

METROPOLITAN STATE UNIVERSITY OF DENVER
Office of Academic and Student Affairs

REGULAR COURSE SYLLABUS

School of: Letters, Arts, and Sciences

Department: Mathematical and Computer Sciences

Prefix & Course Number: MTH 2410

Crosslisted With*: _____

Course Title: Calculus II

Banner course title (30 characters): Calculus II

Check All That Apply: Required for Major: X Required for Minor: X Specified Elective: _____

Required for Concentration: _____ Elective: _____ Service Course: X

To receive Title IV financial aid funds, all institutions of higher education must comply with the federal definition of a credit hour. The Higher Learning Commission requires institutions to maintain policies and procedures for verifying compliance with this definition.

***Federal Credit Hour Definition:** A credit hour is an amount of work represented in intended learning outcomes and verified by evidence of student achievement that is an institutionally-established equivalency that reasonably approximates not less than:*

(1) one hour of classroom or direct faculty instruction and a minimum of two hours of out-of-class student work each week for approximately fifteen weeks for one semester or trimester hour of credit, or ten to twelve weeks for one quarter hour of credit, or the equivalent amount of work over a different amount of time; or (2) at least an equivalent amount of work as required in paragraph (1) of this definition for other activities as established by an institution, including laboratory work, internships, practica, studio work, and other academic work leading toward the award of credit hours. 34CFR 600.2 (11/1/2010)

Credit Hours: 4 (4 + 0)

Face-to-Face or Equivalent Hours per course:

Lecture 60 Lab _____ Internship _____ Practicum _____ Other (please specify type and hours): _____

Additional Student Work Hours per course: 120

Schedule Type: Lecture Grade Mode: Letter

Variable topics umbrella course: No X Yes _____ If Yes, number of credit hours allowed _____

Specified repeatable course: No X Yes _____

APPROVED:

Department Curriculum Committee

Clark Dallard

10/1/2015
Date

LB Packer

10.1.2015

Department Chair OR Program Director

Linda Long-Kratt

Date

12-11-15

Dean OR Associate Dean

Bernice Harris

Date

1-18-16

Associate VP, Academic Affairs

Date

Prefix and Course Number: MTH 2410

August 21, 2015

Prerequisite(s): MTH 1410 with a grade of "C" or better, or permission of instructor

Corequisite(s): _____

Prerequisite(s) or Corequisite(s): _____

Banner Enforced:Prerequisite(s): MTH 1410 with a grade of "C" or better or MTH 1410 with a grade of "T" or better

Corequisite(s): _____

Prerequisite(s) or Corequisite(s): _____

Registration restrictions: Level _____ Class _____ Program/Major _____ Student attribute _____

Catalog Course Description:

This is a second course in calculus. The topics covered include techniques of integration, applications of the integral, and infinite series, including Taylor's series. All sections of the course will make integrated use of the software package Mathematica and/or a graphing calculator.

Required Reading and Other Materials will be equivalent to:

Briggs, Cochran, and Gillett (2013). *Calculus for Scientists and Engineers*, Boston, MA: Pearson.

Specific, Measurable Student Behavioral Learning Objectives:

Upon completion of this course the student should be able to:

1. Find the arc length of a curve.
2. Find volumes.
3. Integrate by parts, and by partial fractions.
4. Determine convergence of infinite series.
5. Find the radius of convergence of power series.
6. Compute Taylor series.
7. Use Polar coordinates, graph polar equations, and find area of polar regions.

Detailed Outline of Course Content (Major Topics and Subtopics):**CORE TOPICS****COMMENTS****I. REVIEW**

- A. Fundamental Theorem of Calculus
- B. Substitution

II. Applications of Integration

- A. Acceleration, velocity, position
- B. Regions between curves
- C. Volumes by slices
- D. Arc length
- E. Physical applications
- F. Exponential models Optional
- G. Hyperbolic functions Optional

III. Integration Techniques

- A. Basic approaches
- B. Integration by parts
- C. Trigonometric Integrals
- D. Trigonometric substitution
- E. Partial Fraction Decomposition
- F. Other techniques Optional
- G. Numerical Integration
- H. Improper integrals

IV. Parametric and Polar Curves

- A. Parametric curves
- B. Polar Coordinates
- C. Slopes and areas in polar coordinates

V. Sequences and Series

- A. Introduction
- B. Limits of sequences
- C. Infinite series
- D. Divergence and integral tests
- E. Ration and comparison tests
- F. Alternating series and absolute convergence

VI. Power Series

- A. Taylor polynomials
- B. Power series
- C. Taylor series(not Binomial series)
- D. Differentiating and integrating power series

VII. Differential EquationsOptional

- A. Solutions
- B. Limits of sequences
- C. Separable differential equations

GRAPHING CALCULATORS

All instructors will use the same calculator, which will be the recommended calculator for the course. Students may use any calculator with a comparable capability, but they will be encouraged to use the recommended calculator. On exams, students will not be allowed to use calculators which give derivatives and integrals in closed form.

The recommended calculator for MTH 1410, MTH 2410, and MTH 2420 is the TI-83, TI-83 Plus, or TI-84 Plus graphing calculator.

GATEWAY EXAMS

Each student in Calculus II is required to pass a gateway exam in order to receive a passing grade for the course. The gateway exam in Calculus II is designed to ensure that each student possesses basic mechanical skills in integration, to include the following:

- I. Integration of Basic Functions
 - a. Power/polynomial functions
 - b. Trigonometric functions
 - c. Exponential/logarithmic functions

- II. Basic Integration Techniques
 - a. Power Rule
 - b. Substitution
 - c. Integration by parts
 - d. Partial fraction decomposition

Different versions of the gateway exam will be generated periodically by the calculus committee and kept on file in the main office. The instructor should administer Version A of the exam in class shortly after all of the above topics have been covered. The passing score on the exam is 90%. Students not passing the initial version of the gateway exam are allowed to retake the exam until the exam is passed. At the end of the semester, students who do not pass this requirement will receive a grade of incomplete if they are passing the course and a grade of F if they are not passing the course. Additionally, instructors may use the score on the gateway exam as a portion of the final course grade.

Please include an **exit policy** similar to the following in your class policies sheet (your actual policy on retakes may vary):

“Exit Policy In order to receive a passing grade for the course, students must pass a gateway exam in integration. The passing level for this exam is 90% and it will be given once during a regular class period. Students may retake the exam in my office, during office hours, after it has been given in class. The maximum number of attempts at the exam for any one day is two. After two failures, students must wait until the next day to retake the exam again. Students who are passing the course, but do not pass the gateway exam, will be given an incomplete for the class. Students who are failing the course will receive an F whether or not they have passed the gateway exam.”

Evaluation of Student Performance (format: I, a, i, ii, etc.):

1. Quizzes/Homework
2. Exams
3. Projects
4. Final Exam

All of the above are subject to the following Quality Standards

QUALITY STANDARDS FOR MTH 1080, 1110, 1120, 1210, 1310, 1320, 1400, 1410, 2410, AND 2420:

1. An in-class comprehensive final exam must be given in a period of one hour 45 minutes or longer, as prescribed in the institutional final exam schedule; at least 20% of the total grade must come from the final exam. Excusing individual students from the final exam is prohibited.
2. Classes meeting four days a week or three days a week must give at least three 50 minute in-class exams prior to the final. Those meeting two days a week and not giving at least three 50 minute in-class exams prior to the final must give at least two 75-or-more minute in-class exams prior to the final. None of the grades on these exams will be dropped in computing the final course grade if only two exams are given. The final will count as at least 20% of the student's grade.
3. Sample exams which closely parallel actual exams are discouraged.
4. The entire core of the course syllabus must be covered.
5. The Department Chair may approve exceptions to the items 1-4.