# College Algebra MTH203 (Online) (ACTS: MATH1103)
# University of Arkansas Rich Mountain
# Fall 2020

**Class Time and Location:** Online

**Instructor Name:** Ron Webb --- B.S. Mathematics, Sam Houston State University;
ME, Southeastern Oklahoma State University

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**Prerequisite**: Minimum score of 22 on both the mathematics and English sections of the ACT or a grade of C or better in MTH033 (Intermediate Algebra) or a minimum score of 77 on the Accuplacer Algebra Skills Placement Exam

**Resources**:
Text: *A Graphical Approach to College Algebra*, 6th Edition, John Hornsby, Margaret L. Lial, and Gary K. Rockswold, Pearson Education, Copyright 2015, ISBN-10: 0-321-92030-9

**Course Description**: 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. (ACTS MATH1103)

**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.

**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 MTH 203 College Algebra, the student should, with minimum of 70% accuracy on daily work, tests, and the final exam, be able to:

1. Perform and solve basic function operations and algebraic problems using appropriate vocabulary and technology.
2. Use critical thinking to formulate decisions and problem solving based on reasoning and analysis.
3. Appropriately use technology to supplement and enhance conceptual understanding, visualization, and inquiry.
4. Synthesize information from a variety of sources to solve problems and interpret results.
5. Demonstrate understanding of functions including linear, absolute value, quadratic, polynomial, rational, logarithmic, and exponential.
6. Graph equations and inequalities by hand and on the graphing calculator.
7. Demonstrate an understanding of the applications of systems of equations and matrices.

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

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

**Tests** are 40% of your final grade. Five chapter tests are scheduled.

**Homework** is 40% of your final grade.

**Final Exam** is 20% of your final grade. The final exam is comprehensive. Problems are similar to chapter test problems.

**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 |

**Supplies Needed for daily work:** TI-83/84 Calculator supplied by UA Rich Mountain as needed, 3-ring notebook, college rule 3 hole paper, graph paper, cardboard folder, mechanical pencils with extra erasers, yellow highlighter, small pack colored pencils, small ruler or straight edge.

**Criteria for Credit:** Homework must be neat and complete. Each problem assigned has three parts: 1) Q: the original problem complete with figures drawn, 2) W: <u>all steps or an explanation</u> of how to arrive at the correct answer, and 3) A: the final answer. ***Answers alone are not acceptable***. Use pencils and straight edge paper; ***no ink or ruffles please***. Write the lesson topic at the top of the first page. Label each page with your name and lesson number in the top right hand corner. Work in two columns if possible. Box final answers with a yellow highlighter. Leave at least one 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, you may check your answers for most assigned problems in the back of the book. *You will not receive credit for any problems not meeting the criteria for credit described above.*

I will email your assignments and chapter reviews and tests along with due dates on the dates in the included schedule found below.

All assignments are due by **midnight** on their due date as assigned.

All chapter exams are due by **midnight** on the date they are assigned.

All homework or exams can be emailed or texted To Mr. Webb at any of the three email addresses or phone number given above. I welcome any questions at any time via the same email or texts.

**UA Rich Mountain Credit Hour Calculator:** Success in this class demands good attendance, good listening and note-taking skills, practicing by doing assigned homework problems daily, sufficient practice in and out of class to become very proficient with your graphing calculator, and concentrated study before tests and final exam. For every course credit hour, you should expect to spend at least three clock hours per week of concentrated attention on course-related work, including but not limited to time attending class, as well as out-of-class time spent completing homework, seeking help from instructor or tutors, preparing for upcoming quizzes/tests/exam, reviewing material, problem solving, and organizing your notebook. For a three-hour course, a typical student should expect to spend at least nine hours per week dedicated to this course. This includes the time spent in class. Please see credit hour calculator attached to end of syllabus.

**Make-up Policy**: No make-up exams will be given. If you miss an exam, the missing grade will be replaced by the final exam score at the end of the course. Deliberately missing an exam is not advised due to the comprehensive nature of the final exam and the possibility of missing a future exam.

**Computer and On-Campus Resources:** Computer labs with printers are available in several places on campus including the Johnson Learning Commons. UA Rich Mountain offers students assistance with quality tutors available in the Student Support Services (SSS) and Learning Enrichment and Counseling Center (LEAC) in the Johnson Learning Commons. You may access www.tutor.com/uarichmountain nights and weekends when SSS is not available.

**Academic Dishonesty**: Any suspicion of academic dishonesty will result in no credit for the paper in question.

**UA RICH MOUNTAIN Mission:** The University of Arkansas Rich Mountain exists to provide exemplary educational and enrichment opportunities to improve the quality of life and standard of living.

**ADA Statement**: It is the policy of UA Rich Mountain to accommodate students with disabilities, pursuant to federal law, state law, and the college's commitment to equal educational opportunities. Any student with a disability who needs accommodations, (ex: seating placement, examinations, or access to information on the web), should inform the Vice President of Student Affairs at the beginning of the semester. The Vice President of Student Affairs will contact the faculty member as to the accommodations needed for the course. To contact the Vice President of Student Affairs, students seeking accommodation should go to the Tower Room, located in the Maddox Building or call the College at 479-394-7622, ext. 1400.

**Arkansas Clean Air Act**: In compliance with the Arkansas Clean Air Act, UA Rich Mountain 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 UA Rich Mountain catalog.

**Topical Course Outline:**

Chapter 1: Linear Functions, Equations, and Inequalities

1.1 Real Numbers and Coordinate System
1.2 Introduction to Relations and Functions
1.3 Linear Functions
1.4 Equations of Lines and Linear Models
1.5 Linear Equations and Inequalities
1.6 Applications of Linear Functions

Chapter 2: Analysis of Graphs of Functions

2.1 Graphs of Basic Functions and Relations; Symmetry
2.2 Vertical and Horizontal Shifts of Graphs
2.3 Stretching, Shrinking, and Reflecting Graphs
2.4 Absolute Value Functions: Graphs, Equations, Inequalities, Applications
2.5 Piecewise – Defined Functions
2.6 Operations and Composition of Functions

Chapter 3: Polynomial Functions

3.1 Complex Numbers
3.2 Quadratic Functions and Graphs
3.3 Quadratic Equations and Inequalities
3.4 Applications of Quadratic Functions and Models

Chapter 4: Rational, Power, and Root Functions

4.1 Rational Functions and Graphs
4.2 More on Graphs of Rational Functions
4.3 Rational Equations, Inequalities, Applications, and Models
4.4 Functions Defined by Powers and Roots

Chapter 5: Inverse, Exponential, and Logarithmic Functions

5.1 Inverse Functions
5.2 Exponential Functions
5.3 Logarithms and Their Properties
5.4 Logarithmic Functions
5.5 Exponential and Logarithmic Equations and Inequalities

## 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 |
| | **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 |
| **Total Hours** | | | | 128.9 |
| **Required Hours** | | | | 112.5 |
| **Difference** | | | | Ok + 16.4 |

**Proposed Schedule**: **College Algebra Fall 2020**

| Wk | Begin Date | Section | Pg | Assignment | # Problems |
|---|---|---|---|---|---|
| 1 | 8/24 | 1.1 | 8 | #1-93, Every Other Odd (EOO); skip #53 | 23 |
| | 8/26 | 1.2 | 19 | #1-69 EOO | 18 |
| 2 | 8/31 | 1.3 | 32 | #1-69 EOO; skip #21, #29 | 16 |
| | 9/2 | 1.4 | 44 | #1-53 EOO | 14 |
| 3 | 9/8 | 1.5 | 61 | #1-81 EOO; skip #17 | 20 |
| | 9/9 | 1.6 | 71 | #1, 3, 5, 7, 9, 11, 19, 21, 23, 41, 49, 61, 65, 69, 73 | 15 |
| | | | | | |
| 4 | 9/14 | | | **EXAM CHAPTER 1** | |
| | 9/16 | 2.1 | 96 | #1-69 EOO | 18 |
| 5 | 9/21 | 2.2 | 104 | #1, 5, 9, 13, 17, 21, 25, 31, 37, 41, 45, 47, 55, 65 | 14 |
| | 9/23 | 2.3 | 116 | #1, 5, 9, 13, 17, 21, 33, 45, 49, 59, 65, 69, 73 | 13 |
| 6 | 9/28 | 2.4 | 128 | #1, 5, 9, 13, 17, 21, 29, 41, 45, 49, 53, 57, 61, 65, 69, 73 | 16 |
| | 9/30 | 2.5 | 139 | #1, 5, 7, 9, 13, 21, 23, 33, 35, 37 | 10 |
| 7 | 10/5 | 2.6 | 152 | #1, 5, 9, 13, 17, 25(d)(e), 29(d)(e), 59, 63, 67, 77 | 11 |
| | | | | | |
| | 10/7 | | | **EXAM CHAPTER 2** | |
| 8 | 10/12 | 3.1 | 172 | #11, 13, 23, 27, 31, 35, 39, 43, 47, 51, 55, 59, 63, 67, 71, 75, 79, 89, 95, 99 | 20 |
| | 10/14 | 3.2 | 183 | #1, 5(a)(b), 9(a)(b), 13(a)(b), 25(a), 29(a), 33(a), 45, 55, 57, 59 | 11 |
| 9 | 10/19 | 3.3 | 199 | #1, 5, 9, 13, 17, 21, 25, 29, 33, 53, 61, 69, 71, 75, 103 | 15 |
| | 10/21 | 3.4 | | #1- 8 | 8 |
| | | | | | |
| 10 | 10/26 | | | **EXAM CHAPTER 3** | |
| | 10/28 | 4.1 | 275 | #1, 5, 9, 13, 17, 21, 25, 29, 33 | 9 |
| 11 | 11/2 | 4.2 | 286 | #1, 5, 9, 13, 21, 25, 29, 41, 43, 71, 73 | 11 |
| | 11/4 | 4.3 | 299 | #1, 21, 29, 37, 41, 59, 61, 89, 91 | 9 |
| 12 | 11/9 | 4.4 | 314 | #7, 13, 21, 25, 31, 37, 47, 49, 51, 75, 79, 85, 89 | 13 |
| | | | | | |
| | 11/11 | | | **EXAM CHAPTER 4** | |
| 13 | 11/16 | 5.1 | 343 | #1, 5, 9, 17, 21, 37, 55, 63, 71, 75, 113 | 11 |
| | 11/18 | 5.2 | 356 | #5, 9, 13, 21, 25, 29, 41, 45, 49, 53, 69, 71 | 12 |
| 14 | 11/23 | 5.3 | 367 | #1,5,9,13,17,21, 29, 37, 41, 45, 53, 65, 69, 73, 77, 81, 89 | 17 |
| 15 | 11/30 | 5.4 | 376 | #1, 13, 15, 31, 33, 35, 37, 39, 43, 57 | 10 |
| | | | | | |
| | 12/2 | | | **EXAM CHAPTER 5** | |
| | | | | | |
| 16 | 12/7 | | | **FINAL EXAM** | |

**Important Dates:**

| | |
|---|---|
| August 24 (M) | Classes start |
| September 7 (M) | Labor Day Holiday (No classes, campus closed) |
| October 12 (M) | Mid-semester grades due |
| December 7 (M) | Final Exam |