Course Title: Calculus

Course #: 1433-1434

Course Description: This course is a two-semester course that covers the elements of beginning college calculus. Topics to be studied include limits, differentiation and integration of polynomial, trigonometric, logarithmic, exponential and other functions. Their applications to area, volume, arc length, optimization, rates of change, position, velocity, and acceleration problems will be studied. This course does not follow the curriculum needed to take the Advanced Placement Exam in Calculus. This course is still challenging and rigorous due simply to the fact that Calculus is very advanced mathematics. This course is ideal for students who would like an introduction to Calculus for college preparation, but do not desire the rigor or pace of the Advanced Placement Course.

UC/CSU Approval: “c” approved

Grade Level: 10-12

Estimated Homework Per Week: 2-4 Hours/week

Prerequisite: Completion of Pre-Calculus or Pre-Calculus H with a grade of “C” or higher

Recommended Prerequisite Skills: Students should have a strong foundation in Algebra. These students should have done very well in Algebra 1, Algebra 2/Trig and Pre-Calculus level courses. These students are potentially going to major in a STEM field, but do not want to take the AP Calculus course and want to be ready to excel in college-level Calculus during their freshman year of college. Students must understand this is a rigorous course, and Calculus should only be taken by students truly interested in mathematics.

Course Grade Scale: Homework: 20%
Quizzes: 25%
Tests: 40%
Final Exam: 15%

Major Assessments/Units/Topics:
I. Unit 1 - Precalculus Review
   ● Review of functions - linear, quadratic, polynomial, exponential, logarithmic, rational
   ● Understanding of domain, range, intercepts
• Intervals of increase/decrease
• Local min/max
  ○ This unit will consist of at least two quizzes and two major tests

II. Unit 2 - Limits
• Limits of functions analytically, graphically, and numerically
• Determine one-sided limits and continuity
• Infinite Limits
  ○ This unit will consist of at least one quiz and one major unit exam

III. Unit 3 - Differentiation
• Calculate the derivative of a function using the definition and the sum, difference, product, quotient, and chain rules.
• Calculate max and min points using the derivative and its properties
• Solve optimization problems
  ○ This unit will consist of at least 2 to 3 quizzes and 2 to 3 major tests

IV. Unit 4 - Integration
• Calculate the integral of functions
• Connect the integral to the area under the graph of the function over a defined interval
  ○ This unit will consist of at least 2 to 3 quizzes and 2 to 3 major tests