

**DEPARTMENT: MATHEMATICS****NAME OF COURSE: ADVANCED PLACEMENT CALCULUS BC****GENERAL DESCRIPTION:**

Calculus AB and Calculus BC are primarily concerned with developing students' understanding of the concepts of calculus and providing experience with its methods and applications. The courses emphasize a multi-representational approach to calculus with concepts, results, and problems being expressed geometrically, numerically, analytically, and verbally. The connections among these representations also are important.

Both courses are intended to be equally challenging and demanding. Calculus BC is an extension of Calculus AB rather than an enhancement; common topics require a similar depth of understanding.

Broad concepts and widely applicable methods are emphasized. The focus of the courses is neither manipulation nor memorization of an extensive taxonomy of functions, curves, theorems, or problem types. Thus, although facility with manipulation and computational competence are important outcomes, they are not the core of these courses.

Technology is used regularly by students and teachers to reinforce the relationships among the multiple representations of functions, to confirm written work, to implement experimentation, and to assist in interpreting results.

Through the use of unifying themes of derivatives, integrals, limits, approximations, and applications and modeling, the course becomes a cohesive whole rather than a collection of unrelated topics.

**PREREQUISITES**

Before studying calculus, all students should have completed four years of secondary mathematics designed for college-bound students: courses in which they studied algebra, geometry, trigonometry, analytic geometry, and elementary functions. These functions include those that are linear, polynomial, rational, exponential, logarithmic, trigonometric, inverse trigonometric, and piecewise defined. In particular, before studying calculus, students must be familiar with the properties of functions, the algebra of functions, and the graphs of functions. Students must also understand the language of functions (domain and range, odd and even, periodic, symmetry, zeros, intercepts, and so on) and know the values of the trigonometric functions of

common angles such as  $0, \frac{\pi}{6}, \frac{\pi}{4}, \frac{\pi}{3},$  and  $\frac{\pi}{2}$ .

**GRADING PROCEDURES:**

The grade for each of the four marking periods is determined by unit exams, quizzes, a cumulative quarterly examination, and timely completion of homework assignments. Students will take a departmental midyear exam which will count as 20% of their second quarter grade. A final exam or project will be given and will be used to determine their fourth quarter grade. The final average will be determined by averaging the four quarter grades.

**TEXTBOOK:** Calculus, Early Transcendental, 6<sup>th</sup> edition, James Stewart