ERRATA FOR PDEs: SOURCES AND SOLUTIONS
Updated September 8, 2005.

1. In Exercises 1.1, number 2, page 15, the exponent is wrong for the case $\lambda > 0$.

Show that the general solution to the differential equation

$$x^2 y'' + xy' = \lambda y$$

can be written as

$$Y(x) = \begin{cases} c_1 x^{\sqrt{\lambda}} + c_2 x^{-\sqrt{\lambda}} & \text{if } \lambda > 0, \\ c_1 + c_2 \ln x & \text{if } \lambda = 0, \text{ or} \\ c_1 \cos\left(\sqrt{-\lambda} \ln x\right) + c_2 \sin\left(\sqrt{-\lambda} \ln x\right) & \text{if } \lambda < 0, \end{cases}$$

2. In Figure 1 of Section 2.2, page 69, the cubic curve should be labeled

$$1 + x + \frac{x^2}{2} + \frac{x^3}{6}$$

3. Also page 69, the exponents have been omitted in the first Taylor series :

$$1 + 1x/1! + 2x^2/2! + 6x^3/3! + \ldots + (n!)x^n/n! + \ldots,$$

4. In the set of equations preceding (54) on page 287, replace the hyperbolic trig functions with regular trig functions:

$$X'(0) = 0 = \begin{cases} \sqrt{\lambda} a_1 \sinh 0 + \sqrt{\lambda} a_2 \cosh 0 = \sqrt{\lambda} a_2 \\ b_2 \\ -\sqrt{-\lambda} c_1 \sin 0 + \sqrt{-\lambda} c_2 \cos 0 = \sqrt{-\lambda} c_2 \end{cases},$$

5. Odd pages 405-435 should be titled "Eigenfunction Expansions", not "Section 6.10. The Associated Legendre Equation."

6. Page 348, problem 10: change $f(\theta)$ to $g(\theta)$, three times.

7. Page 445, in the equation on line 8, change $\rho^2 R'' + \rho R''$ to $\rho^2 R'' + \rho R'$.

8. Page 300, equation (21); the term $2rR$ should be $2rR'$.

9. Page 341, equations (28) and (29); the term $2rR$ should be $2rR'$.

10. Page 314, in equation (26), omit the "n" and change "log" to "ln" twice.

11. Omit Exercise 10, page 452.

12. Page 145, Figure 5: on part (c), the formula should be

$$\frac{c}{2\pi} + \frac{2}{\pi c} \sum_{n=1}^{\infty} \frac{(-1)^n}{n^2} (1 - \cos nc) \cos nt$$

13. On the left hand side of equation (7), page 270, omit the "y" in the numerator:

$$\frac{\partial \psi(x, \pi)}{\partial y}$$

14. On page 298, just above equation (16), reverse the order of the colon and the superscript

$$\Theta :^3$$

15. In Figure 7 on page 339, change λ to μ twice.

16. The very first letter on page 361, ν, should be n.

17. In equation (9) on page 456, all four sums should start from $n = 1$ rather than $n = 0$.

18. In the "References" section, change the publication date on number 36 from 1999 to 2000 (page 653), and on number 60 insert the state abbreviation "Upper Saddle River, NJ, 1973." (page 654). Also add another reference:

Lighthill, M. J., *Introduction to Fourier Analysis and Generalized Functions*, Cambridge University Press, New York, 1958.

19. Change the spelling of "Schwartz" to "Schwarz" on pages 322 (above equation (15)) and 329 (Exercise 4).

20. The last line of equation (35), page 328, should read

$$= (-1)^n \frac{8}{(2n+1)^2 \pi}$$

21. Primes should appear on the second set of subscripts in equation (32), page 451:

$$\int_0^\pi \int_0^{2\pi} Y_{lm}(\phi, \theta) \overline{Y_{l'm'}(\phi, \theta)} \sin \phi \, d\theta d\phi = \left\{ \begin{array}{ll} 1 & \text{if } l = l' \text{ and } m = m', \\ 0 & \text{otherwise.} \end{array} \right.$$

$$(1)$$

22. In the last two equations on page 468, replace x by y and z respectively.

$$
\begin{aligned}
X_m(x) &= \cos\frac{m\pi}{a}x, & \lambda_m &= -\left(\frac{m\pi}{a}\right)^2, & m &= 0, 1, 2, \ldots; \\
Y_n(y) &= \cos\frac{n\pi}{b}y, & \mu_n &= -\left(\frac{n\pi}{b}\right)^2, & n &= 0, 1, 2, \ldots; \\
Z_p(z) &= \cos\frac{p\pi}{c}z, & \nu_p &= -\left(\frac{p\pi}{c}\right)^2, & p &= 0, 1, 2, \ldots.
\end{aligned}
$$

23. Don't indent at the top of page 313.

24. In the preface, page xi, change the author's web page address to http://ee.eng.usf.edu/people/snider2.html, and his email address to snider@eng.usf.edu. Note also that the expert system software is now projected to be on the web page in December 2002.

CORRECTIONS TO THE SECOND PRINTING

25. On page 253 Example 1 (Section 4.6), the identity for z^3 should be

$$z^3 = (x^3 - 3xy^2) + i(3x^2y - y^3) .$$

26. Figure 15, page 348 (Section 6.3), should read "$\psi = f(\theta)$".

27. On page 129 (Section 3.1) immediately after equation (10), $A = de^\phi$ should read $A = de^{i\phi}$.

28. On page 195 (Section 3.9), Equation (33) should read

$$x(t) = -\frac{it}{2}e^{it} + x(0)\cos t + [\dot{x}(0) + \frac{i}{2}]\sin t$$

29. On page 313 (section 6.1), the second member of Equation (21) should be

$$\frac{1}{r^2} \exp\{\int^r \left(\frac{\eta}{\eta^2}\right) d\eta\}$$

30. On page 444 (section 7.1), change r to ρ in the argument list of ψ:
$$\nabla^2 \psi(\rho, \theta, z) = \cdots$$

31. On page 149 above equation (8), it should read "any two distinct functions $\phi_1(t)$ and $\phi_2(t)$ in the set"

32. On page 82 problem 2, the answer should read "$\cdots + x^{10}/3 \cdot 4 \cdot 6 \cdot 7 \cdot 9 \cdot 10 + \cdots$".

33. On page 257, the caption to Figure 5 should read "*Exercise 7*".

34. On page 339 below equation (22), change the reference to "Table 2.2" to "Table 2.3".

35. On page 617 two lines above equation (11), replace $f''(x_0)$ by $f'(x_0)$.

36. On page 458, insert $= 0$ at the end of the equation.

37. On page 411, replace a_p by c_p in the third line from the bottom.

38. On page 413, replace "whexe" by "where" in the equation below "Eigenvalues."

39. On page 424, replace $c_0(x)$ by $c_0\phi_0(x)$ in the final equation.

40. On page 188 below equation (2), replace $(\nu < 0)$ by $(\nu > 0)$.