

## Calculus AB Schedule -- Unit 6 Differential Equations and Mathematical Modeling

	Monday	Tuesday	Wednesday	Thursday	Friday
<b>Week 20</b>					<i>31-Jan</i>
<b>Lesson</b>					7.1 Ordinary Differential Equations
<b>HMWK</b>					<b>HW1</b> --p.543 #31,35,38,39, AP Practice #4, p.542 #21
<b>Week 21</b>	<i>3-Feb</i>	<i>4-Feb</i>	<i>5-Feb</i>	<i>6-Feb</i>	<i>7-Feb</i>
<b>Lesson</b>	7.2 Separable Differential Equations	<b>1/2 DAY</b> 7.2 Separable Differential Equations	7.2 Separable Differential Equations	4.4 Indeterminate Forms & L'Hôpital's Rule	4.4 Indeterminate Forms & L'Hôpital's Rule
<b>HMWK</b>	<b>HW2</b> --p.551 #15, 18,19,21, AP Practice #1,2,3	<b>HW3</b> --p.551 #22, 23, AP Practice #5,9, p.569 #16b	<b>HW4</b> --p.551 #16, 17,20, AP Practice #4,6	<b>HW5</b> --p.299 #7, 9,27,29,34,37, AP Practice #1,8	<b>HW6</b> --p.299 #35, 39,40,41, AP Practice #2,7
<b>Week 22</b>	<i>10-Feb</i>	<i>11-Feb</i>	<i>12-Feb</i>	<i>13-Feb</i>	<i>14-Feb</i>
<b>Lesson</b>	7.3 Slope Fields	7.3 Slope Fields <b>Quiz 7.2 &amp; 4.4</b>	<b>EARLY DISMISSAL</b> 7.3 Slope Fields	7.3 Slope Fields	<i>Unit 6 Review (Book Chapters 4 &amp; 7)</i>
<b>HMWK</b>	<b>HW7</b> --Calculator p.557 Graph slope field in calculator & sketch the particular solution on paper, #11-16 <b>Study for Quiz 7.2 &amp; 4.4</b>	<b>HW8</b> --Sketch slope fields from handout #29-34	<b>HW9</b> --p.557 #17, 18, AP Practice #1,3, p.570 AP Practice #5	<b>HW10</b> --AP FRQs	<b>HW11</b> --p.304 23, 27,31, AP Practice 3, p.569 #11b,14b, AP Practice #5
<b>Week 23</b>	<i>17-Feb</i>	<i>18-Feb</i>	<i>19-Feb</i>		
<b>Lesson</b>	<b>NO SCHOOL</b> -- President's Day	AP Activity: Unit 6 (Book Chapters 4 & 7)	<b>EARLY DISMISSAL</b> Unit 6 TEST		
<b>HMWK</b>	<b>No Additional Homework</b>	AP Activity: Unit 6 due Feb 25	<b>No Additional Homework</b>		

# Calculus AB Schedule -- Unit 6 Differential Equations and Mathematical Modeling

## Unit 6: Differential Equations & Mathematical Modeling

### FUN-7

Solving differential equations allows us to determine functions and develop models.

#### LEARNING OBJECTIVE

##### FUN-7.A

Interpret verbal statements of problems as differential equations involving a derivative expression.

##### FUN-7.B

Verify solutions to differential equations.

##### FUN-7.C

Estimate solutions to differential equations.

##### FUN-7.C

Estimate solutions to differential equations.

##### FUN-7.D

Determine general solutions to differential equations.

##### FUN-7.E

Determine particular solutions to differential equations.

#### ESSENTIAL KNOWLEDGE

##### FUN-7.A.1

Differential equations relate a function of an independent variable and the function's derivatives.

##### FUN-7.B.1

Derivatives can be used to verify that a function is a solution to a given differential equation.

##### FUN-7.B.2

There may be infinitely many general solutions to a differential equation.

##### FUN-7.C.1

A slope field is a graphical representation of a differential equation on a finite set of points in the plane.

##### FUN-7.C.2

Slope fields provide information about the behavior of solutions to first-order differential equations.

##### FUN-7.C.3

Solutions to differential equations are functions or families of functions.

##### FUN-7.D.1

Some differential equations can be solved by separation of variables.

##### FUN-7.D.2

Antidifferentiation can be used to find general solutions to differential equations.

##### FUN-7.E.1

A general solution may describe infinitely many solutions to a differential equation. There is only one particular solution passing through a given point.

##### FUN-7.E.2

The function  $F$  defined by  $F(x) = y_0 + \int_a^x f(t) dt$  is a particular solution to the differential equation  $\frac{dy}{dx} = f(x)$ , satisfying  $F(a) = y_0$ .

##### FUN-7.E.3

Solutions to differential equations may be subject to domain restrictions.

##### FUN-7.F

Interpret the meaning of a differential equation and its variables in context.

##### FUN-7.F.1

Specific applications of finding general and particular solutions to differential equations include motion along a line and exponential growth and decay.

##### FUN-7.F.2

The model for exponential growth and decay that arises from the statement "The rate of change of a quantity is proportional to the size of the quantity" is  $\frac{dy}{dt} = ky$ .

##### FUN-7.G

Determine general and particular solutions for problems involving differential equations in context.

##### FUN-7.G.1

The exponential growth and decay model,  $\frac{dy}{dt} = ky$ , with initial condition  $y = y_0$  when  $t = 0$ , has solutions of the form  $y = y_0 e^{kt}$ .