

Significant errata appearing in ISBN 978-048683735-2 and Version 5.00. All errata have been corrected in Version 5.10 (except for the ones on: pgs. 180, 259, 265, and 472, the second one on pg. 254, and the last two on pg. 418, which will all be corrected in Version 5.20)

Page 19, eqns. (15) and (16): change sign of lefthand side of both equations

Page 24, line 2b: delete “ $c =$ ”

Page 25, Fig. 1.12: “gas temperature” should be “initial temperature difference”

Page 39, Prob. 1.9: answer is “1125 J” (not 1123)

Page 43, Prob. 1.28: change “2,257,000” to “2,450,000”

Page 44, Prob. 1.33: answer is “ -270 W/m^2 ” (not 270)

Page 49, line 3b: should read “heat conduction, or heat diffusion, equation...”

Page 68, 2nd equation: change sign of the righthand side to have $-kC_1/r_o$

Page 91, Prob. 2.23: change “firebrick” to “facing brick”; answer is 40°C (not 460)

Page 92, Prob. 2.32: answer is “ $7.21 \times 10^6 \text{ kJ/h}$ ” (not 7.12×10^6)

Page 94, Prob. 2.42: Change “50” to “1.5” and change “99.66%” to “89%”

Page 96, Prob. 2.46(e): Change “reduce” to “increase”

Page 100, Fig. 3.1: “exhaust” should be “compressor air” and “kitchen” should be “refrigerator”

Page 100, line 9b: “3.7” should be “3.7b”

Page 112, line 7: Change “ $T_{h_{out}}$ ” to “ $T_{c_{out}}$ ”

Page 132, Prob. 3.18: answer is “ 76.85°C ” (not 75.09)

Page 132, Prob. 3.20: answer is “ 135.7°C ” (not 140.5)

Page 135–6, Prob. 3.41: The latent heat should be “ 23.1 kJ/kg ” (not 850). This problem has been rewritten in Version 5.10.

Page 178, unnumbered equation: $x = dx$ should be $x + dx$

Page 180, second equation: $(0.04 - 0.15)^3$ should be $(0.04 - 0.015)^3$

Page 259, Prob. 5.27: For (b), T_{sfc} should be “ 216°C ” (not 200); for (c), T_{sfc} should be “ 259°C ” (not 255)

Page 261, Prob. 5.42: melting temperature should be “ 60°C ” (not 40)

Page 264, Prob. 5.52b: τ should be T in the equation.

Page 264, Prob. 5.53: “eqn. (5.13)” should be “eqn. (5.14)”

Page 265, Prob. 5.56b: “a wire” should be “a wire of radius δ ”

Page 265, Prob. 5.61: solve this problem for a fixed position and take $r/r_o = 1$.

Page 307, eqn. (6.62): Change “0.565” to “0.564”

Page 311, eqn. (6.71): Change “0.453” to “0.4587”

Page 313, eqn (6.75): Sign of leftmost term should be “-”

Page 320, line 7b: “(6.88)” should be “(6.87)”

Page 328, line 16: “viscosity” should be “Prandtl number”

Page 329, line 1 and legend of figure: “4.1” should be “4.3”

Page 333, eqn. (6.124): The last term should be: “ $\frac{1}{c}(0.0296 \text{Re}_u^{0.8} \text{Pr}^{0.6} - 0.332 \text{Re}_l^{1/2} \text{Pr}^{1/3})$ ”

Page 335, Example 6.9 solution: The previous correction should be carried into the example, leading to these changes: $\overline{\text{Nu}}_L = 1,435$, $\overline{h} = 18.82 \text{ W/m}^2\text{K}$, $Q = 752.8 \text{ W}$.

Page 339, Prob. 6.18: “eqn. (6.115)” should be “eqn. (6.114)”

Page 399, Prob. 7.15: tube temperature should be “30 °C” (not 27)

Page 399, Prob. 7.16, last line: “0.5 mm” should be “0.4 mm”

Page 399, Prob. 7.17: The relative roughness should be “ $\varepsilon/D = 0.002$ ” (not 0.0006) and the answer should be “ $h = 394 \text{ W/m}^2\text{K}$ ”.

Page 418, eqn. (8.13b): The subscript “ D ” should be “ L ” on both Nu and Ra.

Page 418, eqn. (8.13b): The exponent 1/6 should apply only to Ra, not to the entire expression in square brackets.

Page 418, last line: β should also be evaluated at T_f .

Page 456, Problem 8.13: Use $\varepsilon = 0.9$; the answer should be “4.59 W/m²K” (not 1.9)

Page 459, Problem 8.37: Use $\varepsilon = 0.7$; the answer should be “25.8 W” (not 10.5)

Page 472, line 1: Change “like operate” to “like to operate”

Page 602, Problem 10.10: Answer should be “0.087” (not 0.145).

Page 743, second entry for c : Replace “ c ” by “ c_i ”

VERSION HISTORY

Additional changes (other than errata) incorporated in Version 5.20.

Chapter 3 :

Page 139: Delete reference [3.9], which was the same as [3.7] in Version 5.10.

Chapter 4 :

Page 190: Edit Problem 4.42.

Page 190: Edit Problem 4.43.

Page 191: Edit Problem 4.44.

Page 191: Edit Problem 4.45.

Chapter 5 :

Page 217: Add additional data to Table 5.2 for low values of Biot number.

Page 259: Edit Problem 5.27.

Page 265: Edit Problem 5.58.

Page 266: Edit Problem 5.63.

Chapter 6 :

Page 342: Edit Problem 6.38. Raise wind chill temperature to 24°F.

Page 342: Edit Problem 6.39.

Chapter 7 :

Page 356: Edit footnote.

Additional changes incorporated in Version 5.10.

Chapter 1 :

Pages 4-7: A few small edits for clarity.

Page 10, Fig. 1.3: Figure has been revised and relabeled for clarity.

Page 11: Eliminate footnote with small text edits.

Page 11, Ex. 1.1: Change conductivity of lead from 35 to 34 W/m·K and adjust numbers

Page 13-14: Rewrite discussion of thermal conductivity values.

Page 14: Change thermal conductivity of copper to “398 W/m·K” and “230 Btu/h·ft²·°F”

Page 16-17, Example 1.2: Extensively rewritten for better clarity.

Page 17: Rephrase eqns. (1.12) and (1.13) and some surrounding text, including footnote.

Page 19, second paragraph: Rewritten for greater clarity.

Page 23, Fig. 1.10: Expand caption for greater clarity.

Page 24, Fig. 1.11: Minor adjustment to labeling for clarity.

Page 24-25: Minor text edits.

Page 25, Fig. 1.12: Redraw and correct.

Page 26, lines 11-12, 14: Minor rephrasing for better clarity.

Page 26, line before Expt. 1.2: “opposed” changed to “oppose”

Page 29, Fig. 1.13: Figure has been completely redrawn for accuracy and clarity.

Page 29, lines 3-7: Rephrase for clarity and simplicity, also eliminating eqn. (1.27a)

Page 34: Minor rephrasing for clarity.

Page 39, Fig. 1.17: Redraw and relabel for conformance with SI units.

Page 41, Fig. 1.20: Redraw and relabel for conformance with SI units.

Page 42, Fig. 1.21: Redraw and relabel for conformance with SI units.

Page 42, Problem 1.24: Edit text.

Page 43, Fig. 1.22: Redraw and relabel for conformance with SI units.

Page 44, Problem 1.35: Change 134 mm to 112 mm, to avoid considering ullage in can.

Page 46, Problem 1.43: Edit text.

Chapter 2:

Pages 49–56, Sect. 2.1: Various text edits to improve clarity. Content same.

Pages 58–72, 76, 78–83, 85–86: Various minor text edits to improve clarity. The page breaks have shifted slightly on pp. 64–71, 75–77, 78–86.

Page 71, Fig. 2.14: Adjust line weights.

Page 86, Problem 2.1: Edit text.

Page 88, Problem 2.9: Edit text.

Page 89, Problem 2.14: Edit text.

Page 88, Fig. 2.22: Relabel for conformance with SI units.

Page 89, Fig. 2.23: Redraw and relabel for conformance with SI units.

Page 91, Problem 2.26: Edit text.

Page 93, Problem 2.34: Edit text.

Page 93, Problem 2.36: Edit text.

Page 94, Prob. 2.41: Change to “in a room at 25°C”

Page 96, Problem 2.43: Edit text.

Page 96, Problem 2.47: Added this new problem.

Page 97, Problem 2.48: Added this new problem.

Page 97, Problem 2.49 with Fig. 2.24: Added this new problem and new figure.

Chapter 3:

Pages 99–101, Sect. 3.1: Various text edits to improve clarity. Content same. Some figures now on different pages.

Page 101: Mention that fins serve to reduce gas-side thermal resistance

Pages 108–111, 114, 116–117, Sect. 3.2: Minor text edits to improve clarity, new description of sources for Fig. 3.14.

Page 115, Fig. 3.12: Change to SI units. Expand caption to better describe device.

Pages 118–119, Fig. 3.14: Redraw all frames from equations for better accuracy; edit captions.

Page 120, lines 11–13: Revised for better clarity.

Pages 121–123, 126–127, Sect. 3.3: Minor text edits to improve clarity. Describe *P*-NTU method.

Page 123, Fig. 3.16: Redraw figure.

Sect. 3.4: Minor text edits to improve clarity.

Fig. 3.17: Move from page 125 to page 124.

Page 125, Table 3.1: Added this new table of equations.

Page 130, Prob. 3.4: Change “0.81” to “0.80”

Page 135, Prob. 3.38: Edit problem statement slightly.

Page 135–6, Prob. 3.41: This problem has been rewritten.

Page 136, Prob. 3.43 : Edit problem statement; remove equation number [eqn. (3.26)]

Prob. 3.44: Added this new problem.

Pages 124–138: Page breaks have moved ahead by about 1 page relative to Version 5.0

Chapter 4:

Page 182, fin root temperature: Edited these paragraphs for clarity.

Chapter 5:

Page 253, Prob. 5.4, Fig. 5.28: Edit figure.

Page 259, Prob. 5.27: Add answer to part (c).

Chapter 6:

Pages 271–277, Sect. 6.1: Various text edits to improve clarity.

Pages 277, Fig. 6.5: Expand caption to explain δ'_t

Pages 275, Fig. 6.4: Revised to better indicate the potential range of boundary layer transition.

Pages 279–283, 287–293, Sect 6.2: Various text edits to improve clarity. Adjust property values in examples.

Pages 293–298, Sect. 6.3: Minor edits for clarity and to improve description of physical property variations.

Pages 298–302, Sect. 6.4: Rework dimensional analysis. Other minor edits for clarity.

Pages 302–312, Sect. 6.5: Various edits for clarity. Adjust property data in both examples. Some larger changes are as follow.

Page 305, Fig. 6.14: Completely redrawn. Wider range of Pr , plot exact result. Discussion of figure rewritten.

Page 306, eqns. (6.58) and (6.59): Better describe the accuracy and Pr ranges of these two fits to Pohlhausen's closed-form solution of the governing equations.

Page 310, Ma and Ec discussion: These passages revised to better explain property variations and the role of each parameter.

Page 311, eqn. (6.71): Change numerical coefficient to more accurately fit the exact solution for uniform heat flux. State accuracy.

Pages 313–315, Sect. 6.6: This section was completely rewritten. The limitations of the Reynolds-Colburn analogy are clarified, and the text no longer presents a “derivation.” Equation numbering shifts. Examples 6.7 and 6.8 have both been dropped.

Pages 314–323, Sect. 6.7: Various minor edits for clarity. Equation number shifts slightly.

Page 323, eqns. (6.100) and (6.101): These two equations have been moved to a footnote.

Pages 323–335, Sect. 6.8: This section has been substantially reorganized and divided into Sect. 6.8 on the turbulent b.l. and Sect. 6.9 on the transitional b.l. Equations (6.112)–(6.124) have changed significantly, with some equations eliminated, some edited, and almost all renumbered.

Page 327, Fig. 6.19: This figure has been replaced by a new figure that shows only fully turbulent data, with accompanying text that describes the statistical accuracy of eqn. (6.111).

Pages 326–328: Equations (6.112) and (6.113) have been eliminated (the latter now appears in Prob. 6.46), and eqn. (6.114) is presented by itself. The reason for this is that eqn. (6.112) is not accurate over a wide range of Re .

Figures 6.20, 6.21, and 6.22: These figures have been replaced by new figures and text. The previous Fig. 6.20 has been redrawn and is now Fig. 6.22.

Page 331, Average Nusselt number: The discussion of a direct laminar-to-turbulent transition has been dropped entirely because recent research shows that it is an oversimplification. The remainder of the section has been revised to focus on the physically correct 3 piece model (laminar/transition/turbulent b.l.), eqn. (6.124). The example that follows has been rewritten, with two follow-on examples.

Page 338, Prob. 6.12: This problem has been rewritten.

Page 338, Prob. 6.17: This problem has been rewritten.

Page 344, Prob. 6.46: This problem has been rewritten.

Probs. 6.47, 6.48, 6.50: These problems are now 6.50, 6.47, and 6.49, respectively.

Page 344-5, Prob. 6.49: This problem has been rewritten because the previous data are now plotted in the new Fig. 6.20.

Chapter 7:

Page 371, line 3b: Edited to mention Fig. 8.6.

Page 406-7, Prob. 7.51: This new problem has been added.

Chapter 8:

Page 415, top: Edit discussion of β .

Several problems have been edited to better account for thermal radiation in gases.

Page 454, Prob. 8.5: This problem has been edited.

Page 454, Prob. 8.6: This problem has been edited.

Page 456, Prob. 8.13: This problem has been revised.

Page 456, Prob. 8.15: This problem has been fully rewritten.

Page 457, Prob. 8.17: This problem has been edited.

Page 457, Prob. 8.20: This problem has been edited.

Page 457, Prob. 8.22: This problem has been edited.

Page 458, Prob. 8.24: This problem has been edited.

Page 458, Prob. 8.30: This problem has been revised.

Page 459, Prob. 8.37: This problem has been edited.

Page 459, Prob. 8.38: This problem has been edited.

Pages 458-460: Page breaks have shifted slightly.

Page 464, Prob. 8.59: Added this new problem.

Chapter 10:

Page 592, Fig. 10.26: Update percentages and reference for this figure.

Page 593, last paragraph: Incorporate recent developments in radiative materials.

Page 596, last paragraph: Add reference for atmospheric aerosols.

Page 609, Problem 10.55: Added this new problem.

Chapter 11:

Page 666, paragraph 4: Edit text.

Appendix A:

Pages 707–713: Updated property data sources and edited text.

Tables A.3, A.4, A.5, A.6: Updated properties of Ammonia, Carbon Dioxide, Methanol, Nitrogen, and Oxygen.

Table A.3: Updated properties of CFC-12, D₂O, Lead, and NaK.

Table A.4: Minor adjustments to some triple point and critical point temperatures.

Table A.6: Updated properties of Air and Hydrogen

Other edits:

Various tables in Chpts. 2, 5, 6, 9, 11, and App. A: Miscellaneous adjustments to layout.