

**Mississippi Valley State University
Fall 2022**

College: Arts & Sciences

Department: Department of Mathematics,
Computer & Information Sciences

Course Number: MA 111-02(03)

Course Name: College Algebra

Instructor: Jinglong Ye

Class Meetings: MWF: 10:00-10:50 am (MWF:
2:00-2:50 pm)

Office Location: CRB 111C

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Office Hours: M/W: 9:00-10:00am, 3:00-4:00pm,
TR: 8:00-11am (WCONLINE),
TR: 2:00-3:40pm,
F: 9:00-10:00am.

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 and have a subtest score of 20 or above on the mathematics portion of the ACT. Otherwise MA 100B is a prerequisite for 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. Topics will be taken from chapters throughout rather than chapter by chapter coverage.

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Course Objectives And Goals

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-debt 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, R. (2008). **College Algebra**. 2nd ed. Charleston, SC: Hawkes Learning Systems/Quant Systems, Inc.

Mississippi Valley State University uses Hawkes Learning Systems (HLS) Student Access Kit **(You MUST purchase your ACCESS CODE for HLS immediately, so you do not get behind in the course.)**

- TI-84 or below (or similar) calculator. The TI-84 is highly recommended.

Major Areas of Study:

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

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- c. Solving quadratic equation by completing the square
 - d. The quadratic formula
- 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
- 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
- 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
- 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
 - a. Linear functions and their graphs

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- 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
- 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:

- 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, numeric, 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

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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.

Textbook

The textbook(s) for this course are available on Reserve at the Circulation Desk at the James H. White Library for a 2-hour loan period (books must stay in the Library). Please take advantage of this resource, but keep in mind that copies of textbooks for each course are limited and may be in use by another student, particularly right before an assignment or reading is due, so plan your textbook use accordingly.

Technology Infusion

This course has an online component and you are expected to ensure that you can access all course material on a regular basis either from the university or from home. 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 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. Additionally, certain technical abilities will be required, such as installing necessary plug-ins, and upload files. **If you have a problem with a personal computer or interrupted network connection, know that you are still responsible for submitting your work on time!**

*****Note***** You are responsible for submitting your work to my online gradebook. I do not have control over technical issues you may encounter with YOUR computer at home. Therefore, if you do not submit your work to me by the deadline because of technical issues, then you should find another avenue to do your work. (The Math Lab 108/109 is open for your convenience from 8am-5pm).

Major Student Activities

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

Class Requirements:

- Every student must have a textbook and must bring it to class.
- 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.

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- Failure to make up an exam will result in a grade of zero.
- Students are expected to pass written examinations based on classroom lectures and homework assignments.
- Any individualized problems should be discussed in the 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.

Evaluation Criteria

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

Grading Scale

Score (Average)	Grade
90-100	A
80-89	B
70-79	C
60-69	D
Below 60	F
Classroom Activities	55%
Quizzes [20%]	
Exams 1 & 3 [20%]	
Exam 2 [15%]	
Homework	20%
Final Exam	25%

Quizzes and Homework

There will be a quiz and a graded homework assignment given during each week. They must be completed before each expiration date and time. **No extension will be given.** You must be in “Certify” in order for the software to record your score. **NOTE: You will not be given help on your quizzes or tests.**

Working From Home

The MA 111 course work can be done on your personal computer. However, there is a risk when working outside the Lab. Internet access is required to reach the website where the notes and quizzes are found. **Students doing graded work from home risk grades not being properly saved.** If scores are not successfully sent from home and the deadline passes, you will NOT be able to make up the work.

****Note You are responsible for submitting your work to my online gradebook. I do not have control over technical issues you may encounter with YOUR computer at home. Therefore, if you do not submit your work to me by the deadline because of technical*

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issues, then you should find another avenue to do your work. (The Math Lab 108/109 is open for your convenience from 8am-5pm).

Make-Up Policy

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**.

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 in the Social Science Auditorium on TUESDAY OF FINALS WEEK from 3-5pm 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 necessary for students to attend every class meeting and lab sessions. Any student who misses more than the allowed number (**3**) of absences will be subject to a decrease in their final grade.

SSD/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 during the first week of the course. The instructor meets with the student to insure access of available resources in the university and make appropriate instructional modifications.

ADA Syllabus Statement

Mississippi Valley State University is committed to providing reasonable accommodations for students with a documented disability. If a student has a disability that qualifies under the Americans with Disability Act (ADA) and requires accommodations, he/she should contact the Services for Students with Disability Office to obtain this service. Disabilities covered by the ADA may include learning, physical, psychiatric, vision, hearing, or chronic health disorders. Students who are uncertain if their condition/disability is qualified should contact *This document does not constitute a contract with the university. It contains guidelines and I reserve the right to make changes on this syllabus as needed. If changes are made, you will be notified of the changes in class or by your university e-mail address.*

the SSD Office.

Mrs. Kathy Brownlow/ ADA Coordinator

Social Science Building Office 105

Phone/e-mail: 662-254-3443, kbrownlow@mvsu.edu.

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 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

The volume of cell phones and pagers must be turned **off/vibrate** if you have these items with you in class. The noise is distracting not only to the instructor but to your classmates as well.

Calendar of Activities/Course Outline/Schedule

Week	Dates	Section no	Section Title	Important Information
1	8/22-8/26	1.6 2.1	The Complex Number System Linear Equations in One Variable	
2	8/29-8/2	2.1	Continue	
		2.2	Linear Inequalities in One Variable	
3	9/5-9/9	2.3	Quadratic Functions in One Variable	
		2.4	Higher Degree Polynomials Equations	
4	9/12-9/16		Review & Exam 1	
5	9/19-9/23	2.5	Rational Expressions and Equations	
		2.6	Radical Equations	
6	9/26-9/30	3.1	Cartesian Coordinate System	
		3.2	Linear Equations in Two Variables	
7	10/3-10/7		Review and Midterm	MIDTERM WEEK

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8	10/10-10/14	3.3	Forms of Linear Equations Review	
		3.4	Parallel and Perpendicular Lines	
9	10/17-10/21	3.6	Introduction to Circles	
		4.1	Relations and Functions	
10	10/24-10/28	4.2	Linear and Quadratic Functions	
		4.5	Combining Functions	
11	10/31-11/4		Review and Exam 3	
12	11/7-11/11	4.6	Inverse Functions	
		5.2	Polynomial Division and the Division Algorithm	
13	11/14-11/18	5.3	Locating Real Zeros of Polynomials	
		8.1	Solving Systems by Substitution and Elimination	
14	11/21-11/25		THANKSGIVING	THANKSGIVING WEEK
15	11/28-12/2		Review (Final)	
16	12/5-12/9		MA 111 Final Exam-TBA	

Comprehensive Final Exam (TBA). Failure to report for the final exam will result in a penalty. See exam rules.

NOTE: Failure to adhere to any of the preceding statements could cause a decrease in the FINAL GRADE!!!!!!

Bibliography

Barnett, R., Ziegler, M., & Byleen, K. (2001). College Algebra (7th ed.). McGraw-Hill.

Crisler, N. and Froelich, G. (2002). College Algebra: Modeling Our World. W.H. Freeman & Company.

Gustafson, R. & Frisk, P. College Algebra (7th ed). Brooks/Cole -Thomas Learning Publishing Company.

Kaufmann, J. (2001). College Algebra (5th ed). Brooks/Cole Publishing.

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McKeague, C. (2000). Elementary Algebra (6th ed). Saunders College Publishing Co.

*Other resources available in the MVSU library

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