# DEPARTMENT OF SOFTWARE ENGINEERING BACHELORS IN SOFTWARE ENGINEERING

**Course Code: IF-301**

# Course Title: Applied Economics for Engineers Assignment (Affective Domain)

**TE Batch 2022, Fall Semester 2024**

## Course Learning Outcome

**CLO 3: Apply appropriate methods to solve different and Real-time Economic Problems.**

## Problem Statement

**Students are required to meet with a representative of a software house to inquire about their procedures with respect to software engineering economics.**

## Minimum Required Features:

1. **Understanding the Company's Approach:**
   * Could you provide an overview of the typical stages your software projects go through, from initiation to delivery?
   * How do you incorporate economic considerations into your software development lifecycle?

## Specific Areas to Explore:

1. **Cost Estimation:**
   * What cost estimation models or methods do you use to determine the budget for a new project (e.g., COCOMO, Function Point Analysis, parametric models)?

* How do you deal with uncertainties in cost estimation, especially in agile or iterative development models?

## Budgeting and Resource Allocation:

* + How do you allocate resources (e.g., team members, tools, infrastructure) in a cost-effective manner for each project?
  + What cost drivers are most significant?
  + Is there a process to re-allocate resources if costs overrun or a project gets delayed?

## Risk Management:

* + What strategies do you use to handle the financial risks associated with software projects (e.g., unplanned rework, changing requirements)?
  + How do you model the financial impact of risks (e.g., Monte Carlo simulations, decision tree analysis)?

## Pricing Models:

* + What pricing strategies do you employ when quoting a project to clients (e.g., fixed price, time and materials, cost- plus)?
  + How do you negotiate these pricing models with clients, particularly with respect to changing project scope?

## Tools and Automation:

* + What tools do you use for tracking costs, resources, and overall project economics?
  + Have you automated any parts of cost estimation or economic evaluation in your projects?

## Client Involvement in Economic Decisions:

* + How do you involve the client in economic decisions (e.g., scope adjustments, added features)?
  + How transparent are you with the client regarding project costs, risks, and financial trade-offs?

## Documentation

Create an informal document in the form of discussion with the Organization’s Representative

* + Evaluation of the company’s software development procedures according to the software engineering economics as per the discussion with the representative. You might look for gaps such as:
    - **Lack of a structured cost estimation framework:** For instance, if they’re using a less detailed model like

Function Points, but could benefit from a more robust one like COCOMO II.

* + - **Inadequate risk analysis:** If they don’t have a formal way to quantify and mitigate risks, they might be

overlooking major cost drivers.

* + Suggest the possible recommendations gathered from the discussion to align the Organization’s procedures with sound economic principles
    - Introduce a detailed estimation model.
    - Implement risk management tools like **Monte Carlo Simulation** or **PERT** (Program Evaluation Review Technique) to estimate uncertainties in cost and scheduling.
    - Implement metrics like **Cost Performance Index (CPI)** and **Schedule Performance Index (SPI)** to track project economic efficiency and keep costs within budget.
    - Plan for future updates, upgrades, and bug fixes by integrating **maintenance cost forecasting** models, which help reduce unexpected post-delivery costs.

## Instructions and Guidelines:

1. **Steps to Follow for Project Completion**: Step 1: Meeting Preparation

Step 2: Prepare Key Questions to Ask Step 3: Analyzing the Procedure

Step 4: Suggesting Plans Based on Principles of Software Engineering Economics

## Documentation:

The document contains two sections, Section I comprises of company’s details and procedures followed by the company in the form of questionnaire shared by you with the company. Section II comprises of your suggestions for the betterment of company’s procedure according to the studied principles of Software Engineering Economics in light of answers given by the company representative.

## Deliverables:

* + The students have to submit a written report in a prescribed format. The report must be plagiarism free i.e., plagiarism must be within 15%. The report must not be AI generated.
  + The students also need to give the 10 min presentation of the same.

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| **PLO 3 Design/Development of Solutions – Rubric for Affective Domain Assessment (A-3)-Discussion** | | | |
| **Level of Attainment** | | | |
| **Criterion** | **0** | **1** | **2** |
| ***Acknowledges*** responsibilities and attitudes, relevant to organization privacy and practice of software economics rules. | **Doesn’t** acknowledge responsibilities and attitudes, relevant to organization privacy and practice of software economics rules. | **Fairly** acknowledges responsibilities and attitudes, relevant to organization privacy and practice of software economics rules. | **Satisfactorily** acknowledges responsibilities and attitudes, relevant to organization privacy and practice of software economics rules. |
| ***Practices***  responsibilities and attitudes, relevant to organization privacy and practice of software economics  rules. | **Doesn’t** practice responsibilities and attitudes, relevant to organization privacy and practice of software economics rules. | **Fairly** practices responsibilities and attitudes, relevant to organization privacy and practice of software economics rules. | **Satisfactorily** practices responsibilities and attitudes, relevant to organization privacy and practice of software economics  rules. |
| ***Values*** responsibilities and attitudes, relevant to organization privacy and practice of software  economics rules. | **Doesn’t** value responsibilities and attitudes, relevant to organization privacy and practice of software  economics rules. | **Fairly** values responsibilities and attitudes, relevant to organization privacy and practice of software  economics rules. | **Satisfactorily** values responsibilities and attitudes, relevant to organization privacy and practice of  software economics rules. |

Student’s Name: Hashir Jamal Khan, Muhammad Bilal, Shayan Zaheer, Muneer Hussain

Total Score =

Instructor’s Signature:

Seat No.: SE-22036, SE-22037, SE-22038, SE-22043

Assignment Title: Weighted Score (%) =

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| --- | --- | --- | --- | --- |
|  | **PLO 3 Design/Development of Solutions – Rubric for Affective Domain Assessment (A-3)-Presentation** | | | |
|  | **Level of Attainment** | | | |
| **Criterion** | **0** | **1** | **2** | **3** |
| ***Acknowledges*** responsibilities and attitudes, relevant to the presentation ethics including; use of direct eye contact, seldom looking at  notes. | **Doesn’t** acknowledge responsibilities and attitudes, relevant to the presentation ethics including; use of direct eye contact, seldom looking at  notes. | **Partially** acknowledges responsibilities and attitudes, relevant to the presentation ethics including; use of direct eye contact, seldom looking at  notes. | **Fairly** acknowledges responsibilities and attitudes, relevant to the presentation ethics including; use of direct eye contact, seldom looking at  notes. | **Satisfactorily** responsibilities and attitudes, relevant to the presentation ethics including; use of direct eye contact, seldom looking at notes. |
| ***Practices***  responsibilities and attitudes, relevant to the presentation ethics including; clear purpose provisioning; facts, and/or statistics provisioning; conclusions/ideas with evidence support. | **Doesn’t** practice responsibilities and attitudes, relevant to the presentation ethics including; clear purpose and subject provisioning;  facts, and/or statistics provisioning; conclusions/ideas with  evidence support. | **Partially** practices responsibilities and attitudes, relevant to the presentation ethics including; clear purpose and subject provisioning; facts, and/or statistics provisioning; conclusions/idea with  evidence support. | **Fairly** practices responsibilities and attitudes, relevant to the presentation ethics including; clear purpose and subject provisioning;  facts, and/or statistics provisioning; conclusions/ideas with  evidence support. | **Satisfactorily** practices responsibilities and attitudes, relevant to the presentation ethics including; clear purpose and subject provisioning; facts, and/or statistics provisioning; conclusions/ideas with evidence support. |
| ***Values***  responsibilities and attitudes, relevant to the presentation ethics  including; time bounded content delivery. | **Doesn’t** value responsibilities and attitudes, relevant to the presentation ethics including; time bounded  content delivery. | **Partially** values responsibilities and attitudes, relevant to the presentation ethics including; time bounded  content delivery. | **Fairly** values responsibilities and attitudes, relevant to the presentation ethics including; time bounded content delivery. | **Satisfactorily** values responsibilities and attitudes, relevant to the presentation ethics including; time bounded content delivery. |

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