MTH203-ME1
COLLEGE ALGEBRA/ Precalculus
Fall 2023

Class Time and Location: M T W R F Room 107
Instructor: Bernice Philpot, B.S.E., M.S.E., Henderson State University EdS., U.A. Fayetteville
Office Location: Mena High School, room 107
Office Hours: 1:40 -2:30 Mena High School, Room 107
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Resources Text: Ron Larson , Paul Battaglia, Precalculus with Limits: A graphing approach, Eight Edition, Boston, MA, Cengage, 2019.

Tutoring before and after school if needed.

Prerequisite: For High School credit only successful completion of Algebra 2.
Concurrent option a minimum score of 19 on both the mathematics and reading sections of the ACT or equivalent Accuplacer score.

Course Description: This course is designed to provide a comprehensive study of functions, which are the basis of calculus and other higher mathematics courses. It is expected that students who enroll in this course have plans to take AP Calculus during their senior year or a first semester college calculus course. The content of this course includes concepts linear and quadratic functions; transformations of basic curves, composition of functions; direct and inverse variations; solving and graphing problems whose mathematical models are polynomial, rational, exponential and logarithmic functions; solving systems of linear and nonlinear equations and inequalities with applications for each; determinants and matrices; linear programming; conic sections; binomial expansions; arithmetic and geometric sequences and series; and counting techniques and probability. Topics covered 2nd semester include, but are not limited to, using trigonometric identities, graphs of trigonometric functions, proving trigonometric identities, solving conditional trigonometric equations, Laws of Sines and Cosines, areas of triangles, vectors, complex numbers, polar coordinates, and parametric equations, families of functions, transformations, extrema, domain and range, graphing techniques, conic sections, probability and statistics, and limits. **Students scoring a C or higher will be awarded 3 college credit hours in College Algebra MTH203.**

Program Outcomes: The knowledge and critical thinking skills acquired in the general education component enable students to analyze problems, to arrive at intelligent conclusions, and to make reasoned choices in their professional and personal lives.

- Use computational mathematics, algebraic operations, and their practical applications to solve problems which they encounter at home and the workplace.
- Possess basic technological skills to identify, locate, and process information.

Fall 2023 **College algebra/ Pre Calculus Syllabus** Bernice Philpot

Rationale: An objective of post-secondary education is to provide a core of knowledge that is shared with most educated people. By studying and developing a deeper understanding of mathematical computations, students can better analyze, problem solve, and prepare critical thinking strategies for real world scenarios. Technological skills with the graphing calculator are necessary for future math courses.

Course Objectives: Upon successful completion of Pre-calculus, the student should be able to do the following:

1. Solve linear, quadratic, and other nonlinear equations and be able to graph those solutions by hand as well as by graphing calculator.
2. Recognize equations and graphs involving the conic sections
3. Recognize graphs and properties of functions and their inverses and interpret data involving graphs
4. Perform operations and procedures on polynomials, rational expressions, and numbers (real and complex).
5. Use exponential and logarithmic functions in practical applications.
6. Solve systems of equations using two and three variables by various methods, including the graphing calculator.
7. Use arithmetic and geometric sequences and series to find sums and products as well as to solve practical application problems.
8. Perform factorial notations and the binomial expansion.
9. Apply permutations and combinations to fundamental principles of probability.
10. Use the graphing calculator to analyze and interpret data involving different kinds of regression models.

Course Conduct: The class will be taught using a combination of lecture, group interaction, question and answer approach, and independent study. New topics will be demonstrated using the board overhead (Elmo) projector. Students are strongly encouraged to discuss concepts and examples as opportunities are presented during the instructor presentation. It is the student's responsibility to inform the instructor when a concept is confusing or otherwise unclear.

Course Requirements / Evaluation (Grading):

Tests are 50% of your quarter grade.
Homework is 50% of your quarter grade.

Criteria for Credit: Homework must be neat and complete. Each problem assigned has three parts: 1) the original problem complete with figures drawn, 2) all steps or an explanation of how to arrive at the correct answer, and 3) the final answer. ***Answers alone are not acceptable***. Use pencils and straight edge paper; no ink or ruffles please. Write the lesson assignment at the top of the first page. Label each page with your name and page number in the top right hand corner. Leave a blank line between problems. All graphs are to be

accurately sketched on graph paper with all parts properly labeled and all work for the problem shown on the same page as the graph. For immediate feedback, Turn the assignment in on time. *You will not receive credit for any problems not meeting the criteria for credit described above.*

HOMEWORK CORRECTIONS

Homework corrections will only be graded if all the following are true.

I. Redo only the missed problems that were attempted on a separate sheet of paper.

II. Reflect and tell exactly what was mathematically wrong originally.

III. Staple the corrections to the front of the original assignment. and place in the 3 ring binder

IV. Corrections are only graded for **on time assignments, check the date and time stamps for each assignment in Google classroom.**

V. All corrections are due the class period of the chapter test. Take a picture and upload the corrections in google classroom as you complete them.

Late Homework

I. Late homework may not be graded as promptly as homework turned in on time, but it will be graded.
II. 1 day late will result in a 20% penalty, 2 days late will result in a 50% penalty and 4 days late will be a zero for the assignment.
III. Late homework **will not** be handed back for corrections.

An attendance bonus will be added to total homework points first then tests then test points before averaging.

Your final grade for this course comes from tests at the end of each chapter, homework , and a comprehensive final exam. On each of these, all work must be shown in neat form so that the teacher can grade it for partial credit even if you got the wrong answer. The final grade for the course will be determined by the sum of 3/7 of the 1st quarter grade, 3/7 of the 2nd quarter grade and 1/7 of the Final. Grades are assigned on the basis of the following percentage scale:

90 – 100 = A 80 – 89 = B 70 – 79 = C 60 – 69 = D 0 – 59 = F

Required Supplemental Materials: Students will need paper along with pencils and a graphing calculator (preferably TI-84+ or better) one of their own or a rental one from MHS.

Rationale: By studying and developing an ability to apply the mathematical principles precalculus/college algebra students will be prepared to study higher mathematics courses.

Class Procedures/Student Requirements:

UA Rich Mountain offers students assistance with quality tutors available in the Student Support Services and Learning Enrichment and Counseling Center in the Johnson Learning Commons.

Attendance / Make-up Policy: If a student is absent from any class, it is the student's responsibility to go on Google Classroom and watch the lesson. Approved make-ups will be taken before the class period following the absence unless other arrangements are made ahead of time with the teacher. Meanwhile, the student is responsible for instruction missed during that class by watching the lesson on Google Classroom.

Students enrolled in concurrent courses are expected to attend and participate in class just as traditional college students must. In order for students to be fully engaged and prepared for university entrance upon graduation, students who choose concurrent courses during high school must not have excessive absences. **Students who have more than six absences in a class per semester can lose their concurrent credit for that course**. It is important that students communicate with their teachers ahead of class time. Students who communicate with their teachers prior to their absences and turn in their assignments on or before the assigned due date will not be considered excessively absent. School sponsored events will not count toward the students' absences. (See Board Policy 5.22)

UARM Attendance Policy: Missing an excessive number of classes is detrimental to the success of students in this course causing them to fall behind. The following number of absences is considered excessive:

-Regular classes- failure to attend class for more than a week (2 class sessions)

- On-line classes - failure to participate in posted assignments for more than a week

** Students who do not attend class may receive a grade of NF which can negatively affect financial aid.

Cell Phones: The use of cell phones in the classroom is prohibited. Turn the cell phone off or on vibrate and store it in the phone holder. It is illegal for you to post either photos or videos of people without their permission. You DO NOT HAVE MY PERMISSION TO TAKE and post photos or videos of me on any social media site.

Academic Dishonesty: Any suspicion of academic dishonesty will result in no credit for the assignment/ test in question.

Topical/Unit Outline:

Chapter 1: Functions and Their Graphs

1.1 Lines in the plane (3)
1.2 Functions (16)
1.3 Graphs of Functions (29)
1.4 Shifting, Reflecting, and Stretching Graphs (41)
1.5 Combinations of Functions(50)
1.6 Inverse Functions (60)
1.7 Linear Models and Scatter Plots (71)

Chapter 2: Polynomial and Rational Functions

2.1 Quadratic Functions (90)
2.2 Polynomial Functions of Higher-Degree (100)
2.3 Real Zeros of Polynomial Functions (113)
2.4 Complex Numbers(128)
2.5 The Fundamental Theorem of Algebra (135)
2.6 Rational Functions andAysmptoes (142)
2.7 Graphs of Rational Functions (151)
2.8 Quadratic Models (161)

Chapter 3: Exponential and Logarithmic Functions

3.1 Exponential Functions and Their Graphs (182)
3.2 Logarithmic Functions and Their Graphs (194)
3.3 Properties of Logarithmic (205)
3.4 Solving Exponential and Logarithmic Equations (212)
3.5 Exponential and Logarithmic Models (223)
3.6 Nonlinear Models (235)

Chapter 7: Linear Systems and Matrices

7.1 Solving Systems Equations (478)
7.2 Systems of Linear Equations in two Variables (488)
7.3 Multivariable Linear systems (497)
7.4 matrices and Systems of Equations (512)
7.5 Operations with Matrices (526)
7.6 The inverse of a square Matrix (541)
7.7 The Determinant of a square Matrix (550)
7.8 Applications of Matrices and Determinants (557)

Chapter 8: Sequences, Series and Probability

8.1 Sequences and Series (580)
8.2 Arithmetic Sequences and Partial Sums (591)
8.3 Geometric Sequences and Series (599)
8.4 The Binomial Theorem (609)
8.5 Counting Principles (617)
8.6 Probability (626)

Chapter 9: Topics of Analytic Geometry

9.1 Circles and Parabolas (646)
9.2 Ellipses (657)
9.3 Hyperbolas and Rotation of conics (666)
9.4 parametric Equations (679)
9.5 Polar Coordinates (687)
9.6 Graphs of Polar Equations (693)
9.7 Polar Equations of Conics

Chapter 10: Analytic Geometry in Three Dimensions

10.1 The Three-Dimensional Coordinate System (722)
10.2 Vectors in Space (729)
10.3 The Cross Product of Two Vectors (736)
10.4 Lines and Planes in Space (743)

Chapter 11: Limits and an Introduction to Calculus

11.1 Introduction to Limits(760)
11.2 Techniques for evaluating Limits (770)
11.3 The Tangent line problem (780)
11.4 The Area problem (799)

Disability Policy: It is the policy of UA Rich Mountain to accommodate students with disabilities, pursuant to state and federal law. Any student with a disability who needs accommodations should contact the Vice Chancellor for Student Affairs Office, 394-7622, ext. 1400.

Title IX and Discrimination Policy: UA Rich Mountain adheres to a policy that enables all individuals

regardless of race, color, gender, national origin, age, religion, sexual orientation, veteran's status, or disability, to work and study in an environment unfettered by discriminatory behavior or acts. Harassment of an individual or group will not be condoned, and any person (student, faculty, of staff member) who violates this policy will be subject to disciplinary action.

Harassment that is considered discriminatory includes actions or conduct (verbal, graphic, gestural, or written) directed against any person or group with the intent to demean or create a hostile or threatening environment. It is not the intent of this policy to infringe upon or limit educational, scholarly, or artistic expression. Any person who believes he or she has been discriminated against should contact the Title IX Coordinator to obtain assistance and information concerning the filing of a complaint.

Face mask policy: Students are encouraged but not required to wear face masks in class and public spaces.

Arkansas Clean Air Act: In compliance with the Arkansas Clean Air Act, UARM is a smoke and tobacco free facility. Students and guests are to refrain from the use of all tobacco products while on campus.

Student Misconduct: Students committing misconduct are subject to disciplinary sanction(s) and/or restrictions. Misconduct or prohibited behavior includes, but is not limited to endangerment, harassment, disruption, sexual misconduct, illegal drugs and/or alcohol, fire or safety issues, gambling, property violations, computer violations or other violations as listed in the UARM catalog.

UARM Mission: University of Arkansas Rich Mountain exists to provide all residents of the Ouachita Mountain Region with exemplary educational and enrichment opportunities to improve the quality of life and standard of living.

Campus Security: UA Rich Mountain strives to provide a safe learning environment; therefore, students who know of any security risk are asked to contact a college official. For more information follow this link and look under the title Health and Safety: http://www.uarichmountain.edu/at-a-glance/disclosures

Credit Hour Requirement Calculator

Course Information

Department, Course Number	Mathematics	MTH203

Course Title		College Algebra
Credit Hours	3	
Mode of Delivery	Traditional	
Weeks in Part of Term	15	
Level of Reading Material	Advanced/Scientific/Technical (2)	2
Reading Level of Students	Average Student (2)	2
Average Pages per Hour	11	

Enter either week or term, not both

Contact Hours	**Hours/Week**	**Hours/Term**	**Total Hours**
Lecture/Recitation		45	45

Syllabus Items	**Pages Asg'd**	**Hours/Week**	**Hours/Term**	
Weekly Homework Assignments		4		60
Prepare for Chapter Tests			12	12
Prepare for Final exam			4	4
Study Assigned Examples	87			7.9
				0
				0
				0
				0
				0
				0

Total Hours	128.9
Required Hours	112.5
Difference	Ok + 16.4