Errata for *Elementary Differential Geometry*, 2nd Edition by O'Neill

Chapter 1:

Page/Line	Correction
15/4	missing period after "differentiation".
15/7	In $y^2U_3[x^2y]$ the y^2U_3 should be italicized.
15/-6	Should read $V[x_i]U_i$ (subscript "i").
24/-8	Should read $\mathbf{R}^3$, not $\mathbf{R}^2$, and $f_i = \phi(U_i)$, not $f_t = \phi(U_i)$
26/-2	Should read $... = xU_1$ (subscript "1").
32/11	Should read r, ϑ, z, not r, ϕ, z
36/-1	Should read $... = \mathbf{v}[f_i]$, not $\mathbf{v}[f]$.

Chapter 2:

Page/Line	Correction
50/4	Should read $\vartheta_0 + \int_0^t (fg' - gf')\,du$.
50/7	Replace 0_j by 0; (semicolon).
56/17	"$+Y$", Y should be italicized.
65/22	$\tilde{\kappa}$, not κ.
66/4	Should read $\sigma = 1/\tau$, not $\sigma = 1/r$
66/7	Should read $\gamma = \alpha + \rho N + \rho'\sigma B$.
77/22,24	We need simple closed plane curve here and corresponding definition of simple. We also need to know that the curve closes up smoothly (that is, is periodic) in order that statement is true.
83/-10	Should read ...increasing ϑ, not increasing φ.
85/9	Should read $\omega_{ji} = -\omega_{ij}$.
86/1	Should read $\omega_{ji} = -\omega_{ij}$, and $\omega_{ji}(\mathbf{v}) = -\omega_{ij}(\mathbf{v})$.
88/-2,-1	In the first matrix, replace "1" by "0". In the third matrix, both thetas should be ϑ.
94/-2	Should read $d\rho, \rho\cos\varphi\,d\vartheta, \rho\,d\varphi$.

Chapter 3:

Page/Line	Correction
102/6	Should read $\mathbf{q} = F(\mathbf{p})$.
116/-6	Insert subscript "V" on left side of equation and italicize W.
121/15	In (2), replace E_2 by E_i.
121/-1	Each E_i should have an overbar.
121/-7	In $F_i' \cdot F_j$, the Fs need to be italicized.

Chapter 4:

Page/Line	Correction
125/7	Should read $\mathbf{R}^3$, not $\mathbf{R}^2$.
142/9	Should read $-1 \le u \le 1$, not $-1 \le v \le 1$.
172/-11	The first double integral should be an integral over R, not $\mathbf{x}$.
172/-9	The formula should be labelled (1), for reference on p. 173.
176/13	Should read: ...and η is a 2–form on N, then $\int_{\mathbf{x}} F^*\eta = \int_{F(\mathbf{x})} \eta$.
177/16	Replace ϕ by η.
177/-7	Replace $\int_{\mathbf{x}} V...$ by $\int_{\partial\mathbf{x}} V....$
180/17	Replace $Z(\mathbf{p})$ by $U(\mathbf{p})$.
182/5	Should read: $\mathbf{x}(u,v) = v\alpha(a) + (1-v)\alpha(u)$.
187/-17	Replace "Exercise 9" by "Exercise 11".
190/5	In the formula, add the subscripts thus: $p_3\mathbf{x}_u(p_1, p_2) + p_4\mathbf{x}_v(p_1, p_2)$.

Chapter 5:

Page/Line	Correction
195/-3	Z_a should read Z_α.
195/-2	Should read $(Z_\alpha)'(0)$.
196/8	Replace $(Z\alpha)'(0)$ by $(Z_\alpha)'(0)$.
197/-13	Replace $\alpha\nabla_v U$ by $a\nabla_v U$.
200/11	$f_y{}^2$ in denom should be italicized.
200/-9	Should read $(g_1(\mathbf{p}), g_2(\mathbf{p}), g_3(\mathbf{p}))$.
205/4	Should read: normal sections of C all...
216/-14	$x(D)$ should be $\mathbf{x}(D)$.
217/13	Last component of $\mathbf{x}_{uu}$ is $\frac{\partial^2 x_3}{\partial u^2}$.
220/-1	Should read: $-1/b^2 \le K < 0$.
220/12	Should read: $\mathbf{x}_{uu} = (0,0,0)$.
221/1	Should read: The minimum value $K = -1/b^2$ occurs...
223/3	Should read: $f_{uu}f_{vv} - f_{uv}{}^2 = 0$;
224/9	Should read: $(\sqrt{1+x^2}, \pm\sqrt{1+y^2}, y\sqrt{1+x^2} \pm x\sqrt{1+y^2})$.
225/-4	Should read: If β is a unit speed curve...
232/20	Should read: ...principal curvature k_i, not κ_i.
238/-16	The first row of the determinant should read $a_2'^2 \quad -a_1'a_2' \quad a_1'^2$.
243/-5	h'^2 in denom for K should be italicized.
244/11	Should read: The curve $y = c\cosh(x/c)$, not (v/c).
245/11	Should read: By exercise 2.8, not 2.10.
245/-3	Should read: ...are given in Exs. 5.5 and 6.15.
248/-6	Should read: $\sin(a_*/c)$, not $\sin(u_*/c)$.
248/-5	Should read: $h(a_*) = a\cos(a_*/c) = ...$, and c needs to be italicized.

Chapter 6:

Page/Line	Correction
260/7	matrix given is transpose of desired matrix.
266/11	$\mathbf{R}^3$ should be bold.
263/-16	Replace "from" with "form".
268/-10	second V in $V[V[f]]$ should be italic.
269/5	Should read: Ex. 2.2(a), not Corollary 2.4.
269/-14	$\mathbf{R}^3$ should be bold.
270/-15	Should read: $M \subset \mathbf{R}^3$, not $\mathbf{R}^2$ and be bold.
270/9	Should read: Ex. 8.14, not Ex. 8.7.
273/10	Warning: In this Lemma F stands for the isometry and coordinate expression for $\mathbf{x}_u \cdot \mathbf{x}_v$.
286/12	Should read: Ex. 4.8, not Ex. 4.7.
287/3	Should read: $\mathbf{x}(u,v)$ to $\mathbf{x}(u, v + \Delta v)$ is approximated by $\Delta v\mathbf{x}_v$.
289/9	Should read: ...one set $\mathbf{x}_i(R_i^\circ)$.
290/5	Should read: ...on any pair of tangent vectors to M is $\pm\|\mathbf{v} \times \mathbf{w}\|$.
291/7	Should read: area$(\mathbf{x}_i(R_i))$.
294/-7	Should read: Example 7.1 of Chapter 5 (not Example 6.1).
294/-2	Delete $du\,dv$.
297/-12	Should read: $G^*(d\Sigma)(\mathbf{v}, \mathbf{w}) = ...$
302/4	Should read: Ex. 7.6, not Ex. 7.8.
303/-13	Replace $x^2 + y^2$ in the numerator by $x^2 - y^2$.

Chapter 7:

Page/Line	Correction
313/2	the first subscript on this line should be "2", not "1".
314/11	The expression beneath the square root sign should be: $a_1'^2 + a_2'^2$.
315/11	Delete the "2" from the formula.
320/-1	Should read: $s(t) = \int_0^t \frac{du}{1-(u/2)^2} = ...$
326/10	Delete two parens "(": one before the first E_1, the other before the first E_2.
328/19	What is J? Rotation operator from Ex. 1.3 of Chapter 7?
332/-9	Should read: ...where $\dot{Y}$ denotes ...
334/-1	Change sign $...-G_v a_2'^2$ to $+G_v a_2'^2$.
345/1	Should read: $\cos^{-1}(c/u)$.
345/7	Replace **v** by **x**.
347/19	Should read: Poincaré.
351/-11	Should read: ...but $\kappa_g < 0$ for a (right turning) clockwise trip.
351/-9	Should read: Corollary 4.6, not Lemma 4.6.
354/5	Should read: ...of **x**, not $\mathbf{x}_u$.
364/-10	Delete "no" from (1).
368/11	The first integral is over the whole manifold M, not just the polygonal region.
372/1	Should read Figure 7.26, not Example 7.26.

Chapter 8:

Page/Line	Correction
375/14,17	Should read: arc length.
377/5	Should read: $\gamma_v'(0)$, not $\gamma_v(0)$.
379/-15	Should read: $\exp_p$, not $\exp_v$.
380/-3	The expression under the square root should read: $a_1'^2 + Ga_2'^2$.
384/4,5	Reletter (b)..(c) as (c)..(d).
385/2,3	(a) should read "...to these geodesics." (b) should read "...curves in (a)."
389/11	Delete the sentence: "Similarly..."
389/-2	Should read: Section 7, not Section 6.
392/4	Should read: $(u\cos v, u\sin v)$.
392/14	Should read: $\sqrt{G}(\pi, v)$.
396/10	Should read: $g'(s) \geq 1$.
398/8	Should read: $...+o(\varepsilon^3)$.
400/8	Should read: (Ch. 4, Sec. 2).
402/-2	The N should be $\tilde{M}$ as in the Proposition.
410/15	Should read: Hopf–Rinow theorem (2.1) , not (2.2).
416/9	Should read: $... = (x^2/\sqrt{2}, y^2/\sqrt{2}, z^2/\sqrt{2}, ...)$.
426/-14,-13	Replace larger by smaller and longer by shorter, also Fig. 6.8, not 6.9.
426/-6	Should read: $4\pi/k$.

Answers:

Page/Line	Correction
451/1	Should read: y^3.
451/6	Should read: $\alpha'(\pi/2) = (-1, 0, 1/\sqrt{2})_p$, where $p = (1, 1, \sqrt{2})$.
469/5	Replace $\omega_{13}(Y)E_3$ by $\omega_{12}(Y)E_3$ and subscript "y" by "Y".
474/-5	Should read: Lemma 7.4, not 7.3.

Index:

Figures:
Also, on p. 35, replace Fig. 1.14–a duplicate of Fig. 1.13 by

FIG. 1.14