

Southern Cayuga Central School District – Curriculum Map

Subject: AP/CCC Calculus

School Year: 2020-2021

Title or Topics w/ NYS Standards	Essential Questions & Vocabulary	Content Skills (Activities to cover Essential Questions)	Major Assessments (Tests, Project, etc.)	Time Frame
Limits and Continuity	Piecewise function, trigonometric functions, vertical asymptote, infinity, removable discontinuity, indeterminate form, horizontal asymptote, continuous, jump discontinuity, average rate of change, slope, secant, tangent, derivative	Evaluate limits algebraically and graphically, determine continuity using the three step definition, determine types of discontinuities, find the average rate of change, write equations of tangent/normal lines, use the limit definition for a derivative to derive functions	Quiz (2)	3 weeks
Derivatives	Instantaneous rate of change, power, product/quotient, chain rules	Evaluate derivatives using power, product/quotient, and chain rules	Quiz (2)	2 weeks
			<i>Above topics assessed on marking period 1 exam</i>	
Trigonometry and differentiability	Sine, cosine, tangent, cosecant, secant, cotangent, continuity, one-side limits	Evaluate derivatives of trigonometric functions, determine differentiability	Quiz	5 days
Implicit differentiation and derivatives of exponential functions (base e only)	Implicit/explicit differentiation, variable of differentiation, exponential functions, Euler's number, related rates	Use implicit differentiation techniques to find first and second derivatives of relations, derive exponential functions, solve applied related rates problems	Quiz (2)	1.5 weeks
Curve sketching	1 st /2 nd derivative test, increasing/decreasing, relative extrema, local minimum/maximum, absolute minimum/maximum, concavity, end behavior	Apply first and second derivative tests to determine intervals of increase/decrease, relative/absolute extrema, and concavity. Problems will be algebraic and graphical in nature.	Quiz (2)	2 weeks
			<i>Above topics assessed on</i>	

			marking period 2 exam	
Straight line motion	Position, velocity, acceleration	Use first/second derivatives to determine velocity and acceleration. Analyze position, velocity, and acceleration functions to determine intervals where motion is speeding up and slowing down	Quiz	2 days
Intermediate Value Theorem, Rolle's Theorem, and The Mean Value Theorem	Continuous, differentiable, average rate of change, instantaneous rate of change	Apply the Intermediate Value Theorem, Rolle's Theorem, and The Mean Value Theorem to numeric and algebraic problems	Quiz	3 days
Optimization	Maximum, minimum	Derivative application; minimize and maximize functions	Quiz	2 days
Derivatives of Natural Logarithms	Natural log, chain rule	Find first and second derivatives of function/relations involving natural logarithms	Quiz	1 day
Integration	Riemann Sums, trapezoid rule, definite/indefinite integration, trigonometry, u-substitution, accumulation function	Introduction to integration by geometric means, evaluate basic indefinite integrals, as well as complicated indefinite integrals via u-substitution, work with functions defined by integrals	Quiz	3 weeks
L'Hopital's Rule	Limit, derivative, L'Hopital's Rule	Evaluate limits of indeterminate form using L'Hopital's Rule	Take-Home Quiz	1 day
			Above topics assessed on marking period 3 exam	
Differential equations, Fundamental Theorem of Calculus (Part II), definite integration	Differential equation, Fundamental Theorem (Part II), definite integration, natural logarithm, exponential functions	Solve differential equations, use the Fundamental Theorem of Calculus (Part II) to evaluate definite integrals, use u-substitution to evaluate definite integrals, integrate natural logs and exponential functions (both indefinite and definite)	Quiz	1 week
Integration and straight line motion, Fundamental Theorem of Calculus (Part I), average value	Position, velocity, acceleration, Fundamental Theorem Calculus (Part I), average value	Solve application problems involving motion by using integration, evaluate integrals and derivatives using the Fundamental Theorem of Calculus (Part I), use integration to find the average value of a function	Quiz	1 week
Area and volume	Area, volume, washer method, disk method, volume	Use integration to find the area between curves, volume of revolution (washer and	Quiz	2 weeks

	of revolution, cross sections	disk methods), and volume via cross sections		
			<i>Above topics assessed on marking period 4 exam</i>	
Logarithm property review, advanced differential equations	Logarithm, differential equation	Review logarithm properties, solve advanced differential equations using a variety of algebraic techniques	Quiz	3 days
Slope fields	Slope field, differential equations, solution equation	Graphically and algebraically evaluate slope fields	Quiz	2 days
AP EXAM REVIEW		In-class practice exam, practice with released multiple choice and short answer questions, mini-lessons	AP Exam	3 weeks
Derivatives of inverse functions and inverse trigonometric functions	Inverse function, trigonometric function	Basic derivative rules for inverse functions	AP Exam	2 days
Newton's method of roots, error in measurement, exponential growth/decay	Newton's method of roots, error in measurement, exponential growth/decay	Review for the Cayuga Community College final exam, plus additional topics: find roots using Newton's method, identify the error in measurement given various constraints, solve exponential growth/decay application problems	CCC Final Exam	2 weeks