MATH C185: CALCULUS 2

Item	Value
Curriculum Committee Approval Date	10/23/2009
Top Code	170100 - Mathematics, General
Units	5 Total Units
Hours	90 Total Hours (Lecture Hours 90)
Total Outside of Class Hours	0
Course Credit Status	Credit: Degree Applicable (D)
Material Fee	No
Basic Skills	Not Basic Skills (N)
Repeatable	No
Grading Policy	Standard Letter (S), • Pass/No Pass (B)
Local General Education (GE)	• CL Option 1 Math Competency (CA3)
California General Education Transfer Curriculum (Cal-GETC)	• Cal-GETC 2A Math Concepts (2A)
Intersegmental General Education Transfer Curriculum (IGETC)	• IGETC 2A Math Concepts (2A)
California State University General Education Breadth (CSU GE-Breadth)	• CSU B4 Math/Quant.Reasoning (B4)

Course Description

Second course in the calculus sequence. It satisfies the requirement for majors in mathematics, science, or engineering. Topics include techniques and applications of integration, calculus applied to parametric curves and polar curves, analytic geometry, sequences, series, and an introduction to differential equations. PREREQUISITE: MATH C180. Transfer Credit: CSU; UC.

Course Level Student Learning Outcome(s)

1. Apply higher-level integration skills appropriate for STEM majors, including but not limited to: evaluate indefinite and definite integrals using a variety of integration formulas and techniques, and differentiate and integrate functions in parametric form.
2. Determine the convergence or divergence of sequences, series; and work with power series.

Course Objectives

- 1. Apply integration to solve an application of a first-order differential equation.
- 2. Use integration to solve application problems involving areas between curves, volumes by washers and cylindrical shells, arc length, and areas of surfaces of revolution.
- 3. Determine the convergence or divergence of sequences, series; and work with power series.
- 4. Apply derivatives or integrals in logarithmic and exponential functions to solve a growth or decay problem.
- 5. Use appropriate technology such as calculators or computer software to enhance mathematical thinking, visualization, and understanding; to solve mathematical problems; and to judge the reasonableness of the results.
- 6. Demonstrate quantitative reasoning skills by developing convincing arguments and by communicating mathematically both verbally and in writing.

Lecture Content

INTEGRALS AND TRANSCENDENTAL FUNCTIONS The Logarithm Defined as an Integral Exponential Growth and Decay Relative Rates of Growth Hyperbolic Functions TECHNIQUES OF INTEGRATION Basic Integration Formulas Integration by Parts Integration of Rational Functions by Partial Fractions Trigonometric Integrals Trigonometric Substitutions Integral Tables and Computer Algebra Systems Numerical Integration, including trapezoidal and Simpsons rule Improper Integrals FURTHER APPLICATIONS OF INTEGRATION Slope Fields and Separable Differential Equations First-Order Linear Differential Equations Eulers Method Graphical Solutions of Autonomous Equations Applications of First-Order Differential Equations CONIC SECTIONS AND POLAR COORDINATES Conic Sections and Quadratic Equations Classifying Conic Sections by Eccentricity Quadratic Equations and Rotations Conics and Parametric Equations; The Cycloid Polar Coordinates Graphing in Polar Coordinates Area and Lengths in Polar Coordinates Conic Sections in Polar Coordinates INFINITE SEQUENCES AND SERIES Sequences Infinite Series Comparison Tests The Ratio and Root Tests Alternating Series, Absolute and Conditional Convergence Power Series; Radius of Convergence, Interval of Convergence. Taylor and Maclaurin Series Convergence of Taylor Series; Error Estimates. Differentiation and Integration of Power Series Applications of Power Series Fourier Series

Method(s) of Instruction

- Lecture (02)
- DE Live Online Lecture (02S)
- DE Online Lecture (02X)
- Video one-way (ITV, video) (63)
- Cable (CA)

Instructional Techniques

Deliver lectures of course content. Assign homework and quizzes. Require participation including student-to-student and student-to-instructor interaction through the use of small-group activities and whole-class discussion.

Reading Assignments

Homework assignments from the textbook, real world application research

Writing Assignments

Homework, research report, and projects

Out-of-class Assignments

Homework problems and exercises from the textbook.

Demonstration of Critical Thinking

Students are required to explain solutions and justify reasoning verbally or in writing. Critical thinking may also be included in classroom discussions, quizzes, Midterm Examination, Final Examination, and Projects.

Required Writing, Problem Solving, Skills Demonstration

Included as homework assignments, part of classroom lectures and discussions, part of quizzes, Midterm Examination, Final Examination, and Projects.Students will be able to explain solutions and justify reasoning verbally or in writing and will participate in classroom discussions, quizzes, Midterm Examination, Final Examination, and Projects.

Eligible Disciplines

Mathematics: Masters degree in mathematics or applied mathematics OR bachelors degree in either of the above AND masters degree in statistics, physics, or mathematics education OR the equivalent. Masters degree required.

Textbooks Resources

1. Required Briggs, William; Chchran, Lyle; Gillett, Bernard. Calculus: Early Transcendentals, 2nd ed. Person, 2015

Other Resources

1. Coastline Library