Wind Energy Explained, 2nd Edition
Errata

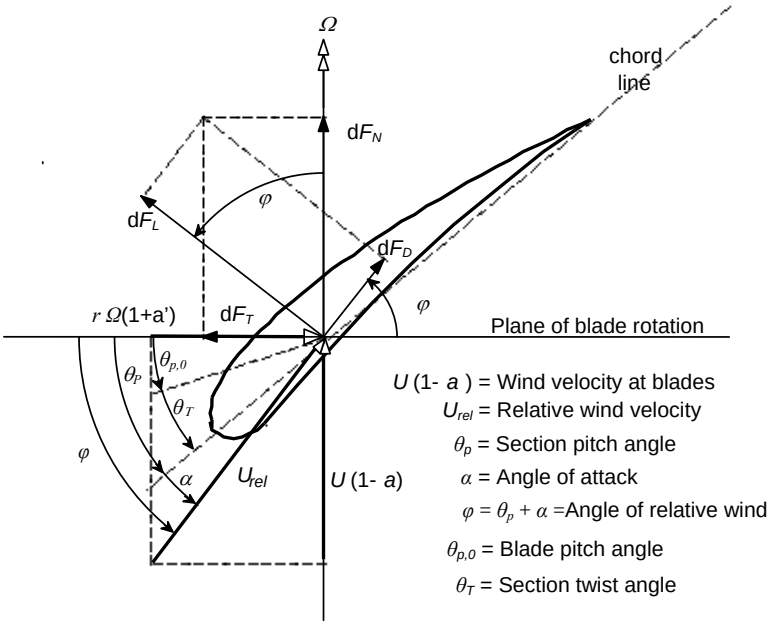
This summarizes the known errata in Wind Energy Explained, 2nd Edition. The errata were originally compiled on July 6, 2011. Where possible, the change or location of the change is noted in red. These errata should only apply to printings before this date. Additional errata, identified after November 1, 2011, are listed at the end.

p. 45-6
The correct symbol for friction velocity is u^* rather than U^*.

p. 60
Equation 2.64 should read:

$$\sigma_u^2 = \overline{U}^2 \left[\frac{\Gamma(1+2/k)}{\Gamma^2(1+1/k)} - 1 \right]$$

p. 120, in the following figure, the open arrowhead under $r\Omega$ $(1+a')$ should point towards the origin, as shown below.



p. 126, line 32-33, the equation should be $\varphi = \alpha + \theta_p$

p. 173, line 14
Equation 4.42 should read:

$$\sigma_{\beta,\max} = M_\beta c / I$$

p. 173, line 15
The sentence should read:
"…and *I* is the area moment of inertia…"

p. 180
The gravity term G is given by $G = g\, m_B\, r_g / I_b$

p. 192

The element (3,1) in the matrix in Eq. 4.111 should be: $\frac{\gamma \overline{V}_0}{6}$

p. 222
The sentence in line 4 should read:
"The DC field current is normally provided by a small AC generator."

p. 228, line 18
The term should be $R_R^{'} / s$.

p. 228, line 20
The sentence should read:
"From measurements of voltage, current and power, it is…"

p. 228, line 25
The sentence should read:
"Once the voltage, current, and power are measured…"

p. 238, line 17
The sentence should read:
"Some filtering may be done (as with the inductors shown in Figure 5.27)"

p. 244, line 15
Figure 5.27 should be Figure 5.29

Page 247-248, lines 45 and 46 and line 10 (p. 248). In all cases, "stator" should be used instead of "rotor". The sentences should read:
"In this configuration the generator side converter (PWM 1) provides reactive power to the generator stator as well as accepting real power from it. It controls the frequency to the generator stator, and hence its speed. PWM 1 also converts the stator power to DC."

p. 250, line 15
The resistance is: R_X (not R_x)

p. 251, line 27
The expression should read:
$\left(R_R^{'} + R_X\right)/s$

p. 251
In Equation (5.81) and (5.82) $R_r^{'}$ should be $R_R^{'}$

p. 305, lines 9-10
The sentence should read:
"…I is the area moment of inertia of…"

p. 393-
From page 393 to the end of Chapter 8, most of the equation numbers quoted in the text are incorrect. For example, on page 393, line 34, "Equation (8.10) without the derivative term…" should be "Equation (8.11) without the derivative term…" Specifically, the correct equation numbers are:
p 393 line 33-34 Equation 8.11
p 393 line 35-36 Equation 8.12
p 394 line 33-34 Equation 8.11
p 396 line 5 Equation 8.13
p 402 line 19-20 Equation 8.17

p. 414, lines 20 and 26
The constants "*a*" and "*b*" were reversed. The sentences should read:
"In this relationship the slope, *a*, is the ratio of the standard deviations…"
"The offset, *b*, is a function of the mean wind speeds at the concurrent reference site…"

p. 441, line 27
The sentence should read:
"In this example, the peak loads, those over 20GW, occur 15% of the time and account for only 1.5% of the annual energy."

p. 473
Equation 10.14 should read:
$\hat{F} = \frac{1}{2} C_d \rho_w D \left|U_w\right| U_w + C_m \rho_w A \dot{U}_w$ (Note that the sea water density is ρ_w.)

p. 562, line 41
The sentence should read:
"…a 0 dB sound power intensity level will yield…"

p. 563, lines 8-9
The sentence should read:

"where p is the instantaneous sound pressure and p_0 is a reference sound pressure (usually 20 x 10^{-6} Pa for sound in air and 1 x 10^{-6} Pa for sound in water)."

p. 595
The correct symbol for friction velocity is u^* rather than U^*.

p. 598, line 27
The line should read:
"I_b Mass moment of inertia of a single blade"

p. 605, line 7
This should read:
"I Area moment of inertia"

p. 606, line 15
This should read:
"I Area moment of inertia"

p. 618

Problem 2.9: The equation should read: $CF = 0.087\overline{U} - \frac{P_R}{D^2}$

"where $\overline{U}$ is the average wind speed (m/s) at the hub…"

p. 621
Problem 2.13: The correct symbol for friction velocity is u^* rather than U^*.

p. 622, line 36, the problem statement should read:
3.4 a) Find φ, θ_P, θ_T, and …

p. 623, line 1, The problem statement should read:
3.5 a) Find φ, θ_P, θ_T, and…

p. 629
Problem 4.6, line 41
The sentence should read:
"…(b) mass moment of inertia…"

p. 637
Problem 6.1: Add the sentence: "The moments of inertia are to be taken about the long axis of the shaft."

Problem 6.2:
Lines 7-8 should read:
"It is made of steel with a shear modulus of elasticity of G = 80 GPa…"

Lines 15-16

Hint: The rotational stiffness of a shaft, k_θ, is given by $k_\theta = JG/l$"

p. 639
Problem 6.9: The modulus of elasticity of steel is 206.9 GPa.

p. 645
Problem 8.8, line 10
The sentence should read:
"The total polar mass moment of inertia…"

p. 646
Problem 8.10, line 15: $K_D = 0.01$

p. 654
Problem 10.6: Third sentence should read:
"The wind speed is 12 m/s, the wave height is 2 m and the wave length is 100 m."

p. 655
Problem 10.11: The first sentence should read:
"A natural gas-fired turbine operating on an ideal Brayton cycle…"

p. 655
Problem 10.13: The volume of the Hindenburg is 199,000 m^3.

Additional errata, identified after November 1, 2011, are listed below.

p. 38 The third line should read: "For an adiabatic process (no heat transfer) dq=0, and Equation (2.14) becomes:"

p. 42 The first sentence of 2.3.3.3 should be replaced with "The autocorrelation function provides a measure of the relation between the wind speed at one point in time to that at another point in time."

p. 106
The caption for Figure 3.11 should read: "(a) Flow around stationary cylinder; (b) flow around rotating (CW) cylinder"

p. 167 Equations 4.25 and 4.27 should read:

$$x(t) = \frac{F_0}{k} \frac{\sin(\omega t - \phi)}{\sqrt{\left[1-(\omega/\omega_n)^2\right]^2 + \left[2\xi(\omega/\omega_n)\right]^2}}$$

$$\frac{xk}{F_0} = \frac{1}{\sqrt{\left[1-(\omega/\omega_n)^2\right]^2 + \left[2\xi(\omega/\omega_n)\right]^2}}$$

p. 173

Equation 4.45 should read: $Q = C_Q \frac{1}{2} \rho \pi R^3 U^2$

p. 216 Section 5.2.3.4

The vector d***l*** should be bold**:** $d\boldsymbol{F} = Id\boldsymbol{l} \times d\boldsymbol{B}$

p. 230

Equation 5.66 should read

$Q_m = P_{in} / (2\pi n / 60)$

p. 305

Equation 6.24 should read:

$$D = \frac{1}{\sqrt{\left[1 - (f_e / f_n)^2\right]^2 + \left[2\xi (f_e / f_n)\right]^2}}$$

p. 435

Equation 9.18 should read:

$$V_G{}^4 + V_G{}^2 \left[2(QX - PR) - V_S{}^2\right] + (QX - PR)^2 + (PX + QR)^2 = 0$$

p. 622 Problem 3.1

The second line should read: “horizontally if the blade’s drag to lift ratio, C_d/C_l, is 0.03?”

p. 634 Problem 5.11

The parameters are $X_{LS} = X_{LR} = 0.15\ \boldsymbol{\Omega}$, $R_S = 0.014\ \boldsymbol{\Omega}$, $R_R = 0.0136\ \boldsymbol{\Omega}$, $X_M = 5\ \boldsymbol{\Omega}$.

p. 670 Under Step 5, the first executable line should read:

j% = CInt(Y_range / binWidth)