

Cuyamaca College Spring 2022

Math 175 – Section 7245

College Algebra

4 Hours Lecture, 4 Units

Instructor: Joseph Assof, jassof@hshmc.org

Class Times: Tuesdays, Wednesdays, Thursdays 10:00-11:05

Lab/Office Hours: Tuesdays, Wednesdays, & Thursdays 3:10-3:30, Mondays 1:45-3:30

Room: HSHMC 200B

Course Description

College level course in algebra for majors in science, technology, engineering, and mathematics: polynomial, rational, radical, exponential, absolute value, and logarithmic functions; systems of equations; theory of polynomial equations; and analytic geometry. *Maximum of 7 units can be earned for successfully completing any combination of MATH 170, 175, 176.*

Prerequisite

"C" grade or higher or "Pass" in MATH 110 or equivalent

Entrance Skills

Without the following skills, competencies and/or knowledge, students entering this course will be highly unlikely to succeed:

- 1) Identifying and/or simplifying:
 - a. Linear, quadratic, rational, radical, absolute value, exponential and logarithmic equations
 - b. Polynomial expressions
 - c. Rational expressions
 - d. Algebraic expressions involving radicals and/or rational exponents
 - e. Logarithmic expressions
 - f. Complex numbers
 - g. Basic mathematical formulas from related disciplines
- 2) Solving:
 - a. Algebraic equations
 - b. Logarithmic and exponential equations
 - c. Systems of equations and inequalities
 - d. Applications to a variety of disciplines
- 3) Factoring polynomials
- 4) Functions:
 - a. Determine the domain and range
 - b. Find the inverse
 - c. Perform basic operations

- 5) Graphing, transforming, and/or operating on the following:
 - a. Polynomial, absolute value, exponential and logarithmic functions and their inverses
 - b. Linear and quadratic inequalities
 - c. Systems of equations and inequalities
- 6) Mathematical reasoning and problem solving:
 - a. Inductive and deductive reasoning
 - b. Effective communication of mathematical arguments

Course Content

- 1) Functions including linear, polynomial, rational, radical, exponential, absolute value, logarithmic: definitions, evaluation, domain and range
- 2) Inverses of functions
- 3) Algebra of functions
- 4) Graphs of functions including asymptotic behavior, intercepts, vertices
- 5) Transformations of quadratic, absolute value, radical, rational, logarithmic, exponential functions
- 6) Equations including rational, linear, polynomial, radical, exponential, absolute value, logarithmic
- 7) Linear, nonlinear, and absolute value inequalities
- 8) Systems of equations and inequalities
- 9) Characterization of the zeros of polynomials
- 10) Properties and applications of Complex numbers
- 11) Properties of conic sections
- 12) Sequences and series

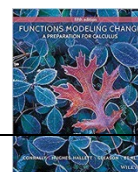
Course Objectives

Students will be able to:

- 1) Analyze and investigate properties of functions;
- 2) Synthesize results from the graphs and/or equations of functions;
- 3) Apply transformations to the graphs of functions;
- 4) Recognize the relationship between functions and their inverses graphically and algebraically;
- 5) Solve and apply rational, linear, polynomial, radical, absolute value, exponential, and logarithmic equations and solve linear, nonlinear, and absolute value inequalities;
- 6) Solve systems of equations and inequalities;
- 7) Apply techniques for finding zeros of polynomials and roots of equations;
- 8) Apply functions and other algebraic techniques to model real world STEM applications;
- 9) Analyze conics algebraically and graphically; and
- 10) Use formulas to find sums of finite and infinite series.

Textbook and Materials

- 1) Functions Modeling Change: A Preparation for Calculus. 5th edition
- 2) Graphing Calculator TI 83 or TI 84 is required.
- 3) Notebook paper, graph paper, pencils with erasers, ruler



Exit Skills

Students having successfully completed this course exit with the following skills, competencies and/or knowledge:

- 1) Identifying and/or performing:
 - a. Range and domain of functions
 - b. Operations on functions
 - c. Inverses of functions
 - d. Operations with complex numbers
- 2) Solving:
 - a. Algebraic and absolute value equations and inequalities
 - b. Logarithmic and exponential functions
 - c. n^{th} order systems of equations and inequalities
 - d. Applications from a variety of disciplines
- 3) Analyzing and graphing:
 - a. Algebraic and absolute value functions and inequalities
 - b. Logarithmic and exponential functions
 - c. Conic sections
 - d. Family of curves

Student Learning Outcomes

Upon successful completion of this course, students will be able to:

- 1) Use analytical, numerical, and graphical methods to solve college algebra level problems.
- 2) Solve multi-disciplinary application problems and interpret the results in context.

Evaluation and Grading

This class is a 4 unit course. Your semester grade will be based on the different categories listed below:

- (10%) Homework
- (10%) Classwork (Individual & Group)
- (10%) Quizzes
- (70%) Exams
- Comprehensive Final Exam (Can increase or decrease overall grade, see details in **Comprehensive Final Exam** section below)

An A = 90% or higher, B = 80% - 89.9%, C = 70% - 79.9%, D = 60% - 69.9%, F = below 60%.

Note: You must earn at least a 60% on the final exam to earn a passing grade in this course.

Homework – 10% of Overall Grade

Homework will be assigned during each class meeting. The purpose of homework is to practice skills and procedures learned in class, consolidate conceptual understanding, spiral review prior content in order to maintain mastery, and expose learning deficits that need to be addressed during the next class.

Homework will be graded on the grounds of completion and accuracy. For full credit, all assigned problems must be completed and a subset of randomly selected problems must be accurate. Further, show your work on all assigned problems. *It is not the reader's job to read the author's mind or infer his/her thinking.* All thinking should be fully communicated – *don't just write the answers!*

Homework should be logically organized and easily legible. Logically organized homework includes a dedicated space for the student's name, the date, as well as the assignment title and details. Further, problems should flow numerically in the order they were assigned. *It is not the reader's job to discern the author's random flow.* Easily legible homework is clear enough to read and individual problems have clear starting and ending points. A sample homework assignment will be provided so that you may adopt its structure.

Classwork – 10% of Overall Grade

A substantial portion of class and lab time will be devoted to various individual and group classwork assignments. The purpose of classwork can be inquiry and discovery of mathematical concepts, practicing complex mathematical procedures, or applying concepts and procedures to various contexts. In the event of a group assignment, it is expected that all group members participate and contribute to the final product. If, by the instructor's judgment, this does not occur, nonparticipants will not receive credit.

Quizzes – 10% of Overall Grade

Most class meetings will have a quiz. Quizzes will mostly cover content from the week before, but any prior content is fair game – *mastery requires maintenance.*

Competency Exams – 70% of Overall Grade

There will be three competency exams during the course, each covering approximately two chapters of the textbook. Competency exams will contain content from the homework, classwork, quizzes, lectures, and some novel applications. Competency exams will be completed individually.

Comprehensive Final Exam

The final exam will be comprehensive of all course content.

Mastery requires maintenance. All students are required to take the final exam. You must earn at least a 60% on the final exam to earn a passing grade in this course.

It is never too late to learn. A student can demonstrate competency on the final exam and pass the course. A score of 70% on the final exam guarantees a passing grade in the course.

Final Exam Grading:

Score on Final Exam	Impact on Course Grade
70-100%	<p><i>Replace</i> current grade, if higher and course grade above 70% entering final</p> <p><i>Defend</i> current grade, if lower and course grade above 70% entering final</p> <p><i>Raise current grade to 70%</i>, if course grade below 70% entering final</p>
60-69%	<i>Reduce</i> current grade by 5%
0-59%	<i>Do not pass course</i> , course grade capped at 69%

Attendance

You are expected to attend each class, arriving on time and remaining for the entire class. Please grant me the courtesy of letting me know at the beginning of class if you will need to leave early.

- **You may be dropped from the class if you are absent more than 4 days (8 hours).** If this becomes a problem, please come and speak with me. I may decide to drop you unless you convince me of your motivation to stay, and *your grades support this motivation*. When you are dropped you may receive a "W" or an "F", depending on the date dropped.
- **Excessive tardiness will result in being dropped.** Arriving late or leaving early twice will be counted as one hour of absence. Tardiness affects the learning environment and is therefore intolerable. The tardy policy will begin on the second week of class for a full-semester session.
- **Unassigned break.** If you leave the class for more than 15 minutes this will constitute as a tardy. If an emergency arises please grant me the courtesy of letting me know (expecting cell phone calls).

**Do not assume that you will be dropped if you do not attend classes. To ensure that you are withdrawn, you must officially withdraw online, in person, or by telephone. Failing to drop a class in a timely manner may earn you a failing grade in the class.

**You are responsible for getting class notes from other classmates and getting any schedule changes or other class announcements from classmates on days missed from the class. Any changes and class announcements will be made known in class. It is not acceptable to return to class following an absence and claim that you did not know.

Cell Phone Policy

All cell phones must either be turned off or put on silent during class time. They are not allowed on desks during class at all and are not to be used as a calculator or a clock. Having a cell phone out will result in the student being dismissed from class which will be marked as an absence (up to 1.5 hours).

Accommodations

Academic accommodations are available for students with disabilities. Please identify yourself to me (after class) and to Disabled Students Programs & Services staff so that the appropriate accommodations can be ensured. If you suspect you have a learning disability or need services for any other type of disability, contact the Disabled Students Programs & Services (DSP&S) Office, A-113, at the Student Services One-Stop Center or call (619) 660-4239.

Honesty Policy

Students are expected to display the utmost integrity. During tests and quizzes, calculators cannot be shared, students are not to communicate with others and your eyes should remain on your papers. No other electronic device may be used during tests or quizzes. If a question arises during the assessment see the instructor. You may not leave during the exam. There is absolutely NO tolerance for cheating in this class. Any student caught cheating or assisting another student in the act of cheating will receive a zero on the assignment, test or quiz. If it happens a second time, you will earn a '0' on that assignment and you will be reported to the Dean of Student Services which will go on your permanent record and may result in removal from the class. (On test days, the instructor reserves the right to move students to different seats, do not take it personally).

Course Outline and Calendar (Tentative)

Week/Date	Content and Assignments
Week 1 1/31-2/2	Lecture Chapter 1
Week 2 2/7-2/9	Lecture 2.1, 2.2 Quiz 1
Week 3 2/14-2/16	Lecture 2.3, 2.4 Quiz 2
Week 4 2/21-2/23	Lecture 2.5, 2.6, 3.1, 3.2 Quiz 3
Week 5 2/28-3/2	Test 1 – Ch 1, 2, & 3
Week 6 3/7-3/9	Lecture 4.1, 4.2, 4.3
Week 7 3/14-3/16	Lecture 4.5 Quiz 4
Week 8 3/21-3/23	Lecture 5.1 Quiz 5
Week 9 3/28-3/30	Spring Break No Class
Week 10 4/4-4/6	Lecture 5.2, 5.3 Quiz 6
Week 11 4/11-4/13	Lecture 6.1, 6.2, 6.3 Quiz 7
Week 12 4/18-4/20	FLEX WEEK
Week 13 4/25-4/27	Test 2 – Ch 4, 5, & 6
Week 14 5/2-5/4	Lecture 10.1, 10.2, 10.3
Week 15 5/9-5/11	Lecture 11.1, 11.2, 11.3 Quiz 8
Week 16 5/16-5/18	Lecture 11.4, 11.5, Ch13 Quiz 9
Week 17 5/23-5/25	FLEX WEEK
Week 18 5/30-6/2	Test 3 – Ch 10, 11, 13
Week 19 6/6-6/8	Final Exam