAL: 90.0

STUDY/NON-CONTACT HRS RECOMMENDED: 126.0

CATALOG DESCRIPTION:

This is the second course in the calculus sequence. It satisfies the sequence for majors in mathematics, science, or engineering. Topics include techniques and some applications of integration, calculus applied to parametric curves and polar curves, analytic geometry, sequences, series, and an introduction to differential equations. May be taken for grades or on a pass-no pass basis. Transfer Credit: CSU; UC.

JUSTIFICATION FOR COURSE:

Comparable to UC and CSU courses

PREREQUISITES:

- MATH A180: Calculus 1 with a minimum grade of C or better
  or
- OCC Math Placement Level of 80 or higher.
- MATH A180H: Calculus 1 Honors with a minimum grade of C or better
- OCC Math Placement Level of 90 or higher.
  or
- GWC Math Placement Level of 90 or higher.
  or
- CCC Math Placement Level of 90 or higher.
  or
- MATH A180: Calculus 1 with a minimum grade of C or better
  or
- MATH A180H: Calculus 1 Honors with a minimum grade of C or better
  or
- MATH G180: Calculus 1 with a minimum grade of C or better
  or
- MATH C180: Calculus 1 with a minimum grade of C or better
  or
- MATH A182H: Calculus 1 and 2 Honors with a minimum grade of C or better
  or
- MATH A230: Introduction to Discrete Mathematics with a minimum grade of C or better
  or
- MATH A235: Applied Linear Algebra with a minimum grade of C or better
  or
- MATH G235: Applied Linear Algebra with a minimum grade of C or better
  or
- MATH A280: Calculus 3 with a minimum grade of C or better
  or
- MATH A280H: Calculus 3 Honors with a minimum grade of C or better
  or

- MATH G282: Ordinary Differential Equations with a minimum grade of C or better
  or
- MATH A285: Introduction to Linear Algebra and Differential Equations with a minimum grade of C or better
  or
- MATH G285: Introduction to Linear Algebra and Differential Equations with a minimum grade of C or better
  or
- MATH C285: Introduction to Linear Algebra and Differential Equations with a minimum grade of P or better
  or
- MATH A290H: Introduction to Tensors and Calculus on Manifolds Honors with a minimum grade of C or better
  or

COREQUISITES:

ADVISORIES:

ASSIGNED DISCIPLINES:
Mathematics

MATERIAL FEE: Yes [ ] No [X] Amount: $0.00

CREDIT STATUS: Noncredit [ ] Credit - Degree Applicable [X] Credit - Not Degree Applicable [ ]

GRADING POLICY: Pass/No Pass [X] Standard Letter [X] Not Graded [ ]

OPEN ENTRY/OPEN EXIT: Yes [ ] No [X]

TRANSFER STATUS: CSU Transferable[ ] UC/CSU Transferable[X] Not Transferable[ ]

BASIC SKILLS STATUS: Yes [ ] No [X] **LEVELS BELOW TRANSFER:** Not Applicable

CALIFORNIA CLASSIFICATION CODES: Y - Not Applicable

NON CREDIT COURSE CATEGORY: Y - Not applicable, Credit Course

OCCUPATIONAL (SAM) CODE: E

REPEATABLE ACCORDING TO STATE GUIDELINES: No [X] Yes [ ] NUMBER REPEATS:

REQUIRED FOR DEGREE OR CERTIFICATE: No [ ] Yes [X]
Associate in Science in Physics for Transfer(Associate in Science for Transfer)
COMPUTER PROGRAMMING(Associate in Science)
COMPUTER PROGRAMMING(Certificate of Achievement)

GE AND TRANSFER REQUIREMENTS MET:

IGETC Area 2: Mathematical Concepts and Quantitative Reasoning
2A: Mathematic

CSU GE Area B: Scientific Inquiry and Quantitative Reasoning
B4 - Mathematics/Quantitative Thinking

OCC AA Gen Ed
AREA A2: LANGUAGE AND RATIONALITY - Communication and Analytical Thinking

OCC AS Gen Ed
AREA A2 – ENGLISH COMMUNICATION - Communication and Analytical Thinking

COURSE LEVEL STUDENT LEARNING OUTCOME(S) Supported by this course:

1. Evaluate definite integrals using the fundamental theorem of calculus.
2. Use numerical methods to estimate the value of definite integrals.
3. Use techniques of integration to evaluate definite and indefinite integrals.
4. Find limits of sequences.
5. Determine whether series diverge, converge conditionally, or converge absolutely, find or estimate sums of series and find the approved intervals of convergence.
6. Interpret and solve certain types of differential equations, including separable and first order linear.

COURSE OBJECTIVES:

1. Calculate definite and indefinite integrals using simple substitutions, integrating by parts, trigonometric substitutions, and partial fractions.
2. Use integration to solve a variety of applications including areas, volumes of revolution, surface areas of revolution, lengths of curves, and centers of mass.
3. Calculate derivatives and compute integrals to solve applications given by functions in polar or parametric form.
4. Compute limits of sequences.
5. Apply tests for convergence or divergence of series, distinguishing among divergence, absolute convergence, and conditional convergence.
6. Construct and analyze Taylor and Maclaurin series.
7. Solve simple first order differential equations.

COURSE CONTENT:

LECTURE CONTENT:

A. Techniques of Integration
   1. Computing definite and indefinite integrals using integration by parts
   2. Computing definite and indefinite integrals of products and powers of trig functions
   3. Computing definite and indefinite integrals using the method of trigonometric substitutions
   4. Computing definite and indefinite integrals of rational functions using the method of partial fractions
   5. Computing definite and indefinite integrals using a rationalizing substitution
   6. Approximating definite integrals using the trapezoid rule and Simpson's rule and the accompanying analysis of bounds for the errors in these approximations
   7. Computing improper integrals with infinite limits of integration
   8. Computing improper integrals with discontinuous integrands

B. More Applications of Integration
   1. Computing the length of a curve
   2. Computing the area of a surface of revolution
   3. Moments and centers of mass in one and two dimensions

C. Differential Equations
   1. Solving separable differential equations with or without initial conditions
   2. Solving first order homogeneous differential equations
   3. Solving first order linear differential equations using the integrating factor method

D. Parametric Equations and Polar Coordinates
   1. Standard parameterizations of simple conics and cycloids
   2. Graphing simple parametric curves
   3. Computing first and second derivative of y with respect to x for curves given parametrically
   4. Computing the length of a curve given parametrically
   5. Computing the surface area of revolution for a parametric curve revolved about a horizontal or vertical line
   6. Graphing in polar coordinates
   7. Finding tangents to polar curves
   8. Computing areas and curve length in polar coordinates
   9. Conic sections in Cartesian form

E. Infinite Sequences and Series
1. Computing limits of sequences using properties of same
2. Discussion of the definitions of limits of sequences
3. Discussion of monotone sequences and bounds for sequences
4. Definition of a series as the limit of its sequence of partial sums
5. Computing with geometric series
6. Discussion of properties of convergent series
7. Discussion and use of the Nth Term Test and p-series
8. Discussion and use of the Comparison Test, the Integral Test,
9. and the Limit Comparison Test for series with non-negative terms
10. Discussion of absolute convergence and conditional convergence for series
11. Discussion and use of the Alternating Series Test and truncation errors
12. Discussion and use of the Nth Root Test and the Ratio Test for series
13. Discussion of power series and the interval of convergence
14. Constructing Taylor Series and Maclaurin Series
15. Discussion of Taylor's Formula and using Taylor and Maclaurin Series for approximations to functions, complete with the accompanying error analysis
16. Discussion and use of binomial series

LABORATORY CONTENT:

METHODS OF INSTRUCTION:

A. Lecture:
B. Independent Study:

INSTRUCTIONAL TECHNIQUES:

The primary mode of instruction is the lecture/demonstration method. Some sections may utilize graphing calculators.

COURSE ASSIGNMENTS:

Reading Assignments

As assigned from text. 1 hour

Out-of-class Assignments

As assigned by instructor. 6 hour

Writing Assignments

Proofs of theorems and problem solving exercises commonly appear on exams or quizzes. These require written responses of the students. Critical thinking is an integral part of a calculus course. 1 hour

METHODS OF STUDENT EVALUATION:

Midterm Exam
Final Exam
Short Quizzes
Report
Projects (ind/group)
Problem Solving Exercises
Oral Presentations
Skills Demonstration

Demonstration of Critical Thinking:

Grades are determined by performance on quizzes and exams. Some instructors may also include grades on homework, cooperative assignments, or participation in cooperative learning sessions. A comprehensive final exam is part of this course.

Required Writing, Problem Solving, Skills Demonstration:

Proofs of theorems and problem solving exercises commonly appear on exams or quizzes. These require written responses of the students. Critical thinking is an integral part of a calculus course.

TEXTS, READINGS, AND RESOURCES:

TextBooks:

1. Stewart, James.. *Calculus, Early Transcendentals* , 7TH ed. Belmont: Brooks/Cole Publishing Co.,, 2010

Other:

1. Other appropriate textbook as selected by faculty.

LIBRARY:

Adequate library resources include: Print Materials
Non-Print Materials
Online Materials
Services

Comments:

Attachments:

Attached Files