

## **CE657 – Construction Economics and Infrastructure Financing**

### **Assignment - 01**

**Purpose:** To develop a general understanding of Basic engineering economics concepts and apply them to real-world applications.

**Weightage:** This assignment will have 15% weightage in your final grades. Detailed rubrics for evaluation are available at the end of this document.

#### **Deliverables:**

- a) Excel-based financial model (Developed by following best practices for spreadsheet modeling and clearly showing all calculations, assumptions, and decisions)
- b) A maximum of a 4-page summary document explaining your decision, the analysis conducted, and your results.
- c) Submit a zip file on Mookit platform. Submissions through email will not be entertained.

#### **Other guidelines:**

- a) You can complete the assignment either alone or with a friend of your choice. (Maximum group size – 2).
- b) The last date to submit the deliverables is **February 16, 2024 (Midnight)**. There is a “Minus 2 Marks” penalty for each day the submission is delayed.
- c) The financial model and report should not have more than 20% similarity and not more than 25% of the text generated using AI. There is a strict penalty of “Minus 10 marks” for submissions violating these.

This assignment is divided into two parts.

#### **Part 1: Buy vs Rent a Home**

**10 Marks**

Suppose you have successfully graduated from IIT Kanpur and moved to a new city for your job. You foresee staying in the new town for at least 10+ years. You are contemplating whether you should “Buy” a home or “Rent” a place for your stay. You decide to use the concepts you learned in the CE657 course to make an informed, data-driven financial decision.

Please use real-world numbers pertaining to your hometown while doing the analysis. Specify your assumptions and values used with a proper explanation.

Some of the decision-making pointers are provided in the tables below. Please note this is not an exhaustive list, and you should use values that suit your specific case. Feel free to add/modify these parameters as you see fit for your case.

- a) Parameters pertaining to the purchase of a new home (Table 1)
- b) Parameters related to renting a home (Table 2)
- c) Income and investment opportunities.
- d) Tax implications.

Given all these details, what would be the best choice for you? Use suitable economic decision-making parameters discussed in the class. Prepare a financial model that is reliable, legible, and flexible. Also, document your findings in a report.

Conduct a comprehensive sensitivity analysis of the key variables to see how they may influence the outcomes and the final decision. Identify primary factors, which, if changed, can consequently influence your decision.

*Table 1 Parameters pertaining to the purchase of a new home.*

Initial home purchase price		
Down payment	25	%
Interest rate	8	%
Loan term	30	years
Buying closing cost		%
Property tax		%/year
Property tax increase		%/year
Home Insurance		/year
House Owner Association fee		/year
Maintenance cost		%/year
Home value appreciation		%/year
Cost/insurance increase		%/year
Selling / closing price & associated cost		%

*Table 2 Parameters pertaining to renting a home*

Monthly rental cost		
Rental cost increase	5	%/year
Renter's insurance		/month
Maintenance fees		/month
Security deposit		
Upfront cost		

## **Part 2: Investing in a property after taking a loan from the bank**

**5 Marks**

In this part, you will analyze whether you should invest in a land property (assume there is no rental income from this purchase) in your hometown by taking a loan from the bank. Make appropriate assumptions. Prepare a separate financial model for analysis and document your findings. Assume that you will make a down payment of 25% of the property's cost from your savings. Consider parameters like interest rate, property appreciation, taxes, costs, fees, etc.

### **Rubrics**

<b>Part</b>	<b>Components</b>	<b>Marks</b>
Part 1	Spreadsheet financial model – Reliability, flexibility, legibility, and completeness	6
Part 1	Summary report – Concise summary, completeness, formatting, and adherence to guidelines	4
Part 2	Spreadsheet financial model	3
Part 2	Documentation of findings	2
	<b>Total Marks</b>	<b>15</b>