

**E355 Engineering Economics Spring 2022
Classroom Assignment #5**

“I pledge my honor that I have abided by the Stevens Honor System”

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1. Given the following information: Two year loan, loan proceeds of \$4,800, interest on the loan is 8%. Calculate the interest and principle replacement payments. If answers end up being wrong, you must have shown the math to get any partial credit. [3 points]

Year	Beginning Balance	Annual Payment	Interest	Principle Repayment	Ending Balance
1	\$4,800	\$2,691.84	\$384	\$2,307.84	\$2,492.16
2	\$2,492.16	\$2,691.84	\$199.37	\$2,492.46	-0.30
Total		\$5,383.68	\$583.37	\$4,800.30	

$$A = 4800\left(\frac{A}{P}, 8\%, 2\right) = 2691.84$$

Year 1:

$$\text{Interest} = (4800)(0.08) = 384$$

$$\text{Principle Repayment} = 2691.84 - 384 = 2307.84$$

Year 2:

$$\text{Interest} = (2492.16)(0.08) = 199.37$$

$$\text{Principle Repayment} = 2691.84 - 199.37 = 2492.46$$

$$\text{Rounding Error} = 2492.16 - 2492.46 = \sim 0.30$$

2. Given the following information: Two year loan, depreciable capital at year 0 is \$3,500, depreciation rates of 0.55 and 0.45 and assume that the working capital is returned in year two. Calculate the depreciation expense and the accumulated depreciation expense: If answers end up being wrong, you must have shown the math to get any partial credit. [2 points]

Year	Initial Costs	Depr. Rate	Depr. Expenses	Accumulated depreciation	Ending BV
0	\$3,500	-	-	-	-
1		55%	\$1,925	\$1,925	\$1,575
2		45%	\$1,575	\$3,500	\$0
Total		100%	\$3500		

1:

$$3500(0.55) = 1925$$

$$3500 - 1925 = 1575$$

2:

$$3500(0.45) = 1575$$

$$3500 - 3500 = 0$$

3. Calculate the taxes on the Non-depreciable capital, given the following. Non-depreciable capital at year zero is \$1,100. Non-depreciable capital at the end of the project life is \$2,500 and the yearly tax rate is 20%. [1 point]

$$\text{Tax Rate (TR)} = 20\% = 0.2$$

$$\text{End of life (FMV)} = 2500$$

$$\text{Year 0 (IC)} = 1100$$

$$\text{Tax} = (\text{FMV} - \text{IC})(\text{TR}) = (2500 - 1100)(0.2)$$

$$\text{Tax} = \$280$$