

**COLLIN COUNTY COMMUNITY COLLEGE
COURSE SYLLABUS**

COURSE NUMBER: Math 2414

COURSE TITLE Calculus II

CREDIT HRS: 4 **LECTURE HRS:** 3 **LAB HRS:** 3 **CLN/REC HRS:** 0

PREREQUISITE: Math 2413

COREQUISITE: None

TEXTBOOK:

Onsite courses: Thomas' Calculus / Early Transcendentals, Eleventh Edition, Weir-Hass Giordano, ©2006, Pearson Education.

Online courses: e-mail your professor, vantohe@cccdd.edu or dbrown@cccdd.edu, for textbook information.

SUPPLIES: Graphing calculator required

COURSE DESCRIPTION:

Applications of integration, techniques of integration, infinite series, parametric equations, polar functions, and differential equations.

COURSE MEASURABLE LEARNING OBJECTIVES:

Upon completion of this course the students should be able to do the following:

1. Use various integration techniques to find the definite and indefinite integrals, both algebraically and numerically.
2. Use definite integrals to find volumes, curve lengths, centers of mass, surfaces of revolution, work, and fluid force.
3. Use differential and integral calculus with parametric equations, polar and hyperbolic functions .
4. Evaluate improper integrals, and prove the divergence or convergence of infinite series.
5. Use various power series such as Taylor, Maclaurin, or binomial to approximate functions.
6. Solve differential equations by separation of variables, integrating factors, or numerical techniques with applications.

COURSE REQUIREMENTS:

Completion of required exams, labs, and assignments.

COURSE FORMAT:

Lecture, lab and guided practice.

METHOD OF EVALUATION:

A minimum of four written exams, a lab component grade, and a comprehensive final exam. Homework and/or quizzes may be used in place of one exam or in addition to exams. The weight of each of these components of evaluation will be specified in the individual instructor's addendum to this syllabus. All out-of-class course credit, including take-home exams, home assignments, service-learning, etc. may not exceed 25% of the total course grade; thus, at least 75% of a student's grade must consist of exams given in the class or testing center, and no student may retake any of these exams.

ATTENDANCE POLICY:

Attendance is expected of all students. If a student is unable to attend, it is his/her responsibility to contact the instructor to obtain assignments. Please see the schedule of classes for the last day to withdraw.

RELIGIOUS HOLY DAYS:

In accordance with section 51.911 of the Texas Education Code, the college will allow a student who is absent from class for the observance of a religious holy day to take an examination or complete an assignment scheduled for that day within a reasonable time. A copy of the state rules and procedures regarding holy days and the form for notification of absence from each class under this provision are available from the Admissions and Records Office.

COURSE REPEAT POLICY:

All students may repeat this course only once after receiving a grade, including W. For example students who have taken this course twice have to choose a different course to take after two trials.

ADA STATEMENT:

It is the policy of Collin County Community College to provide reasonable and appropriate accommodations for individuals with documented disabilities. This College will adhere to all applicable Federal and State laws, regulations and guidelines with respect to providing reasonable accommodations as required to afford equal educational opportunity. It is the student's responsibility to contact the ACCESS Office (G-200) or 972.881.5898, (TDD 972.881.5950) in a timely manner if he/she desires to arrange for accommodations.

ACADEMIC ETHICS:

The college may initiate disciplinary proceedings against a student accused of scholastic dishonesty. Scholastic dishonesty includes, but is not limited to, statements, acts, or omissions related to applications for enrollment or the award of a degree, and/or the submission of material as one's own

work that is not one's own. Scholastic dishonesty may involve one or more of the following acts: cheating, plagiarism, collusion, and/or falsifying academic records.

Cheating is the willful giving or receiving of information in an unauthorized manner during an examination, illicitly obtaining examination questions in advance, using someone else's work for assignments as if it were one's own, copying computer disks or files, and any other dishonest means of attempting to fulfill the requirements of a course.

Plagiarism is the use of an author's words or ideas as if they were one's own without giving credit to the source, including, but not limited to, failure to acknowledge a direct quotation. Contact the Dean of Students at 972.881.5771 for the student disciplinary process and procedures or consult the CCCC Student Handbook.

COURSE CONTENT:

Note: Proofs and derivations will be assigned at the discretion of the instructor.

MODULE 1: APPLICATIONS of INTEGRATION

The student will be able to:

1. Use the definite integral to find the volume of a solid by slicing
2. Use the definite integral to find the volume of a solid of revolution with discs or shells
3. Use the definite integral to find the arc length of a curve
4. Use the definite integral to find the moments, mass and center of mass of a thin plate
5. Use the definite integral to find the area of a surface of revolution
6. Use the theorem of Pappus to find the area of a surface of revolution
7. Apply the definite integral to solve physics and engineering problems
8. Use the definite integral to find the area of a region defined in polar coordinates
9. Define and perform Calculus on hyperbolic functions

MODULE 2: TECHNIQUES OF INTEGRATION

The student will be able to:

1. Define the natural logarithm as an integral
2. Use substitution to evaluate definite and indefinite integrals
3. Use integration by parts to evaluate definite and indefinite integrals
4. Use the method of partial fractions to find definite and indefinite integrals
5. Use the method of trig substitution to find definite and indefinite integrals
6. Use integral tables to evaluate definite and indefinite integrals
7. Approximate the definite integral using the trapezoidal and Simpson's rules
8. Evaluate improper integrals

MODULE 3: DIFFERENTIAL EQUATIONS

The student will be able to:

1. Model problems involving exponential growth and decay using differential equations
2. Solve separable differential equations and various applications
3. Identify solutions of a differential equation from a slope field
4. Solve first-order linear differential equations
5. Use Euler's method to approximate a solution to a differential equation
6. Construct a graphical solution to autonomous differential equations using phase lines
7. Solve differential equations involving resistance proportional to velocity problems
8. Solve differential equations involving the logistic equation
9. Find the orthogonal trajectories of a family of curves

MODULE 4: INFINITE SEQUENCES and SERIES

The student will be able to:

1. Find the limit of a sequence
2. Determine whether a series converges or diverges using: Test for Divergence, Integral Test, p-series Test, Comparison Test, Limit Comparison Test, Alternating Series Test, Ratio Test, or Root Test
3. Estimate the sum of a series
4. Find the radius of convergence and interval of convergence of a power series
5. Find the power series representation of a given function
6. Find Taylor and Maclaurin series for a given function
7. Use the binomial series to find a power series
8. Use Taylor series to solve applications
9. Use Taylor series to solve differential equations