Errata for *Classical Dynamics*, 5th edition by Thornton and Marion

First printing:
Corrections as of May 24, 2006

p. 19 First item in Equation (1.39) should be $(\mu\lambda)' =$, not $(\mu\lambda')=$.

p. 25 First line after Equation (1.66). It should read …is the **permutation symbol** (or ***Levi-Civita* density**) and has… That is, move the left parenthesis.

p. 26 Page 26, Equation 1.70 should read: $(AB\sin\theta)^2 = C_1^2 + C_2^2 + C_3^2 = |\mathbf{C}|^2 = C^2$. That is the absolute value sign must be moved.

p. 34 The minus sign at the end of the first equation on the page should be removed. It should appear as $\ldots = \dot{\phi}\mathbf{e}_\phi$

p. 35 Second line in caption for Figure 1-18 should read: …has an angular velocity $\boldsymbol{\omega}$ about that axis. That is, remove the $= \mathbf{v}\times\mathbf{r}$.

p. 61 The last sentence above Equation (2.24) should read:
Then $C_1 = \ln v_0$, and

p. 63 The second line of the caption for Figure 2-6 should read:
…initial speeds $|\mathbf{v}_0|$ as they approach the terminal velocity.

p. 64 The right hand side of Equation (2.35) should be
$= \left(v_0^2 t^2 + \frac{g^2 t^4}{4} - v_0 g t^3 \sin\theta \right)$ That is, the t^2 term should be t^4.

p. 65 The first line of the second full paragraph should read: To find the maximum predicted height, we need to calculate y for the …

p. 72 Equation (2.67) should be
$m_2\ddot{x}_2 = m_2 g - T$

p. 81 The left hand side of the equation should have p replaced by $\frac{dE}{dt}$.

p. 86 Top most equation should be $x_2 =$, not $x^2 =$ on far left side.

p. 97 Problem 2-47, first line after equation. It should have
…where $U_0 = 1$ J and $a = 2$ m… That is, change α to a. a is italic.

p. 117 The equation number (3.43) on the right hand side above (3.48) should be deleted.

p. 120 Second line after Equation (3.63). Should read ... No resonance occurs if $\beta > \omega_0/\sqrt{2}$. That is, change 2 to $\sqrt{2}$.

p. 125 Second equation in Example 3.5. Change L to R in 3 places. Equation should be

$$V_R = RI = R\frac{dq}{dt} = R\dot{q} \quad \text{(editor: dot should be lower)}$$

p. 126 Last line before Section 3.8 has a typo in the value of ω_R. It should be

$$\omega_R = \sqrt{1/LC - R^2/2L^2}$$

p. 198-99 In Equations (5.48), (5.49), and (5.50) the $\ddot{r}$ on the left side of the equation should be bold $\ddot{\mathbf{r}}$, not italic. Leave the superscripts and subscripts as they are.

p. 199 First line of text underneath Figure 5-10. The $\ddot{r}$ should be bold $\ddot{\mathbf{r}}$, not italic. The first equation underneath this should have a bold $\mathbf{r}$, not an italic r. It should be

$$\ddot{\mathbf{r}} = \ddot{\mathbf{r}}_m' - \ddot{\mathbf{r}}_E' = \frac{m\ddot{\mathbf{r}}_m'}{m} - \frac{M_E\ddot{\mathbf{r}}_E'}{M_E}$$

Note that the primes are not quite placed properly in this equation. See the text. The dots over the variables do not quite look correct here or in any of the other equations typed here either.

p. 200 Second line after Equation (5.53): Change D to d. Now reads as ...similarly at point d the same magnitude, but the ...

p. 209 The label in Figure 6-2 should be changed from
$y(\alpha, x) = \alpha \sin x$ to $y(\alpha, x) = x + \alpha \sin x$

p. 255 Equation (7.101). The subscripts on $\dot{q}$ and q in the denominator should be i, not j.

p. 267 Equation (7.165) should be
$v^2 = \dot{R}^2 + R^2\dot{\theta}^2 + \dot{z}^2$

p. 294 Equation above Equation (8.28): the last term should be $\frac{l}{\mu r^2}$, not $\frac{1}{\mu r^2}$. That is, change 1 to l (italic l).

p. 377 The last equation at the bottom of the page should have a t in it.

Replace the equation $H_{bo} = -g\int_0^T dt + \frac{u}{\alpha}\int_{m_0}^{m_f} \ln\left(\frac{m}{m_0}\right) dm$

by the equation $H_{bo} = -g\int_0^T t dt + \frac{u}{\alpha}\int_{m_0}^{m_f} \ln\left(\frac{m}{m_0}\right) dm$

p. 388 Last line of text on page (right above Equation (10.3): should read ...the time rate of change of ...

p. 393 Figure 10-3. The ω in the figure should be bold ω. The cross product symbol $\times$ should also be bold $\times$.

p. 397 Paragraph above Figure 10-6:

Add a minus sign – in front of ω in the 5th line.

7th line: Add comma after the word "term" and delete the first left parenthesis (. Add a comma after the] and before the word "is".

p. 436 Line of text above Equation (11.74): add minus sign (-) before $\cos^{-1}\left(\sqrt{\frac{2}{3}}\right)$.

It should be $-\cos^{-1}\left(\sqrt{\frac{2}{3}}\right)$.

p. 441 The first line of text after Equation (11.92) should read: ...to transform the x_i' into the x_i''. Because the rotation ... That is, change the second subscript of x from 1 to i.

p. 451 Ninth line of text from bottom (do not count footnote): Change $1/\Omega$ to $2\pi/\Omega$.

p. 470 Second line should read ..the force on m_1 is $-\kappa x - \kappa_{12}(x_1 - x_2)$... Note that one of the minus signs was incorrectly a long dash.

p. 524 Equation (13.50): the term in the denominator $\left(\frac{s^2\pi^2\tau}{\rho b^2}-\omega^2\right)$ should be squared as in $\left(\frac{s^2\pi^2\tau}{\rho b^2}-\omega^2\right)^2$.

Equation (13.52): the term in the denominator $\left(\frac{r^2\pi^2\tau}{\rho b^2}-\omega^2\right)$ should be squared as in $\left(\frac{r^2\pi^2\tau}{\rho b^2}-\omega^2\right)^2$.

p. 536 Two text lines below Equation (13.99) should read: ...of forcing the string to vibrate at an angular frequency ...

The text line below Equation (13.101) should read: If the angular frequency is to be a real...

p. 571 The third line of the second full paragraph might be a little clearer if it reads: The use of the imaginary number i ($=\sqrt{-1}$) does not include...

p. 591 The equation above Equation (A.12) should be

$$\int_0^x \frac{dt}{1+t} = \int_0^x \left(1-t+t^2-t^3+\ldots\right)dt, \qquad |t|<1$$

That is, the part inside the ( ) must be changed.

p. 600 The second line of text after Equation (C.4), in the new paragraph, should read: The properties (a) and (b) above can be verified by direct substitution, ...

p. 604 The last line of text on this page should read: Equating coefficients of like powers...

p. 620 Equation (F.18) should have the last "+" removed and appear as

$$\ldots+\frac{1}{r\sin\theta}\frac{\partial A_\varphi}{\partial\phi}\ldots$$