ERRATA FOR INTERMEDIATE MECHANICS OF MATERIALS BY J.R.BARBER

Page 32: Example 2.2: The stress σ_{xx} whould read $\sigma_{xx} = -2$ ksi (in other words, insert a minus sign).

Page 33: Equations [2.20] – [2.22] should read

$$\begin{aligned}
\sigma_1 &= \frac{I_1}{3} + \frac{2}{3}\sqrt{I_1^2 - 3I_2}\cos(\phi) \\
\sigma_2 &= \frac{I_1}{3} + \frac{2}{3}\sqrt{I_1^2 - 3I_2}\cos\left(\phi + \frac{2\pi}{3}\right) \\
\sigma_3 &= \frac{I_1}{3} + \frac{2}{3}\sqrt{I_1^2 - 3I_2}\cos\left(\phi + \frac{4\pi}{3}\right) \ ,
\end{aligned}$$

In other words, there is a factor of 3 missing in the denominator on the square root term.
Also, the inequality [2.24] should read

$$\sigma_1 \geq \sigma_3 \geq \sigma_2$$

Page 159: Problem 3.3. The expression for U should be

$$U = \frac{AE}{2L}[(u_x^B - u_x^A)\cos\theta + (u_y^B - u_y^A)\sin\theta]^2 \ ,$$

Page 164: Problem 3.19. The figure requires an angle α which is the external angle between the lines DE and AG.

Page 165: Problem 3.22. The trial function should be

$$u(z) = \sum_{i=1}^{N} C_i\left(\cos\left(\frac{i\pi z}{L}\right) - (-1)^i\right)$$

Page 183: Example 4.1. The units in the second moments of area should be mm^4, not mm^6.

Page 185: Example 4.2. The units in the second moments of area should be mm^4, not mm^6.

Page 247: The upper limit on the first integral should be a, not b. In other words,

$$F = \int\int_A \sigma_{zz} dA = -S_Y bc + \int_c^a [-S_Y + C(y-c)]bdy + \int_a^{a+b} [-S_Y + C(y-c)]ady \ .$$

Page 261: Delete the statement "Notice that M_P is the same for both directions of loading, whereas the first yield moment is not because the distances from the neutral axis to the top and bottom of the section are different" because it is incorrect. The first yield moment will only depend on the direction of loading if the yield stresses in tension and compression are different. But if this is the case, the fully plastic moment will also generally depend on the direction of loading.

Page 305: Omit 'pt' in the second integral in equation [6.27] — i.e.

$$T = \oint_S ndF = \oint_S qndS = C \oint_S ndS$$

Page 307: Equation [6.33] requires an additional L in the second integral — i.e.

$$\frac{1}{2}T\theta = \frac{L}{2G}\oint_S \left(\frac{T}{2At}\right)^2 tdS = \frac{T^2L}{8A^2G}\oint_S \frac{dS}{t}$$

Page 308: Example 6.6, the expression for τ should read

$$\tau = \frac{20,000}{2 \times 225 \times 1} = 44.5 \text{ MPa.}$$

Page 311: Second paragraph, first sentence. Replace $T = d$ by $T = V_y d$.

Page 313: Example 6.7. End of problem statement. Reference to Figure 6.34 should be to Figure 6.35.

Page 319: Example 6.8. The twist per unit length should be 0.025 rad/m.

Page 434: Equations (10.18, 10.19, 10.20) and two unnumbered intermediate equations, the factor $(1-\nu)$ in the terms involving Ω^2 should read $(1-\nu^2)$.

Page 443: Figure 10.9. The curve for σ_{rr} should start at $-p_0$ but rise to zero at $r = b$. The curve for $\sigma_{\theta\theta}$ should be a mirror image of the σ_{rr} curve about the line for σ_{zz} and hence should come down to a lower value than shown at $r = b$.

Page 505: The equation on this page should read

$$M = M_1 + Pu - R_1 z \ .$$

In other words, the last term should be negative.

Page 506: There are sign errors in the first two equations. They should read

$$\frac{d^2u}{dz^2} + \frac{Pu}{EI} = -\frac{M_1}{EI} + \frac{R_1 z}{EI} \ .$$

and

$$u = -\frac{M_1}{P} + \frac{R_1 z}{P} + A\cos\lambda z + B\sin\lambda z$$

Page 588: The solution to Problem 8.18 should read

$$u_r = -\rho_s g h^2 \tan\alpha((2-\nu)\tan^2\alpha - \nu)/2E\ .$$