Numerical Methods for Engineers, Second edition: Chapter 1 Errata

1. p.2 first line, remove "the Free Software Foundation at"
2. p.2 sixth line of the first proper paragraph, `fe95.res` should be replaced by `nm95.res`
3. p.10 third line should be "multiplication"

Numerical Methods for Engineers, Second edition: Chapter 2 Errata

1. p.26, the superscript in equation (2.22) should not be bold and should be as follows

$$[\mathbf{U}] = [\mathbf{D}][\mathbf{U}^1]$$

2. p.32, The matrix expression in Solution 2.5 has a u_{22} and u_{33} which should be l_{22} and l_{33} as follows

$$\begin{bmatrix} 16 & 4 & 8 \\ 4 & 5 & -4 \\ 8 & -4 & 22 \end{bmatrix} = \begin{bmatrix} l_{11} & 0 & 0 \\ l_{21} & l_{22} & 0 \\ l_{31} & l_{32} & l_{33} \end{bmatrix} \begin{bmatrix} l_{11} & l_{21} & l_{31} \\ 0 & l_{22} & l_{32} \\ 0 & 0 & l_{33} \end{bmatrix}$$

3. On p.49 in the Jacobi iteration Solution 2.6, it should state

$$\left\{ \begin{array}{c} x_1 \\ x_2 \\ x_3 \end{array} \right\}_2 = \left\{ \begin{array}{c} 0.1273 \\ 0.8364 \\ 0.4818 \end{array} \right\} \longrightarrow \left\{ \begin{array}{c} -0.25 \\ 1.0 \\ 0.5 \end{array} \right\} \quad \text{(after many iterations)}$$

4. p.52, just below Table 2.3, remove a repeated "than".

5. p.54, The matrices on p.54 in Solution 2.7 should read 0.3636 in the (3,1) position and not 0.2626.

6. p.65, equation (2.65)(d) should read $\{\mathbf{r}\}_{k+1} = \{\mathbf{r}\}_k - \alpha_k\{\mathbf{u}\}_k$

7. p.81, Remove "," between "Kelley" and "1995".

8. p.83 the vector of unknowns is missing from question 7.

9. p.83 the vector of unknowns is missing from question 8.

10. p.87, question 25, spelling of "Exercises".

Numerical Methods for Engineers, Second edition: Chapter 3 Errata

1. p.96, Table near bottom of page. Entry -13.35 should be -13.28 and entry 8.41 should be 8.29.

2. pp.122-123, In two places it should be

$$\begin{Bmatrix} -f_1 \\ -f_2 \end{Bmatrix} = \begin{Bmatrix} -e^{x_1} - x_2 \\ x_1 - \cosh x_2 + 3.5 \end{Bmatrix}$$

3. p.123, Just above the start of Program 3.8 the *Updated values* should be

$$\begin{aligned} x_1 &= -2.4968 + 0.0002 = -2.4966 \\ x_2 &= -0.0819 - 0.0004 = -0.0823 \quad \text{etc.} \end{aligned}$$

4. p.130, top line, $r = 10$ (instead of $r = 100$)

Numerical Methods for Engineers, Second Edition: Chapter 4 Errata

1. p.144. The first equation in Solution 4.2 is missing a closing parenthesis after the matrix A. It should be

$$[\mathbf{B}] = [[\mathbf{A}] - p\,[\mathbf{I}]]^{-1}$$

2. p.145, just before Program 4.3 should state,

$$\text{and after many iterations } \{\mathbf{x}\} = \begin{Bmatrix} 1.0 \\ -1.0 \end{Bmatrix} \quad \lambda = -1.0000$$

   The eigenvalue of $[\mathbf{A}]$ closest to 2 is then retrieved as

$$\frac{1}{-1} + 2 = 1$$

3. Strange line break at the top line of p.151 . "stiffness matrix" should all be on second line.

4. Strange line break in the title of Section 4.4.1 on p.154. "standard form" should all be on second line of the title.

5. p.159, eq. (4.65), should be $[\mathbf{P}]$ instead of $[\mathbf{P}]^T$

6. p.160, third paragraph, comma should be at the end of the line (not the beginning)

7. p.188 For consistency with the text, question 6 should be:

   "...can be reduced to the standard symmetrical form"

$$\begin{bmatrix} 0.4 & 0.2 \\ 0.2 & 2.6 \end{bmatrix} \begin{Bmatrix} z_1 \\ z_2 \end{Bmatrix} = \lambda \begin{Bmatrix} z_1 \\ z_2 \end{Bmatrix}$$

Numerical Methods for Engineers, Second edition: Chapter 5 Errata

1. On p. 219, last line of Section 5.4.2 should state "Tables 5.2, 5.3 and 5.4 respectively."

2. p.230, Table 5.5, the penultimate row, third column should have
   $X = x$
   $Y = \ln \dfrac{y}{x}$

3. On p.239, question 7 the solutions should be,
   Answer: First order 0.4803, second order 0.4710, third order 0.4695, fourth order 0.4695.

4. On p.239, question 12 should say "Rework Exercise 7...."

5. On p.240, question 17, first *Answer* should be -0.971

6. On p.240, question 20, *Answer* should be $f(x) = 15.35x^{-1.23}$

7. On p.241, question 21, should say "...equation of the form $y = ae^{bx}$ to the data"

Numerical Methods for Engineers, Second edition: Chapter 6 Errata

1. p.246, near the bottom of the page there is an unnecessary line break. It should read "; however rules will also be described..."

2. p.252, Both of equations (6.15) and (6.16) are missing h from the weighting terms. They should be

$$\int_{-h}^{h} F(x)\,dx \approx \frac{1}{3}h\,F(-h) + \frac{4}{3}h\,F(0) + \frac{1}{3}h\,F(h) \qquad (6.15)$$

$$\int_{x_1}^{x_3} f(x)\,dx \approx \frac{1}{3}h\,f(x_1) + \frac{4}{3}h\,f(x_2) + \frac{1}{3}h\,f(x_3) \qquad (6.16)$$

3. p.253, In equation (6.18), the closing parenthesis is missing on the $xf(x_1)$ term on the right hand side.

4. p.272, The third line should be continuous with the second line and equation (6.53) should be

$$\int_a^b f(x)\,dx \equiv \int_{-1}^{1} g(\xi)\,d\xi$$

5. p.277, The term being integrated in equation (6.57) should be x^4 rather than x^2.

6. p.293, Just below section 6.6.1.1 there is an unnecessary line break. It should read "...over the rectangular region..."

7. p.294, Three lines from the bottom should state "...in both (6.78) and (6.79) come from..."

8. p.295, Solution 6.12 should be

$$\begin{aligned} I &\approx \frac{1}{4}hk\,[f(1,1) + f(2,1) + f(1,3) + f(2,3)] \\ &= 16.0000 \text{ (cf. exact solution } 15.3333) \end{aligned}$$

9. p.295, Solution 6.13 should state "...so from equation (6.79)"

10. p.297, Several problems with Solution 6.14. (i) it should state "...so from equations (6.80) and (6.81)". (ii) one of the sampling points should be $y_2 = -0.2113$, (iii) it should state "Hence from equation (6.82)", (iv) Working to 4 DP, solution should be 0.7779 rather than 0.7778

11. p.299, Solution 6.15 should state "...so from equations (6.83) and (6.84)"

12. p.300 One line below equation (6.89) should be "This is analogous to equation (6.53)..."

13. On p.308, question 3, the answer should be "(e) $1.5454b^2$"

14. On p.308, question 6, the answer should be "10 repetitions"

15. p.310, The second integral in question 18 should be labeled "(b)"

16. p.310, q12 has many errors. It should be as follows:

    12. Use Polynomial Substitution to find the weighting coefficients w_1, w_2 and w_3, and the sampling points x_1, x_2, and x_3 in the Gauss-Legendre formula

    $$\int_{-1}^{1} f(x)\,dx = w_1 f(x_1) + w_2 f(x_2) + w_3 f(x_3)$$

    You may assume symmetry of weights and sampling points about the middle of the range.
    Answer: $w_1 = w_3 = 5/9$, $w_2 = 8/9$, $x_1 = -x_3 = -\sqrt{3/5}$, $x_2 = 0$

17. On p.310, question 13, the answer should be
    Answer: 19.1067 (Exact: 18.8496)

18. On p.311, question 24 should be,

    $$\int_{-2}^{0}\int_{0}^{1} e^x \sin y\,dx\,dy$$

Numerical Methods for Engineers, Second edition: Chapter 7 Errata

1. p.331, eq. (7.44) initial values of x should be included in all the terms, thus

$$y(x_0) = A_1, \quad \frac{dy}{dx}(x_0) = A_2, \quad \frac{d^2y}{dx^2}(x_0) = A_3, \quad \cdots \quad , \frac{d^{n-1}y}{dx^{n-1}}(x_0) = A_n$$

2. On p.386, question 6 should state " with $\theta = 0.5$"
3. On p.387, question 12 should state " $g = 9.81$ m/s^2"
4. On p.387, question 16 should state " *Answer:* 0.9152 (Exact: 0.9152)"
5. On p.388, question 18, first line of table should be "0.0 0.1000"
6. On p.388, question 22, solution should be "(b) 0.335"
7. On p.389, question 27, solution should be "(b) 0.0496"
8. On p.391, question 35, should state "(Exact: 4.8245)"

Numerical Methods for Engineers, Second edition: Chapter 8 Errata

1. On p.407, Figure 8.6, the label in the middle of the figure should be $h_{i,j}$ (not $u_{i,j}$).

2. On p.435, question 3, should state
"*Answer:* $T_3 = 85.71$, $T_2 = T_6 = 71.43$, $T_1 = T_5 = T_9 = 50$, $T_4 = T_8 = 28.57$, $T_7 = 14.29$"

3. On p.435, question 4, should state
"*Answer:* $T_1 = 40.18$, $T_2 = 65.22$, $T_3 = 83.73$, $T_4 = 25.81$, $T_5 = 50.00$, $T_6 = 74.19$, $T_7 = 16.27$, $T_8 = 34.78$, $T_9 = 59.82$"

4. On p.436, question 5, solutions should be negative and state
"*Answer:* $\phi_1 = \phi_3 = \phi_7 = \phi_9 = -5.5$, $\phi_2 = \phi_4 = \phi_6 = \phi_8 = -7$, $\phi_5 = -9$ "

5. On p.437, Figure 8.21, the dependent variable should be labelled as T (not ϕ) and the bottom right grid point should be labelled $T = 10^o$

6. On p.437, question 7, should state
"*Answer:* $T_1 = T_3 = 76.12$, $T_2 = T_4 = 26.71$, $Q = 1.45$ GJ"

7. On p.438/489, question 9, solutions should be
"*Answer:* $T = 60$. Change in bc leads to a 2-d analysis where $T = 63.33$"

8. On p.439, question 10, should state
"*Answer:* 49%"

9. On p.440, question 13, the answers should be in upper case for consistency with Figure 8.24, hence
"*Answer:* Case 1: $3H_{i,j} - 2H_{i,j+1} - H_{i+1,j} = 0$,
Case 2: $5H_{i,j} - 2H_{i,j+1} - 2H_{i+1,j} - H_{i,j-1} = 0$"

10. On p.443, question 22, the first solution should be
"*Answer:* $u(2, 20) = -38$"