Misprints and inconsistencies in the textbook 'Elements of Engineering Electromagnetics,' 6th Edition, by N.N. Rao

p.33

All SI symbols that represent physical quantities by definition incorporate units, so the permittivity of free space is $\varepsilon_0 = 8{,}854 \cdot 10^{-12}$ F/m. It is a deviation from the SI standard to omit the units, as done when ε_0 is defined near the top of page 33. The same deviation from of the SI standard can often be found in the text whenever numerical examples are presented, like in Example 1.10.

p.201

The answer to problem P3.27 is given under P3.26 on p.804.

p.203

In problem P3.38, one of the given fields $\mathbf{E}$ or $\mathbf{H}$ has to point in the ϕ direction.

p.204

The answer to problem P3.39(b) is given under P3.39(a) on p.808.

p.209

According to the SI standard, the symbol e as used in (4.1) should represent a positive elementary charge.

p.251

A second-order expansion in $\sigma/(\omega\varepsilon)$ does not yield (4.110), a *third-order* expansion is needed.

p.375

$V^+ - V^-$ in Eq. (6.35) should be $V^+ + V^-$.

p.441

The sign convention used for distance in Ch.7 is to have the generator a positive distance from the load at the origin, which normally would put the generator to the right of the load. In all the figures in Ch. 7, however, the generator is to the left and the load is to the right, and the distance axis runs from the right to the left.

p.454

According to the SI standard, symbols for physical quantities should be single characters in italics. Multiple-character symbols like 'SWR' should be avoided, since SWR in an equation by convention means S times W times R. A possible SI-compliant symbol for the standing wave ratio SWR is r_{SW} .

p.567

The convention used elsewhere in the book is that propagation a positive distance corresponds to a negative phase, as in $\exp(-j\beta s)$, and that a positive delay corresponds to a negative phase in the reflection coefficient Γ. Suddenly, in Eq. (8.83) the opposite sign convention is introduced, without any warning in the text. The wrong sign convention for the reflection coefficient confuses the reader for the remaining part of Ch. 8. There is important physics conveyed by this sign, and it should be treated with great care. For example, both signs of the square-root expression for $\cos\theta_2$ used in Eq. (8.85) are needed, one for each side of the waveguide slab.

p.583

An important element of the ray treatment of the graded-index waveguide is the phase shift of $\pi/2$ associated with the turning point of the ray. The derivation of the phase shift, however, is a nontrivial mathematical excercise that cannot be done as simply as presented on p.583. There is no argument on p.583 preventing us from choosing Δx to be different on each side of the turning point, and then the derivation fails.

p.593

In problem P8.5(c) the task is to calculate the power flow in the direction of propagation, whereas the text specifies 'normal to' that direction.

p.615

Equation (9.27c) is an expression for $\bar{H}_r$ not for $\bar{H}_z$.

p.627

In equation (9,58), in the final expression for $\langle P_f \rangle$ at the bottom of the page, a should be raised to the power 3 instead of 2.

p.638

The single-mode cutoff condition is $J_0(u) = 0$, whereas $J_1(u) = 0$ is erroneously stated in the text in the middle of the page. $u = 2.405$ is the first zero of $J_0(u)$.

p.649

Example 9.10 is not affected by the sign confusion in Chapter 8, regarding the phase of the reflection coefficient at a dielectric interface. On p. 649, a positive delay is represented by a negative phase, as it should be.

p.668

In problem P9.17(a), the energy per unit area is given as $\delta E_0^2 l/4$, but should be $\varepsilon E_0^2 l/4$.

p.670

The task given in problem P9.29 is to compute the half-width at half-maximum of the transmission peaks. The given result $\Delta f/F$, however, is the full width.

p.672

In problem P9.35, the frequecy given for the circularly polarized wave is 3 GHz. Then the wavelength should be 10 cm, not 1 m as given in the expression for the electric field.

p.721

In problem P10.15, the sign is wrong in the formula given for the vector potential $\mathbf{A}$.

p.804

The answer to problem P3.27 is given under P3.26.

p.804

The answer to problem P3.39(b) is given under P3.39(a).

p.809

The answer to problem P8.25(b) is $1/\sqrt{5} = 0.45$.