Instructor: Mrs. Bernice Philpot B.S.E, M.S.E; Henderson State University EdS, U.A. Fayetteville

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Conference: 8:54-9:44 Room 107

Resources Text: Ron Larson, Paul Battaglia, Precalculus with limits, A Graphing Approach, Eight Edition, Boston, MA, Cengage, 2015.

Resources Text: Jerome Kaufmann, Karen L. Schwitters, Algebra for College Students, Tenth edition, Boston, MA Cengage, 2015

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

**Face Mask Policy:** As per the Executive Order from the governor of Arkansas, all students are required to wear a proper face covering that completely covers the nose and mouth while on campus and in class. Masks with holes or masks that do not completely cover nose and mouth are not acceptable. Any student that does not have a proper mask will leave class and be referred to the Vice Chancellor for Student Affairs for possible disciplinary action.

**Food and Drink:** Food and drinks, including water are not allowed in the classroom at any time.

**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 for both semesters will be awarded 3 college credit hours in College Algebra MTH203 and awarded 3 college credit hours in College Trigonometry MTH213. *NCAA Core Course***

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.

Methods of Instruction: This course will be taught through lecture, question and answer, and tutorial methods. Students may be asked to work in groups for some assignments.

Course Requirements/Evaluations:

Assessments**:** Students are assessed through homework assignments, quizzes, and exams. Calculators are allowed on exams; however some exams have both calculator active and non-calculator active portions. Exams include multiple choice and open response items.

**Course Requirements / Evaluation (Grading):**

1. **Tests and Quizzes** are 50% of your quarter grade. Four chapter tests are scheduled for each quarter. Quizzes may or may not be announced.
2. **Homework** are 50% of your quarter grade.

Final grades will be assigned according to 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.

## Homework Policy

Purpose: The homework policy described below is based on the assumptions that **homework assignments are primarily a *learning* tool, not a grading tool,** and that the purpose of homework is threefold:

I. **Homework is to give students practice in explaining the concepts and using the techniques learned in the course;**
II. **Homework is to allow the teacher to see how the students are doing and to try to correct errors they are making BEFORE quizzes and exams;**
III. **Homework is to give students a chance to see the errors they are making and to correct them BEFORE the quizzes and exams.**

**HOW TO TURN IN**

I. Homework should be neat, legible and written in pencil; **always show your work** on a standard sheet of paper in your handwriting. Take a picture and upload to google classroom, Enter the answers in the google assessment form. (This will check for accuracy and help you know instantly which problems you missed.)
II. Unless otherwise indicated, assigned homework is due **at the beginning of class every other day** after it is assigned. Check the due date and time for each lesson in google classroom.
III. Homework (and all other work of more than one page) should be **stapled (1 staple is sufficient) in the upper left hand corner**.

## HOMEWORK CORRECTIONS

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

I. Redo only the missed problems that were attempted on 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.
IV. Corrections are only graded for **on time assignments.**
V. All corrections are due the class period of the chapter test.

## Late Homework

I. Late homework may not be graded as promptly as homework turned in on time, but will be graded.
II. Late homework **will not** be handed back for corrections.

## Make-up exam/quiz policy

Exams: **Make-up exams are given; however, it will not be the same exam given during the class.** Students who have to miss an exam will be given a new date and time for the exam. Make-up exams will be parallel to the original exams, not more difficult.

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

question.

**Cell Phones:** The use of cell phones in the classroom is prohibited. Turn cell phone off, store it out of sight during class time. Cell phones and smart watches will not be allowed on the student during test times.

Topical/Unit Outline:

Chapter 1: Functions and their Graphs

1.1 Lines in the Plane (2)
1.2 Functions (16)
1.3 Graphs of Functions (29)
1.4 Shifting, Reflecting, and Stretching Graphs (41)
1.5 Combinations of Functions (5)
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 and Asymptotes (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 Logarithms (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 of Equations (478)
7.2 Systems of Linear Equations in Two Variables (488)
7.3 Multivariate Linear systems (497)
7.4 Matrices and Systems of EQuations (512)

7.5 Operations with Matrices (526)
7.6 Inverse of a Square Matrix (541)
7.7. The Determinant of a Square Matrix (550)
7.8 applications of Matrices and Determinants (577)

Chapter 8 Sequences , Series and Probability

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

Chapter 9: Topics in Analytic Geometry

9.1 Circles and Parabolas (646)
9.2 Ellipses (657)
9.3 Hyperbolas and Rotation of Conics (665)
9.4 Parametric Equations (679)
9.5 Polar Coordinates (687)
9.6 Graphs of Polar Equations of Conics (701)

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 of Evaluating Limits (770)
11.3 The Tangent Line problem (780)
11.4 The area Problem (799)

## Credit Hour Requirement Calculator

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|---|---|---|---|---|---|
| **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 |
| | **Pages Asg'd** | **Hours/Week** | **Hours/Term** | |
| **Syllabus Items** | | | | |
| 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 |