Chapter-1

pp 36, Exercise Problem 1.10:

(i) (for Exercise problem 1.4) should be (for Exercise problem 1.7)

(ii) “in terms of PGA for 10% probability of exceedance” should be “in terms of PGA for 10% probability of exceedance in 1year”.

Fig. 1.24/1.26, P[R=r] should be P[M=m]

Chapter -2

pp 45, Equation 2.10, should be $\phi_n = \tan^{-1}\left(\frac{a_n}{b_n}\right)$

pp 48, Last two lines, $\frac{32\pi}{(31\times 0.02)} = 335 rads^{-1}$ should be $\frac{32\pi}{(32\times 0.02)} = 157.07 rads^{-1}$ and

$d\omega = \frac{2\pi}{T} = 9.81 rads^{-1}$

pp 49, 2 lines above section 2.4, .the outputs from the FFT of MATLAB are divided by N/2 should be replaced by inputs i.e., x_r for FFT in MATLAB are divided by N/2

pp 50, below Equation 2.16, c_n is the absolute value of the complex quantity (Equation 2.9 should be replaced be Equation 2.13)

pp 63, remove [6]

pp 68, 2nd line, O should be D

pp 79, Equation 2.43, PHA in cms^{-1} should be in cms^{-2}

pp 81, Equation 2.54, PGA in cms^{-1} should be in cms^{-2}

pp 89, Example 2.11, (i) Kanai and Tajimi (Equation 2.73 should be 2.72)

(ii) Clough and Penzien (Equation 2.75 should be 2.74)

(iii) given by Equations 2.70, 2.71, 2.73 and 2.76 should be 2.70, 2.71, 2.72 and 2.74

pp 91, Equation 2.83, $e^{c(t-t_2)}$ should be $e^{-c(t-t_2)}$

pp 92, Equation 2.92, (i) terms within **exp** should be with negative sign

(ii) $\omega_0 = 1.09$ should be $f_0 = 1.09$

pp 95, Exercise problem 2.18, Equation 2.69 should be 2.66

Figure 2.45 should be 2.46

Exercise problem 2.19, Equation 2.75 should be 2.74

Exercise problem 2.20, Equation 2.75 should be 2.74

Equation 2.94 should be 2.93

Equation 2.93 should be 2.92

Equation 2.95 should be 2.94

Exercise problem 2.21, Equations 2.84, 2.85 and 2.87 should be 2.83, 2.84 and 2.86 respectively.

Chapter-3

pp 100, 3.2.2 subheading, “Absolute motion” should be “Absolute motions”

pp 101, Equation 3.5b, k and c should be $\frac{k}{m}$ and $\frac{c}{m}$ respectively.

pp 104, Just above Example 3.2, u_1 and u_2 should be u_1 and v_1

pp 108, 2nd para, 2nd line, “the other two DOF locked” should be “the other DOF locked”

pp110, Equation 3.16, r should be placed after M_{ss}, C_{SS} etc.

pp110, Equation 3.19, r should be placed after M_{ss}

pp 111, Example 3.4,

$$K_{rr} = \frac{EI}{3.6L}\begin{bmatrix} 38.4 & 12 & 0 \\ 12 & 48 & 12 \\ 0 & 12 & 38.4 \end{bmatrix}; \qquad K_{rr}^{-1} = \frac{L}{EI}\begin{bmatrix} 0.102 & -0.028 & 0.009 \\ -0.028 & 0.039 & -0.028 \\ 0.009 & -0.028 & 0.102 \end{bmatrix}$$

Second part of $\bar{K}_{uu}$ matrix changes to $\frac{EI}{L^3}\begin{bmatrix} 8 & 5.33 & -8 & -4 \\ 5.33 & 52 & -5.33 & 6.33 \\ -8 & -5.33 & 8 & 4 \\ -4 & 6.33 & 4 & 3.69 \end{bmatrix}$

$$\bar{K}_{us} = \frac{EI}{L^3}\begin{bmatrix} 16.03 & 10.68 \\ 10.68 & 129.5 \end{bmatrix} \qquad \bar{K}_{usg} = \frac{EI}{L^3}\begin{bmatrix} -4 & -8 \\ 5.33 & -22.3 \end{bmatrix}$$

$$r = -\bar{K}_{us}^{-1}\bar{K}_{usg} \begin{bmatrix} 0.661 & -0.0054 \\ -0.0054 & 0.0082 \end{bmatrix}\begin{bmatrix} -4 & -8 \\ 5.33 & -22.3 \end{bmatrix} = \begin{bmatrix} 0.2926 & 0.4074 \\ -0.654 & 0.1389 \end{bmatrix}$$

pp.113, Example 3.5, K_{41} should be $-\frac{3}{2}\frac{AE}{l_1}\cos^2\theta$; $K_{71} \neq 0$, but $= -\frac{AE}{2l_1}\cos^2\theta$;

$K_{42} \neq 0$, but $= K_{71}$

pp 115, Example 3.6, A matrix, 4th diagonal term should be -0.1025ρ

pp.115, r matrix is changed to

$$r = -\begin{bmatrix} -0.781 & -0.003 & 0.002 & -0.218 \\ -0.218 & 0.002 & -0.003 & -0.781 \\ -0.147 & -0.0009 & 0.0009 & 0.147 \end{bmatrix}$$

pp 123, Equation 3.79, e^{-i} should be e^{i}

pp 123, 2nd line after Eqn 3.79, r=1----N and k=1----N should be r = 0-----N-1 and k = 0----N-1

pp 123, 2nd paragraph, 6th line, $2\pi/T$ should be $2\pi/(T+\Delta t)$

pp 123, 2nd paragraph, 7th line, $\omega_i = \left[(N/2-1)\right]$ should be $\omega_i = N(\Delta\omega)/2$

pp 123, after Eqn 3.80, 1st line, j=1---- $N/2$ should be j = 0--- $N/2$

pp 123, last line, (r=1----N) should be (r = 0----N-1)

pp 124, first line, $N/2$ should be $N/2+1$

pp 124, 2nd line, $\left[(N/2)-1\right]2\pi/T$ should be $N\pi/(T+\Delta t)$

pp 124, 3rd line, $j = 0 to (N/2-1)$ should be $0 to N/2$

pp 124, 4th line, $\omega_j = 0 to (N/2-1)\Delta\omega$ should be $0 to\ N(\Delta\omega)/2$

pp 124, 5th line, $j = 0\cdots(N/2-1)$ should be $j = 0\cdots N/2$

pp 124, 6th line, $j = N/2$ should be $j = N/2+1$

pp 124, 7th line, $j = N-1$ and j = 0 should be j = N and j = 1

pp 124, Example 3.7, $C_1 = 0.97$, $C_2 = 0.0196$, $C_3 = 1.31 \times 10^{-4}$, $C_4 = 6.6 \times 10^{-5}$, $D_1 = -2.93$, $D_2 = 0.946$, $D_3 = 9.69\times10^{-3}$, $D_4 = 9.87\times10^{-3}$

pp 125, Figure 3.11, u should be replaced be x

pp 126, after ϕ matrix, $e^{\bar{\lambda}\Delta T}$ should be $e^{\bar{\lambda}\Delta t}$ and $e^{A\Delta T}$ should be $e^{A\Delta t}$

pp 128, Equation 3.91, α should be replaced β

pp.131, Example 3.9, $r = \begin{bmatrix} 0.2926 & 0.4074 \\ -0.654 & 0.1389 \end{bmatrix}$;

Figure 3.14b will have 0 ordinates $K = \dfrac{EI}{L^3}\begin{bmatrix} 16 & 10.49 \\ 10.49 & 129 \end{bmatrix}$

pp 135, Values of Matrix A should be multiplied by m

pp.138,Example 3.11, $r = -\begin{bmatrix} -0.781 & -0.003 & 0.002 & -0.218 \\ -0.218 & 0.002 & -0.003 & -0.781 \\ -0.147 & -0.0009 & 0.0009 & 0.147 \end{bmatrix}$ The peak values of z_1, z_2 and z_3 (given in the first row of Table 3.4) change to 0.0377m, 0.025m and 0.02m respectively.

pp 136, Figure 3.17b, should be replaced by the new Figure given at the end of Errata of Chapter-3

pp 139, 2nd paragraph, 2nd line, after 45 s duration, add (a segment of 35s is shown in the figure)

pp 142, Equation 3.115, $\rho_i = \dfrac{\sum_{r=1}^{n} m_r \phi_{ir}}{M}$ should be $\rho_i = \dfrac{\sum_{r=1}^{n} \lambda_i m_r \phi_{ir}}{M}$

pp.142, after Equation 3.115 and after " where ", add "λ_i is defined by Equation 3.114 for single support excitation".

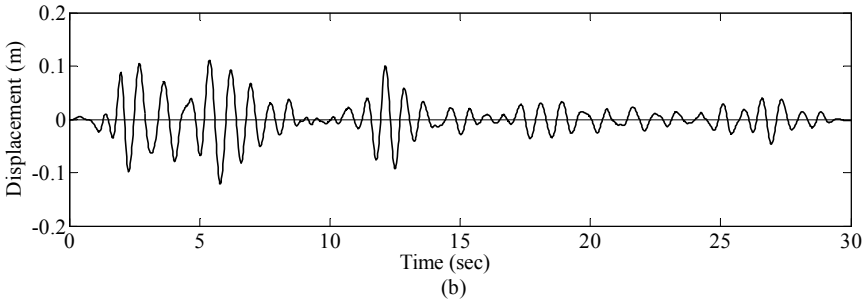
pp 147, Table 3.6, all -0.0001 should be replaced by -0.0015

pp 147, Above Section 3.5.7, 2nd line, time histories of the moment should be replaced by time histories of the shear

pp 152, Figure 3.23, black dot showing the mass is missing for the 3rd mass from the left.

pp 160, Figure 3.35a, F_2 should be changed to F_1; $1L\dfrac{\sqrt{13}}{6}$ should be $\dfrac{\sqrt{13}}{6}L$; a force vector $\vec{F}_4$ must be shown at the base of right hand column.

pp 160-161, all M should be changed to m



(b)

Chapter-4

pp 172, Figure 4.1, t, t_1 should be changed to t_1, t_2 respectively and within the gap τ should be shown

pp 173, 1st line, sample s should be samples and equation should be corrected as

$$\sigma_{xi}^2 = \frac{1}{T}\int_0^T \left[x_i(t) - \overline{x}_i(t) \right]^2 dt$$

pp 175, $k = 0 \cdots\cdots N/2 - 1$

pp 178, 4th para, 8th line: $\phi \neq 225^0$, but 180^0

pp 179, 2nd line of Equation 4.29 should be omitted

pp180, after equation 4.32b, $\boldsymbol{a} = \left[a_1 \;\; a_2 \right]$

pp 183, 3rd line from bottom, $S_{\ddot{x}g}$ should be $S_{\ddot{x}_g}$

pp 184, Equation 4.68 should be $S_{\dot{X}X} = \left(i\omega S_X \right)^{*T}$ and Equation 4.69a should be $S_X = \left(-\omega S_X \right)^{*T}$

pp 184, below Equation 4.69a, the line should be replaced by; As S_X is a complex matrix with diagonal terms as real quantities, it is found that

pp 186, Equation 4.76 should be $S_{\ddot{x}_g x} = -HMIS_{\ddot{x}_g}$

pp 187, just above section 4.9.2, 0.0154 should be 0.0154m

pp 188, just above the last equation, Equation 2.93 should be replaced by Equation 2.93 (with c=1)

pp 189, Example 4.3, $K = \frac{EI}{L^3}\begin{bmatrix} 16 & 10.49 \\ 10.49 & 129 \end{bmatrix}$; $r = \begin{bmatrix} 0.2926 & 0.4074 \\ -0.654 & 0.1389 \end{bmatrix}$

the rms responses are to be corrected as: DOF(4)=0.0237m DOF(5)=0.00081m for partially correlated; DOF(4)=0.0332m DOF(5)=0 for fully correlated

The figure 4.14a should be removed; caption of the figure should be changed accordingly

pp 191, 1st line Equation 4.36 should be replaced by Equation 4.37

pp 191, add after Equation 4.83; if S_{xg} is a complex matrix, then $S_{xx_g} = S_{x_g x}^{*T}$

pp 193, Section 4.10, 3rd line, Figure 4.7 should be Figure 3.7

pp 193, Section 4.10, all θ, x, δ should be in bold

pp 196, Equation 4.98, $h_i h_j^{*i}$ should be $h_i h_j^*$

pp 197, 2nd line, Equation 2.93 should be Equation 2.93 (with c=1)

pp 197, below **r,** add the following;

$$\rho_1 = \exp\left(-\frac{5\omega}{2\pi}\right); \rho_2 = \exp\left(-\frac{10\omega}{2\pi}\right); \rho_3 = \exp\left(-\frac{15\omega}{2\pi}\right) \quad \mathbf{S}_{\ddot{x}_g} = \begin{bmatrix} 1 & \rho_1 & \rho_2 & \rho_3 \\ \rho_1 & 1 & \rho_1 & \rho_2 \\ \rho_2 & \rho_1 & 1 & \rho_1 \\ \rho_3 & \rho_2 & \rho_1 & 1 \end{bmatrix} S_{\ddot{x}_g}$$

pp 197, Example 4.6, rms values of displacement of DOF (1), left tower, and DOF(3, not 2 as printed), centre of the deck should be corrected as 0.0219m and 0.0152m respectively.

Chapter-5

pp 214, Example 5.3, 1st line, (…. Example 3.9) should be (…. Example 3.1)

pp 216, above Equation 5.24a, (foe s=3 and m=3) should be (for s=3 and m=2)

Equation 5.24a: $\overline{\phi}_2\beta_{21}$ should be $\overline{\phi}_2\beta_{12}$

Equation 5.24b should be modified as, $\overline{\boldsymbol{z}}^{\boldsymbol{T}} = \{\overline{z}_{11} \quad \overline{z}_{21} \quad \overline{z}_{31} \quad \overline{z}_{12} \quad \overline{z}_{22} \quad \overline{z}_{32}\}$

Equation 5.27b, $\overline{\phi}_m\beta_{11}D_{1m}$ should be $\overline{\phi}_m\beta_{1m}D_{1m}$ and $\overline{\phi}_m\beta_{s1}D_{sm}$ should be $\overline{\phi}_m\beta_{sm}D_{sm}$

pp 218, Example 5.4, $\overline{\phi}$, r should be made bold and $\boldsymbol{\phi}_{\beta D}$ should be $\boldsymbol{\phi}_{\beta D}^{T}$

pp 219, above Example 5.5, (Example 3.10….) should be (Example 3.8….)

pp 221, Figure 5.5, Caption (b) SDOF is to…. Should be (b) SDOF to…..

pp 222. Example 5.6, For Example 3.5….should be replaced by For Exercise Problem 3.18…

pp 225, Equation 5.43, $\sum\left|(V_b)\right|$ should be replaced by $\sum\left|(V_{bi})\right|$

pp 227, Figure 5.7 is wrong plots of Equations 5.46 and 5.47. The values of c_h and $\frac{A}{g}$ should be obtained directly from the given Equations (revised Figure 5.7 is given at the end of Errata of Chapter-5)

pp 228, In Equation 5.51b, replace U by v; U in Equation 5.51a is defined as a calibration factor.

pp 229, In Figure 5.9, top curve is for $Z_a > Z_v$; middle one is for $Z_a = Z_v$; last one is for $Z_a < Z_v$.

pp 231, (i) Figure 5.11 is drawn for stiff soil

(ii) In Figure 5.12, categories 1 and 3 refer to stiff and soft soils respectively.

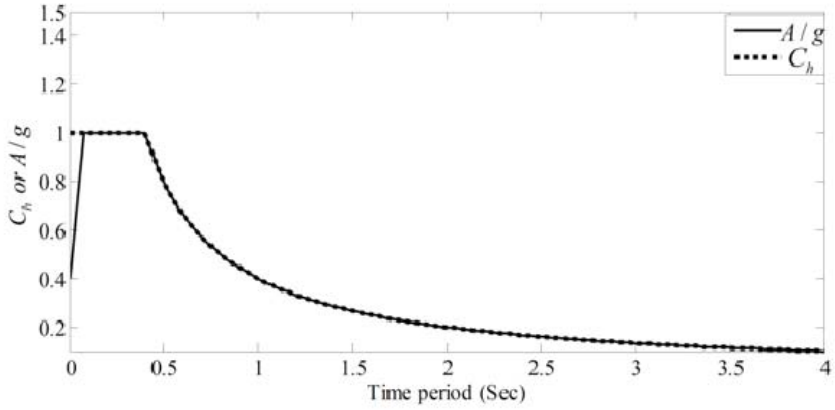


Figure 5.7: Variation of C_h and A/g with time period T

Chapter-6

pp 241, Section 6.2.2.3, Equation 6.3, should be Equation 6.8

pp 241, Example 6.1, solution, $\Delta\ddot{x}_g$ should be = -0.0312 or -0.00312g

pp242, Figure 6.3, 0.147m should be 0.0147m

pp 242, 6th line from bottom, Δx should be = -0.00004156

pp 242, 8th line from top, Δx_2 and $\Delta\dot{x}_2$ should be Δx and $\Delta\dot{x}$

pp 242, last two equations should be replaced by

$$\Delta\dot{x}_1 = \frac{2}{\Delta t} e\Delta x - 2\dot{x}_t$$

$$\dot{x}_t + \Delta\dot{x}_1 = 0 \ \textit{gives}$$

$$e = -6.8; \Delta x_1 = 0.000283$$

pp 243, 3rd line, $\Delta x_2 = 0.00028$ should be replaced by $\Delta x_2 = -0.000325$

pp 243, last equation, should be corrected to $f_{x(t+\Delta t)} = f_{xt} + k_t \Delta x_2 = 1.4435N$

pp 244, Figure 6.5a, all k should be $k/2$

pp 245, 4th and 5th lines from bottom, k should be $k/2$

pp 246, K_t matrix should be $\begin{bmatrix} 100 & -100 & 0 \\ -100 & 200 & -100 \\ 0 & -100 & 100 \end{bmatrix}$ and $\bar{\boldsymbol{K}}$ should be

$$10^4 \times \begin{bmatrix} 1.026 & & sym \\ -0.0124 & 1.026 & \\ 0 & -0.0124 & 1.0137 \end{bmatrix}$$

pp 259, Example 6.5, solution, 1st line, 1 and 6 should be 1 and 2

pp 262, step iv $\Delta_{1n} = \sum_{i=1}^{n} \delta\Delta_{1i}$; Step vii V_{Bi} Vs Δ_{1i}

pp 269, equation 6.41, 2nd equation, T_c should be T_c!

pp 273, Exercise problem 6.12, at the end of the problem, add $\xi = 5\%$

pp 274, In Figure 6.32, section B is at the left end of the third beam from the bottom

Chapter-7

pp 277, last para, 2nd line, creast should be crust

pp 294, 2nd para, 3rd line, $\left(V_I - u_g\right)^T$ should be $\left(V_I - Iu_g\right)^T$

pp 295, Section 7.5.2, 1st line, soil-structure foundation should be soil-structure-foundation

pp 298, 5th line, flooring should be footing

pp 300, Figure 7.30, $v(t)$ should be $u(t)$

pp 301, Equation 7.50, should be $-\begin{bmatrix} V_b \\ M_b \end{bmatrix} = \boldsymbol{G}_d(\omega)\begin{Bmatrix} v(\omega) \\ \theta(\omega) \end{Bmatrix}$

pp 315, Equation 7.77, $\frac{1}{2}\bar{m}\omega_i$ should be $\frac{1}{2}\bar{m}_i\omega_i$

pp 320, Section 7.6.3, 1st line, Figure 7.46 should be 7.47

pp 320; Example 7.9: First line should read as: It is assumed that a building frame is pile founded in soft soil…(of Exercise 7.5 should be omitted)

pp 322: first line; Exercise 7.4 should be Example 7.4

pp 325: Example 7.10, solution, $C_s = \rho V_s S_u rl$ should be replaced by $C_s = \rho V_s \bar{S}_u rl$

pp 330, Example 7.11, 4th line, ξ for the pipe = 2% (not 5%)

pp 331, 1st line, should read as, Stiffness and mass matrices for the structure, shown in Figure 7.57, are obtained as

pp 331, in matrix $[K]_l$, 3rd element of 6th row should be $-\frac{l}{2}$ (not 0); 4th element of 7th row should be $-\frac{l}{2}$ (not 0);

In $\bar{K}_l$ matrix, 4th diagonals value should be 19.75 (not 23.17);

In $\bar{K}_a$ matrix, 2nd 3rd and 4th diagonal values should be 60 (not 6);

Note: For all exercise problems, take $\xi = 5\%$ for both soil and structure wherever these material damping are not mentioned.

Chapter-8

pp 339, Equation 8.14, $\frac{\partial^2 \boldsymbol{G}}{\partial x_i \partial x_j}$ should be $\left(\frac{\partial \boldsymbol{G}}{\partial x_i}\right)\left(\frac{\partial \boldsymbol{G}}{\partial x_j}\right)$

pp 340, Equation 8.17, $\boldsymbol{X}_d$ should be $\boldsymbol{X}'_d$

pp 341, Equation 8.26, $\left(\frac{\partial G}{\delta x'_{di}}\right)$ should be $\left(\frac{\partial G}{\partial x'_{di}}\right)$

pp 343, last para above Section 8.4.4, add at the end, ….space at the design point.

pp 344, Equation 8.35, denominator P_f should be $\overline{P}_f$

pp 352, 357, Examples 8.3, 8.5: Damping of the structure ξ should be taken as 5%

pp 360, Below Table 8.7, $\sum(8)(11)$ means multiplication of values of columns 8 and 11 of Table 8.7 etc.

pp 360, in Table 8.7, P_1, P_2, P_3 should be replaced by P_1,I; P_2,I; P_3,I respectively

pp 365, Exercise problem 8.8, at the end of the problem, add $\xi = 5\%$

Chapter 9

pp 384, Equation 9.23a, $\Delta\ddot{\boldsymbol{v}}_b$ should be $\Delta\ddot{\boldsymbol{v}}_s$

pp 386, in K matrix, last entry 0.431 should be aligned with -0.431

pp 390, the line above Equation 9.48, vector should be vectors

pp 404, Equation 9.68b, $\ddot{x}_g$ should be $\ddot{x}_{g_0}$

pp 405, Equation 9.69a, $\ddot{x}_g$ should be $\ddot{x}_{g_0}$

pp 407, Equation 9.75d: in $\bar{K}$ matrix, all k should be k_t

pp 408, Example 9.5, add at the end of the problem, $\xi_t = 2\%$; take ξ for the frame as 5%.

pp 409, matrices, **K**, **M** and **C** should be $\bar{\boldsymbol{K}}$, $\bar{\boldsymbol{M}}$, and $\bar{\boldsymbol{C}}$

pp 409, $\bar{\boldsymbol{C}}$ matrix, last but one raw, 512.3 0, should be 527.7 -15.4

pp 409, $\bar{\boldsymbol{C}}$ matrix, last raw, 0 15.4, should be -15.4 15.4

pp 410 and 411, Figs 9.42 and 9.43, time scale 35s as in Figure 9.41

pp 419, Example 9.6, Solution: 1st line; Example 9.4 should be 9.5

pp 428, 1st line, Equation 9.153b should be Equation 9.156b

pp 440, Equation 9.190, $\frac{\tau}{2}$ should be $\frac{\tau^2}{2}$

pp 443, 3rd para, 2nd line, the damping coefficient should be damper coefficient

pp 444, after the 1st line, **K** (Equation 9.201b) should be $\boldsymbol{K}_s$ (stiffness matrix)