8-3-06

Corrections for Next Printing

***Process Dynamics and Control, 2nd Edition* (2004)**

by Seborg, Edgar, and Mellichamp

Page	Item
xiv	Section 19.3: Change the title to "Unconstrained and Constrained Optimization".
23	After "For case (b)": In the first equation, add a left parenthesis before "200". For "(c)": In the first equation, add a left parenthesis before "500".
27	Item 2: After "thus,", insert: "w_i = w and"
29	In (2-46), replace "Q" by "$\frac{Q}{\rho CV}$".
31	First line: add a left parenthesis before "2-48)". Change "0.5 min" to "1.0 min" on the right sides of the expressions for $m_e C_e / h_e A_e$ and $m_e C_e / wC$.
31	In the first equation of the "Solution": Change the minus sign to an equals sign.
48	Exercise 2.10: Add "k_1" above the left arrow and "k_2" above the right arrow. In (ii), in the equation for r_2, change "c_A" to "c_B". Finally, reduce the space between "h" and "L" by half, in both equations
56	Eq. (3-22): Add a minus sign after the first equals sign on the RHS.
76	Exercise 3.16: The correct wording below the equation is: "has initial conditions, $y(0) = 1, \frac{dy}{dt}(0) = 2.$"
76	Exercise 3.17:In the 3rd line: After "operator", insert: " shuts off the pure water flow and" In the 4th line, add "with" after "but". Also, in the "Data" section, change c_i to $\overline{c}_i$.
82	1st equation: Replace $"X_1'(s)"$ by $"X'(s)"$. Eq. (4-22): remove minus sign before 0.0531.
83	Eq. (4-25): Replace the equals sign in the bracketed term by a minus sign.
85	Two lines below (4-41): Change "dx/dt" to "du/dt"
86	Two lines above Fig. 4.2: change "Y_3" to "Y_2".

89	Example 4.5: Change the 1st line below Eq. (2-18) to: "Now we assume that x_2=1, the volume of liquid remains constant, and…"
90	Eq. (4-65): The right side of each of these four equations should be divided by "$V\rho$".
91	Replace the sentence above Eq. (4-66) by: "Combining (4-64) and (4-65) and multiplying by $V\rho$ gives:"
99	Exercise 4.1, part (d): Change "the term" to "a term". Also, change "contain" to "contains".
117	2nd line below (5-51): The sentence should begin as, "Thus, when …"
123	Exercise 5.2: Change the first sentence to read: "A heater for a semiconductor wafer has first-order dynamics;".
130	Second line from the bottom: Change "Eq. 6-20" to "Eq. 6-2".
182	Exercise 7.2: In the line above (a), change "four" to "three".
184	Part (a) of Exercise 7.10: Insert the following statement at the beginning: A process output temperature T is measured for a step change in input flow rate w equal to 80 kg/min. The temperature change is shown in Fig. E7.10. Part (b) of Exercise 7.10: Change Q' to w'.
196	Omit "s" in the denominator of the integral term.
201	Replace the last two sentences below (8-29) by: "When the set point is constant, it cancels out in both the proportional and derivative error terms. Thus, if the integral mode is omitted, the response to a disturbance will tend to drift away from the set point."
218	3rd line below Eq. (9-4): Delete "However, signal level."
282	2 lines below Eq (11-88): The inequality should be: $K_c K_v K_p > -1$.
285	5 lines above 11.4.3: Change "Example 14.5" to "Example 14.6".
287	Solution, 5 lines from top: Replace "K_c=15" by "$K_c = K_{cm}$=15"
290	Exercise 11.2: In the 3rd line, before "and", add, "K_{IP}=0.75 psi/mA,". Also, change "K_c=4" to "K_c=5.33".
293	Exercise 11.11: Under "Composition Transmitter Data", change "neglible" to negligible,"
308	Case L: In the denominator of the 2nd column, replace τ_e with τ_3.
340	5 lines below Section 13.3: change the formula for f to: $f = \omega / 2\pi$

342	Revision of Table 13.3 (see attached)
352	The last equation should be numbered (13-67).
373	Eqs. (14-13) and (14-14): Replace "ω_c" by "ω_g".
375	Add a 4th column to the last table. The column heading is "ω_g (rad/min)". The number in the "Ziegler-Nichols" row is "1.02"; the number in the "Tyreus-Luyben" row is "0.79".
385	Part (b) of Exercise 14.3. Change the last part of the first sentence to read: "… provide a phase margin of 30 º. What is the gain margin?"
400	In the "Solution", change "K_v=300/1.2" to "K_v=300/12". In Eq. (15-30), change "0.1083" to "1.083".
404	Figure 15.14: Change FB to AC (inside the circle)
421	2nd line from top: Replace the wording after "system" with: "for P-only control, but not necessarily for PI control (cf. Example 14.4)."
421	8th line from top: Change "process gain delay" to "process gain".
436	Last line of Exercise 16.4; change T_{c1} to τ_{c1} and T_{c2} to τ_{c2}.
436	Exercise 16.7: Add a computer symbol to the exercise.
478	3 lines below (18-6): Change "Section 6.7" to "Section 6.5".
479	4th line below Fig. 18.3: Remove the space in "hidd en".
483	Equation for a_1: Replace "+8" with "-37".
493	1st line below Eq. (18-57): Replace "$\boldsymbol{A}$" by "$\boldsymbol{W}$".
518	Section 19.3: Change title to "UNCONSTRAINED AND CONSTRAINED OPTIMIZATION".
520	Section heading, 19.3.2: Omit "Unconstrained".
533	Add computer symbol to Exercise 19.13.
537	Example 20.1, part (b): Change "θ= 2 min" to "θ=3 min". Also, change "t=3 min" to "t=2 min".
543	Change the second inequality in (20-28) to: "$4 < t \leq 10$ min".
588	Left column: Change "Khourti" to "Kourti".

590	Exercise 21.9: At the end, add: "For the CUSUM chart, use: K=0.5s and H=5s where s is the sample standard deviation. For the EWMA chart, use λ=0.25."
596	Caption for Table 22.1: Change "Tale" to "Table".
599	Line 3: change "22.7" to "22.6". Also, in line 5, change "opened" to "open".
598-601	TFE will send revised figures to Wiley.
666	Exercise 24.4(b), last line: Change "24.8" to "24.7".
698	Modeling Assumptions, in items # 2,4, and 5: Change "V_R" to "Volume V_R", "V_F" to "Volume V_F", and "V_R" to "Volume V_T".

% Revision of Table 13.3

```
s = tf('s');
G = 5/(10*s+1);                 % Define transfer function

ww = logspace(-3,1,100);        % Define frequencies
[mag,phase,ww] = bode(G,ww);    % Calculate frequency response

for i = 1:size(ww,1)            % Restructure mag and phase
  mag2(i,1) = mag(1,1,i);
  phase2(i,1) = phase(1,1,i);
end

figure(1)                       % Plot results
subplot(2,1,1)
loglog(ww,mag2);
axis ([0.001 10 0.01 10]);
title('Frequency Response for a 1st Order System')
ylabel('AR')

subplot(2,1,2)
semilogx(ww,phase2);
axis ([0.001 10 -90 0]);
ylabel('Phase Angle (degrees)')
xlabel('Frequency (rad/s)')
```