Math Field Day Short Course Event - Engineering Economy
Symbols, Notation, Formulas, Key Terms

"Engineering economic analysis (often called engineering economy) is a group of techniques for the systematic analysis of alternative courses of action."

"To make a decision, alternatives must be resolved into equivalent sums so that they may be compared accurately."

TERMS
Cash Flow (receipt of money up; disbursement of money down)
Time value of money
Equivalence
Compound interest
Present worth
Annual cost
Rate of return
Nominal interest rate
Effective interest rate

Three major methods of Comparing alternatives
Present worth
Annual cost
Rate of return
Benefit-Cost Ratio

Notation	
Present Sum	P
Future Sum	F
End-of-period payments or receipts in a uniform series continuing for a specified number of periods	A
Number of interest periods	n
Interest rate per interest period	i
Nominal interest rate per year	r

Let interest be compounded m times per year at an interest rate of $i = \frac{r}{m}$ per compounding period, then:

Nominal interest rate per annum $= m\left(\frac{r}{m}\right) = r$

Effective interest rate per annum $= \left(1+\frac{r}{m}\right)^{m} - 1$

Number of interest periods, n, is:

$$n = m \times (number\ of\ years)$$

Formulas for Calculating Compound Interest Factors	
1. Single Payment – Compound Amount Factor $(F/P,i,n)$	$(1+i)^n$
2. Single Payment – Present Worth Factor $(P/F,i,n)$	$\frac{1}{(1+i)^n}$
3. Sinking Fund Factor $(A/F,i,n)$	$\frac{i}{(1+i)^n - 1}$
4. Capital Recovery Factor $(A/P,i,n)$	$\frac{i(1+i)^n}{(1+i)^n - 1}$
5. Uniform Series – Compound Amount Factor $(F/A,i,n)$	$\frac{(1+i)^n - 1}{i}$
6. Uniform Series – Present Worth Factor $(P/A,i,n)$	$\frac{(1+i)^n - 1}{i(1+i)^n}$