

MA 111 College Algebra

Mississippi Valley State University Fall 2022

College: Arts & Sciences

Department: Department of Mathematics,
Computer & Information Sciences

Course Number: MA 111-1

Course Name: College Algebra

Instructor: E. Holman, Jr.

Office: 106B

Time: Tuesday & Thursday 1:00pm – 2:15pm & 4:00pm-5:15pm

Office Hours: **Wednesday** 9:00am – 11:00am and 12:00pm – 2:00pm **Tuesday & Thursday** 9:00am – 12:00pm **WCONLINE** Wednesday 10:00am -11:00am & 12:00pm – 2:00pm

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Course Description:

Exponents and radicals, polynomials, factoring, functions and graphs, linear and quadratic equations inequalities systems of equations

Course Credit

3 hours

Prerequisites

It is preferred that students would have completed several courses in advance mathematics in high school in preparation for the rigor of this course.

Purpose/Rationale

This course will serve as a tool to provide the necessary background in algebra for students who need additional preparation for the study of higher mathematics and related courses in fields such as the sciences, business and education. Students are expected to read extensively from the textbook and spend a considerable amount of time solving problems to help understand the concepts. This course will allow students the opportunity to use mathematics more effectively as a problem- solving tool in their personal and professional lives. A combination of exercises and activities will be included to help all students acquire certain skills that must be embedded in every potential holistic transformer.

Course Objectives And Goals

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The objectives and goals of this course are:

1. To provide students with adequate exposure and subject matter to prepare them for a more in-depth study of upper level mathematics courses.
2. To help students develop their critical thinking, technological and mathematical writing skills.
3. To help students develop a step-by-step procedure for solving problems.
4. To prepare students to communicate mathematically both orally and in writing.

Course Content:

Text (REQUIRED)

Sisson, P. (2021). **College Algebra**. 3rd Ed. Charleston, SC: Hawkes Learning Systems/Quant Systems, Inc.

Major Areas of Study and Purposed Dates (Subject to be adjusted as needed)

August 22- September 2

1. Number Systems and Fundamental Concepts of Algebra
- 1.6 The Complex Number System

September 5 – September 16

2. Equations and inequalities in one variable
 - 2.1 Linear equations in one variable
 - a. Equivalent equations and the meaning of solutions
 - b. Solving linear equations
 - c. Solving absolute value equations
 - d. Solving linear equations for one variable
 - e. Interlude: Distance and Interest Problems
 - 2.2 Linear Inequalities in one variable
 - a. Solving linear inequalities
 - b. Solving compound linear inequalities
 - c. Solving absolute value inequalities
 - 2.3 Quadratic Equations in one variable
 - a. Solving quadratic equation by factoring
 - b. Solving “perfect square” quadratic equations
 - c. Solving quadratic equation by completing the square
 - d. The quadratic formula

September 19 – September 30

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2.4 Higher Degree Polynomials Equations

- a. Solving quadratic-like equations
- b. Solving general polynomial equations by factoring
- c. Solving polynomial-like equations by factoring

October 3 – October 14

2.5 Rational expressions and equations

- a. Simplifying rational expressions
- b. Combining rational expressions
- c. Simplifying complex rational expressions
- d. Solving rational equations

2.6 Radical equations

- a. Solving radical equations
- b. Solving equations with positive rational exponents

October 17 – October 28

3. Linear equations and inequalities of two variables

3.1 The Cartesian coordinate system

- a. The components of the Cartesian coordinate system
- b. The graph of an equation
- c. The distance and midpoint formulas

3.2 Linear equations in two variables

- a. Recognizing linear equations in two variables
- b. Intercepts of the coordinate axes
- c. Horizontal and vertical lines

3.3 Forms of linear equations

- a. The slope of a line
- b. Slope-intercept form of a line
- c. Point-slope form of a line

3.4 Parallel and perpendicular lines

- a. Slopes of parallel lines
- b. Slopes of perpendicular lines

3.6 Introduction to Circles

- a. Standard form of a circle
- b. Graphing circles

October 31 – November 11

4. Relations, functions, and their graphs

4.1 Relations and functions

- a. Relations, domain, and ranges
- b. Functions and the vertical line test
- c. Functional notation and function evaluation
- d. Implied domain of a function

4.2 Linear and Quadratic functions

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- a. Linear functions and their graphs
 - b. Quadratic functions and their graphs
- 4.5 Combining Functions
- a. Combining functions arithmetically
 - b. Composing functions
- 4.6 Inverse Functions
- a. Inverses of relations
 - b. Finding inverse function formulas

November 14 – December 2

5. Polynomial Functions
- 5.2 Polynomial division and the division algorithm
- a. Polynomial long division and synthetic division
- 5.3 Locating Real Zeros of Polynomials
- a. The Rational Zero Theorem
- 8.1 Solving systems by substitution and elimination
- a. Definition and classification of linear systems of equations
 - b. Solving systems by substitution
 - c. Solving systems by elimination

(OPTIONAL)

7. Exponential and Logarithmic Functions
- 7.1 Exponential Functions and Their Graphs
- 7.2 Applications of Exponential Functions
- 7.3 Logarithmic Functions and Their Graphs
- 7.4 Properties and Applications of Logarithms
- 7.5 Exponential and Logarithmic Equations

Student Learning Outcomes

After successfully completing the course, the student will be able to do the following:

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- Express relationships using the concept of a function and use verbal, numerical, graphical and symbolic means to analyze a function.
- Model situations from a variety of settings by using polynomial, exponential and logarithmic functions.
- Manipulate mathematical information, concepts, and thoughts in verbal, numerical, graphical and symbolic form while solving a variety of problems which involve polynomial, exponential or logarithmic functions.
- Apply a variety of problem-solving strategies, including verbal, algebraic, numerical, and graphical techniques, to solve multiple-step problems involving polynomial, exponential, logarithmic equations and inequalities and systems of linear equations.
- Shift among the verbal, numeric, graphical and symbolic modes in order to analyze functions.
- Use appropriate technology in the evaluation, analysis and synthesis of information in problem-solving situations.

Teaching Methods

The method used to accomplish the goals and objectives of this course include a combination of lectures, demonstrations, class discussions, use of technology and group activities.

Technology Infusion

The text is accompanied by a *cd* that serves as supplementary material to the text. This *cd* also contributes to completion of homework, quizzes, and exams given by the instructor. Also, the students may use simple (non-scientific) calculators in this course. **(No sharing of calculators allowed/No cell phones may serve as calculators).** Students are also encouraged to use the internet to explore other activities on a given concept.

Major Student Activities

(Including attendance policy, make-up policy, etc...)

Class Requirements:

- Every student **must have** a textbook.
- An organized notebook consisting of all the students' work **should be neatly kept.**
- The notebook should contain lecture notes and all homework assignments properly labeled
- Students are expected to attend class, take notes, and carefully complete all homework assignments and submit them when due. Incomplete or late assignments will not be accepted.
- Students are strongly encouraged to **participate** in all class activities.
- Failure to make up an exam will result in a grade of zero.

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- Any individualized/personal problems will be discussed in the instructor's office and not in the classroom.
- DO NOT wait until the end of the semester to ask for help. Use my office hours, as well as tutors, if and when you may need extra practice.
- Students are strongly encouraged to make use of every available tutoring situation and

Evaluation Criteria

The evaluation methods, with exception to the midterm and final exam, may vary with instructors. (See Final Exam below)

Attention: Canvas is not the true representation of your grade point average. That will be kept by the instructor. Please see the instructor for your true average.

Grading Scale

Score (Average)	Grade
90-100	A
80-89	B
70-79	C
60-69	D
Below 60	F

Classroom Activities (Homework, Quizzes, etc.....)	40%
Attendance for tutoring Sessions.....	10%
Midterm.....	25%
Final Exam.....	25%

Quizzes and Homework

There may be a quiz and a graded homework assignment given during each week. They must be completed by a specified **expiration date and time**. **No extension will be given.** **NOTE: You will not be given help on your quizzes or tests.**

***Please note: The grade book in Canvas will not be the final grade for the student. The official document that gives the true progress and present/permanent grade of the student will be the instructor's personal grade book which will contain ALL grades that will be accumulated by the student.**

Make-Up Policy

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No make-up work will be allowed. All students can make up a missed exam with an approved absence. If an exam is missed due to a serious verifiable circumstance, the zero exam grade will be replaced with the final exam grade (see Replacement Policy). Students who must miss work due to official University business must make other arrangements **beforehand**.

ATTENTION: No work done by APPLICATIONS will be accepted. Only the procedures shown will be accepted. Also, work must be shown to receive credit.

Replacement Policy

Zeros due to an unexcused absence or academic misconduct **will not be replaced**. Students who miss an exam but have an excused must turn in an official university excuse and supporting documents within **two days of missed work**. The missed exam will be replaced if the instructor verifies the excuse.

Final Exam

The final exam is a comprehensive examination consisting of all topics covered. The final exam is common to all MA 111 courses. **The final exam will be given to all MA 111 students.** Students should not bring personal items (backpacks, cell phones, etc...) to the testing area. However, students should bring two (2) pencils and a calculator (optional) to the exam site.

Attendance Policy

It is vital for students to attend every class meeting and lab sessions (if assigned). Any student who misses more than the allowed number (**3**) of absences will be subject to a decrease in their final grade. * **Arriving late to class three times will be counted as an absence.**

ADA/Special Needs Statement

Students having any special needs (handicaps, problems, or any factors that may affect their performance in class or require special instructional strategies) should make these special needs known to the instructor as soon as possible.

ADA/STUDENTS WITH SPECIAL NEEDS:

Mississippi Valley State University is committed to providing reasonable accommodations for students with a documented disability. If you feel you are eligible to receive accommodations for a covered disability (medical, physical, psychiatric, learning, vision, hearing, etc.) and would like to request it for this course, you must be registered with the Services for Students with Disabilities (SSD) program administered by University College. It is recommended that you visit the Disabilities Office located in the Social Science Building Office 105 to register for the program at the beginning of each semester. For more information or to schedule an appointment, please contact Mrs. Kathy Brownlow, via phone or email at 662-254-3443 or kbrownlow@mvsu.edu.

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Cheating, Plagiarism/Academic Integrity and Penalties:

Cheating is a serious offense and will not be tolerated. You are expected to complete your own work for the homework assignments submitted on Hawkes Learning Systems for a grade, although you are free to seek assistance with similar problems before submitting your homework problems. Any student(s) found cheating on homework or any other class activity will be subject to disciplinary action. Penalties for academic dishonesty might include the assignment of an "F" for the course grade and/or other administrative penalties consistent with the policies of the university.

Pagers or Cell Phones

No cell phones or any other electronic device will be allowed for usage in class.

You may bring a calculator (non-scientific) for the benefit of computing during class.

Class Disturbance/Distractions

Any student who intentionally disrupts class may be kindly asked to leave the class for the remainder of the class setting.

Arriving late/tardy to class.

If a student arrives after class has begun, the student is to quietly enter the room, sign the class roll and have a seat without disturbing the class. It is advantageous for the student to arrive on time as many activities will be timed. **Arriving late for class three times will result in a recorded absence.**

Calendar of Activities/Course Outline/Schedule

Important days during the semester

- **August 22nd** (Late Registration begins/Fee \$100), (Weekend College Session I Begins)
- **September 12th** (Last day to drop/Add courses)
- **September 16th** Report of Non-Attendance Due....Fall Graduations Due
- **September 24th** Weekend College Session II begins
- **September 23rd** , Weekend College Session I ends
- **October 3 – 7**, Midterms
- **October 29th**, Weekend College Session II ends
- **November 4th**, Last Day to withdraw from class.
- **November 21st -25th** , Fall Break/Thanksgiving Holidays
- **December 5th – 9th**, Final Exams

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NOTE: Failure to adhere to the policies and procedures listed could directly or indirectly affect your final grade for the class.

Bibliography

Sisson, Paul (2021) College Algebra (3rd ed) Hawkes Learning Systems

*Other resources available in the MVSU library

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