GROSSMONT COLLEGE

 COURSE OUTLINE OF RECORD

Curriculum Committee Approval: 04/26/2022

GCCCD Governing Board Approval: 06/14/2022

MATHEMATICS 175 – COLLEGE ALGEBRA

 1. Course Number Course Title Semester Units

 MATH 175 College Algebra 4

Semester Hours

4 hours lecture: 64-72 hours 128-144 outside-of-class hours 192-216 total hours

 2. Course Prerequisites

A grade of “C” or higher in Math 108 or110 or equivalent or appropriate placement beyond intermediate algebra. *Note: Math 103 is not equivalent to Math 110*.

 Corequisite

 None

 Recommended Preparation

 None.

 3. Catalog Description

Graphic, numeric, and analytic approaches to the study of precalculus concepts from college algebra. Application of appropriate technology including but not limited to graphic utilities to model, analyze, and interpret a collection of data or to solve real-world application problems from a wide variety of disciplines. Topics include the real number system; algebraic, exponential, and logarithmic functions and their inverses; graphing techniques for polynomial and rational functions; complex numbers; theory of equations; partial fractions; mathematical induction; sequences and series; matrices; and the binomial theorem. Passing both MATH 170 and MATH 175 is equivalent to passing MATH 176. A student will earn a total of 7 units for passing both MATH 170 and MATH 175. A student will earn only 6 units if they pass both Math 175 and Math 176.

 4. Course Objectives

 The student will:

 a. Analyze linear, quadratic, polynomial, rational, absolute value, exponential, and logarithmic functions and their inverses from a graphic, numeric, and analytic perspective.

 b. Analyze and solve applied problems from various disciplines and involving a wide variety of equations, including but not limited to: linear, quadratic, polynomial, rational, radical, absolute value, exponential, and logarithmic, equations.

 c. Apply critical thinking and mathematical reasoning skills necessary in collegiate-level algebraic problem solving in related disciplines such as science, business, and engineering.

 d. Use the techniques of analytic geometry to graph conic sections.

 e. Observe, interpret, and analyze the behavior of graphs of a wide variety of functions.

 f. Use sequences and series to solve theoretical and applied problems from various disciplines such as science, business, and engineering.

 g. Select and apply appropriate technology including but not limited to graphing utilities to model, analyze, and interpret a collection of data or to solve real-world application problems requiring the use of collegiate-level mathematics.

 5. Instructional Facilities

 Standard classroom facilities.

 6. Special Materials Required of Student

 Graphing calculator

7. Course Content

 a. Linear, quadratic, polynomial, rational, absolute value, exponential, and logarithmic functions, their graphs, and their inverses.

 b. Graphic, numeric, and analytic methods to solve application problems including linear, quadratic, polynomial, rational, absolute value, exponential, and logarithmic equations.

 c. Polynomial and rational functions and equations including the use of graphing utilities and synthetic division to graph.

 d. Graphic, numeric, and analytical methods to solve linear and non-linear systems of equations and inequalities.

 e. Matrices and determinants.

 f. Sequences and series.

 g. Binomial theorem.

 h. Mathematical induction.

 i. Conics.

j. Introduce contributions from a diverse group of mathematicians relevant to the content of the course.

k. Application problems relevant to current events and students’ lived experiences.

 8. Method of Instruction

 Employ a variety of teaching methods, including lectures, instructor presented examples, student-led discussions, collaborative learning, think-pair-share, formative assessments (e.g. exit slips), and multimedia presentations. These instructional techniques strive to include students’ lived experiences and different cultural and historical perspectives.

 9. Methods of Evaluating Student Performance

 a. Homework.

 b. Independent exploration activities such as finding the minimum surface area of a box

 c. Class participation/problem presentations.

 d. Quizzes.

 e. Chapter exams.

 f. In-class final exam (comprehensive).

10. Outside Class Assignments

 a. Homework.

 b. Take-home projects such as predictive modeling with exponential functions

 c. Problem sets.

11. Representative Texts:

 a. Representative Text(s):

 Stewart, James, Lothar Redlin, Saleem Watson*. Precalculus, Mathematics for Calculus.* Boston, MA: Cengage Learning, 2016.

 b. Supplementary texts and workbooks:

 None

 Addendum: Student Learning Outcomes

Upon completion of this course, our students will be able to do the following:

1. Categorize college algebra problems and use appropriate theorems, formulas, and algorithms to solve them.
2. Use the appropriate technology to solve problems requiring college algebra.
3. Formulate, analyze, and differentiate mathematical functions numerically, graphically, and symbolically at the college algebra level and have the ability to transition between these representations.
4. Communicate the mathematical process and assess the validity of the solution.
5. Analyze and graph polynomial function.