# Conceptual Dynamics 1st Edition Errata

## Chapter 1

- P1.3-1) The center-to-center distance between the spheres should be **1.5 ft** not 1.5 m.

## Chapter 2

- CE2.1-2) The velocity referred to in this problem should be the **average speed** within the specified time interval.
- CE2.1-3) Instantaneous and average velocity should be **instantaneous** and **average speed**.
- SP2.4-5) has been created. See attached.
- RP2-10 ) A simpler version has been created. See attached.
- P2.1-8) Ans: b) $v$ = 1 m/s
- P2.2-1) Ans: $t$ = 9.111 s, $v_{max}$ = 15.61 m/s, $t$ = 6.54 s, $a_{max}$ = 2.64 m/s$^2$, $t$ = 9.111 s
- P2.2-3) Ans: $\Delta s$ = 14 m
- P2.2-4) Ans: $\Delta s = s_{total}$ = 500 m
- P2.3-2) The associated figure is labeled P2.1-8 by mistake.
- P2.4-1) Ans: a) $t$ = 2 s, 6.5 s, b) $t$ = 3.41 s
- P2.5-1) The acceleration should be ft/s$^2$.

## Chapter 3

- EP3.1-7) The average acceleration should be 6**i**+2**j** in the solution.
- SP3.2-10) was added. See attached.
- EP3.3-8) Part b) of the question should ask you to find 'the total acceleration and velocity of the car as it approaches point *B*.'
- SP3.3-12) was added. See attached.
- EP3.4-3) $\ddot{r}$ was eliminated from the answer choices because it cannot be determined.
- EP3.6-1) Figure labeling in PPT. Fig. B should be labeled C.
- PPT Joints figure does not match the book. See the website for the current PPT file.
- RP3.3) Velocity should be **speed**.
- RP3.8) Answer b) should be, "Ball *A* has a larger initial velocity."
- RP3-16) The units on constants $b$ and $d$ should be **meters**.
- RP3-17) The units of the initial bike speed should be **kph**. The equation for the total height of the bike in the givens should be $h = y_B$ + 5 m.
- RP3-21) Moved to the P3.18-5 and replaced with a new problem. See attached.
- P3.3-1) The figure gives the correct $y$. $y = 0.001x^2$
- P3.5-4) The units in the answer should be **ft/s**.

- P3.8-3) Answer is missing the acceleration $a = 3.5\hat{e}_t + 18.5\hat{e}_n \ \frac{\text{m}}{\text{s}^2}$
- P3.10-1) The acceleration's leading constant should be **+1** not -1.
- P3.10-5) Ans: $a$ = 9.6 m/s$^2$
- P3.11-7) Solution is not physically realizable. Change $\ddot{\theta}$ to -10 rad/s$^2$. The new answer for the acceleration is $a$ = 361.1 ft/s$^2$.
- P3.12-2) Evaluate the time at $\theta = 30^o$
- P3.14-4) The river speed is $v_R$ = 2 knots

Chapter 4

- P4.1-4) $\theta(t)$ should be $\theta(t) = t^3 - 10t^2 + 2$ .
- P4.2-2) Ans: Both $\omega$ and $\alpha$ should be in the -**k** direction.
- SP4.2-7) was added. See attached.
- SP4.3-7) was added. See attached.
- P4.4-1) is a fixed axis problem and will be moved to P4.2-6.
- P4.5-1) Ans: $\omega_{AB} = 2v_c / (L\tan\phi)$, where $\phi$ is the angle between the ground and bar $BC$.
- P4.6-2) Ans: a) $\mathbf{v}_B = -v_C(\mathbf{i} - \mathbf{j})$, $\mathbf{v}_D = 2v_C\mathbf{i}$ b) $\mathbf{v}_B = v_C(\mathbf{i} - \mathbf{j})$, $\mathbf{v}_D = 2v_C\mathbf{i}$ c) $\mathbf{v}_B = v_C(\mathbf{i} - \mathbf{j})$, $\mathbf{v}_D = -2v_C\mathbf{i}$ d) $\mathbf{v}_B = 2v_C(\mathbf{i} - \mathbf{j})$, $\mathbf{v}_D = 2v_C\mathbf{i}$
- P4.6-5) The disk radius is $r$ = 0.5 m.
- P4.7-1) Ans: $\mathbf{a}_A = -548.7\mathbf{i} + 4.5\mathbf{j}$ m/s$^2$
- P4.9-2) Answer: $\omega_{cd}$ = 0.09 rad/s ccw
- P4.10-1) Units on the answer should be **rad/s$^2$**.

Chapter 5

- Conceptual Example 5.2-5 PPT answers are incorrect. Correct answers should be "3, b, 2, a".
- SP5.6-13) The radius and its time derivatives are in terms of inches and need to converted to feet. The answers are $\boxed{N = (\sin\theta + 2.68\sin(3\theta) + 2.9)\ \text{lb}}$ and $\boxed{F = (0.194\cos(3\theta) + \cos\theta)\ \text{lb}}$.
- SP5.7-4) was added. See attached.
- P5.2-6) Ans: $\Delta s = 9.5$ m up the incline
- P5.3-1) Ans: $\ddot{x} = -(k/m)x$ . Note that the position $x$ = 0 corresponds to the static equilibrium position.
- P5.4-4) Ans: $L$ = 745 lb.
- P5.9-3) Positions $x$ and $y$ in the problem statement should be $x_1$ and $x_2$, respectively, to match the figure.
- P5.11-2) This problem was updated to make it different from the EP within the text. Change $\mu_{sb}$ to 0.35 and the ramp angle to 45$^o$. This will make the Ans: $a_{B/A}$ = 3 ft/s$^2$.

Chapter 6

- SP6.6-5) was added. See attached.
- P6.2-3) Assume that the drag force is applied horizontally at the center of gravity.
- P6.4-2) As written, this problem is not physically possible. Change $\alpha$ to $0.5g/b$ and the solution becomes $O = 0.5W$.
- P6.5-1) was as stated was moved to the advanced section P and replaced with a simplified version of the problem.
- P6.5-2) Ans: $O$ = 27.8 lb
- P6.5-6) Ans: $\alpha$ = 12.6 rad/s$^2$
- P6.5-7) The units on $I_O$ should be **kg-m$^2$**.
- P6.8-2) Ans: $\alpha$ = 9.4 rad/s$^2$
- C6-1) Find the tension for the first **0.1 s**.

Chapter 7

- Page 7-52 in the Equation derivation box: The first line should read, "The derivation of Equation 7.8-2 uses the fact that $d\mathbf{r} = \mathbf{v}dt$ and …"
- P7.3-4) Ans: $N$ = 250 lb.
- P7.4-1) The velocity should be $v_3$ = 2.45 m/s.
- P7.4-8) $H$ = 20 ft
- P7.5-1) Answer: $\ddot{\theta} + \frac{g}{L}\sin\theta = 0$, $\theta(t) = \theta_o \cos(\omega t)$, $\omega = \sqrt{\frac{g}{L}}$ rad/s, $\theta_o = \frac{\pi}{36}$ rad
- P7.8-1) In the answers, a) $P$ = 0.398 hp
- RP7-12) The fourth choice should be 1.12x10$^{-4}$ ft-lb, 1.5x10$^{-4}$ J.

Chapter 8

- SP8.5-7) was added. See attached.
- P8.1-5) Ans: $\omega_A$ = 2.41 rad/s, $\omega_B$ = 7.24 rad/s
- P8.2-2) Ans: $v$ = 2.62 m/s
- P8.5-2) The outer radius is 1 m and the inner radius is 0.6 m.
- P8.5-4) The angular velocity is in the **clockwise** direction.
- P8.5-5) The associated figure is labeled P8.5-6. It should be labeled P8.5-5.

Chapter 9

- CE9.2-1) Figure B midpoint should be labeled **2.5** not 4.
- Solved Problem 9.4-5) See attached

- Equation 9.7-8 should be labeled **angular momentum** not angular impulse-momentum and the equation is $\mathbf{H}_{O,2} = \mathbf{H}_{O,1}$ $\sum(\mathbf{r}_{i,2} \times m_i \mathbf{v}_{i,2}) = (\mathbf{r}_{i,1} \times m_i \mathbf{v}_{i,1})$
- EP9.7-3) The problem statement should ask for the **magnitude of the force as a function of time**.
- SP9.7-6) See attached
- P9.1-1) Ans: $F$ = 14 lb
- P9.1-6) Ans: $v_{s,2}$ = 2.29 mph, $v_{s,2}$ = 0
- P9.2-9) Ans: $\Delta x$ = 0.54 m
- P9.2-10) Should be placed in the angular impulse and momentum section. Lengths are $l_1$ = 1 ft, $l_2$ = 3 ft. Ans: $\theta$ = 27.6°
- P9.4-1) $W$ = 2 lb
- P9.4-3) Ans: $\mathbf{G}$ = -1 $\mathbf{e}_\theta$ kg-m/s. Note the velocity in the associated figure should be perpendicular to the bar.
- P9.4-5) $\dot{\mathbf{H}}_O = (y_P F_2 - z_P F_1)\mathbf{i} - x_P F_2 \mathbf{j} - x_P F_1 \mathbf{k}$
- P9.4-6) Answer d) $\omega = 5v / 4L$ rad/s ccw
- RP9-5) Figure B (The midpoint should be labeled as 2 not 4)

Chapter 10

- Conceptual Example 10.5-2) The perpendicular distance between the bar and point $O$ is $l$/2.

Appendix A

Appendix B

- SPB.2-2) The solution to $-3y + x^2 \le 8 + y$ should by $y \ge (8 - x^2)/-4$
- SPB.4-3) See attached
- SPB.5-4) The second minimum stated is the local minimum. The actual minimum occurs at $t$ = 0 and is $v$ = 3.
- SPB.6-1) $v_{t=2}$ = -2 m/s

Appendix C

Appendix D