COLLEGE ALGEBRA (MTH203)
SPRING 2024

Class Time and Location: UARM Main Campus

Section: Online (Asynchronous)- Lecture notes & videos will be available on Blackboard before the start of each week. Exams and quizzes are usually due on a Monday or Wednesday before midnight.

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

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Office Hours:	MW	10:50-12:20, 2:00-4:00
	TR	9:30-11:00, 12:20-1:50
	F	10:00 – 12:00

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.

Topical Course Outline:

Chapter 1: Linear Functions, Equations, and Inequalities Weeks 1 – 2

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

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 Weeks 5 – 7

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

Chapter 4: Rational, Power, and Root Functions Weeks 8 – 9

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

Spring Break; Week 10 March 18-March 22

Chapter 5: Inverse, Exponential, and Logarithmic Functions Weeks 11 – 12

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

Chapters 6: Systems and Matrices Week13-14

6.1-6.2 Systems of Equations in two and three variables
6.5 Matrices (Computations, Determinants and Solving systems of equations)

Chapter 7-8 Analytic Geometry & Further Topics Week15-16

7.1 Circles and Parabolas
8.1-8.3 Sequence and Series
Final Review

Important Dates:

January 16	T	Classes begin.
January 18	F	Last day to drop with a refund
February 19	M	Winter Break (no classes, offices open)
February 26-March 1	M-F	Priority Registration for Summer & Fall
March 11	M	Mid-semester/first 8-week classes final grades due
March 18-22	M-F	Spring holidays begin (no classes, offices open)
May 2	R	Graduation
May 3	F	Classes end/Last day to drop a class with a W
May 6-9 May 9	M-R R	Final exams Grades due by 4:30pm

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 the end of syllabus.

Course Requirements / Evaluation (Grading):

Tests are 30% of your final grade.
Class Attendance & Participation 10%
Homework Assignments 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. <u>All steps or an explanation</u> of how to arrive at the correct answer must be given. ***Answers alone are not acceptable***. Write the lesson topic at the top of the first page. 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 <u>on the same page as the graph</u>. 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.*

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.

Attendance Policy: For attendance purposes, a student who is displaying symptoms of illness must email: contact.tracing@uarichmountain.edu to determine next steps for an excused absence related to COVID or flu. Contacting an instructor **DOES NOT** start this process or guarantee an excused absence.

Exams and Make-up Policy: Please note that even though this is an online course, you may be asked to do a proctored exam on campus. Make up work should be completed promptly after the absence. Make-up exams are given only in instances of the most unavoidable, serious circumstances. Prior notice of absence from an exam is required. Upon return after an absence the student is expected to be prepared for the days' class activities.

Assignment Due Dates: Students are expected to submit the assignments and other graded tasks on or before the assigned due dates. You will be penalized for late work depending on the number of days and full point and importance of the tasks assigned.

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 tutoring 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 at nights and weekends when SSS is not available.

Cell Phones: The use of cell phones is prohibited during tests and other online assessments.

Academic Dishonesty: Any act of academic dishonesty will result in no credit for the paper in question and further disciplinary action by the university. This includes the use of Artificial Intelligence (AI) to generate your work.

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 accommodation 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.

Campus Security: UA Rich Mountain strives to provide a safe learning environment; therefore, students who know of any security risk are 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	

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