List of Corrections in the 1st Edition

Inside Cover, Page i, and on back cover page: Designation of Saumyen Guha should be "Professor"

Preface, Page vii, add at the end of acknowledgements: "Last but not least, thanks to our beloved student Shivam Gupta for writing and testing the programs on the CD."

Chapter 1:

Location	Existing	Corrected
Page 1, para 2	However rarely, one does	However, rarely does one
Page 2, line 1	characteristics	variables or parameters
Page 2, last para	his own software	his or her own software
Page 3, para 2	looking out the window	looking out of the window
Page 4	since, $(x_n - \sqrt{a^2})$	since, $(x_n - \sqrt{a})^2$
Page 4	since, $x_{n+1} \geq a$	since, $x_{n+1} \geq \sqrt{a}$
Page 5, para 2	one scheme Eq. (1.4)	one scheme, Eq. (1.4),
-do-	the other one Eq. (1.3)	the other one, Eq. (1.3),
-do-	computational scheme Eq. (1.4)	computational scheme of Eq. (1.4)
Page 16, Example 1.5, end of example line	after 2nd para	after 1st para

Chapter 2:

Location	Existing	Corrected
Page 25, para1, line 1 and para 2, line 6	x is not bold	x should be boldface
Page 26, para 2	difference between the two	difference between two
Page 26, para 3	A^{-1} exist	A^{-1} exists
Page 28, Eq. (2.18) and last para, line 4	x is not bold	x should be boldface
Page 29, line 1	any multiple	any scalar multiple
page 30, Fig. 2.4	solid ellipse shown in the figure	should be circle
Page 32, last para, line 2	x is not bold	x should be boldface
Page 34, line after (2.35)	*p* distinct eigenvalue	*p* distinct eigenvalues
Page 35, Direct Methods	group of methods obtain	group of methods obtains
Page 36, lines 1 and 2	*diagonal matrix* elements of the solution vector $\mathbf{x}_i$'s can be obtained directly by dividing the elements of ***b*** vectors	*diagonal matrix,* the solution vector **x** can be obtained directly by dividing the elements of ***b*** vector
Page 36, 3rd line after (2.41)	for all *i* values	for all values of *i*

Page 36, line after (2.42)	entries below the	entries above the
Page 37, line 2	values to the	values in the
Page 37, section 2.2.1.1, 1st para	shown in Eq. (2.6).	shown in Eq. (2.6) with $m = n$.
Page 41, last para	the above diagonal elements are	the elements above the diagonal are
Page 42, (2.55)	"…" in the 6th column	Delete the "…" but insert three spaces so that the spacing between 5th and 7th column remain same.
Page 42, line after (2.56)	We leave it up to the	We leave it to the
Page 44, para before the end of example line		Add at the end of the para: So, now we introduce *LU* decomposition.
Page 46, Theorem 2.3, line 1	sequence of matrix	sequence of matrices
Page 46, Theorem 2.3, last two lines	Eqs (2.60) and (2.61)…, by Eq. (2.62)	Eqs (2.61) and (2.62)…, by Eq. (2.63)
Page 49, Eq. (2.72), line 3, lhs of the eq.	Subscript of *u* is *ij*	Subscript of *u* should be *kj*
Page 49, Eq. (2.72), line 4	Subscript of *a* is *ij*	Subscript of *a* should be *ik*
Page 50, Eq. (2.74)		Delete "=" sign between 2nd and 3rd matrix.
Page 50, 1st line in the paragraph after Theorem 2.4		*LU* and *LDU* should be italic
Page 50, Second line above Eq. (2.75)		*LDU* should be italic
Page 55, Section 2.2.1.4, 1st Para, 2nd Line	..as a result the quantum..	..as a result, the quantum..
Page 55, last para, last line	Last line of the last para ends abruptly at the middle of the sentence but the line is not complete: "…can be solved"	Last line should be: "can be solved by vector operations. Thomas algorithm is one such procedure." This text is moved from Page 56.
Page 56, 1st line below Fig. 2.5	"by vector operations. Thomas algorithm is one such procedure."	Move this at the last line of Page 55. Delete here.
Page 57, Eq. 2.86	$\beta_i = b_i - \left(\frac{l_i}{\alpha_{i-1}}\right)\beta_i$	$\beta_i = b_i - \left(\frac{l_i}{\alpha_{i-1}}\right)\beta_{i-1}$
Page 65, 1st Para, 2nd, 3rd and 4th lines	All *x, e* and ε are italic	All $\boldsymbol{x}$, $\boldsymbol{e}$ and $\boldsymbol{\varepsilon}$ should be bold and italic
Page 65, 2nd Para, 2nd line	ε is italic	$\boldsymbol{\varepsilon}$ should be bold and italic

Page 65, equations after 2nd Para	*x* on the rhs of both the equations are italic	*x* on the rhs of both the equations should be bold and italic
Page 69, Eqs. (2.126) and (2.127)	*S* on the rhs of both the equation is italic	*S* on the rhs of both the equation should be italic and bold
Page 70, 2nd line	***R***is bold and italic	*R* should be italic but not bold
Page 74, line before the last line	measurements with parameters	measurements for parameters
Page 75, 2nd Para, 1st line	coefficient matrix that the first column elements are about 3 orders	coefficient matrix that the elements in the first column are about 3 orders
Page 75, 3rd Para, 4th line	replace x_1 by x_1' 10th set of equation becomes	replace x_1 by x_1', the set of equation becomes
Page 80, Problem 4	$\begin{bmatrix} 10^{-5} & 10^{-5} & 1 \\ 10^{-5} & 10^{-5} & 1 \\ 1 & 1 & 2 \end{bmatrix}\begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix} = \begin{bmatrix} 2\times10^{-5} \\ -2\times10^{-5} \\ 1 \end{bmatrix}$	$\begin{bmatrix} 10^{-5} & 10^{-5} & 1 \\ 10^{-5} & -10^{-5} & 1 \\ 1 & 1 & 2 \end{bmatrix}\begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix} = \begin{bmatrix} 2\times10^{-5} \\ -2\times10^{-5} \\ 1 \end{bmatrix}$ (Notice the change of sign in the middle element on the left.)
Page 81, Problem 13, below the large matrix equation	c^T	$\boldsymbol{c}^T$(Notice, *c* is bold and italic)
Page 81, Problem 13, matrix equation before "Answer the following:"	*A, b, x, d* in the first row and *c* ofc^Tin the 2nd row are all italic.	***A, b, x, d***in the first row and***c***of$\boldsymbol{c}^T$in the 2nd row: all of them should be bold and italic
Page 81, last line	system of equation and ***Ay*** = ***b***	system of equation ***Ay*** = ***b***
Page 82, Section 2.3.1, 1st Para, 3rd line	$\{x_1, x_2, \ldots, x_n\}$	$\{\boldsymbol{x}_1, \boldsymbol{x}_2, \ldots, \boldsymbol{x}_n\}$ (Notice, ***x*** is italic and bold.)
Page 92, Para after Theorem 2.8, lines 5-6	We will demonstrate the procedure for orthogonalization stated in Theorem 2.9 by construction,	We will demonstrate the procedure for orthogonalization by construction,
Page 92, Para before section 2.3.5.1, line 3	We will now show that	We will show that
Page 92, Para before section 2.3.5.1, line 4	multiplication of a orthogonal matrix	multiplication of an orthogonal matrix
Page 98, 2nd line below Eq. (2.165)	The change can be measure in absolute	The change can be measured in absolute

Chapter 3:

Location	**Existing**	**Corrected**
Page 132, second last line	$k^{(i-1)}$-$x^{(i-2)}$	$k(x^{(i-1)}-x^{(i-2)})$

Page 133, line before Eq. (3.27)	$x^{(i)}$	$x_*^{(i)}$
Page 134, Exercise 3.3, Problem 1, line 2	x =cos(x/2)=0	x =cos(x/2)
Page 136, Exercise 3.3, Problem 13, line 2	method using	method
Page 138, third last line	One *way*	*One way*
Page 148, equation after Eq. (3.43)	$x_{i+1}=x_i$ -	$x^{(i+1)}=x^{(i)}$ -
Page 152, third line after Eq. (3.48)	$x^{(i+1)}=\phi x^{(i)}$	$x^{(i+1)}=\phi(x^{(i)})$
Page 157	All B and J	Should be bold and italic (***B*** and ***J***)
Page 157, point 2 above Eq. (3.56)	$[B^{(0)}J(x^{(0)})]$	$[\boldsymbol{B}^{(0)}=\boldsymbol{J}(\boldsymbol{x}^{(0)})]$

Chapter 4:

Location	**Existing**	**Corrected**
Page 165 and 166	$f(x)-B_{n(x)}$	$f(x)-B_n(x)$
Page 173, Exercise 4.2, Problem 1, last line	comments	comment
Page 173, fourth last line	probably, do	probably do,
Page 179, Box 4.2, denominator of the last term in the last equation	$<O_1, O_{m-1}>$	$<O_{m-1}, O_{m-1}>$
Page 187, Fig 4.4, axis label	*X*	*x*
Page 189, second line after Eq. (4.18)	*[-1,1]*	*(-1,1)*
Page 189, third line after Eq. (4.18)	*[a,b]*	*(a,b)*
Page 201, fourth last line	$c_2x^2\ c_3x^3$	$c_2x^2+ c_3x^3$
Page 208, last line	*0.60395*	*0.60395=5.49772*
Page 209, Exercise 4.4, Problem 2, first line	function is…to be	function…is to be
Page 210, first line	polynomials and	polynomials and
Page 210, Problem 5, third line from the end	(i.e., the points at which..	(i.e., the point at which..
Page 210, Exercise 4.4, Problem 7, first line	function x=4	function at x=4
Page 213, Last Para	Indent is less than the bulleted list	should be equal to the bulleted list

Page 230, Example 4.12, 6th line of the solution	(see Exercise 4.6.3).	(see Exercise 4.6, Problem 3).
Page 231, Eq. (4.63)	x^l at lhs and rhs	should be x^l (Notice italics l)
Page 238, Problem 12, 2nd line	Lagendre	Legendre
Page 239, first equation	upper limit of integral missing	should be 1
Page 239, first equation	P_1	P_i
Page 239, third last line	$\omega(-2\pi/T)$	$\omega(=2\pi/T)$
Page 240, last equation	Wrongly positioned	Move after the first line of preceding paragraph
Page 246, lines 2 and 3 below Fig. 4.13(b)	π, for $j=0$ $= \frac{2}{\pi}\frac{1-(-1)^j}{j^2}$, otherwise	$= \begin{cases} \pi & \text{for } j=0 \\ \frac{2}{\pi}\frac{1-(-1)^j}{j^2} & \text{otherwise} \end{cases}$
Page 246	End of example line is wrongly positioned	Move the line just above the last para
Page 250, Exercise 4.7, problem 2, last line	$\pi/8$	$\pi/4$

Chapter 5:

Location	**Existing**	**Corrected**
Page 266, sixth last line	we do…get the	we do get the
Page 274, Exercise 5.2, Problem 10, below the table	at the end, problem statement is missing	Estimate the acceleration at 20 s using numerical differentiation of the highest possible order. Also estimate the distance travelled in 40 s to an accuracy $O(h^6)$ applying the Romberg integration algorithm to three estimates obtained by the trapezoidal rule.
Page 274, Exercise 5.2, problem 11, first line	Lagrance	Lagrange
Page 278, first line of Eq. (5.28), lower limit of the integral	h_{i-1}	$-h_{i-1}$
Page 280, last para, first line	Combining the trapezoidal rule, estimate over	Combining the trapezoidal rule estimates over
Page 280, last para, last line above Eq. (5.34)	(…. somewhat complicated).	(…. somewhat complicated)
Page 304, line below Eq. (5.71)	quadrature, we get, using the fact	quadrature, and using the fact
Page 304, between equation (5.72) and the equation on the line before		Insert: We get

Page 307, Box 5.3, at two places	[(a,b) or (a,b)]	[a,b) or (a,b]
Page 312, Problem 11, Fig. 5.7	$z = z_0$	$z = 0$
Page 313, Problem 16, third line	If *v* velocity is	If the velocity is
Page 313, Problem 18	(a) single application of Simpson's rule could be applied and then evaluate the integral using (a) single application of Simpson's rule and (b)	(a) single application of Simpson's rule and (b)

Chapter 6:

Location	**Existing**	**Corrected**
Page 319, 2nd line below Eq. (6.9)	not very easy to apply.	not easy to apply.
Page 323, two lines above Eq. (6.21)	on the left hand side.	on the left.
Page 327, fourth para, first line	time stepping formulae for	time stepping schemes for
Page 327, fourth para, second line	methods listed	formulae listed
Page 331, line below Eq. (6.29)	γ_0=2/3	γ_0=3/2
Page 341, first line	$t > 0$	$t < 0$
Page 342, Problem 11, first line	Table 6.6	Table 6.9
Page 359, Fig. 6.10	y-axis label is on the left.	Move the y-axis label to the right, next to the axis
Page 361, Fig. 6.11	y-axis label is horizontal and next to the x-axis	Move it next to the y-axis above and align vertically.
Page 362, first line	Following in a	Following on a
Page 364, first bullet, 2nd line	therefore these are stable for	therefore, it is stable for
Page 365, 2nd line from last	$\lambda r > 0$	$\lambda_r > 0$
Page 366, Definition 6.4, first line	Eq. (6.26)	Eq. (6.83)
Page 372, lines 3-4	at different locations and the starting points of the waves for imaginary part at zero time are also different.	at different locations.
Page 372, 2nd Para, line 4	becomes spiral	becomes a spiral
Page 373, last line	the true solution.	the true solution (Fig. 6.15).
Page 375, Exercise 6.3, Problem 1, line 3	$h_{n+1} = h_{n-1} + 2hf_n$	$y_{n+1} = y_{n-1} + 2hf_n$

Page 375, Exercise 6.3, Problem 3, line 2	in Table 6.6. …boudary….	in Table 6.9. …boundary….
Page 377, Last Para, first line	...=1 but the values at negative…	..=1 is known, but the values at the negative…
Page 383, Para below Table 6.15, 3rd line	t = 0.5	t = 1.0
Page 386, 2nd line	…corrector method is same…	…corrector method with repeated application of the corrector is same…
Page 386, Table 6.20, heading of the 6th column	$y_{n+1}^{c,i}$	$f_{n+1}^{c,i}$
Page 387, Para before Exercise 6.4, 2nd line	a system of IVPs	a system of coupled IVPs
Page 391, Eq. (6.112)	$u_1 = y,\ u_2 = y', u_3 = y'', \cdots u_m = y^{[m-1]}$	$y^{[m]} = f\left(y^{[m-1]}, y^{[m-2]}, \cdots y', y; t\right)$
Page 391, 3rd line above Eq. (6.115)	…the scalar arithmetic operations…	…the scalar operations…
Page 392, equations on the last line	..and $\boldsymbol{f}(\boldsymbol{y},\boldsymbol{x})$=..	..and $\boldsymbol{f}(\boldsymbol{y},x)$=.. (notice x is not bold)
Page 398, Example 6.11, first line	..Example 6.10 using..	..Example 6.10 with $f''(0) = 5.0$ using..
Page 404, Fig. 6.12	Missing axes labels, dashed line is wrongly visible below horizontal axis.	Label for the horizontal axis is 't', Label for the vertical axis is 'u, v' Dashed line should asymptotically disappear into horizontal axis from above and should not be visible below it.
Page 414, Problem 7, 2nd from last line	Can you recognize the *catenary*.	Can you recognize the *catenary*?
Page 420, 2nd line from last	…derivatives and a grid size…	…derivatives in (6.132) and a grid size…

Chapter 7:

Location	**Existing**	**Corrected**
Page 430, line above Eq. (7.5)	dimensional for such cases	dimensions for such cases
Page 432, Section 7.2, 1st Para, last line	….helps us understand…	….helps us to understand…
Page 441, Eq. (7.44) and (7.45)	numerator in the derivative term is φ	numerator in the derivative term should be ϕ like every other term
Page 442, 1st Para, last line	…this in Example 7.1.	…this in Example 7.2.
Page 456, 4th Para, 1st line	Let us choose central difference for..	Let us choose 2nd order central difference scheme for…
Page 456, 5th Para, 1st line	….for the central…	….for the 2nd order central…

Page 457, 3rd line below Eq. (7.71)	…using central difference scheme.	…using 2nd order central difference scheme.
Page 460, Para 3, line 2	difference approximation of …	difference or ghost node approximation of …
Page 460, Para 3, line 3	For example, equations for….	For example, 2nd order backward difference equations for….
Page 463, 1st line	Node 16”:	Node 16’:
Page 463, Para below Eq. 7.86, line 3	…condition has (have) changed….	…condition(s) has (have) changed….
Page 463, Para below Eq. 7.86, line 4	…to all other entries will remain…	…to all other nodes will remain…
Page 464, Example 7.3, Line 3	T(8,y)	T(2,y)
Page 470, 1st and 2nd Para	Last two sentences in the first para: “The line at t=0….the plotted result.”	Move these two sentences from the present location to the end of second para, after “…progresses with time.”
Page 472, Para after Eq. (7.106), last but one line	….methods descriped in Eqs. (7.105)…	….methods described in Eq. (7.105)…
Page 476, line 8	…secondorder accuracy in time,…	…second order accuracy in time,…
Page 478, Eq. (7.114), Line 1	A ‘+’ sign is missing just before the square bracket containing [1+2(….)]	Insert the ‘+’ sign before the square bracket containing [1+2(….)]
Page 480, 2ndpara, line 7	Problem 3 of Exercise 7.3 a method..	Problem 3 of Exercise 7.4 a method..
Page 481, last line of Problem 2	approximation in space….	approximation in space with….
Page 482, para below Fig 7.13, line 4	steady temperature (T)…..	steady state temperature (T)…..
Page 483, Prob 7, line 1	…circular disc shown….	…circular disc of unit radius shown….
Page 483, Prob 9, line 1	…following hyperbolic dimensions wave equations:	…following wave equation:
Page 487, Eq. (7.139)	Subscript of λ is n-1	Subscript of λ should be m-1

Chapter 8:

Location	**Existing**	**Corrected**
Page 515, Line 1	...=c_3-1/35,…	...=c_3=1/35,…
Page 529, sixth line	$x_1\Delta x_2 I=\Delta$	$I=\Delta x_1\Delta x_2$
Page 534, 1st line below Fig. 8.8	thin holds for the…	thing holds for the…
Page 537, line 4	$f(t_1)$	$f(t_l)$
Page 539, 3rd Para, line 4	used to March forward…	used to march forward…
Page 546, 6th line of the section “Confidence Interval”	m and s are not correct	replace by μ and σ, respectively
Page 556, first equation in Section 8.7.1	$\delta(x_i)$	$\delta(x-x_i)$

Page 567, expression for b_0, second line	b_0=…. =0 …… (a '-' sign is missing after zero)	b_0=…. =0 - …… (put the '-' sign between zero and the next term on the same line)
Page 569, equation below the first para	$\ldots + 4\tilde{y} = 4$	$\ldots + 4\widetilde{y_1} = 4$
Page 573, Para below Fig. 8.20, line 4	temperature stress has to be…	temperature distribution has to be…
Page 576, 2nd line above Eq. (8.91)	…which will be required…	…which may be required…
Page 577, 2nd line above section 8.8.3	…i.e., is implementation….	…*i.e.*, implementation….