

Errata to
Research Methods in Biomechanics
 (Last revised 1 December 2009)

Page 28. Equations 1.15 and 1.16, should read: $r = \sqrt{x^2 + y^2}$
 $\theta = \tan^{-1}(y/x)$

Page 46. Ignore the horizontal blue vector in Figure 2.11.
 The following replaces the text immediately after the figure:
 The rotation matrix $[R_x]$ describing this transformation is:

$$[R_x] = \begin{bmatrix} \cos\phi & \sin\phi \\ -\sin\phi & \cos\phi \end{bmatrix} \quad (2.35)$$

A vector \vec{P} can be represented in either one LCS ($\vec{P}' = P_Y, P_Z$) or another LCS ($\vec{P}'' = p_y, p_z$).
 We can use this rotation matrix to describe the position of the vector in the GCS in terms of
 the rotation matrix and the coordinates in the LCS as follows:

$$\vec{P}'' = [R_x] \vec{P}' \quad (2.36)$$

or

$$\begin{bmatrix} y \\ z \end{bmatrix} = [R_x] \begin{bmatrix} Y \\ Z \end{bmatrix} \quad (2.37)$$

Similarly, we can present the vector in the LCS in terms of the transpose of the rotation
 matrix and the coordinates in the GCS as follows:

$$\vec{P}' = [R_x]^T \vec{P}'' \quad (2.38)$$

or

$$\begin{bmatrix} Y \\ Z \end{bmatrix} = [R_x]^T \begin{bmatrix} y \\ z \end{bmatrix} \quad (2.39)$$

Page 48. Equation 2.46, “then $\alpha = \pi - \phi$ ” should read “then $\alpha = \pi - \alpha$ ”.
 In equation 2.47, replace “ $\cos \theta$ ” with “ $\cos \beta$ ” twice.

Page 50. Last line on page should be “ $\sin \theta \leq \frac{1}{2}\sqrt{2}$ ”.

Page 51. Line before equation 2.54 should be “ $\sin \theta > \frac{1}{2}\sqrt{2}$ ”.

Page 60. Figure 3.10 should be figure 3.9 and in the following sentence table 3.4 should be
 table 3.9.

Page 65. Equations 3.18 and 3.19 should be: $I_{proximal} = I_{cg} + m(R_{proximal} \times l)^2$
 $I_{distal} = I_{cg} + m(R_{distal} \times l)^2$

Page 70. Table 3.7. Elliptical cylinder. Equations are out of order. Last equation should be
 first, first should be second and second should be third.

Page 80. Euler was an 18th-century mathematician.

Page 96. In figure 4.22, letters “a” and “b” should be reversed.

Page 106. The second sentence should be “Next, the force couple (\vec{F} and $-\vec{F}^*$) is replaced by the moment of force ($M_F \vec{k}$).”

Page 112. Example 5.4. The object has an angular acceleration of 10 rad/s^2 .

Page 145. Second paragraph should refer to chapter 2 instead of chapter 3.

Page 156. Equation 7.31 should be a dot product, i.e., $P = \vec{J}\vec{M} \cdot (\vec{\omega}_{proximal} - \vec{\omega}_{distal})$. Note, power is a scalar quantity; however, it is often desirable to report the power of a moment of force as having three values, one for each axis.

Page 185. Equation 9.1 should be $(P + a)(v + b) = (P_0 + a)b$

Page 195. Table 9.1, CC, FV concentric equation should be $(P + a)(v + b) = (P_0 + a)b$

Page 227. Units of ordinate should be g (i.e., 9.81 m/s^2) not g/s .

Page 240. Line labeled “Plane angle, degree” the “ $i/180 \text{ rad}$ ” should be “ $\pi/180 \text{ rad}$ ”.
Also two lines below, the formula should be “ $2 \pi \text{ rad}, 360^\circ$ ”.

Page 263. Equation beginning v_L^2 should be v_T^2 .

Pages 272 to 280. Change all boxes (\square) to arrows (\rightarrow).