MATH C115: COLLEGE ALGEBRA

Item	Value
Top Code	170100 - Mathematics, General
Units	4 Total Units
Hours	72 Total Hours (Lecture Hours 72)
Total Outside of Class Hours	0
Course Credit Status	Credit: Degree Applicable (D)
Material Fee	No
Basic Skills	Not Basic Skills (N)
Repeatable	No
Grading Policy	Standard Letter (S), • Pass/No Pass (B)
Local General Education (GE)	• CL Option 1 Math Competency (CA3)
California General Education Transfer Curriculum (Cal-GETC)	• Cal-GETC 2A Math Concepts (2A)
Intersegmental General Education Transfer Curriculum (IGETC)	• IGETC 2A Math Concepts (2A)
California State University General Education Breadth (CSU GE-Breadth)	• CSU B4 Math/Quant.Reasoning (B4)

Course Description

Basic concepts of algebra, equations, and inequalities along with functions and graphs, polynomial and rational functions, exponential and logarithmic functions, systems, matrices and determinants, linear programming, conic sections, sequences, series, and combinatorics. PREREQUISITE: A course taught at the level of intermediate algebra or appropriate math placement. Transfer Credit: CSU; UC: Credit Limitation: MATH C115 and MATH C170 combined: maximum credit, five semester or seven and one-half quarter units.

Course Level Student Learning Outcome(s)

1. Demonstrate proficiency of concepts to solve, graph, model, and apply various collegiate level algebraic functions.

Course Objectives

• 1. Solve quadratic and rational equations and inequalities.
• 2. Find the domain, range, and inverse and graph (with the translations) the following: linear, radical, polynomials, rational, exponential, and logarithmic functions.
• 3. Manipulate polynomials and solve polynomials equations using the Rational Zero Theorem, Synthetic Division, The Remainder Theorem, and Factor Theorem.
• 4. Solve polynomials equations by factoring and solve radical equations.
• 5. Simplify expressions involving integers and rational exponents and radicals and complex fractions.
• 6. Use appropriate technology such as calculators or computer software to enhance mathematical thinking, visualization, and understanding, to solve mathematical problems, and judge the reasonableness of the results.

• 7. Demonstrate quantitative reasoning skills by developing convincing arguments and by communicating mathematically both verbally and in writing.

Lecture Content

LINEAR FUNCTIONS, EQUATIONS, AND INEQUALITIES Real Numbers and the Rectangular Coordinate System Introduction to Relations and Functions Linear Function Equation of Lines and Linear Models Linear Equations and Inequalities Applications of Linear Functions ANALYSIS OF GRAPHS OF FUNCTIONS Graphs of Basic Functions and Relations; Symmetry Vertical and Horizontal Shifts of Graph Stretching, Shrinking, and Reflecting Graphs Absolute Value Functions: Graphs, Equations, Inequalities, and Applications Piecewise-Define Functions Operations and Composition POLYNOMIAL FUNCTIONS Complex Numbers Quadratic Functions and Graph Quadratic Equations and Inequalities Further Applications of Quadratic Function and Models Higher-Degree Polynomials Functions and Graphs Topics in the Theory of Polynomials Functions I and II Polynomials Equations and Inequalities; Apply Functions and Other Algebraic Techniques to Model Real World Applications RADICAL, RATIONAL, POWER, AND ROOT FUNCTIONS Radical Functions and Graphs Rational Functions and Graphs Analyze the Graph of a Rational Function Including Asymptotes, Intercepts, and Vertices Rational Equations, Inequalities, Applications, and Models Functions Defined by Powers and Roots and Their Graphs Equations, Inequalities, and Applications Involving Root Functions INVERSE, EXPONENTIAL, AND LOGARITHMIC FUNCTIONS Inverse Functions Exponential Functions Logarithms and Their Properties Logarithmic Function Exponential and Logarithmic Equations and Inequalities Further Applications and Modeling with Exponential and Logarithmic Functions ANALYTIC GEOMETRY Circles and Parabolas Ellipses and Hyperbolas Summary of the Conic Sections Parametric Equations SYSTEM OF EQUATIONS AND INEQUALITIES; MATRICES Solve Linear and Nonlinear Systems of Equations and Inequalities Solution of Linear Systems in Three variables Solution of Linear Systems by Row Transformations Matrix Properties and Operations Determinants and Cramers Rule Solution of Linear Systems by Matrix Inverses Partial Fractions FURTHER TOPICS IN ALGEBRA Sequences and Series Arithmetic Sequences and Series Geometric Sequences and Series Binomial Theorem Counting Theory Probability

Method(s) of Instruction

• Lecture (02)
• DE Live Online Lecture (02S)
• DE Online Lecture (02X)
• Video one-way (ITV, video) (63)
• Cable (CA)

Instructional Techniques

The instructor shall deliver lectures of course content; assign homework and quizzes; deal with math anxiety by establishing a friendly, student-centered learning environment; relate material in the course to real life and the outside world; involve active learning and require participation and regular, substantive interaction (RSI), including student-to-student and student-to-instructor interaction through the use of individual, small-group and whole-class discussion; apply and include technology to increase motivation such as scientific and/or graphing calculators, the Internet, and computer software; and include appropriate methods of

summative assessment (such as a midterm exam and a comprehensive final).

Reading Assignments

Reading assignments are included as part of studying for and completing homework, quizzes, midterm exam, final exam, and projects (optional).

Writing Assignments

Writing assignments are included as part of completing homework, quizzes, midterm exam, final exam, and projects (optional).

Out-of-class Assignments

Out-of-class assignments include studying for and completing homework and quizzes and preparing for exams. Also may include projects, presentations, or reports pertaining to the discipline or subject matter covered as part of the course.

Demonstration of Critical Thinking

Students will be able to choose from a variety of approaches to solve and explain solutions and justify reasoning verbally or in writing and may be included in classroom discussions, quizzes, Midterm Examination, Final Examination, and Projects.

Required Writing, Problem Solving, Skills Demonstration

Included as homework assignments, part of classroom lectures and discussions, part of quizzes, Midterm Examination, Final Examination, and Projects.Students will be able to explain solutions and justify reasoning verbally or in writing and may be included in classroom discussions, quizzes, Midterm Examination, Final Examination, and Projects.

Eligible Disciplines

Mathematics: Masters degree in mathematics or applied mathematics OR bachelors degree in either of the above AND masters degree in statistics, physics, or mathematics education OR the equivalent. Masters degree required.

Textbooks Resources

1. Required Sullivan, Michael. College Algebra Through Functions, 4th ed. Pearson, 2019 Rationale: -

Other Resources

1. Coastline Library 2. Student Handbook for Telecourse students.