

**Errata for Deen, *Analysis of Transport Phenomena*, Second Edition
Updated April 24, 2018**

- p. xix Line 6, "... see Appendix A."
- p. 33 Line 2, Eq. (2.2-1) should be (2.2-4).
- p. 48 In the integral in Eq. (2.8-18), " dt " should be " dr ."
- p. 70 Line 3, Eq. (3.3-3) not (3.2-3).
- p. 74 Line 3, the exponent in the text expression should be $+\frac{1}{2}$ not $-\frac{1}{2}$.
- p. 75 Table 3-1, line 3, right column: $N_{A0} = 3.0 \times 10^{-9}$ (not 6.0×10^{-9}).
Table 3-1, line 4, right column: $N_{B0} = -6.0 \times 10^{-8}$ (not -1.2×10^{-7}).
- p. 76 Equation (3.2-21) should be (3.3-21).
Equation (3.2-22) should be (3.3-22).
9 lines below Eq. (3.3-23), 23 pM (not 0.23 pM).
- p. 95 In footnote 10, "example" not "problem."
- p. 99 The two lines above Fig. P3-4 should be indented to match text of part (c).
- p. 124 In Eq. (4.3-19), " $O(\varepsilon^3)$ " not " $O(\varepsilon^2)$."
- p. 125 In last part of Eq. (4.3-33), $\partial C_A / \partial x$ not $\partial C_A / \partial t$.
- p. 129 5 lines above Eq. (4.4-6), "Problem 4-16" not "Problem 4-15."
- p. 132 In Eq. (4.4-27), " $Y \rightarrow \infty$ " not " $\gamma \rightarrow \infty$."
- p. 132 In Eq. (4.4-31), " $O(\varepsilon^{3/2})$ " not " $O(\varepsilon^{1/2})$."
- p. 133 In the caption for Figure 4-5, "Eq. (4.4-20)" not "Eq. (4.4-22)."
- p. 133 Immediately below Eq. (4.4-39), delete period after $C_B(t)$.
- p. 135 In Eq. (4.4-57), $\tilde{\theta}_0(\tau)$ (add tilde).
- p. 136 In Eq. (4.4-70), $\tilde{\phi}(\tau)$ (tilde not carot, on left side of equation only).
- p. 138 Insert ε in Eq. (4.4-84) to read

$$\frac{\partial^2 \tilde{\Theta}}{\partial \eta^2} + \varepsilon \frac{\partial^2 \tilde{\Theta}}{\partial Z^2} = 0$$

p. 138 Insert subscript zero in first part of Eq. (4.4-89) to read

$$\frac{\partial^2 \tilde{\Theta}_0}{\partial \eta^2} = 0$$

p. 144 In both equations in Problem 4-5, replace "R" by "a."

p. 148 In Problem 4-14(b), " H_V " in denominator of equation, not "H."

p. 150 In Problem 4-18(b), line 4, "be rescaled" not "by rescaled."

p. 158 3 lines below Eq. (5.3-4), "Eq. (5.3-3)" not "Eq. (5.5-3)."

p. 160 In Eq. (5.3-17), "sin $n\pi x$ " not "sin $n\pi y$ " (two places).

p. 167 Replace Eq. (5.4-34) with the computationally better

$$a_n = \sqrt{2} \left(1 - \frac{1}{A} + \frac{\lambda_n^2}{A^2} \right)^{-1/2}$$

p. 184 Replace "p" by " p_{nm} " in Eqs. (5.6-68), (5.6-70), and (5.6-71).

p. 184 In Eq. (5.6-71), remove space between n and h in "sinh" (two places).

p. 189 The equation in the last line of Example 5.7-2 should read $f(z) = 1 - (z/\gamma)$.

p. 192 In Table 5-5, the characteristic equation for Case III should be

$$\lambda_n \ell = (1 - A\ell) \tan \lambda_n \ell$$

p. 201 In Eq. (5.9-9), add superscript 2 after $(z - z')$ in second expression.

p. 202 In Eq. (5.9-17), " $p(1, t)$ " not " $p(L, t)$."

p. 224 In Eq. (6.2-18), insert and delete minus signs to read

$$\lim_{S \rightarrow 0} \frac{1}{S} \left[\mathbf{s}(-\mathbf{n}) \Big|_1 S_1 + \mathbf{s}(\mathbf{n}) \Big|_2 S_2 \right] = \mathbf{0}$$

p. 225 Two lines below Eq. (6.2-24), "Eq. (1.2-10)" not "Eq. (1.2-8)."

p. 241 In text equation 4 lines below Eq. (6.5-12), " $|dv_x/dy|$ " not " $|dv_x/dy|$."

p. 243 In Eq. (6.6-2), delete extra "=" to read

$$v_t \Big|_2 - v_t \Big|_1 = \frac{L_s}{\mu} \tau_{nt} \Big|_2 = 2L_s \Gamma_{nt} \Big|_2$$

p. 256 In the cylindrical (z, r) entry in Table 6-12, change the first "+" to "-" to read

$$\frac{\partial}{\partial t} (E^2 \psi) - \frac{1}{r} \frac{\partial(\psi, E^2 \psi)}{\partial(z, r)} + \frac{2}{r^2} \frac{\partial \psi}{\partial z} E^2 \psi = \nu E^4 \psi .$$

p. 263 Zero on left side of Eq. (6.9-11) should be bold.

p. 274 In line 5 of Example 7.2-3, align left.

p. 288 4 lines below Eq. (7.5-31), $z \geq 2H$ not $z \leq 2H$.

p. 321 3 in Eq. (8.3-11) (font correction for script P).

p. 327 3 lines below Eq. (8.4-30), insert space between "for" and " $f(r)$."

p. 342 3 in Eq. (8.6-41) (font correction for script P).

p.362 In the middle part of Eq. (9.2-1), correct the vertical alignment in

$$\frac{\partial \mathbf{v}}{\partial t}$$

p. 365 Delete period after Eq. (9.2-15).

p. 366 In line 7, "boundary-layer thickness" not "boundary layer-thickness."

p. 368 In middle expression within Eq. (9.2-23), add tilde over 3.

p. 374 In parentheses in the line below Eq. (9.3-19), " $\mathbf{v} = \nabla \phi$ " not " $= \nabla \mathbf{v}$."

p. 378 Font size for U in third entry of Eq. (9.4-2) should be enlarged to match that in fourth and fifth entries.

p. 379 In last part of Eq. (9.4-6), insert minus sign to read

$$\frac{\partial^2 \hat{\psi}}{\partial \hat{x} \partial \hat{y}} = -\frac{g'}{g} \eta f'' .$$

p. 380 First line below Eq. (9.4-12), $f''(0)$ not $f'(0)$

p. 390 In Eq. (9.5-23), "0.375" not "0.211" (equation otherwise correct).

p. 405 6 lines from bottom, reduce font size of "Pe > 10" to match other text

p. 413 Last line, "Problem 10-4" not "Problem 10-3."

p. 429 Line 2, "Problem 10-17" not "Problem 10-10."

p. 447 In Eq. (11.3-5), insert superscript "2" in last term to read

$$\tilde{v}_x \frac{\partial \tilde{v}_x}{\partial \tilde{x}} + \hat{v}_y \frac{\partial \tilde{v}_x}{\partial \hat{y}} = \tilde{u} \frac{d\tilde{u}}{d\tilde{x}} + \frac{\partial^2 \tilde{v}_x}{\partial \hat{y}^2}$$

p. 447 In Eq. (11.3-7), insert superscript "2" in last term to read

$$\tilde{v}_x \frac{\partial \Theta}{\partial \tilde{x}} + \hat{v}_y \frac{\partial \Theta}{\partial \hat{y}} = \text{Pr}^{-1} \frac{\partial^2 \Theta}{\partial \hat{y}^2}$$

p. 464 Add period at end of sentence two lines below Eq. (12.2-5).

p. 466 In first equation label, "(12.2-11)" not "(12.2.11)."

p. 498 Two lines above Eq. (13.2-12), " ε " not " ϵ ."

p. 514 Immediately below Eq. (13.4-35), delete hyphen in "flow-example."

p. 516 In last line of Fig. 13-10 caption, "using."

p. 528 After first equation in Problem 13-8, delete extra period.

p. 530 4 lines below Eq. (14.2-1), delete comma after \mathbf{g}_i .

p. 531 In Eq. (14.2-4), italicize D in denominator of $D\mathbf{v}/Dt$.

- p. 544 In Eq. (14.3-68), $\theta(0) = \hat{C}_p (T_F - T_0)$ not $\theta(0) = 0$.
- p. 553 Two lines below Eq. (14.5-18), insert "to" to read "could be used to complete the solution."
- p. 574 In Eq. (15.2-4), ∇C_i not ΔC_i .
- p. 577 Line 2, "principle" not "priniple."
- p. 590 In Eq. (15.4-13), $d^2 \Phi/dx^2$ not $d^2 \Phi/dy^2$.
- p. 596 In second part of Eq. (15.5-17), argument should be (a, θ) not (a, ∞) .
- p. 624 In the last term in Eq. (A.6-4), $\partial f/\partial x_j$ not df/dx_j .
- p. 633 All four zeros in Eq. (A.7-41) should be bold.
- p. 643 The right-hand side of Eq. (B.4-6) should read

$$\frac{L^2}{2} [J_0^2(mL) + J_1^2(mL)]$$

- p. 647 In the line above Eq. (B.5-4), "Section B.2" not "Section B.1."
- p. 649 The upper limits of the integrals in Eqs. (B.5-14) and (B.5-16) should be $x^{1/n}$, to read, respectively,

$$P(1/n, x) = \frac{n}{\Gamma(1/n)} \int_0^{x^{1/n}} e^{-s^n} ds = \frac{\gamma(1/n, x)}{\Gamma(1/n, x)}$$

$$P(k/n, x) = \frac{n}{\Gamma(k/n)} \int_0^{x^{1/n}} s^{k-1} e^{-s^n} ds = \frac{\gamma(k/n, x)}{\Gamma(k/n, x)}$$

- p. 649 Given the preceding correction, the general solution in Eq. (B.5-15) should read

$$y(x) = AP(1/n, x^n) + B$$

and the text equation below Eq. (B.5-14) should read

$$P(1/2, x^2) = \text{erf}(x) .$$

p. 651 In the first line for Bird, "97" not "67."

p. 663 Under "Solidification" (right-hand column), 142 not 144.