

Detailed Course Schedule for Phys (110)

| Week # | Date | Topic |
|---------------|-------------|--|
| 1 | Mon | General Introduction Chapter (1) Measurement (1-1) (1-2),(1-3),(1-4 page 3 Only) , (1-5,1-6,1-7 definition only) |
| | Wed | Chapter(2) Motion along a straight line (2-1) (2-2), (2-3), (2-4), S.P (2-1). |
| 2 | Sat | (2-5), S.P (2-3), (2-6), S.P (2-4 a-b). |
| | Mon | (2-7), S.P (2-5). |
| | Wed | (2-9), S.P (2-7), S.P (2-8). |
| 3 | Sat | Chapter (3) Vectors(3-1) (3-2), (3-3), S.P (3-1). |
| | Mon | (3-4), S.P (3-2), (3-5). |
| | Wed | (3-6), S.P (3-4). |

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|---------------|-------------|---|
| 4 | Sat | (3-8), S.P (3-7). |
| | Mon | (3-7 the vector product), S.P (3-9). |
| | Wed | Chapter(4)Motion in Two and Three Dimensions(4-1) (4-2), S.P (4-1), S.P (4-2 a). |
| 5 | Sat | (4-3), S.P (4-3), (4-4), S.P (4-4). |
| | Mon | S.P (4-5) ,(4-5 only page 65). |
| | Wed | (4-6 for this section you must solve problem21 and problem 38). |
| 6 | Sat | S.P (4-7), (4-7) but the proof of Eq.4-34 (NO), S.P (4-10) |
| | Mon | Chapter(5) Force and Motion-I (5-1) (5-2), (5-3), (5-4)(but inertial reference frames (NO)), (5-5). |
| | Wed | (5-6), S.P (5-1), S.P (5-2). |

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| 7 | Sat | (5-7), (5-8). |
| | Mon | (5-9), S.P (5-4), S.P (5-5). |
| | Wed | S.P (5-8), S.P (5-9). |
| 8 | Sat | Chapter(6) Force and Motion—II (6-1) (6-2 only page117), (6-3), S.P (6-1). |
| | Mon | S.P (6-2 only calculating acceleration a), (6-5), S.P (6-6). |
| | Wed | Chapter(7) Kinetic Energy and Work (7-1) (7-2), (7-3), S.P (7-1). |

| Week # | Date | Topic |
|---------------|-------------|---|
| 9 | Sat | (7-4), (7-5). |
| | Mon | S.P (7-2), S.P (7-3). |
| | Wed | (7-6 work done in lifting and lowering an object (NO)) , S.P (7-4-a) |
| 10 | Sat | (7-7 work done by an applied force (NO)), S.P (7-7). |
| | Mon | (7-9), S.P (7-11). |
| | Wed | Chapter(9) Center of Mass and Linear Momentum (9-1) (9-2 , (solid bodies NO)) , S.P(9-1) |

| Week # | Date | Topic |
|---------------|-------------|--|
| 11 | Sat | (9-3 to equation 9-15, (proof of equation 9-14 NO) S.P(9-3). |
| | Mon | (9-4),(9-5). |
| | Wed | (9-6 for this section you must solve problem 23) |
| 12 | Sat | (9-7), S.P.(9-6),(9-8). |
| | Mon | (9-9) ,Checkpoint 7 |
| | Wed | (9-10) ,Checkpoint 8 |

Detailed Course Schedule for Phys (110)

| Week # | Date | Topic |
|--------|------|---|
| 1 | Tue | 1-General Introduction 2-Chapter (1) Measurement (1-1) (1-2),(1-3),(1-4 page 3 Only) , (1-5,1-6,1-7 definition) |
| 2 | sun | Chapter(2) Motion along a straight line (2-1) (2-2), (2-3), (2-4), S.P (2-1), (2-5), S.P (2-3) |
| | Tue | (2-6), S.P (2-4 a-b) (2-7), S.P (2-5). |
| 3 | Sun | (2-9), S.P (2-7), S.P (2-8). Chapter (3) Vectors (3-1) (3-2). |
| | Tue | (3-3), S.P (3-1), (3-4), S.P (3-2). |

| Week # | Date | Topic |
|---------------|-------------|--|
| 4 | Sun | (3-5), (3-6), S.P (3-4). |
| | Tue | (3-8), S.P (3-7), (3-7 the vector product), S.P (3-9). |
| 5 | Sun | Chapter(4)Motion in Two and Three Dimensions (4-1) (4-2), S.P (4-1), S.P (4-2 a), (4-3). |
| | Tue | S.P (4-3),(4-4), S.P (4-4), S.P (4-5). |
| 6 | Sun | (4-5 only page 65) (4-6 for this section you must solve problem21 and problem 38). |
| | Tue | S.P (4-7), (4-7) but the proof of Eq.4-34 (NO), S.P (4-10). |

| Week # | Date | Topic |
|--------|------|--|
| 7 | Sun | Chapter(5) Force and Motion-I (5-1) (5-2), (5-3), (5-4(but inertial reference frames (NO))), (5-5). (5-6), S.P (5-1). |
| | Tue | S.P (5-2), (5-7), (5-8). |
| 8 | Sun | (5-9), S.P (5-4), S.P (5-5). S.P (5-8). |
| | Tue | S.P (5-9), Chapter(6) Force and Motion—II (6-1) (6-2 only page117), (6-3). |
| 9 | Sun | S.P (6-1),S.P (6-2 only calculating acceleration a), (6-5), S.P (6-6). |
| | Tue | Chapter(7) Kinetic Energy and Work (7-1) (7-2), (7-3), S.P (7-1). (7-4), (7-5). |

| Week # | Date | Topic |
|---------------|-------------|--|
| | | |
| 10 | Sun | S.P (7-2), S.P (7-3). (7-6 work done in lifting and lowering an object (NO)) , S.P (7-4-a). |
| | Tue | (7-7 work done by an applied force (NO)), S.P (7-7), (7-9), S.P (7-11). |
| 11 | Sun | Chapter(9) Center of Mass and Linear Momentum (9-1) (9-2 , (solid bodies NO)) , S.P(9-1), (9-3 to equation 9-15, (proof of equation 9-14 NO) S.P(9-3). |
| | Tue | (9-4),(9-5), (9-6 for this section you must solve problem 23). |
| 12 | Sun | (9-7), S.P.(9-6),(9-8). |
| | Tue | (9-9) ,Checkpoint 7, (9-10) ,Checkpoint 8 |

Chapter 4

Problem 21. (a) From Eq. 4-22 (with $\theta_0 = 0$), the time of flight is

$$t = \sqrt{\frac{2h}{g}} = \sqrt{\frac{2(45.0 \text{ m})}{9.80 \text{ m/s}^2}} = 3.03 \text{ s.}$$

(b) From (Eq. 4-21)

$$\Delta x = v_0 t = (250 \text{ m/s})(3.03 \text{ s}) = 758 \text{ m.}$$

(c) from Eq.(4-23)

$$|v_y| = gt = (9.80 \text{ m/s}^2)(3.03 \text{ s}) = 29.7 \text{ m/s.}$$

Problem 38. . (a) from Eq. 4-21

$$t = \frac{\Delta x}{v_x} = \frac{22.0 \text{ m}}{(25.0 \text{ m/s})\cos 40.0^\circ} = 1.15 \text{ s.}$$

The vertical distance (from Eq. 4-22)

$$\Delta y = (v_0 \sin \theta_0)t - \frac{1}{2}gt^2 = (25.0 \text{ m/s})\sin 40.0^\circ(1.15 \text{ s}) - \frac{1}{2}(9.80 \text{ m/s}^2)(1.15 \text{ s})^2 = 12.0 \text{ m.}$$

(b) $v_x = v_0 \cos 40.0^\circ = 19.2 \text{ m/s.}$

(c) from (Eq. 4-23)

$$v_y = v_0 \sin \theta_0 - gt = (25.0 \text{ m/s}) \sin 40.0^\circ - (9.80 \text{ m/s}^2)(1.15 \text{ s}) = 4.80 \text{ m/s.}$$

(d) As $v_y > 0$ when the ball hits the wall, it has not reached the highest point yet.

Chapter 9

Problem 23

(a) From Eq. 9-35

$$F_{\text{avg}} = \frac{J}{\Delta t} = \frac{32.4 \text{ N}\cdot\text{s}}{2.70 \times 10^{-2} \text{ s}} = 1.20 \times 10^3 \text{ N}$$

From Eq. Eq. 9-31

$$-F_{\text{avg}}\Delta t = mv_f - mv_i.$$

$$v_f = \frac{mv_i - F_{\text{avg}}\Delta t}{m} = \frac{(0.40 \text{ kg})(14 \text{ m/s}) - (1200 \text{ N})(27 \times 10^{-3} \text{ s})}{0.40 \text{ kg}} = -67 \text{ m/s.}$$

$$|v_f| = 67 \text{ m/s.}$$

(b) The velocity is in the $-x$ direction (opposite direction of travel)

(c) $F_{\text{avg}} = 1.20 \times 10^3 \text{ N.}$

(d) The impulse on the ball is $-x$, same as the applied force