

**SEWARD COUNTY COMMUNITY COLLEGE
COURSE SYLLABUS**

I. TITLE OF COURSE: MA1173 - College Algebra

**II. COURSE DESCRIPTION: 3 credit hours
3 credit hours of lecture and 0 credit hours of lab per week.**

College Algebra involves the study of functions, graphing and solving problems using polynomial, rational, radical, exponential, and logarithmic functions. College Algebra is the first course in the college mathematics curriculum for mathematics and science majors and a general education requirement for most students. Success in college level mathematics courses begins with a good understanding of algebra and the goal of this course is to help the student develop that understanding. Many other programs recommend College Algebra or its level of competence for continued study leading to a related field. For each unit of credit, a minimum of three hours per week with one of the hours for class and two hours for studying/preparation outside of class is expected.

Pre-requisite:

Satisfactory score on the ACCUPLACER, ACT, or SAT test, or a "C" or better in Intermediate Algebra.

III. PROGRAM AND/OR DEPARTMENT MISSION STATEMENT:

The Mathematics Department at Seward County Community College will enhance a student's ability to think critically using mathematical principles, ideas, and concepts in order to function in a society with ever-changing technology.

IV. TEXTBOOK AND MATERIALS:

1. Bittinger, Beecher, Ellenbogen, and Penna. College Algebra: Graphs and Models, 6th Edition, Pearson/Addison Wesley, 2017.
2. Bittinger, Beecher, Ellenbogen, and Penna. College Algebra: Graphs and Models Student Solutions Manual, Addison Wesley Longman Inc.,
3. Texas Instruments 83, 83 Plus, 84 or 84 Plus Graphing Calculator

V. SCCC OUTCOMES:

- 4: Demonstrate mathematical skills using a variety of techniques and technologies.
- 5: Demonstrate the ability to think critically by gathering facts, generating insights, analyzing data, and evaluating information

VI. COURSE OUTCOMES:

Expected learning outcomes of this course are in alignment with the learning objectives

established by the Statewide Core Competencies.

Students will be expected to use appropriate technology as one tool to achieve the following outcomes:

Analysis and Graphing of Functions and Equations

1. Use functional notation, including finding arithmetic combinations and compositions of functions.
2. Recognize and distinguish between functions and relations (equations).
3. Use concepts of symmetry, intercepts, left- and right-hand behavior, asymptotes, and transformations to sketch the graph of various types of functions (constant, linear, quadratic, absolute value, piecewise-defined, square root, cubic, polynomial, rational, exponential, and logarithmic) or relations (circle) given in description.
4. Determine the domain and range of relations and function.
5. Write the equation that describes a function (for types given above) or circle given its description.
6. Use graphs of functions for analysis
7. Find the inverse of a function.

Solutions of Equations and Inequalities

8. Solve equations including literal equations, linear equations, quadratic equations by factoring and the quadratic formula, higher-order polynomial equations, equations involving rational expressions, equations involving radicals, equations involving absolute value expressions, along with equations involving exponential or logarithmic functions.
9. Solve inequalities of the following types: linear (in one and two variables), polynomial, rational, absolute value.
10. Solve systems of inequalities by graphing.
11. Apply equations such as constant, linear, quadratic, absolute value, piecewise-defined, square root, cubic, polynomial, rational, exponential, and logarithmic to real-world situations, including but not limited to depreciation, growth and decay, and max/min problems.
12. Examine and analyze data, make predictions/interpretations, and do basic modeling.
13. Solve systems of equations by various methods, including matrices.

VII. COURSE OUTLINE:

1. Function definition, identification, terminology, and notation. Determine domain and range from equations and graphs using interval notation.
2. Graphs and characteristics of functions including intervals where the function is increasing, decreasing, or constant, relative maxima, and relative minima.
3. Operations on functions, composite functions, and evaluate difference quotients.
4. Symmetry and transformations of functions.
5. Evaluate and graph piecewise functions.
6. Analytic Geometry formulas including distance formula, midpoint of a line segment, Pythagorean Theorem, and equation and graphs of circles.
7. Linear functions. Solve, graph, and write linear equations.
8. Absolute value equations and graphs.

9. Quadratic functions. Graphs, solve equations using completing the square method and quadratic formula, modeling and applications.
10. Polynomial functions and equations. Third, fourth, and (n)th degree equations are examined for properties and zeros, (rational, irrational, and complex). The Fundamental Theorem of Algebra is presented along with the Remainder Theorem, the Factor Theorem, and the Rational Zeros Theorem.
11. Rational functions. Graph by hand by finding asymptotes and intercepts. Solve rational equations.
12. Radical functions. Graph and solve radical equations.
13. Graphing. A thorough study of graphing by sketching and by the use of the graphing calculator is done including the graph of the polynomial function and the rational function.
14. Linear, polynomial, rational and absolute value inequalities.
15. Exponential and Logarithmic Functions. Graphs, algebraic properties, solving equations, and applications.
16. Systems of equations with two or more variables and applications. Solve by various methods including matrices.
17. Systems of inequalities and their applications.

VIII. INSTRUCTIONAL METHODS:

1. Lecture/Discussion
2. In class and out of class assignments
3. Calculator and computer exercises
4. Whiteboard drills
5. Calculator demonstrations
6. Quizzes and Examinations
7. Individual help

IX. INSTRUCTIONAL AND RESOURCE MATERIALS:

1. Textbook
2. Library mathematics reference books
3. Supplementary materials prepared by the instructor
4. Computer tutorial programs
5. Computer projector and laptop computer used for computer demonstrations
6. Graphing calculator

X. METHODS OF ASSESSMENT:

Methods of assessing the general course outcomes and the specific course competencies include tests, daily quizzes, and class attendance.

SCCC Outcome #4 will be assessed and measured by quizzes, tests, and use of a graphing calculator.

SCCC Outcome #5 will be assessed and measured using assignments, tests and

nontraditional problem-solving activities.

XI. ADA STATEMENT:

Under the Americans with Disabilities Act, Seward County Community College will make reasonable accommodations for students with documented disabilities. If you need support or assistance because of a disability, you may be eligible for academic accommodations. Students should identify themselves to the Dean of Students at 620-417-1106 or going to the Student Success Center in the Hobbie Academic building, room 149 A.

XII. CORE OUTCOMES PROJECT:

The learning outcomes and competencies detailed in this course outline or syllabus meet, or exceed the learning outcomes and competencies specified by the Kansas Core Outcomes Groups project for this course as approved by the Kansas Board of Regents

KRSN: MAT1010

Syllabus Reviewed: 5/16/2022