# COLLEGE ALGEBRA (MTH203)
# SPRING 2021

**Class Time and Location: UARM Main Campus**

| | | | |
|---|---|---|---|
| Section Lec 01 | MW | 8:00 – 9:15 | S 245 |
| Lec 02 | MW | 11:00 – 12:15 | S 245 |
| Lec 03 | MW | 12:30 – 1:45 | S 245 |
| Lec 04 | TR | 11:00 – 12:15 | S245 |

**Instructor**: Damian Maxwell- BSc, The University of the West Indies, Mona Jamaica. MSC, Indiana State University, USA.

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Office Hours: MW 9:20 – 10:50, 2:30 – 4:30

TR 9:20 – 10:50, 12:20 – 1:50

F 10:00 – 12:00 by appointment

**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.

**COVID-19 Protocols:** For your protection, and the protection of others, please adhere to the following COVID-19 protocols until further notice.

**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. This eliminates the need to remove masks and potentially expose others.

**Attendance:** Daily attendance is mandatory, either in-class or through Zoom (if in-class instructions is not possible). If a student is quarantined, the student will automatically shift to an all-Zoom attendance format for the 14-day period. Students are to notify their instructors of any quarantine orders, and a doctor's note is required. In the event the instructor is quarantined, the entire class will shift to an all-Zoom/online format for the 14-day period. Students will be notified accordingly. Any potential absence is to be shared with the instructor.

**Technology Concerns:** Students with access concerns are expected to communicate with their instructors. Additionally, students can access the wi-fi from the South parking lot near the Ouachita Center. Students with access issues are encouraged to access course Zoom sessions from the parking lot, if needed. Students would be expected to drive to campus under normal classroom conditions. While it is not ideal, it does ensure reliable access and regular course participation. Students may use personal cell phones/devices to attend Zoom sessions. However, students have the option to check out campus computers from the library (Johnson Learning Commons).

**Social Distancing:** Students are to follow the social distancing guidelines as outlined by the Arkansas Department of Health (ADE) and the Centers for Disease Control (CDC). Additionally,

UARM staff have clearly marked hallways, arranged classroom furniture, and removed keyboards from workstations to adhere to such guidelines. Students are asked not to assemble in the hallway before class. Please come to class when your class is schedule to start. When leaving the classroom, students will be asked to exit in an orderly manner to allow 6 feet between each person.

**Seating arrangements:** Students are not to sit at workstations where keyboards have been removed. Furthermore, due to contact-tracing regulations required by the ADE and CDC, students are to sit in the **same** seat/location **each** time they come to class.

**Cleaning procedures:** Students are expected to assist in keeping the classroom clean. Students are to clean their workstations each day upon entry and before leaving. Disinfecting wipes will be provided. Students are expected to wear gloves when using computers and keyboards, as these objects are more difficult to clean without damaging them. Gloves will be provided. To prevent cross-contamination, students are to remove and dispose of gloves upon leaving the classroom.

**Topical Course Outline:**

Chapter 1: Linear Functions, Equations, and Inequalities Weeks 1 – 2 01/11 – 01/22

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 Weeks 3 – 4 01/25 – 02/05

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
**Test 1 (Week 4)**

Chapter 3: Polynomial Functions Weeks 5 – 7 02/08 – 02/26

3.1 Complex Numbers
3.2 Quadratic Functions and Graphs
3.3 Quadratic Equations and Inequalities
3.5 Higher Degree Polynomial Functions and Graphs
3.6 Topics in the Theory of Polynomial Functions (I)
3.7 Topics in the Theory of Polynomial Functions (II)
3.8 Polynomial Equations and Inequalities; Further Applications
**Test 2 (Week 7)**

Chapter 4: Rational, Power, and Root Functions Weeks 8 – 9 03/01 – 03/12

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
4.5 Equations and Inequalities Defined by Powers and Roots

Chapter 5:Inverse, Exponential, and Logarithmic Functions Weeks 10 – 11 03/15-03/19 & 03/29- 04/02

5.1 Inverse Functions
5.2 Exponential Functions
5.3 Logarithms and Their Properties
5.5 Exponential and Logarithmic Equations and Inequalities
5.6 Further Applications and Modeling with Exponential and Logarithmic Functions

**Test 3 (Week 11)**

Chapters 6: Systems and Matrices Week 12 04/05-04/09

6.1-6.2 Systems of Equations in two and three variables
6.5 Matrices (Determinants & Cramer's Rule)

Chapter 7-8 Analytic Geometry & Further Topics Week13-14 04/12 – 04/23

7.1 Circles and Parabolas
8.1-8.3 Sequence and Series

**Test 4 (Week 14)**

Week 15 04/26-04/30 Study week/Reviews/Practice Exams

**Important Dates:**

| | | |
|---|---|---|
| January 11 | M | Classes begin. |
| January 22 | F | Last day to drop with a refund |
| February 15 | M | Winter Break (no classes, offices open) |
| March 1-5 | M-F | Priority Registration for Summer & Fall |
| March 8 | M | Mid-semester/first 8-week classes final grades due |
| March 22-26 | M-F | Spring holidays begin (no classes, offices open) |
| April 30 | F | Classes end/Last day to drop a class with a W |
| May 3-6 | M-R | Final exams |
| May 6 | R | Grades due |

**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 document projector, and TI 84+ Smartview computer program for support of graphing calculator use. Students are strongly encouraged to discuss concepts and examples as opportunities are presented during instructor presentation. It is the student's responsibility to inform the instructor when a concept is confusing or otherwise unclear.

**UA Rich Mountain Credit Hour Calculator:** 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.

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

**Tests are 30% of your final grade. Four tests are scheduled.**
**Class Attendance & Participation 10%**
**Homework Assignments & Quizzes 25%**
**Research & Presentations 15%**
**Final Exam 20%**

**The final exam is comprehensive and will include problems from the chapters we have covered in class.**

**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, pens, 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) the original problem with figures drawn where necessary. 2) <u>all steps or an explanation</u> of how to arrive at the correct answer, and 3) the final answer. ***Answers alone are not acceptable***. Use pencils and /or blue or black ink pens and straight edge papers. 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. Highlight final answers with a yellow highlighter. 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. Graphs much be drawn with a pencil unless otherwise instructed. 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.*

**Attendance / 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. The student is responsible for instruction missed during class by studying the material in the book, seeking help from the teacher and/or student support services, and by getting class notes from the teacher or another student.

**Cell Phones:** The use of cell phones in the classroom is prohibited. Turn cell phone off or set on vibrate and store it out of sight during class time. Cell phones will be taken up during exams.

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

**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.

**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. 1460.

**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.

**UA Rich Mountain Mission**: UA Rich Mountain provides transformative education to all learners.

## 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 | |

| **Contact Hours** | | *Enter either week or term, not both* **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 |
| **Total Hours** | | | | 128.9 |
| **Required Hours** | | | | 112.5 |
| **Difference** | | | | Ok + 16.4 |