

# ERRATA

**J.R. Lamarsh & A. J. Baratta:  
Introduction to Nuclear Engineering (Third Edition)  
Prentice & Hall, Inc. 2001**

On page 10, the exponent in the numeric value of  $m(^{12}\text{C})$  should be -23.

Equation 2.19 should read  $\lambda = hc/\sqrt{E_{total}^2 - E_{rest}^2}$ .

The last sentence of the second-to-last paragraph on page 20 should refer to  $\beta^+$  decay, not  $\beta^-$ .

In the first equation of the solution of Example 2.6, beginning “0.90 = ...”, there should be a minus sign in front of the exponent.

In Equations 2.50 and 2.51, the term  $(A-2Z)$  should be  $(A-2Z)^2$ .

The last line of the table on page 46 should be for isotope  $^{238}\text{U}$ , not  $^{235}\text{U}$ .

In Equation 3.23 and the explanation below it,  $\gamma_r$  should be  $\lambda_r$  and  $\Gamma_g$  should be  $\Gamma_\gamma$ .

The caption of Figure 3.16 should refer to Eq. 3.59, not 3.53.

In Eq. 3.82, the exponent in the final form is missing a minus sign.

In Eq. 5.19, the right-hand side is missing a minus sign.

The last sentence in the first paragraph of Section 5.9 should refer to Section 2.13, not 2.12.

Equation 5.49 should read  $\phi(E) = n(E)v(E) = \frac{2\pi m}{(\pi kT)^{3/2}} \left(\frac{2}{m}\right)^{1/2} Ee^{-E/kT}$ .

Equation 5.51 should read  $\phi_r = \frac{2\pi m}{(\pi kT)^{3/2}} \left(\frac{2}{m}\right)^{1/2} \int_0^\infty Ee^{-E/kT} dE = \frac{2n}{\sqrt{\pi}} \left(\frac{2kT}{m}\right)^{1/2}$ .

The paragraph after Eq. 5.58 should denote the thermal diffusion coefficient as  $\bar{D}$ , not  $D$  (also on the third line of the next page). In the next paragraph, the thermal absorption cross-section should be denoted by  $\bar{\Sigma}_a$ , not  $\Sigma_a$ . After its formula, reference should be made to Eq. 3.44, not Eq. 3.38.

In Eq. 5.67, the right-hand side is missing a minus sign.

Equation 6.1 should not have a minus sign on the right-hand side.

The last column of Table 6.1 should be denoted  $\eta$ , and the last row should be labeled  $^{239}\text{Pu}$ .

The equation of  $B^2$  after Eq. 6.2 should read  $B^2 = \frac{1}{D} \left( \frac{1}{k} \nu \Sigma_f - \Sigma_a \right)$ , and  $B^2$  is defined as the *material* buckling.

On the fourth line of the paragraph after Eq. 6.6, reference should be made to the denominator, not the numerator.

In Example 6.1, the first equation should read  $f = \frac{\Sigma_{aF}}{\Sigma_a} = \frac{\Sigma_{aF}}{\Sigma_{aF} + \Sigma_{aS}}$ .

In Example 6.1, the second equation should read  $f = \frac{1}{1 + \Sigma_{aS}/\Sigma_{aF}} = \frac{1}{1 + N_s \sigma_{aS} / N_F \sigma_{aF}}$ .

The right-hand side of the first formula on page 271 should not have a minus sign.

The general solution of  $\phi$  and Eq. 6.31 on page 276 should have  $Br$ , not  $BR$  in the numerator.

Omitting  $d$  as small in Eq. 6.35, the sine in the numerator should be simply  $\sin(\pi r/R)$ .

Equation 6.39 should read  $\phi(\tilde{R}) = AJ_0(B\tilde{R}) = 0$ .

Between Eq. 6.41 and Eq. 6.42, the integral can be evaluated using the formula  $\int J_0(x')x' dx' = xJ_1(x)$ .

On page 280, the two equations related to  $Z(z)$  should use  $B_z$  instead of  $B$  for clarity. The caption of Table 6.2 should end “(assuming  $d$  is small)”.

In Example 6.3, the answers for  $\tilde{R}_c$  and  $R_c$  should be 48.5 cm and 41.7 cm, respectively.

Equation 6.86 is missing  $N_M$  from the numerator.

In Example 6.5, on the first line of the solution,  $B_2$  should be  $B^2$ . In the critical mass calculation, the variable with value 0.978 should be  $g_{aF}(T)$ , not  $\sigma_{aF}(T)$ .

On page 296, the relation  $H = 1.92R$  should read  $H = 1.95R$ .

Equation 6.98 should read  $AD_c \left( \frac{B \cos BR}{R} - \frac{\sin BR}{R^2} \right) = -A'D_r \left( \frac{1}{RL_r} + \frac{1}{R^2} \right) e^{-R/L_r}$ .

In Example 6.10,  $f = \frac{4.77 \times 10^{-5} \times 0.978 \times 681}{4.77 \times 10^{-5} \times 0.978 \times 681 + 0.0215 \times 0.185 + 0.0167 \times 0.664} = 0.6783$ .

On pages 316-318, the average lethargy change in the moderator should (consistently with Sec. 3.6) be denoted by  $\xi_M$  (letter xi), not by  $\zeta_M$  (letter zeta).

Between Eq. 7.5 and Eq. 7.6, in the formula for the  $1/\nu$  absorption cross section,  $\nu_0$  should be a constant, not a function  $\nu_0(E)$ .

After Eq. 7.20, the sentence beginning “In section 6.5, it was shown...” should define the prompt and delayed fission neutron production rate as  $\eta_T \bar{\epsilon} \bar{\Sigma}_a \phi_T$  or  $k_\infty \bar{\Sigma}_a \phi_T / p$ .

In Figure 7.4, the reference should be to Equation 7.28.

In Equations 7.44 and 7.45, there should be no  $p$ .

Deriving Eq. 7.78 on page 370, there should be a minus sign on the right side of all three formulas of  $\alpha_{\text{prompt}}$ .

In Table 7.4, the scales of the  $A'$  and  $C'$  columns should be  $A' \times 10^{-4}$  and  $C' \times 10^{-2}$ .

In Eq. 7.119,  $N_{25}$  is missing from the first term in the square brackets.

In Eq. 8.9,  $P$  is the total power of the reactor in *watts*.

In Eq. 8.21, there should be no minus sign in front of the integrand.

After Eq. 8.22, “The two terms on the right-hand side of this equation” should read “The first term on the right-hand side of this equation assuming an infinite reactor operation time before shutdown”.

Equation 8.31 should read  $\nabla^2 T + \frac{q'''}{k} = 0$ .

In Figure 8.4, the thickness of the plate-type element should be  $2(a+b)$ , not  $2a$ .

Integrating Eq. 8.33 twice gives the general solution  $T + \frac{q'''}{2k_f} x^2 = C_1 x + C_2$ .

In Eq. 8.63, the denominator should read  $1/hA$ .

The sentence above Eq. 8.72 should begin “However,  $\rho A_c v$  is equal to...”

In the equation before Eq. 8.76,  $R$  is missing from the denominator on the left side.

On page 444,  $T_{LB}$  should be defined as the coolant temperature at which local boiling begins, not as the fuel surface temperature.

Equation 9.10 should refer to  $W_R$ , not  $W$ .

In Equations 9.44 and 9.45, the exponents should be negative.

On page 583, in the sentence beginning “From Table 10.4, ...”,  $\Sigma_{Rl}$  should be  $\Sigma_{Rl}$ .

On page 592, in the formula of  $E_l$ , the term in the brackets should be squared.

In Table II.2 on page 738, the abundances in *a/o* for  $^6\text{Li}$  and  $^7\text{Li}$  have switched places. The second line for  $^{12}\text{C}$  should be labeled  $^{13}\text{C}$ . The footnote sign in the heading of the last column ( $\sigma_f$ ) should be a dagger just like in the  $\sigma_a$  column.

In Table II.3 on page 740, the scattering cross section for hydrogen is 21.0 barns.

In Table V.1 on page 759,  $J_{0x}(1.0)$  should be 0.7652, and  $J_{0x}(3.4)$  should be -0.3643.

*“These are the only ones of which the news has come to Harvard  
and there may be many others but they haven’t been discover’d.”*  
- **Tom Lehrer**, *The Elements Song*