Calculus BC Schedule-- Chapter 9 Infinite Series

Date	Lesson	HW Assignment
25-Feb	9.1 Power Series	**HW2**--p.481 #9,13,14,21,54,55, Video on Power Series Theorems
26-Feb	9.1 Power Series	**HW3**--p.481 #23,29,33,69,70,71, p. 502 Quick Quiz #1,4
1-Mar	**NO SCHOOL**--Pulaski Day	**NO Additional Homework**
2-Mar	9.4 Radius of Convergence	**HW4**--p.511 #7,9,11,23,25,27,49
3-Mar	9.4 Radius of Convergence	**HW5**--p.511 #15,17,29,31,34,37,41,58
4-Mar	9.5 Testing Convergence at Endpoints	**HW6**--p.523 #1,2,5,6,9,11,13,17
5-Mar	9.5 Testing Convergence at Endpoints	**HW7**--p.523 #23,24,25,27,30,31
8-Mar	*Check & Connect Day*	**AP Review Practice Problems**
9-Mar	9.5 Testing Convergence at Endpoints	**HW8**--p.523 #38,39,41,43,47, Video on Power Series
10-Mar	9.2 Taylor Series	**HW9**--p.492 #2,3,13,15,19,22,25
11-Mar	9.2 Taylor Series	**HW10**--p.492 #5,7,8,24,28,41
12-Mar	9.2 Taylor Series **Quick M/C Quiz for Unit 9 (9.1,9.4,9.5)**	**HW11**--AP Taylor Series Practice
15-Mar	*PLT Planning Day*	**AP Review Practice Problems**
16-Mar	9.3 Taylor's Theorem	**HW12**--p.500 #1,3,7,27,39,43
17-Mar	9.3 Taylor's Theorem	**HW13**--p.500 #13,19,20,23,32,41
18-Mar	9.3 Taylor's Theorem	**HW14**--AP Practice Problems
19-Mar	9.5 Testing Convergence at Endpoints	**HW15**--AP Series Problems
22-Mar	*Check & Connect Day*	**AP Review Practice Problems**
23-Mar	**Quick M/C Quiz for Unit 9** Chapter 9 Review	**HW16**--p.526 #1,3,7,12,19,21,23, 27,37,43,45,47,49,53
24-Mar	Chapter 9 Review	**Study for Test**
25-Mar	**Chapter 9 Test**	**AP Review Begins! AP Calculus Exam Monday, May 24 @ 8am.**

Calculus BC Schedule-- Chapter 9 Infinite Series

Unit 9: Infinite Series

LIM-7
Applying limits may allow us to determine the finite sum of infinitely many terms.

LEARNING OBJECTIVE	ESSENTIAL KNOWLEDGE
LIM-7.A Determine whether a series converges or diverges. **BC ONLY**	**LIM-7.A.1** The nth partial sum is defined as the sum of the first n terms of a series. **BC ONLY** **LIM-7.A.2** An infinite series of numbers converges to a real number S (or has sum S), if and only if the limit of its sequence of partial sums exists and equals S. **BC ONLY**
LIM-7.A Determine whether a series converges or diverges. **BC ONLY**	**LIM-7.A.3** A geometric series is a series with a constant ratio between successive terms. **BC ONLY** **LIM-7.A.4** If a is a real number and r is a real number such that $\lvert r\rvert < 1$, then the geometric series $\sum_{n=0}^{\infty} ar^n = \frac{a}{1-r}$. **BC ONLY**
LIM-7.A Determine whether a series converges or diverges. **BC ONLY**	**LIM-7.A.5** The nth term test is a test for divergence of a series. **BC ONLY**
LIM-7.A Determine whether a series converges or diverges. **BC ONLY**	**LIM-7.A.6** The integral test is a method to determine whether a series converges or diverges. **BC ONLY**
LIM-7.A Determine whether a series converges or diverges. **BC ONLY**	**LIM-7.A.7** In addition to geometric series, common series of numbers include the harmonic series, the alternating harmonic series, and p-series. **BC ONLY**
LIM-7.A Determine whether a series converges or diverges. **BC ONLY**	**LIM-7.A.8** The comparison test is a method to determine whether a series converges or diverges. **BC ONLY** **LIM-7.A.9** The limit comparison test is a method to determine whether a series converges or diverges. **BC ONLY**
LIM-7.A Determine whether a series converges or diverges. **BC ONLY**	**LIM-7.A.10** The alternating series test is a method to determine whether an alternating series converges. **BC ONLY**
LIM-7.A Determine whether a series converges or diverges. **BC ONLY**	**LIM-7.A.11** The ratio test is a method to determine whether a series of numbers converges or diverges. **BC ONLY** **EXCLUSION STATEMENT** *The nth term test for divergence, and the integral test, comparison test, limit comparison test, alternating series test, and ratio test for convergence are assessed on the AP Calculus BC Exam. Other methods are not assessed on the exam. However, teachers may include additional methods in the course, if time permits.*
LIM-7.A Determine whether a series converges or diverges. **BC ONLY**	**LIM-7.A.12** A series may be absolutely convergent, conditionally convergent, or divergent. **BC ONLY** **LIM-7.A.13** If a series converges absolutely, then it converges. **BC ONLY** **LIM-7.A.14** If a series converges absolutely, then any series obtained from it by regrouping or rearranging the terms has the same value. **BC ONLY**
LIM-7.B Approximate the sum of a series. **BC ONLY**	**LIM-7.B.1** If an alternating series converges by the alternating series test, then the alternating series error bound can be used to bound how far a partial sum is from the value of the infinite series. **BC ONLY**

LIM-8
Power series allow us to represent associated functions on an appropriate interval.

LEARNING OBJECTIVE	ESSENTIAL KNOWLEDGE
LIM-8.A Represent a function at a point as a Taylor polynomial. **BC ONLY**	**LIM-8.A.1** The coefficient of the nth degree term in a Taylor polynomial for a function f centered at $x = a$ is $\frac{f^{(n)}(a)}{n!}$. **BC ONLY** **LIM-8.A.2** In many cases, as the degree of a Taylor polynomial increases, the nth degree polynomial will approach the original function over some interval. **BC ONLY**
LIM-8.B Approximate function values using a Taylor polynomial. **BC ONLY**	**LIM-8.B.1** Taylor polynomials for a function f centered at $x = a$ can be used to approximate function values of f near $x = a$. **BC ONLY**
LIM-8.C Determine the error bound associated with a Taylor polynomial approximation. **BC ONLY**	**LIM-8.C.1** The Lagrange error bound can be used to determine a maximum interval for the error of a Taylor polynomial approximation to a function. **BC ONLY** **LIM-8.C.2** In some situations, the alternating series error bound can be used to bound the error of a Taylor polynomial approximation to the value of a function. **BC ONLY**
LIM-8.D Determine the radius of convergence and interval of convergence for a power series. **BC ONLY**	**LIM-8.D.1** A power series is a series of the form $\sum_{n=0}^{\infty} a_n(x-r)$, where n is a non-negative integer, $\{a_n\}$ is a sequence of real numbers, and r is a real number. **BC ONLY** **LIM-8.D.2** If a power series converges, it either converges at a single point or has an interval of convergence. **BC ONLY** **LIM-8.D.3** The ratio test can be used to determine the radius of convergence of a power series. **BC ONLY** **LIM-8.D.4** The radius of convergence of a power series can be used to identify an open interval on which the series converges, but it is necessary to test both endpoints of the interval to determine the interval of convergence. **BC ONLY** **LIM-8.D.5** If a power series has a positive radius of convergence, then the power series is the Taylor series of the function to which it converges over the open interval. **BC ONLY** **LIM-8.D.6** The radius of convergence of a power series obtained by term-by-term differentiation or term-by-term integration is the same as the radius of convergence of the original power series. **BC ONLY**
LIM-8.E Represent a function as a Taylor series or a Maclaurin series. **BC ONLY**	**LIM-8.E.1** A Taylor polynomial for $f(x)$ is a partial sum of the Taylor series for $f(x)$. **BC ONLY**
LIM-8.F Interpret Taylor series and Maclaurin series. **BC ONLY**	**LIM-8.F.1** The Maclaurin series for $\frac{1}{1-x}$ is a geometric series. **BC ONLY** **LIM-8.F.2** The Maclaurin series for $\sin x$, $\cos x$, and e^x provides the foundation for constructing the Maclaurin series for other functions. **BC ONLY**
LIM-8.G Represent a given function as a power series. **BC ONLY**	**LIM-8.G.1** Using a known series, a power series for a given function can be derived using operations such as term-by-term differentiation or term-by-term integration, and by various methods (e.g., algebraic processes, substitutions, or using properties of geometric series). **BC ONLY**