HM321 Engineering Economics
Fall 2024 – Lecture 16

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Bring Calculator Always

- Always bring your calculator with you in lectures
- Without practice you will not be able to do the calculations in your exams

Chapter 5

ANNUAL WORTH ANALYSIS

Capital Recovery and AW

- Capital recovery (CR) is the equivalent annual amount that an asset, process, or system must earn each year to just recover the first cost and a stated rate of return over the expected life.
- Salvage value is considered when calculating CR

$$CR = -P(A/P, i\%, n) + S(A/F, i\%, n)$$

Note that annual operating cost (AOC) is not included in CR

Selection Guidelines for AW Analysis

- For one alternative:
  - If AW ≥ 0, the required MARR is met or exceeded and alternative is economically justified
- For two or more alternatives:
  - Select the alternative with the AW that is numerically largest, that is less negative or more positive

Example: Mutually Exclusive Alternative Evaluation by AW

- A company is considering two machines. Machine X has a first cost of $30,000, AOC of $18,000, and S of $7000 after 4 years. Machine Y will cost $50,000 with an AOC of $16,000 and S of $9000 after 6 years. Which machine should the company select at an interest rate of 12% per year?
- Solution:

AW_X = -30,000(A/P,12%,4) –18,000 +7,000(A/F,12%,4)

= $-26,412

AW_Y = -50,000(A/P,12%,6) –16,000 + 9,000(A/F,12%,6)

= $-27,052

Select Machine X; it has the numerically larger AW value

Reference

- Basics of Engineering Economy by Leland Blank and Anthony Tarquin, 2nd edition, McGraw-Hill