MATH G115: COLLEGE ALGEBRA

Item	Value
Curriculum Committee Approval Date	10/04/2022
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
Open Entry/Open Exit	No
Grading Policy	Standard Letter (S)
Local General Education (GE)	• Area 2 Mathematics (GB2)
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

This course is designed for students planning to enroll in MATH G140 or MATH G180. Topics include matrices and determinants, theory of equations and systems, graphing equations and functions, logarithmic and exponential functions and their graphs, polynomial and rational functions, conics sections, sequences and series, counting, and probability. A scientific calculator is recommended. Enrollment Limitation: MATH G115S; students who complete MATH G115 may not enroll in or receive credit for MATH G115S. PREREQUISITE: Course taught at the level of intermediate algebra or appropriate math placement. Transfer Credit: CSU; UC: Credit Limitation: MATH G115 and MATH G170 combined: maximum credit, 5 semester/7.5 quarter units.

Course Level Student Learning Outcome(s)

1. Course Outcomes
2. List the potential rational zeros of a polynomial function, and find all zeros of a polynomial function without a graphing calculator.
3. Solve equations containing rational expressions.
4. Solve logarithmic and exponential equations.

Course Objectives

- 1. Solve linear, quadratic, and rational equations.
- 2. Solve polynomial and rational inequalities.
- 3. Identify relations and transformations for a function and its graph.
- 4. Interpret the concept of a function and its properties.
- 5. Use the calculator in conjunction with the above objectives.
- 6. Demonstrate algebra skills required for success in Survey of Calculus (MATH G140 or MATH G180).
- 7. Demonstrate algebraic techniques associated with equations and inequalities.
- 8. Graph equations and functions, polynomial and rational functions, exponential and logarithmic functions, and conic sections.
- 9. Solve systems of equations and inequalities.
- 10. Find limits of sequences and series.

Lecture Content

Equations and inequalities Linear equations Quadratic equations Inequalities Equations and inequalities involving absolute values Graphs Graphs of equations Circles Lines Functions and their graphs Functions Graphs of functions Properties of functions Library of functions and piecewise-defined functions Graphing transformations Polynomial and rational functions Polynomial functions and their graphs Rational functions and their graphs Polynomial and rational inequalities Zeros of a polynomial Exponential and logarithmic functions Composite functions Inverse functions Exponential functions Logarithmic functions Solving of exponential and logarithmic equations Conic sections The parabola The ellipse The hyperbola Systems of equations and inequalities Substitution and elimination Matrices Determinants Matrix algebra Partial fraction decomposition Systems of nonlinear equations Systems of inequalities Sequences, series and the Binomial Theorem Arithmetic sequences and series Geometric sequences and series The Binomial Theorem

Method(s) of Instruction

- Lecture (02)
- DE Live Online Lecture (02S)
- DE Online Lecture (02X)

Reading Assignments

Texts and websites

Writing Assignments

Exams and quizzes Homework assignments Projects or reports

Out-of-class Assignments

Homework assignments Participation in online discussion board for hybrid and online courses Take-home quizzes, exams/projects Watching online lecture videos for online or hybrid courses

Demonstration of Critical Thinking

Students will demostrate critical thinking and problem-solving skills by using logic, in conjunction with past mathematical solving techniques, to solve and interpret a variety of applicatios not previously seen. Demonstrations will be shown by completing assignments, participating in discussions, and completing required exams and quizzes.

Required Writing, Problem Solving, Skills Demonstration

Demonstrating of problem solving by solving mathematical problems either in exams, quizzes, homework assignments or projects.

Eligible Disciplines

Mathematics: Master's degree in mathematics or applied mathematics OR bachelor's degree in either of the above AND master's degree in statistics, physics, or mathematics education OR the equivalent. Master's degree required.

Textbooks Resources

1. Required Lial, Hornsby, Schneider, Daniels. College Algebra, 13th ed. Pearson, 2020 2. Required Miller, Gerken. College Algebra, 3rd ed. Mc Graw Hill, 2023 3. Required Abramson, North. College Algebra, ed. OpenStax (OER; latest), 2015 Rationale: Mathematics deparment likes to have an OER textbook associated to all our core classes.