

Name: \_\_\_\_\_

## Fundamentals of Engineering Economy

### Excel Lab 1

Complete this lab assignment using Excel. I will give you some useful tips for some of the steps in the following and, if necessary, you can find a number of YouTube tutorials to show you the basics for using Excel. When you have completed all exercises, email your Excel file to me.

**Exercise 1** – In Excel, create the table from Example 1-18a, on page 37 of the 6<sup>th</sup> edition (example 1-17 on page 30 in the 7<sup>th</sup> edition) as follows:

1. Open the Lesson 4 Lab Excel file from the course website ([http://faculty.mercer.edu/moody\\_le/egr312home.html](http://faculty.mercer.edu/moody_le/egr312home.html)).
2. Complete the calculations of the interest earned and cumulative equivalent EOY (end of year) cash flows for both simple and compound interest. Make extensive use of formulas to create table using either the formulas suggested in the text or the following method. Be sure to check your results against those in the example in the text.
  - a. **Compute the Simple Interest earned each year.** In cell C14, type in `'=$B$6*SUM($B$13:B13)'`. Note the dollar signs (\$) – these are used to “anchor” the reference to the cell with the interest rate and the starting cell for the sum (that is, when you copy the formula to another cell it will continue to look for the interest rate in cell B6 – this is known as “absolute addressing”. Because cell B13 is not anchored, the cell that is referenced in the formula will change as you copy the formula to another cell – this is called “relative addressing”).
 

[NOTE: Instead of typing the formula, type '=', then select cell B6 and press the F4 key once (note that this changes 'B6' to '\$B\$6'), then type '\*', then type 'sum(\$B\$13:B13)'.]
  - b. Copy cell C14 to cells C15-C17 using one of the following methods: 1) right-click in the cell and choose “Copy” then highlight cells C15-C17 and right-click and choose “Paste”; 2) select the cell and type “CTRL-C” then highlight cells C15-C17 and type “CTRL-V”; 3) select the cell then select “Copy” from the “Home” tab on the ribbon then highlight cells C15-C17 and choose “Paste” from the ribbon; or, 4) select the cell, then select the small square in the lower right hand corner of the cell (your cursor will change from a large “+” sign to a smaller “+” sign” when it is positioned over the square) and drag it down to cell C17.
  - c. **Compute the Cumulative Equivalent EOY Cash Flow for each year.** Put `"=D13+B14+C14"` into cell D14 using either of the methods described in part a. Copy this formula to cells D15-D17 using any of the methods described in part b.

- d. **Compute the Compound Interest earned each year.** Put “=F13\*\$B\$6” into cell E14 using any of the methods described in part a. Copy this formula into cells E15-E17 using any of the methods described in part b.
- e. **Compute the Cumulative Equivalent EOY Cash Flow for each year.** Put “=F13+B14+E14” into cell F14 using either of the methods described in part a. Copy this formula to cells F15-F17 using any of the methods described in part b.
- f. Demonstrate the power of using formulas and referencing by conducting the following sensitivity analyses:
  1. What will be the interest earned if the ROR is only 6%? 4%? 2%? (Hint: you can change the interest rate in cell B6, then copy your results and 'Paste Special' → 'Values and Number Formatting' into the corresponding cells in the table below your interest calculations.)
  2. Assume again an 8% ROR, what is the interest earned if EOY 3 cash flow increases to \$400,000? What is the interest if EOY 4 also increases to \$400,000?
  3. Why is the use of formulas important when doing sensitivity analysis in Excel?

**Exercise 2** – Using Excel, create a table similar to Exercise 1 to help answer the following:

If you were to invest \$2000 today in a CD paying 8% per year, how much would the CD be worth at the end of year four?

- a) Assuming simple interest
- b) Assuming compound interest

**Exercise 3** – Using Excel, create a table, similar to Exercise 1, to help answer the following:

How much would you need to invest today in a CD paying 5% if you needed \$2000 four years from today?

- a) Assuming simple interest
- b) Assuming compound interest

**Exercise 4** – Use the financial functions in Excel to calculate the Cumulative Equivalent EOY Cash Flow for Exercise 1, as well as the present value and equivalent annual worth, as follows:

- a. Put '=NPV(\$B\$6,B14:B17)' in cell I13 using either of the methods described in part a of exercise 1.
- b. Put '=PMT(\$B\$6,A17,I13)' in cell I15.
- c. Put '=FV(\$B\$6,A17,I15)' in cell I17.

NOTE: We will discuss these and other financial functions in more detail in a future lab. Simply use this exercise as a demonstration of the power and efficiency of these functions.