Errata: Second Printing, Updated 3/1/99

Note: You can also get this information from my web page - www.me.berkeley.edu/faculty/tongue. Just click on publications and then Principles of Vibration. I've put the errata in *.pdf format there, along with instruction on how to do a free download of Adobe Acrobat to read them.

I'm including the TeX (LaTeX) form of the corrected equations here for people that might want to LaTeX them. I think they're understandable in this form but if you have a problem please e-mail me and I'll try to clarify. Also, if you'd like to simply get a postscript version of the errata then you can ftp errata.ps

Also, I'm putting down every typo that I can find. The vast majority aren't going to cause any problems to the reader (in fact they probably wouldn't even be noticed). I wanted to be complete though so please don't be put off by the number of entries.

Errata in the text

Chapter 1

page 30: In (1.5.13) the k should have no subscript

page 31: In (1.5.15) and the next line the $\dot{\theta}^2$ should just be $\dot{\theta}$.

page 34: The left hand side of (1.5.26) should multiplied by m_2.

page 64: In Figure 2.6 τ_r is drawn showing the displacement change rather than the time change.

page 80: In 2.15 (b) ϕ is plotted, not $-\phi$ (as labeled).

page 89: In 2.19 (b) and (c), ϕ is plotted, not $-\phi$ (as labeled).

page 91: An x, y coordinate frame should be included in Figure 2.21, the y direction pointing horizontally to the left.

page 110 In Example 2.13 it should read "discussed in Example 2.12, determine ..."

Chapter 3

page 155: 4th line should be "...exists after t_1."

Chapter 4

page 187: Figures 4.15, 4.16 and 4.23 - The plotting routine joined the results from "plus infinity" to "minus infinity," leaving a vertical line that I erased from some, but not all plots.

page 227: In 4.12.5 the $1 + 9i$ should be $1 + .9i$.

Chapter 5

page 354: In (6.5.43), remove the a from the subscript of $\mathcal{M}$.

page 362: The right square bracket in (6.5.66) should follow $b_4 \cosh(\beta)$. Also, the matrix values in (6.5.69) are wrong. The (3,3) entry should be .36378. The (4,4) entry should be .5. The (4,5) entry should be .28294.

page 366: The first two terms on the right hand side of (6.6.4) should have dx appended. The $+$ in front of the third term should be $-$. The differentiation on the left hand side of (6.6.7) should be with respect to a, not x_1.

Chapter 7

page 377: The text in the final paragraph was garbled. It should read "lumped mass isn't as large (relatively) as before, when compared to the mass of the bar."

Chapter 8

page 407: Second line from top: "... our summation mutates ..." would be clearer as "...our summations in (8.3.1) mutate into ..."

Errata in the problems

Chapter 1

Problem 12: "$m_1 = 1$ kg" should read "$m = 1$ kg."

Problem 17: The solution should be $y(t) = .1(1 - \cos(7.91t)$.

Problem 33: Not really an errata but in the figure the $t = -2$, $t = -1$, $t = 0$ is simply there to give a sense of time passing. The -2, -1 don't correspond to seconds.

Problem 42: This problem was meant to allow the student to obtain an equilibrium that wasn't just zero or $\frac{\pi}{2}$. Unfortunately, what was originally a linear torsional spring was replaced for "clarity" by a linear spring (k_1) and the trigonometric characteristic that should go with the linear spring was ignored. Thus the solution indicates a restoring force proportional to θ rather than $\sin(\theta)$. When revised, this problem will have the torsional spring restored since with the current setup the equilibrium is still going to be $\theta = 0$. For the solution in the solutions manual to hold, the k_1 spring should be replaced by a torsional spring for which the restoring moment is equal to $k_1 l_2^2 \theta$.

Problem 76. The illustration shows the possibility of base motion but the solution doesn't include any. If base motion is allowed the solution should be given by

$$k_e = \frac{1}{2} m \dot{x}^2$$

$$p_e = \frac{1}{2} k_1 (x - y)^2 + \frac{1}{2} k_2 x^2$$

$$r_d = \frac{1}{2} c \dot{x}^2$$

$$L = k_e - p_e$$

$$L = \frac{d}{dt} \frac{\partial L}{\partial \dot{x}} - \frac{\partial L}{\partial x} + \frac{\partial r_d}{\partial \dot{x}} = 0$$

$$m\ddot{x} + c\dot{x} + (k_1 + k_2)x = k_1 y$$

Problem 84: In the figure, a should measure from the top of the pivoted bar to the place that k_2 attaches to the bar.

Chapter 2

Problem 4: In the solution itself there is a typo in the last equation. The denominator should be 36-9(18), not 36-9(36). The final result is correct.

Problem 13: There should be a minus sign after the equals sign in the third from final equation of the solution.

Problem 43: Note that the damping factor in the figure is exact; it is equal to .10

Chapter 3

Problem 4: In the final solution the a_i's and b_i's are reversed.

Chapter 4

Problem 13: Ignore the accompanying figure. Just assume the system has 3 degrees of freedom and that the $[M]$ and $[K]$ matrices match the given conditions.

Problem 39: f_2 should be centered about zero (change -2 to -1).

Problem 49: The second occurrence of k_1 in the problem statement should be k_2.

Problem 72: This problem doesn't, repeat doesn't, actually refer to problem 30. Problems were switched somewhere along the line and what should be looked at for this problem is a serial chain of spring-mass elements with five masses and six springs. The values (from left to right) are $m_1 = 1$ kg, $m_2 = 10$ kg, $m_3 = 50$ kg, $m_4 = 1$ kg, $m_5 = 200$ kg, $k_0 = 1000$ N/m, $k_1 = 10$ N/m, $k_2 = 125$ N/m, $k_3 = 2000$ N/m and $k_4 = 2000$ N/m. Finally, there's an additional spring (k_5) that goes from m_3 and m_5 with a spring constant of 1 N/m.

Problem 76: See Problem 72 - same correction to system.

Chapter 7

Problem 12: In solutions manual, "which from 35.8" should read "which drops from 35.8"

Problem 13: In the solutions manual, "the bar is essentially ..." should read "beams 1 and 3 are essentially ..."

Problem 15: Should read "Shown below is a uniform, rigid, bar ..."

Problem 16: Should read "Shown below is a uniform, rigid, bar ..."

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