



UNIVERSITY OF NORTHERN COLORADO

Extended Campus

College of Natural & Health Sciences
School of Mathematical Sciences

UNC Dual Enrollment at Roosevelt High School

MATH 132-659: Calculus II (4 credits)
Fall & Spring 2020-2021

Instructor: Cheryl Olson

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Office Hours: Everyday 7:00 – 7:25, 2:40 – 3:30

Prerequisite For UNC Dual Enrollment:

- Junior or Senior status
- 3.0 cumulative GPA
- Grade of “C” or better in Calculus I. A grade of C- is not acceptable.
- Counselor/Instructor approval prior to taking the course
- Parent/guardian consent
- Special Exemptions to these qualifications may be made on an individual basis through written request to UNC Extended Campus

Course Description:

Second course in three course sequence in calculus. Integration and applications of integration, sequences and series. (LAC, gtP).

Required Materials:

- Text book: Calculus Graphical, Numerical, Algebraic 5th Edition, Finney, Damana, Waita, Kennedy, Bressoud. ISBN 0-13-331161-9
- Graphing Calculator. Acceptable models include TI-83, TI-83+, TI-84, TI-84+, all other models please ask. (Instructor will be using a TI-83+).
 - Sharing of calculators during quizzes or exams will not be permitted.
 - Bring calculators to class. We will be using them throughout the semester.
- Pencils, lined paper, graph paper, expo markers.

Methods of Evaluation:

Grading Scale:

A	90.0-100%
B	80.0-89.9%
C	70.0-79.9%

D	60.0-69.9%
F	59.9% and below

Grading Allotment:

- 20% Written homework sets
- 50% Three in-class exams
- 20% Comprehensive Final Exam
- 10% Quizzes

Course Requirements and Expectations:

- Arrive on time with all materials ready to learn. Students will adhere to the Roosevelt attendance and behavior policy.
- Come to class with a positive attitude, and the willingness to help other students.
- Complete assignments on time. Assignments will be graded daily, and late assignments will NOT be accepted.
- Tests will be given at the end of each unit as a minimum. Quizzes may be administered at any time to test knowledge within a unit.
- NOTE: Tests, quizzes, and daily assignments that are missed due to an unexcused absence will be given zero grade and will not be allowed to be made up.
- Take responsibility for your learning. It is highly recommended to form study groups to complete homework and be able to receive help from peers when the teacher is not available.

In this course, students will work in cooperative groups to help master concepts. Every student is expected to help create a positive learning environment for all. Listening and showing respect for others’ ideas and questions will enhance everyone’s learning.

Portable Electronic Devices:

Please extend courtesy to your instructor and fellow students by turning off your portable electronic devices such as: cell phones, pagers, and iPods. Your phones should be placed in the phone caddy by the door. If your phone is out during class, the instructor will keep your phone until the end of the day.

Changes

The instructor reserves the right to amend, adjust, or otherwise modify the outline and syllabus at any time during the course. Changes will be announced in class and posted online on Mrs. Olson’s website. The new syllabus will be available under the ‘Syllabus’ link, and I will post an announcement on remind to make everyone aware of the changes.

Accommodations:

Students who believe they may need accommodations in this class are encouraged to contact the Counseling Office at Roosevelt High School as soon as possible to better ensure that such accommodations are implemented in a timely fashion.

UNC Policies

Academic Conduct:

UNC’s policies and recommendations for academic misconduct will be followed. For additional information, please see the Dean of Student’s website, Student Handbook link <http://www.unco.edu/dos/pdf/StudentCodeofConduct.pdf>

Honor Code:

All members of the University of Northern Colorado community are entrusted with the responsibility to uphold and promote five fundamental values: Honesty, Trust, Respect, Fairness, and Responsibility. These core

elements foster an atmosphere, inside and outside of the classroom, which serves as a foundation and guides the UNC community's academic, professional, and personal growth. Endorsement of these core elements by students, faculty, staff, administration, and trustees strengthens the integrity and value of our academic climate.

Dropping or Withdrawing from a UNC Dual Enrollment Course:

Note: Drop and withdrawal dates for the courses at your school can be found at:

<https://extended.unco.edu/courses/dual-enrollment/high-school/roosevelt-johnstown/>

Please use the [Dual Enrollment Drop & Withdrawal Form](#).

- You can drop your course up until the designated Drop Deadline. The course will be removed from your transcript and you will receive a full tuition refund.
- After the Drop Deadline and up until the Withdrawal Deadline you can withdraw from your course. The course will remain on your transcript with a grade of "W" (this does not impact your GPA), and there is no tuition refund.
- After the withdrawal deadline you are unable to be removed from the course. The course will remain on your transcript with the grade that you have earned, and there is no tuition refund.
- If you stop attending the course but fail to officially withdraw from the course(s), you will be responsible for full tuition and fees and the course grade will remain on your transcript.

Liberal Arts Core & Colorado gtPathways:

This course satisfies 4 credits of Area 2. (Mathematics) of the UNC Liberal Arts Core. This course has been approved by the Colorado Commission on Higher Education for inclusion in the Colorado Guaranteed Transfer Program, gtP. gtP courses automatically transfer to any public institution in Colorado and will continue to count toward general education or other graduation requirements for any liberal arts or science associate or bachelor's degree program if a grade of C- or higher is recorded. Statewide articulation agreements prescribe specific general education and degree requirements in the following professional degree programs: business, early childhood, elementary education, engineering and nursing. Most other courses not approved for the gtP designation will also be accepted in transfer by other institutions but may not fulfill general education or degree requirements.

LAC Area 2/ GtPathways content and competency criteria

"The Colorado Commission on Higher Education has approved Math 132 for inclusion in the Guaranteed Transfer (GT) Pathways program in the Area 2 category. For transferring students, successful completion with a minimum C- grade guarantees transfer and application of credit in this GT Pathways category. For more information on the GT Pathways program, go to

<http://higher.ed.colorado.gov/academics/transfers/gtpathways/curriculum.html>.

Students who successfully complete the Area 2 Liberal Arts Core requirement in mathematics will have developed an understanding of fundamental mathematical concepts and their applications, will have developed their quantitative problem-solving skills, and will have developed a level of quantitative literacy that provides a foundation for success in their programs of study, careers, and citizenship.

Specifically, they will be able to:

Demonstrate good problem-solving habits, including:

- estimating solutions and recognizing unreasonable results
- considering a variety of approaches to a given problem, and selecting one that is appropriate
- interpreting solutions correctly

Generate and interpret symbolic, graphical, numerical, and verbal (written or oral) representations of mathematical ideas

Communicate mathematical ideas in written and/or oral form using appropriate mathematical language, notation, and style

Apply mathematical concepts, procedures, and techniques appropriate to the course

Recognize and apply patterns or mathematical structure

Utilize and integrate appropriate technology

Demonstrate competency in Quantitative Literacy by being able to:

- Interpret Information
 - Explain information presented in mathematical forms (e.g., equations, graphs, diagrams, tables, words)

Represent Information

- Convert information into and between various mathematical forms (e.g., equations, graphs, diagrams, tables, words)

Perform Calculations

- Solve problems or equations at the appropriate course level
- Use appropriate mathematical notation
- Solve a variety of different problem types that involve a multi-step solution and address the validity of the results

Apply and Analyze Information

- Make use of graphical objects (such as graphs of equations in two or three variables, histograms, scatterplots of bivariate data, geometrical figures, etc.) to supplement a solution to a typical problem at the appropriate level
- Formulate, organize, and articulate solutions to theoretical and application problems at the appropriate course level
- Make judgments based on mathematical analysis appropriate to the course level

Communicate Using Mathematical Forms

- Express mathematical analysis symbolically, graphically, and in written language that clarifies/justifies/summarizes reasoning (may also include oral communication)

Students will be assessed on these content and competency criteria through a combination of WeBWorK online homework, lab write-ups, in-class exams and quizzes, and a gateway exam. For further details and examples of each kind of assessment, please see addendum document.

Course Outline

Techniques of Integration

- Numerical methods: midpoint rule, trapezoid rule, Simpson's rule
- Integration by substitution
- Integration by parts
- Improper integrals, directly and by comparison
- Trigonometric substitution; partial fraction decomposition; tables of integrals

Using the definite integral

- Areas and volumes; solids of revolution; arc length
- Integrals in polar coordinates
- Density and center of mass
- Applications to physics (work, force, pressure, total mass, etc.)
- Applications to probability (probability density functions, cumulative density functions, mean and median)

Sequences and series

- Sequences; arithmetic and geometric sequences
- Series; arithmetic and geometric series
- Convergence of series
- Tests for convergence: comparison, limit comparison, geometric, ratio, alternating; absolute vs. conditional convergence
- Power series; interval and radius of convergence; testing convergence at endpoints

Polynomial approximation of functions

- Taylor polynomials
- Taylor series; convergence; binomial series
- Finding Taylor series: by substitution; by differentiation or integration; by multiplication
- Error in Taylor polynomial approximations
- (Optional) Fourier series; harmonics

Differential equations

- Slope fields; qualitative solutions
- Euler's method
- Separable differential equations
- Growth and decay; logistic model