

**JEFFERSON COLLEGE**

**COURSE SYLLABUS**

**MTH 185**

**CALCULUS II**

5 Credit Hours

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## MTH185: Calculus II

### I. CATALOG DESCRIPTION

- A. Course pre-requisites/co-requisites: MTH180 with a grade of “C” or better and reading proficiency
- B. 5 semester credit hours
- C. Calculus II is a continuation of Calculus I. The student will study transcendental functions, techniques and applications of integration, infinite series, and conic sections. (F, S)
- D. Fulfills AS degree requirement.  
Elective course applies toward AA and AAT degree requirement.

### II. EXPECTED LEARNING OUTCOMES/CORRESPONDING ASSESSMENT MEASURES

Expected Learning Outcomes	Assessment Measures
Determine the appropriate method (partial fractions, trig integration, trig substitution, inverse trig, integration by parts) for integrating a function and perform definite and indefinite integrals using these methods	Homework, quizzes, and tests
Solve logarithmic and exponential equations by use of inverse functions; differentiate and integrate compound algebraic and transcendental functions	Homework, quizzes, and tests
Graph the solutions of functions in polar and parametric form by traditional methods and through use of technology; translate these functions to and from rectangular form	Homework, quizzes, and tests
Graph conic sections and provide equations for given conic section graphs, in both rectangular and polar form	Homework, quizzes, tests, and projects
Determine centroids, arc lengths, surface areas, and probabilities by integration and determine the reasonableness of these results by comparing them to estimates derived through non-calculus methods	Homework, quizzes, tests, and projects
Represent transcendental functions as infinite polynomials and determine the intervals on which they converge, as well as the number of terms required to achieve a specified accuracy	Homework, quizzes, and tests
Evaluate the reasonableness of results by comparing	Homework, quizzes, and tests

them to estimates derived by non-calculus methods	
Determine appropriate roles for technology (TI calculators and PC software) and apply it to assist in graphing, checking and predicting results and approximating integrals	Homework, quizzes, and tests

### III. OUTLINE OF TOPICS

- A. Exponential, logarithmic, and inverse trigonometric functions
  - 1. Inverse functions
  - 2. Exponential functions and their derivatives
  - 3. Logarithmic functions
  - 4. Derivatives of logarithmic functions
  - 5. Inverse trigonometric functions
  - 6. Hyperbolic functions
  - 7. Indeterminate forms and L'hospital's Rule
  
- B. Techniques of integration
  - 1. Integration by parts
  - 2. Trigonometric integrals
  - 3. Trigonometric substitution
  - 4. Integration of rational functions by partial fractions
  - 5. Strategies for integration
  - 6. Integration using tables
  - 7. Approximate integration
  - 8. Improper integrals
  
- C. Applications of integration
  - 1. Arc length
  - 2. Area of a surface of revolution
  - 3. Applications to physics and engineering
  
- D. Parametric equations and polar coordinates
  - 1. Curves defined by parametric equations
  - 2. Tangents and areas with parametric curves
  - 3. Polar coordinates
  - 4. Areas and lengths in polar coordinates
  - 5. Conic sections
  - 6. Conic sections in polar coordinate
  
- E. Infinite sequences and series
  - 1. Sequences
  - 2. Series
  - 3. The integral test and estimates of sums
  - 4. The comparison tests
  - 5. Alternating series

6. Absolute convergence and the ratio and root tests
7. Strategy for testing series
8. Power series
9. Representation of functions as power series
10. Taylor and Maclaurin series
11. The binomial series
12. Applications of Taylor polynomials

#### IV. METHODS OF INSTRUCTION

- A. Lectures
- B. Discussion

#### V. REQUIRED TEXTBOOK

Briggs, Cochran, and Gillett. *Calculus* (current edition). Boston: Pearson.

#### VI. REQUIRED MATERIALS

Graphics calculator required. TI-83/84 recommended  
Symbolic manipulating calculators prohibited.

#### VII. SUPPLEMENTAL REFERENCES

None

#### VIII. METHODS OF EVALUATION

- A. Homework assignments (problems not from the book) 40%
- B. Quizzes 40%
- C. Comprehensive final 20%
- D. Attendance 5%  
(For every class missed, 1% will be deducted from attendance credit, unless the absence is for a Jeffco-related purpose.)

#### IX. ADA AA STATEMENT

Any student requiring special accommodations should inform the instructor and the Coordinator of Disability Support Services (Technology Center 101; phone 636-481-3169).

## X. ACADEMIC HONESTY STATEMENT

All students are responsible for complying with campus policies as stated in the Student Handbook (see College website, <http://www.jeffco.edu>).

## XI. ATTENDANCE STATEMENT

Regular and punctual attendance is expected of all students. Any one of these four options may result in the student being removed from the class and an administrative withdrawal being processed: (1) Student fails to begin class; (2) Student ceases participation for at least two consecutive weeks; (3) Student misses 15 percent or more of the coursework; and/or (4) Student misses 15 percent or more of the course as defined by the instructor. Students earn their financial aid by regularly attending and actively participating in their coursework. If a student does not actively participate, he/she may have to return financial aid funds. Consult the College Catalog or a Student Financial Services representative for more details.

## XII. OUTSIDE OF CLASS ACADEMICALLY RELATED ACTIVITIES

The U.S. Department of Education mandates that students be made aware of expectations regarding coursework to be completed outside the classroom. Students are expected to spend substantial time outside of class meetings engaging in academically related activities such as reading, studying, and completing assignments. Specifically, time spent on academically related activities outside of class combined with time spent in class meetings is expected to be a minimum of 37.5 hours over the duration of the term for each credit hour.