Math 127 – Elementary Functions (Pre-Calc) (4 credits)

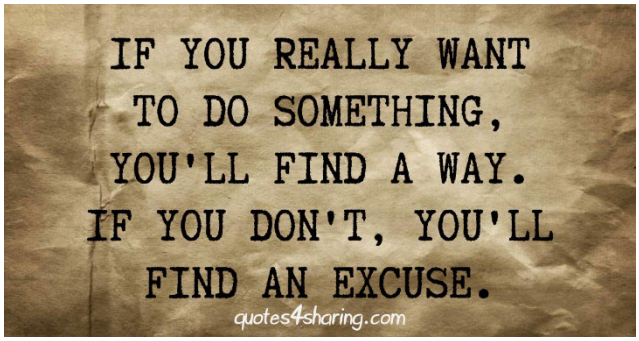
Angela Steele – 970-351-2630 angela.steele@unco.edu

- Office location: Ross 2210C (2nd floor south side of Ross Hall)
- Student (office) hours: Student hours are hours set aside for you to receive help from the instructor.
  - **Monday 9:05-9:55am in Ross 1250**
  - **Monday 12:20-1:10pm in Ross 2210C**
  - **Wednesday 12:20-1:10 in Ross 2210C**
  - **All other office hours by appt.**

Welcome to Pre-Calc!

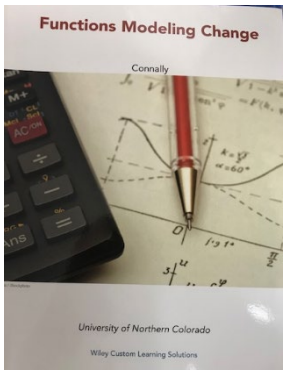
Congratulations! You made it to college! That, in and of itself, is a great accomplishment. For many people, graduating from college is a life-long dream. On record, the oldest person to graduate from college is Leo Plass at 99 years old. **Artie Mae Grisby** was the oldest student I ever taught. In 2013, Artie Mae earned her bachelor's degree in Early Childhood Education from UNC at 79 years young.

Deciding to attend college is a big decision. Take a moment to write down your reasons for wanting to attend College.



	Attendance and Participation (5%)	**Online Homework- WileyPlus (10%)**	**Progress Checks (5%)**	**Project (10%)**	**3 tests (48%- 3@16% each)**	**Final exam (22%)**
How will I be graded?	Attendance and participation is expected. When you are constantly involved with the material, you are more likely to remember a greater portion of the information. If you do miss a class, you are still responsible for the material.	We use online homework so you can have immediate feedback. The online homework is a learning environment that encourages exploratory thought, views mistakes as stepping stones in the learning process, and is low stakes risk. WileyPlus homework is typically due on Mondays.	Progress Checks are essentially take home quizzes. It is a chance for you to work on a few problems and receive feedback	The project is an opportunity for you to explore one topic from this course and understand the topic from a different perspective.	Each test is an opportunity to show us what you know and understand.	The final exam is an opportunity to show us what you know and understand.
What can I do to improve my grade?	Two absences are allowed with no effect to your grade. These absences should be used for funerals, weddings, doctor appointments, etc.	If you are struggling with the homework, visit a tutor or the instructor during their student (office) hours. Please bring your previous attempts at solving the problem because the best way for us to help you is to see your error. There will be opportunities for you to earn bonus WileyPlus points by completing other tasks for the course: (1) you can earn points by responding to questions posed on GroupMe. (2) You can also earn points by turning in a progress check the day its due and earning full credit.	Progress checks are due the next class period and graded using a mastery system where the goal is to earn a full credit. If you did not earn full credit, you have the opportunity to fix your mistake until you have mastered the problem. You can redo the progress checks as often as needed up until the test for that chapter.	You will be provided with a rubric, which will indicate how you can improve your score.	If your final exam percentage is higher than any one of the unit test percentages, your final exam percentage will replace the unit test percentage.	

Materials you will need for the course:



- Connally, Hughes-Hallett, Gleason, et al. (2019) *Functions Modeling Change: A Preparation for Calculus,6th edition*, Wiley plus access code to WileyPlus
- Graphing Calculator- acceptable models include TI-83, TI-83+, TI-84, TI-84+.
  - Sharing of calculators during exams will not be permitted.
- Binder

Course Evaluation

Grading Scale

A	90-100%
B	80-89.9%
C	70-79.9%
D	60-69.9%
F	< 60%

Grading Allotments are listed in the table above

- You will not be allowed to make up a missed test unless you have a university authorized absence.
- There are three unit tests. We will follow the tentative outline/pacing guide and the tests will be given when we are finished with the appropriate chapters. The anticipated schedule is Test #1 will be week 4 or 5. Test #2 will be week 9 and Test #3 will be week 13.
- The final exam will be given during the final exam week. If your final exam percentage is higher than any one of the unit test percentages, your final exam percentage will replace the unit test percentage.
- Attendance is expected. You are allowed two absences with no effect to your grade. We will adjust for Covid on a case to case basis.

Course Overview

The purpose of this course is to provide students with a solid understanding of functions in mathematics as well as real-world contexts. This includes the development of both conceptual understanding and procedural fluency.

This class is based on the belief that everyone has the capability to learn math. With this in mind, the class has the following rules.

» Treat our time with respect. We have short amount of time together, so be ready to learn when class starts. This means come to class early to settle your mind for learning, put your cell phone away, and stay engaged until the class is finished.

» Learning is a process. This class is set up so that you do smaller amounts of work over a greater number of days. An hour's worth of learning done over four days will provide more benefit than four hours of work done on a single day. It is my job to provide just the right amount of work and it is your job to do that work in a good faith way.

Course Objectives

As a result of taking Math 127, students will be able to -

A. Describe what a function is and identify, compare, and understand the relationships between the major function families, especially linear, quadratic, exponential, logarithmic, polynomial, rational, and trigonometric functions and apply this knowledge in real-world contexts.

B. Generate, interpret, and connect different function representations, especially tables, algebraic, graphs, and linguistic and apply this knowledge in real-world contexts.

C. Define, identify, and describe characteristics of functions including: zeroes (x-intercepts), y-intercepts, increasing intervals, decreasing intervals, extrema, growth rates, end-behavior, concavity, domain, range, and asymptotes and apply this knowledge in real-world contexts.

D. Perform operations on functions, interpret the results, and apply this knowledge in real-world contexts. Operations include: arithmetic operations, finding the inverse, composing functions, translating functions, evaluating functions, solving equations involving functional relationships.

Prerequisites: A satisfactory score on the math placement index and either two years of high school algebra with a grade of C or better (C- is not acceptable) or the equivalent.

Description: This course covers families, representations, operations, and characteristics of functions.

Guidelines for a successful semester:

Show up!

Keep up with the work!

Ask questions! Ultimately the responsibility for learning in the class resides on you. It is your responsibility to actively pursue the best educational environment that meets your individual needs. Everyone has a different background, you are the only one who knows what you do and do not know. You have many resources to help you fill in those gaps!

Resources for Additional Help

The following resources can be used for homework help:

Bio-Chem-Math Study Center
This lab, located in Ross 1250, offers homework help for a variety of mathematics courses. Tutors for math coursework will be available at most times between 9:00 a.m. and 5:00 p.m. on Monday, Tuesday, and Friday. The lab schedule is posted in the math office (Ross 2239) and on the door of the Study Center.

UNC Tutoring Center
See http://www.unco.edu/asa/tutoring/ for information.

Pinterest
This is a social network in the form of an app and s website that allows users to link to websites via a picture. The purpose of this resource is to help students find websites that may help them learn/understand material covered in class. This is a new feature for College Algebra, so you can expect more websites as the semester progresses. To link to the college algebra pinterest boards, please follow: email: angela.steele@unco.edu OR username: angelasteel9879

University Policy & Resources

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. Although not an audio issue, text- messaging is a distraction to other students and prevents you from full participation in class. You should keep your portable electronic devices in your backpack or purse during class. Your personal electronic devices should not be on your desks. If you know that you may need to accept an emergency phone call during class or if you have children in childcare or school, please let the instructor know. If you need to take a phone call during class, please step out of the classroom while you complete your call. Thank you for your cooperation.

Disability Resource Center

It is the policy and practice of the University of Northern Colorado to create inclusive learning environments. If there are aspects of the instruction or design of this course that present barriers to your inclusion or to an accurate assessment of your achievement (e.g. time-limited exams, inaccessible web content, use of videos without captions), please communicate this with your professor and contact Disability Resource Center (DRC) to request accommodations.
Office: (970) 351-2289, Michener Library L-80.
Students can learn more here: www.unco.edu/disability-resource-center

Food Insecurity and Basic Needs

Research shows that college students experience food insecurity at higher rates than the American household rate, and that food insecurity can negatively impact academic performance and persistence. In recognition of this problem, UNC offers assistance to students facing food insecurity through an on-campus food pantry. The Bear Pantry is located in University Center 2166A, and is open for regular hours throughout the semester. Please visit www.unco.edu/bear-pantry for more information.
Any student who faces challenges securing their food or housing and believes this may affect their performance in the course is also urged to contact Student Outreach and Support (SOS) for assistance. SOS can assist students during difficult circumstances which may include medical, mental health, personal or family crisis, illness or injury. SOS can be reached at sos@unco.edu or via phone at 970-351-2796.

Academic Integrity

You are expected to practice academic honesty in every aspect of this course. Students who engage in academic misconduct are subject to grading consequences with regard to this course and/or university disciplinary procedures through the Office of Community Standards and Conflict Resolution.

Title IX

The University of Northern Colorado is committed to providing a safe learning environment for all students that is free of all forms of discrimination and sexual harassment, including sexual assault, domestic violence, dating violence, and stalking. If you (or someone you know) has experienced or experiences any of these incidents, know that you are not alone. UNC has staff members trained to support you in navigating campus life, accessing health and counseling services, providing academic and housing accommodations, helping with legal protective orders, and more.

Please be aware all UNC faculty and most staff members are "responsible employees," which means that if you tell a faculty member about a situation involving sexual harassment, sexual assault, dating violence, domestic violence, or stalking, they must share that information with the Title IX Coordinator, Larry Loften. Larry or a trained staff member in the Office of Institutional Equity and Compliance (OIEC) will contact you to let you know about accommodations and support services at UNC as well as your options for pursuing a process to hold accountable the person who harmed you. You are not required to speak with OIEC staff regarding the incident; your participation in OIEC processes are entirely voluntary.

If you do not want the Title IX Coordinator notified, instead of disclosing this information to your instructor, you can speak confidentially with the following people on campus and in the community. They

can connect you with support services and help explore your options now, or in the future.

- UNC's Assault Survivors Advocacy Program (ASAP): 24 Hr. Hotline 970-35-4040 or www.unco.edu/asap
- UNC Counseling Center: 970-351-2496 or www.unco.edu/counseling
- UNC Psychological Services: 970-351-1645 or www.unco.edu/cebs/psych_clinic

If you are a survivor or someone concerned about a survivor, or if you would like to learn more about sexual misconduct or report an incident, please visit www.unco.edu/sexual-misconduct or contact the Office of Institutional Equity and Compliance (970-351-4899). OIEC is located on the third floor of the University Center in room 3060.

Equity and Inclusion Statement
The University of Northern Colorado embraces the diversity of students, faculty, and staff, honors the inherent dignity of each individual, and welcomes their unique perspectives, behaviors, and world views. In this course, people of all races, religions, national origins, sexual orientations, ethnicities, genders and gender identities, cognitive, physical, and behavioral abilities, socioeconomic backgrounds, regions, immigrant statuses, military or veteran statuses, size and/or shapes are strongly encouraged to share their rich array of perspectives and experiences. Course content and campus discussions will heighten your awareness to each other's individual and intersecting identities. If you would like to report an incident or learn more about identity-based discrimination/harassment, please visit www.unco.edu/institutional-equity-compliance

Respect, inclusivity, and diversity:
In my classroom, diversity and individual differences are respected, appreciated, and recognized as a source of strength. Students in this class are encouraged and expected to speak up and participate during class meetings, **and** to carefully and respectfully listen to each other. During the first few weeks of class, we'll work together to create a list of norms that will govern our interactions with each other.

So that everyone feels comfortable participating, every member of this class **must** show respect for every other member of this class. Otherwise, we won't learn anything from each other, and that would defeat the whole point of having a class (instead of just a book or something).

Communication:
If you encounter any problems during the course that may impede your ability to complete the coursework or have any issue with a grade, please let me know ASAP. If after you have spoken to me you feel the problem is not resolved, you may contact the course coordinator, Angela Steele (angela.steele@unco.edu). She will further work to resolve the issue.

Changes to the syllabus:
I reserve the right to make modifications to this syllabus (most likely in ways that work in your favor). I will notify you in class of any major change.

Course Outline

1) Functions
   a) Input and Output
   b) Domain and Range
   c) Function Notation

2) Linear Functions
   a) Family of Linear functions
   b) Rate of change

3) Exponential Functions
   a) Family of Exponential Functions
   b) Comparing Exponential and Linear Functions
   c) Applications of Compound Interest
   d) The number *e*

4) Logarithmic Functions
   a) Logarithms and their Properties
   b) Logarithmic Functions and its Applications

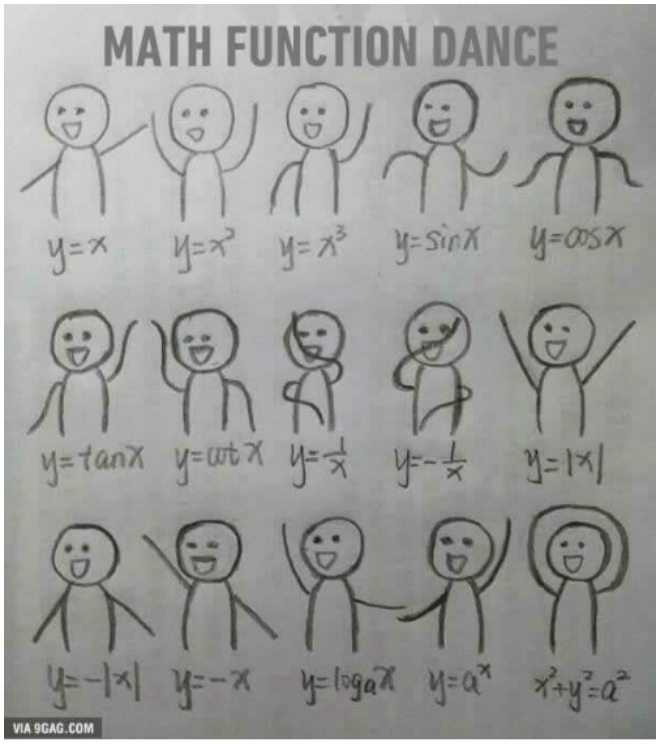
5) Quadratic Functions
   a) Family of quadratic functions
   b) Vertex of a parabola

6) Polynomial and Rational Functions
   a) Power Functions
   b) Polynomial Functions
   c) Short-run behavior of Polynomials
   d) Rational Functions
   e) Short-run behavior of Rational Functions

7) Trigonometric Functions
   a) Sine function
   b) Cosine function

8) Transformations of functions
   a) Shifts, Reflections and Symmetry
   b) Vertical Stretches and Compressions
   c) Horizontal Stretches

9) Composition, Inverse and Combinations of Functions



Important Dates

- Last day to add classes: Friday, January 14, 2022
- Martin Luther King Day: University closed: Monday, January 17, 2022
- Last day to drop classes: Monday, January 24, 2022
- Last day to withdraw from classes and receive a 'W': April 29, 2022
- Spring Break is March 12-20
- Final Exam will be given during the University Scheduled time. (unco.edu; search final exam schedule)

LAX1/ GtPathways Content and Competency Criteria

This course is a part of the Liberal Arts Curriculum at UNC and fulfills 4 credit hours of the Mathematics category. The Colorado Commission on Higher Education has approved Math 127 for inclusion in the Guaranteed Transfer (GT) Pathways program in the GT- MA1 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://highered.colorado.gov/academics/transfers/gtpathways/curriculum.html

UNC's LAC outcomes in Mathematics are aligned with the State of Colorado's GT Pathways student learning outcomes, competencies, and content criteria for GT-MA1. This includes CDHE competency and student learning outcomes in Quantitative Literacy.

Competency in quantitative literacy represents a student's ability to use quantifiable information and mathematical analysis to make connections and draw conclusions. Students with strong quantitative literacy skills understand and can create sophisticated arguments supported by quantitative evidence and can clearly communicate those arguments in a variety of formats (using words, tables, graphs, mathematical equations, etc.)

LAC Mathematics Learning Outcomes + gtP Competency & SLO's Student Learning Outcomes (SLOs) Students should be able to:	Mapping		
	Class	Hmwk	Tests
1. Interpret Information **a. Explain information presented in mathematical forms (e.g., equations, graphs, diagrams, tables, words).**	**X**	**X**	**X**
2. Represent Information **a. Convert information into and between various mathematical forms (e.g., equations, graphs, diagrams, tables, words).**	**X**	**X**	**X**
3. Perform Calculations **a. Solve problems or equations at the appropriate course level.** **b. Use appropriate mathematical notation.** **c. Solve a variety of different problem types that involve a multi-step solution and address the validity of the results.**	**X**	**X**	**X**
4. Apply and Analyze Information **a. 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.** **b. Formulate, organize, and articulate solutions to theoretical and application problems at the appropriate course level.** **c. Make judgments based on mathematical analysis appropriate to the course level.**	**X**	**X**	**X**
5. Communicate Using Mathematical Forms **a. Express mathematical analysis symbolically, graphically, and in written language that clarifies/justifies/summarizes reasoning (may also include oral communication).**	**X**	**X**	**X**

Content Criteria for Mathematics (GT-MA1) ***This course should provide students with the opportunity to:***	Mapping		
	Class	Hmwk	Tests
a) 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.**	**X**	**X**	**X**
b) Generate and interpret symbolic, graphical, numerical, and verbal (written or oral) representations of mathematical ideas.	**X**	**X**	**X**
c) Communicate mathematical ideas in written and/or oral form using appropriate mathematical language, notation, and style.	**X**	**X**	**X**
d) Apply mathematical concepts, procedures, and techniques appropriate to the course.	**X**	**X**	**X**
e) Recognize and apply patterns or mathematical structure.	**X**	**X**	**X**
f) Utilize and integrate appropriate technology.	**X**	**X**	**X**