1 Errata for "Principles of Applied Mathematics; Transformation and Approximation", second edition

1. pg. 7; The law of cosines (line 15) should read

   $||x+y||^2 = ||x||^2 + 2||x|| \cdot ||y|| \cos\theta + ||y||^2$.

2. pg 12; line -3 of footnote. "vetor" should be "vector".

3. pg. 25 line 14; the null space is spanned by $(2, -1)^T$.

4. pg 35; Caption to figure 1.7; "rotations" should be "reflections".

5. pg. 49; Problem 1.3.c; n must be greater than 1.

6. pg. 65, line 23; $\ldots = (||x|| + ||y||)^2$.

7. pg. 67, last line; of the components

8. pg 72 line -6; The coefficient for the scale factor for the Legendre polynomial should be 2^n rather than 2_n.

   line -3 $\omega(x)$ should be $w(x)$.

9. pg 73

   (a) lines 1, 4, 6, 8, 13; $\omega(x)$ should be $w(x)$.

   (b) line 8, $w(x) = (1-x)^\alpha(1+x)^\beta$

   (c) line 10, $p_n^{\alpha\beta}(x) = \frac{(-1)^n}{2^n n!}(1-x)^{-\alpha}\cdots$.

   (d) line 15, The normalization constant is not the same as in other places, such as Hochstadt, The Functions of Mathematical Physics, pg. 41.

10. pg. 80, line 12; "basis functions" rather than "basis function".

11. pg. 93, line 15, Ingrid

12. pg. 94, Exercise 8. (a): Use property 5 ..., (b) Use property 6 ...

13. pg. 96, Exercise 8 e), $T_n(x) = \frac{(-1)^n 2^n}{(2n)!}(1-x^2)^{1/2}\cdots$.

14. pg. 116, line -9; $K_n u$ rather than Ku

15. pg. 129, line 2; dy rather than dt

16. pg. 141, Example 1 should read $\langle H', \phi\rangle = -\int_0^\infty \phi'(x)dx = ...$

17. pg. 142, Example. As $n \to \infty$, ...

18. pg. 171, Problem 1a. second line of definition should be for $|x| \geq 1$.

19. pg. 175 Problem 4.3.9; - β should be replaced by $= -\beta$

20. pg. 180 line -2 Replace $F + \lambda G$ by $F - \lambda G$ (twice)

21. pg. 212, Caption to Figure 6.2, $e^{(\theta_1\theta_2)/2}$ replaced by $e^{i(\theta_1+\theta_2)/2}$.

22. pg. 215, $\frac{\partial v}{\partial z}$ should be $\frac{\partial v}{\partial x}$.

23. pg. 216, line 2, $\cdots = u_x(x_0, y_0) + \cdots$

24. pg. 216 line -1 should read $\frac{e^{z+\Delta z}-e^z}{\Delta z} = \cdots$

25. pg. 223 line -3 the denominator is missing a factor of r, and should be $1 - 2r\cos(\phi - \theta) + r^2$.

26. pg. 276, Problem 6.2.9; The contour should be $|z| = 1$.

27. pg. 276, Problem 6.3.5; The ranges for z should be strict inequalities, that is, Im $z < 0$ and Im $z > 0$.

28. pg. 308 line 4, singularities of $F(s)$ ...

29. pg 309, line 6, becomes $Lu = -d^2u/dt^2 - \lambda u$

30. pg. 311 line 13 $\lambda = 2 - \xi - 1/\xi$.

31. pg. 314, line 2, "to be real" should be "to be nonzero and real".

32. pg. 316, last line; $R_R(k) = -R_L(-k)$ is not correct. The correct statement is $R_R(k)/T_R(k) = -R_L(-k)/T_L(-k)$ for real, nonzero k.

33. pg. 317, line 3: e^{ik_0} should be replaced by $e^{ik_0 x}$.

34. pg. 330 Exercise 11. Reference should be to Theorem 7.3.

35. pg. 361, line 6 ...if and only if $J_n(\sqrt{\lambda}R) =$

36. pg. 382 line -4 should read "$\nabla^2\phi_j = v_j$ in Ω and $\mathbf{n}\cdot\nabla\phi_j = 0$ on $\partial\Omega$, for $j = 1, 2$."

37. pg. 396 line -1 insert "to" before solve.

38. pg. 408, last line should end with "?".

39. pg. 409, Problem 8.4.1, the equation should read $u_{n_t} = \frac{1}{h^2}(u_{n+1} - 2u_n + u_{n-1})$.

40. pg. 411, line 2: **scattering transform** should be **inverse scattering transform**.

41. pg. 412, line 5; For reasons that are somewhat subtle, it is not sufficient to assume that $q(x)$ is absolutely integrable. Instead, one must make a stronger assumption, such as $\int_{-\infty}^{\infty}(1 + |x|)|q(x)|dx < \infty$.

42. pg. 412, line -7, Im $k \geq 0$ should be Im $k > 0$.

43. pg. 426 line -12 $\frac{dq_n}{dt}$ should be replaced by $\frac{d^2q_n}{dt^2}$.

44. pg. 426 line -3 $\frac{dv_n}{dt}$ should be replaced by $\frac{d^2v_n}{dt^2}$.

45. pg. 542 line 17 insert "(" (open parenthesis) before cardiac.

46. pg. 567, 1.1.2 should be 1.1.3.

47. pg. 568; The answer to 1.2.1 is not computed correctly. The matrices C and D are correct, but the representation of A should be

$$\begin{pmatrix} \frac{53}{6} & -\frac{19}{3} & -4 \\ \frac{13}{12} & -\frac{5}{6} & -1 \\ \frac{49}{4} & -\frac{17}{2} & -5 \end{pmatrix} \tag{1}$$

48. pg. 574, 3.4.2; Answer (a) is correct answer for (b). Answer (b) is correct answer some other unrelated problem.

49. pg. 580, Problem 6.1.3;

    (a) $z = \frac{\pi}{2} + 2n\pi - i\ln(2 \pm \sqrt{3})$.

    (b) $z = (2n+1)\pi - i\ln(\sqrt{2}+1), z = 2n\pi - i\ln(\sqrt{2}-1)$.

50. pg. 575, Problem 3.5.2; $u(x) = f(x) + \frac{\lambda}{1-\lambda} + \int_0^1 f(t)dt = x + \frac{\lambda}{2(1-\lambda)}$ when $f(x) = x$.

51. pg. 580, Problem 6.2.3; $\int_C z^{-1/3}dz = -3(2)^{1/3}e^{i\pi/6}$.

52. pg. 581, Problem 6.3.6; (b) $F_x - F_y = -8\rho\pi iA$. (c)$F - x - iF_y = \rho\pi(4\gamma A - 8A^2 i)$.

53. pg. 586, Problem 8.1.13; $u(r,\theta) = -\frac{2}{\pi}\int_0^\infty \ldots$

54. pg. 586, Problem 8.1.14; $u(r,\theta) = \sum_{n=-\infty}^{\infty} a_n \ldots$

55. pg. 593, problem 12.1.8; $\phi_\tau = \frac{1}{6}A^2$ instead of $\phi_\tau = \frac{1}{6}^2$.

Feel free to let me know about any other errors you may find. I'll add them to this list.