Introduction to Calculus and Statistics

Mathematics Practices

- Make Sense of Problems and Persevere in Solving Them
- Reason Abstractly and Quantitatively
- Construct Viable Arguments and Critique the Reasoning of Others
- Model with Mathematics
- Use Appropriate Tools Strategically
- Attend to Precision
- Look For and Make Sense of Structure
- Look For and Express Regularity in Repeated Reasoning

Scope and Sequence

Unit Title	Essential Understandings	Application of Understanding	Summative Assessments	Other Major Assignments and Activities
Rates of change	• Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval • Use average rates of change to estimate instantaneous rates of change • Find derivative functions from algebraic rules, using methods of differentiation	• Draw a velocity graph given a displacement graph, and vice versa • Estimate rate of change from a graph or table	• Test, with and without use of a graphing calculator • Problem sets	• Desmos explorations of functions and their derivatives • Graphing stories • Reboots to practice prerequisite skills
Limits	• Estimate limits from graphs of both continuous and	• Find the limit of algebraically defined functions where	• Quiz • Problem set	• Desmos explorations

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	discontinuous functions. ● Understand left-hand, right-hand limits ● Understand infinite limits and limits to infinity	there are removable discontinuities ● Identify asymptotes and state conclusions correctly using limit notation		
Integrals	● Interpret integral notation ● Correctly apply definite integrals to calculate accumulated values of functions	● Match integrals with descriptions ● Calculate definite integrals using technology and correctly interpret results	● Quiz ● Complete series of AP integration problems	● Trapezoidal Riemann Sum assignment
Descriptive Statistics	● Summarize, represent, and interpret data on a single measurement variable. Use calculators, spreadsheets, and other technology as appropriate.	● Create boxplots, dotplots and histograms to represent data ● Calculate z-scores and use z-tables to draw appropriate conclusions about normal distributions	● Quiz ● Problem Set	● Normal body activity comparing heart rates and body temperatures by sex
Sampling	● Understand the pros and cons of using various sampling methods in terms of efficiency, convenience, and validity.	● Use various sampling methods on the same population and compare and contrast results with population statistics.	● Quiz ● Random rectangles assignment	● Sampling students using various methods, compare distances from school
Inferential Statistics	● Use random sampling to draw inferences about a population ● Understand the concept of a sampling distribution and the relationship between population distributions	● Create and interpret confidence intervals from samples. ● Draw conclusions about sampling distributions given population parameters	● Confidence Intervals and CLT quiz	● Project: Create an Index

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	and sample distributions			