

Applied Engineering Economics Using Excel, By Merwan Mehta
Errata / Corrections to Contents, as of September 2016
Chapter Changes

Chapter 4, Page 62, Exercise 4.6:

The fourth sentence should read:

In other words, you deposit \$2,100 in the 2nd year, \$2,200 in the 3rd year and so on.

Chapter 4, Page 64, Exercise 4.14:

The last sentence should read:

Create a spreadsheet to allow a donor to choose the initial amount that she will need to contribute on Time 0 to establish the professorships.

Chapter 6, Page 103, Exercise 6.6:

The instructions should read:

Details for 6 project proposals are as shown below.

- (a) Find payback for each, considering only the initial costs and the life of the machine. Also, consider first-year benefits as the constant benefits over the life of the project.
- (b) If MARR, salvage cost, and increase in benefits per year are as shown, calculate NPW, EUAW, and NFW for each machine.

Chapter 10, Page 187, Figure 10.14:

Cell C8 should be:

-22% (negative 22%).

A new last line, added at the very end of the page for clarification, should read:

Note: Salvage for Copper is negative 22%.

Chapter 11, Page 207, Example 11.4:

Item b. should read:

The salvage cost for the Base option at the end of each two-year period is 10% of the original investment, and the salvage cost for the Star option at the end of each three-year period is 8% of the initial investment. Salvage cost means you will have to incur an expense at the end of the life rather than getting cash in through the sale of the used piece of equipment.

Chapter 11, Page 208, Figure 11.11:

Cells A4 and A5 should read:

Salvage cost %.

Cells B4 and C4 should read:

-10% and -8%, respectively.

Cells B7 and C7 should read:

-\$120,000 and -\$95,000, respectively.

Answer Key Changes

Page 227, Exercise 4.15:

Answer: See table below:

	Professorship	Assistant	Associate	Full	Endowed
	Yearly cost	\$75,000	\$95,000	\$125,000	\$175,000
Interest rates minus inflation rate	0.50%	\$15,075,000	\$19,095,000	\$25,125,000	\$35,175,000
	3.00%	\$2,575,000	\$3,261,667	\$4,291,667	\$6,008,333
	5.00%	\$1,575,000	\$1,995,000	\$2,625,000	\$3,675,000
	7.25%	\$1,109,483	\$1,405,345	\$1,849,138	\$2,588,793
	9.00%	\$908,333	\$1,150,556	\$1,513,889	\$2,119,444

Page 229, Exercise 5.14:

Answer: 6.772% p. y. c. m.

Page 229, Exercise 6.6:

Answer: See table below.

Answers						
(a) Payback in years	3.2	3.9	3.9	4.4	4.8	6.5
(b) NPW, EUAW and NFW						
Years	Machine A	Machine B	Machine C	Machine D	Machine E	Machine F
0	(\$240,000)	(\$360,000)	(\$420,000)	(\$560,000)	(\$680,000)	(\$850,000)
1	\$75,000	\$92,000	\$109,000	\$126,000	\$143,000	\$131,000
2	\$78,750	\$97,520	\$116,630	\$136,080	\$155,870	\$137,550
3	\$46,688	\$103,371	\$124,794	\$146,966	\$169,898	\$144,428
4		\$59,173	\$133,530	\$158,724	\$185,189	\$151,649
5			\$88,277	\$171,422	\$201,856	\$159,231
6				\$101,135	\$220,023	\$167,193
7					\$144,625	\$175,553
8						\$184,330
9						\$83,047
NPW	(\$68,859)	(\$77,688)	\$4,454	\$14,969	\$76,661	(\$122,791)
EUAW	(\$27,203)	(\$24,508)	\$1,205	\$3,641	\$17,334	(\$24,824)
NFW	(\$89,174)	(\$113,743)	\$7,506	\$29,547	\$180,353	(\$399,309)

NEW Page 230A, add answer for Exercise 6.9:

Answer: See table below.

Machine A						
Years	Initial Cost	Salvage	Benefits	Costs	Net CF	
0	(\$125,000)				(\$125,000)	
1			\$55,000	(\$12,000)	\$43,000	
2			\$58,300	(\$12,480)	\$45,820	
3	(\$140,608)	\$18,750	\$61,798	(\$12,979)	(\$73,039)	
4			\$65,506	(\$13,498)	\$52,008	
5			\$69,436	(\$14,038)	\$55,398	
6	(\$158,165)	\$21,091	\$73,602	(\$14,600)	(\$78,071)	
7			\$78,019	(\$15,184)	\$62,835	
8			\$82,700	(\$15,791)	\$66,908	
9	(\$177,914)	\$23,725	\$87,662	(\$16,423)	(\$82,950)	
10			\$92,921	(\$17,080)	\$75,842	
11			\$98,497	(\$17,763)	\$80,734	NPW
12		\$26,687	\$104,406	(\$18,473)	\$112,620	\$24,933.59

Machine B						
Years	Initial Cost	Salvage	Benefits	Costs	Net CF	
0	(\$229,500)				(\$229,500)	
1			\$73,000	(\$29,000)	\$44,000	
2			\$77,380	(\$30,160)	\$47,220	
3			\$82,023	(\$31,366)	\$50,656	
4			\$86,944	(\$32,621)	\$54,323	
5			\$92,161	(\$33,926)	\$58,235	
6	(\$290,391)	\$22,950	\$97,690	(\$35,283)	(\$205,033)	
7			\$103,552	(\$36,694)	\$66,858	
8			\$109,765	(\$38,162)	\$71,603	
9			\$116,351	(\$39,689)	\$76,662	
10			\$123,332	(\$41,276)	\$82,056	
11			\$130,732	(\$42,927)	\$87,805	NPW
12		\$29,039	\$138,576	(\$44,644)	\$122,971	\$17,209.21

Machine C						
Years	Initial Cost	Salvage	Benefits	Costs	Net CF	
0	(\$345,000)				(\$345,000)	
1			\$99,000	(\$48,000)	\$51,000	
2			\$104,940	(\$49,920)	\$55,020	
3			\$111,236	(\$51,917)	\$59,320	
4			\$117,911	(\$53,993)	\$63,917	
5			\$124,985	(\$56,153)	\$68,832	
6			\$132,484	(\$58,399)	\$74,085	
7			\$140,433	(\$60,735)	\$79,698	
8			\$148,859	(\$63,165)	\$85,695	
9			\$157,791	(\$65,691)	\$92,100	
10			\$167,258	(\$68,319)	\$98,939	
11			\$177,294	(\$71,052)	\$106,242	NPW
12		\$17,250	\$187,932	(\$73,894)	\$131,288	\$103,801.52

NEW Page 230B, add answer for Exercise 6.10:

Answer: See table below.

Process X					
Years	Initial Cost	Salvage	Benefits	Costs	Net CF
0	(\$375,000)				(\$375,000)
1			\$121,000	(\$52,000)	\$69,000
2			\$127,050	(\$53,560)	\$73,490
3			\$133,403	(\$55,167)	\$78,236
4	(\$422,066)	\$52,500	\$140,073	(\$56,822)	(\$286,315)
5			\$147,076	(\$58,526)	\$88,550
6			\$154,430	(\$60,282)	\$94,148
7			\$162,152	(\$62,091)	\$100,061
8	(\$475,039)	\$59,089	\$170,259	(\$63,953)	(\$309,644)
9			\$178,772	(\$65,872)	\$112,900
10			\$187,711	(\$67,848)	\$119,863
11			\$197,096	(\$69,884)	\$127,213
12	(\$534,660)	\$66,505	\$206,951	(\$71,980)	(\$333,184)
13			\$217,299	(\$74,140)	\$143,159
14			\$228,164	(\$76,364)	\$151,800
15			\$239,572	(\$78,655)	\$160,917
16	(\$601,765)	\$74,852	\$251,550	(\$81,014)	(\$356,376)
17			\$264,128	(\$83,445)	\$180,683
18			\$277,334	(\$85,948)	\$191,386
19			\$291,201	(\$88,527)	\$202,674
20	(\$677,292)	\$84,247	\$305,761	(\$91,182)	(\$378,466)
21			\$321,049	(\$93,918)	\$227,131
22			\$337,101	(\$96,735)	\$240,366
23			\$353,957	(\$99,637)	\$254,319
24		\$94,821	\$371,654	(\$102,626)	\$363,849
					NPW
					(\$340,775)

Process Y					
Years	Initial Cost	Salvage	Benefits	Costs	Net CF
0	(\$629,500)				(\$629,500)
1			\$163,000	(\$99,000)	\$64,000
2			\$171,150	(\$101,970)	\$69,180
3			\$179,708	(\$105,029)	\$74,678
4			\$188,693	(\$108,180)	\$80,513
5			\$198,128	(\$111,425)	\$86,702
6	(\$751,656)	\$75,540	\$208,034	(\$114,768)	(\$582,850)
7			\$218,436	(\$118,211)	\$100,224
8			\$229,357	(\$121,758)	\$107,600
9			\$240,825	(\$125,410)	\$115,415
10			\$252,866	(\$129,173)	\$123,694
11			\$265,510	(\$133,048)	\$132,462
12	(\$897,516)	\$90,199	\$278,785	(\$137,039)	(\$665,572)
13			\$292,725	(\$141,150)	\$151,574
14			\$307,361	(\$145,385)	\$161,976
15			\$322,729	(\$149,746)	\$172,982
16			\$338,865	(\$154,239)	\$184,627
17			\$355,809	(\$158,866)	\$196,943
18	(\$1,071,682)	\$107,702	\$373,599	(\$163,632)	(\$754,013)
19			\$392,279	(\$168,541)	\$223,738
20			\$411,893	(\$173,597)	\$238,296
21			\$432,488	(\$178,805)	\$253,683
22			\$454,112	(\$184,169)	\$269,943
23			\$476,817	(\$189,694)	\$287,123
24		\$128,602	\$500,658	(\$195,385)	\$433,875
					NPW
					(\$645,596)

Process Z					
Years	Initial Cost	Salvage	Benefits	Costs	Net CF
0	(\$845,000)				(\$845,000)
1			\$199,000	(\$104,000)	\$95,000
2			\$208,950	(\$107,120)	\$101,830
3			\$219,398	(\$110,334)	\$109,064
4			\$230,367	(\$113,644)	\$116,724
5			\$241,886	(\$117,053)	\$124,833
6			\$253,980	(\$120,565)	\$133,416
7			\$266,679	(\$124,181)	\$142,498
8	(\$1,070,421)	\$84,500	\$280,013	(\$127,907)	(\$833,815)
9			\$294,014	(\$131,744)	\$162,270
10			\$308,714	(\$135,696)	\$173,018
11			\$324,150	(\$139,767)	\$184,383
12			\$340,358	(\$143,960)	\$196,397
13			\$357,375	(\$148,279)	\$209,096
14			\$375,244	(\$152,728)	\$222,517
15			\$394,006	(\$157,309)	\$236,697
16	(\$1,355,977)	\$107,042	\$413,707	(\$162,029)	(\$997,257)
17			\$434,392	(\$166,889)	\$267,503
18			\$456,112	(\$171,896)	\$284,215
19			\$478,917	(\$177,053)	\$301,864
20			\$502,863	(\$182,365)	\$320,498
21			\$528,006	(\$187,836)	\$340,171
22			\$554,407	(\$193,471)	\$360,936
23			\$582,127	(\$199,275)	\$382,852
24		\$135,598	\$611,233	(\$205,253)	\$541,578
					NPW
					(\$413,123)

NEW Page 230C, add answer Exercise 6.11:

Answer: See table below.

Inflation		3%						Inflation		3%					
MARR		9%						MARR		9%					
Year	Machine U						Year	Machine V							
	Initial cost	Costs	Salvage		Benefits	Net CF		Initial cost	Costs	Salvage		Benefits	Net CF		
			Time 0 value	Real time Money						Time 0 value	Real time Money				
0	(\$135,000)						0	(\$234,000)							(\$234,000)
1		(\$11,500)			\$44,900	\$33,400	1		(\$14,500)			\$64,600	\$50,100		
2		(\$11,845)			\$46,247	\$34,402	2		(\$14,935)			\$66,538	\$51,603		
3		(\$12,200)			\$47,634	\$35,434	3		(\$15,383)			\$68,534	\$53,151		
4		(\$12,566)			\$49,063	\$36,497	4		(\$15,845)			\$70,590	\$54,746		
5	(\$156,502)	(\$12,943)	\$43,500	\$50,428	\$50,535	(\$68,482)	5		(\$16,320)			\$72,708	\$56,388		
6		(\$13,332)			\$52,051	\$38,720	6	(\$279,408)	(\$16,809)	\$52,400	\$62,568	\$74,889	(\$158,760)		
7		(\$13,732)			\$53,613	\$39,881	7		(\$17,314)			\$77,136	\$59,822		
8		(\$14,144)			\$55,221	\$41,078	8		(\$17,833)			\$79,450	\$61,617		
9		(\$14,568)			\$56,878	\$42,310	9		(\$18,368)			\$81,833	\$63,465		
10	(\$181,429)	(\$15,005)	\$43,500	\$58,460	\$58,584	(\$79,389)	10		(\$18,919)			\$84,288	\$65,369		
11		(\$15,455)			\$60,342	\$44,887	11		(\$19,487)			\$86,817	\$67,330		
12		(\$15,919)	\$75,500	\$107,645	\$62,152	\$153,878	12		(\$20,071)	\$52,400	\$74,710	\$89,422	\$144,060		
						NPW							NPW	\$75,000	
						EUAW							EUAW	\$10,474	

Page 231, Exercise 7.18:

$P = \$4,863$