

## BC AP Calculus Syllabus – First Semester

### Unit 1 – Review and enrichment of AB Topics; Various Chapters

<b>Book Section</b>	<b>Topic</b>	<b>Time (days)</b>	<b>Assignment</b>
2-6 and 5-6	The Intermediate and Mean Value Theorems	1	2007 AP Exam released problem
4-7	Derivatives of Parametric Functions	1	p. 163 – 66; Q1 – 10, 1 – 9 odd
6.1 (Hughes - Hallett)	The Fundamental Theorem of Calculus – revisited	2	p. 285 – 7 (Hughes – Hallett); 1 – 25 odd
5-11	Simpson's Rule	1	p. 229 – 30; 5, 7 p. 236 - 39; Q1 – 10, 1,3,7,9,11
	Quiz #1-1	1	
6-8	L'Hôspital's Rule	2	p. 287 – 90; Q1 – 10, 1 – 33 odd, 36, 37
7-5	Euler's Method	2	p. 334 – 38; Q1- 10, 1 – 9 odd
7-6	Predator – Prey Problems	1	p. 339 – 40; Q1 – 10, 1 – 15 all
	Quiz #1-2	1	
	Review	1	Review Problems Provided
	Unit 1 Exam	1	

Total Time: 14 days

### Unit 2 – Integration Tricks; Chapter 9 Foerster

<b>Book Section</b>	<b>Topic</b>	<b>Time (days)</b>	<b>Assignment</b>
9 – 1	Integral of the Product of two Functions	1	p. 436; 1 – 7 all
9 – 2	Integration By Parts	1	p. 439; Q1 – 10, 1 – 11 odd
9 – 3	Rapid Repeated Integration	2	p. 443 – 45; Q1 – 10, 1 – 43 odd, 44, 45, 47, 49, 50
9 – 4	Reduction Formulas for Integration	2	p. 449 – 51; Q1 – 10, 1 – 19 odd, 20, 21
9 – 5	Integrating Special Powers of Trig Functions	2	p. 453 – 55; Q1 – 10, 1 – 37 odd
9 – 6	Integration By Trigonometric Substitution	2	p. 459 – 61; Q1 – 10; 1 – 23 odd
	Quiz #2-1	1	
9 – 7	Integration of Rational Functions by Partial Fractions	2	p. 464 – 468; Q1 – 10, 1 – 23 odd, 24
9 – 8	Integrals of Inverse Trig Functions	1	p. 471; Q1 – 10, 1 - 9
9 – 10	Improper Integrals	2	p. 488 – 90; Q1 – 10, 1 – 21 odd, 22, 23, 24

<b>Book Section</b>	<b>Topic</b>	<b>Time (days)</b>	<b>Assignment</b>
9 – 11	Miscellaneous Integral Practice	3	p. 493 – 5; 1 – 99 odd (skip any hyperbolic functions)
	Quiz #2-2	1	
9 – 12 to 9 – 13	Chapter Review	2	p. 497 ; 1 p. 498 – 500; R0 – R7, R10 - R12
	Unit 2 Test	1	

Total Time: 23 days

### Unit 3 Applications of Integration and Differentiation Chapter 8 Foerster + Finney, Demana Waits and Kennedy and Hughes – Hallett

<b>Book Section</b>	<b>Topic</b>	<b>Time (days)</b>	<b>Assignment</b>
8-6	Volumes of Solids of Rotation – Shells	2	p. 399 – 402; Q1 – 10, 1 – 21 odd, 24
	Volumes of Solids – Mixed Practice	2	Finney, Demana Waits and Kennedy: p. 406-09; 1 – 19 odd, 33 – 37 odd, 49, 51, 52
	Quiz #3-1	1	
8-7	Length of a plane curve – arc length	2	p. 406 – 09; Q1 – 10, 1 – 19 odd, 25, 27, 31, 32
8-8	Areas of Surfaces of Rotation	2	p. 413 – 415; Q1 - 10, 1 - 15 odd, 18, 19, 20
8-9	Lengths and Areas for Polar Coordinates	2	p. 421 – 24; Q1 – 10, 1 – 13 odd, 18, 19
	Optimization and Modeling Problems	1	Hughes – Hallett: p. 202; 1 – 9 odd, 11, 12, 18, 19
	Quiz #3-2	1	
8-10	Unit Review	2	p. 427 – 431; R0 – R7, R9, C1, C4, C6
	Unit 3 Test	1	

Total Time: 16 days

### Unit 4 Calculus of Motion and Work – Foerster Chapter 10 and 11

<b>Book Section</b>	<b>Topic</b>	<b>Time (days)</b>	<b>Assignment</b>
	Review Problems: Related Rates of Change and Average Value Problems	2	to be announced
10-5	Minimal Path Problems	1	p. 525-29; Q1 – 10; 1 – 7 all, 11, 13, 14
10-6	Max – Min Problems in Motion and Elsewhere	1	p. 530 – 32; Q1 – 10, 1 -11 all

<b>Book Section</b>	<b>Topic</b>	<b>Time (days)</b>	<b>Assignment</b>
10-7	Vector Functions for Motion in a Plane	2	p. 541 – 548; Q1 – 10, 1 – 13 odd
	Quiz #4-1		
11-1	Review of Work – Force times Displacement	1	p. 557; 1 - 5
11-2	Work Done by a Variable Force	3	p. 561 – 3; Q1 – 10, 1 – 7 odd, 8, 9
	Quiz #4-2	1	
	Chapter Review	1	p. 548 – 9; R0 – R7 p. 551 – 2; C1, C4, C6 p. 592; R1, R2 p. 595; T1
	Unit 4 Exam	1	

Total Time: 13 days

### Unit 5 The Calculus of Functions Defined by Power Series – Foerster Chapter 12

<b>Book Section</b>	<b>Topic</b>	<b>Time (days)</b>	<b>Assignment</b>
12 – 1	Introduction to Power Series	1	p. 599; 1 - 7
12 – 2	Geometric Sequences and Series As Mathematical Models	1	p. 603 - 06; Q1 – 10, 1 – 9 odd
12 – 3	Power Series for an Exponential Function	1	p. 607 – 08; Q1 – 10, 1 – 11 all
12 – 4	Power Series for Other Elementary Functions	1	p. 613 – 15; Q1 – 10, 1 – 7 odd
12 – 5	Taylor and MacLaurin Series and Operations on these Series	3	p. 619 – 21; Q1 – 10, 1 – 9 odd, 13 – 29 odd, 31 – 39 odd, 40
	Quiz #5-1	1	
12 – 6	Interval of Convergence for a Series, The Ratio Technique	3	p. 626 – 30; Q1 – 10, 1 – 7 odd, 11 – 19 odd, 21, 23, 24, 25, 26
12 – 7	Convergence of Series at Then End of the Convergence Interval	4	p. 637 – 42; Q1 – 10, 1 – 11 all, 14 - 30 all
12 – 8	Error Analysis for Series	2	p. 646 – 49; Q1 – 10, 3, 7, 10, 13 – 17 all
	Quiz #5-2	1	
12 – 9	Chapter 12 Review	2	p. 649 – 52; R0 – R8, C1
	Unit 5 Exam	1	

Total Days: 21

**Note:** The number of days for each unit is approximate. This syllabus covers all of the material leading to the AP exam. The remaining time will be spent on preparation for the exam followed by topics and activities after the AP exam.