

Scandinavian Academy Training Center

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Course: Project Cost Estimating, Budgeting and Value Engineering Skills

Code	City	hotel	Start	End	price	Language - Hours
PM-443SA	Al Khobar	Hotel Meeting	2027-11-07	2027-11-18	22450 SR	En - 50

The Course

The decision to proceed with a project is often based almost exclusively on early conceptual costestimates, and these estimates provide the basis for the cash flow projections and budget forecasts used during the project feasibility study. Unreliable cost estimates can result in significant cost overruns later in the project life when it is too late to contain them. As potential projects are considered, management not only requires costs estimates of high accuracy, they seek opportunities to reduce life-cycle costs, improve budget accuracy and optimize whole-life project value.

Determining which estimation method to use, at each stage of project development, depends on theinformation available at the time of preparation and its desired accuracy. Besides, decisions regardingoptimising project costs without sacrificing quality or functionality are highly dependent on the use of a set of systematic and logical procedures and techniques to enhance the whole-life project value.This course will provide the delegates with the necessary skills needed for accurately estimating the total cost of their proposed projects, eliminating unnecessary costs, linking cost estimates to selectedprocurement methods, and enhancing the overall value of project delivery. The course offers a series of estimating techniques and processes to forecast accurately the anticipated costs of projects with a focus on budget estimates, estimates for pre-construction services, estimating contractor and sub-contractor work, estimating general conditions, pricing self-performed work, estimating negotiated contracts, and performing lump-sum and unit-price estimates.

The course also presents the value engineering methodology which emphasizes the return-on-investment aspect of decision-making in terms of lifecycle costs during

project planning, procurement and execution. This methodology can be used to identify alternative ideas/solutions at any project phase to produce the client's best value requirements. Within the project management context this course significantly enhances cost estimating, budgeting, creative thinking, problem solving, and informed decision-making skills.

The Structure

Module 1 - Project Cost Estimating Skills

Module 2 - Value Engineering Skills

The Goals

The primary objectives of the programme are to help delegates to:

- Gain knowledge of techniques used in project estimating, from the conceptual stage to the final detailed estimate
- Understand the different types of estimates used to accurately and progressively estimate project costs
- Understand the different types of contracts based on the distribution of risk between contracting parties
- Effectively apply incentive arrangements to get the best results from the contract
- Understand the fundamental concepts of Value Engineering and Analysis
- Understand how value engineering supports effective project management by providing a continuous thread of good practice throughout the project development process
- Appreciate the level and nature of the information needed to develop a project scope
- Gather and organize information and cost relevant to key elements of the project
- Learn how to capture and incorporate stakeholders' input in the development of the project charter

- Report effectively to top management and project stakeholders in the context of proposing alternatives that improve the overall project value
- Demonstrate proficiency in applying life-cycle costing principles
- Objectively present a convincing case in support of certain project alternatives.

The Delegates

This course is designed for all those responsible for making significant decisions concerning costs, plans and budgets for large and complex projects. Project managers, project cost estimators, cost controllers, project planners, contract professionals, and project procurement staff will find this course highly relevant.

The course should also be of interest to anyone involved in project initiation, project estimating and budgeting, and development as well as critical assessment of project cost proposals in client and contracting companies.

The Process

The course is a mixture of speaker input, case studies and practice exercises which will be used to facilitate group discussion. Delegates will gain detailed knowledge of estimating and value engineering concepts and techniques by active participation in the exercise/training sessions. Through lectures, case studies and practical exercises, delegates will focus on the relevant key concepts, terms, and principles necessary for realistically estimating and optimizing project costs.

The Benefits

Organizations will be better prepared in relation to how they:

- Apply a consistent and streamlined project cost management process according to best practices
- Utilize information from previous projects and industry standards to estimate costs

for a new project.
- Master the application of cost estimating tools and techniques in order to improve all levels of project estimating and control in the organization.
- Effectively incorporate risk in cost estimation to provide a more realistic cost baseline which will be used to monitor cost performance during project execution.
- Form and instill common understanding among multi-disciplinary teams,
- Focus the efforts on the purposes behind the project.
- Adopt and apply a structured approach, tested and successful procedures that are directed toward achieving success in meeting the purposes for the "project" by all involved.

The Results

Delegates attending this course will be able to:

- Integrate all relevant project elements into a cohesive and comprehensive cost estimate
- Prepare budget estimates that will enable the owner-organization to make informed decisions as to the feasibility of a potential project
- Compare the costs of alternative strategies or technical approaches to ensure the most economical project at the desired level of quality
- Structure the contract compensation arrangement to provide the highest level of incentives to complete the project on schedule and within the determined budget
- Keep accurate control of the progressive budgeting process based on the various stages of design
- Prepare accurate budget estimates through the programming phase, the schematic design phase, and finally the design development phase
- Compare the costs of alternatives to ensure the most economical project at the desired level of quality
- Understanding the most appropriate contracting structure to ensure the desired project results
- Apply proper risk analysis to effectively mitigate risks at minimal costs, and to

determine appropriate contingencies for residual risks
- Obtain the skills required to prepare and manage the bidding process
- Prepare lump-sum, unit-price, cost plus, and time-and-materials estimates and contracts
- Keep accurate control of the progressive budgeting process based on the various stages of design
- Manage the interface between many value-adding project phases and management expectations
- Apply systematic and innovative methodology with multi-disciplinary approach to achieve better value and cost optimization for projects.

The Core Competencies

Delegates attending this course will enhance their competencies in the following areas:

- Skill and confidence to estimate project costs accurately and ability to sidestep the most common cost estimating pitfalls and problems.
- Developing an initial project budget for the owner
- Determining project feasibility
- Preparing bids and cost proposals
- Determining the cost impacts of change orders
- Preparing a Schedule of Values
- Creating historical cost databases to improve future estimating accuracy
- Bringing Value Engineering into the organization’s project initiation and planning processes
- Evaluating alternatives based on their cost and true value throughout the project life-cycle.
- Identifying major roadblocks to thinking creatively about project challenges, and ways to mitigate them
- Evaluating the results of a brainstorming session to develop the best value-adding scenario for theproject.

The Programme Content

Module 1: Project Cost Estimating Skills

Cost Estimating Basics

- The estimating life cycle
- Phases of the Design Process
  - Programming phase
  - Schematic design
  - Design development
  - Construction documents
- Estimating accuracy by phase
- Conceptual Cost Estimates
- Rough Order of Magnitude Estimates (Broad Scope Estimates)
- Assemblies cost estimates
- Cost indices
- Semi-detailed Estimates (Narrow Scope Estimates)
- Definitive Estimates (Detailed Scope Estimates)
- Basic procedures
- Lump-sum contracts
- Unit-price contracts
- Cost-plus contracts
- Cost-plus contract with guaranteed maximum price (GMP)
- Time-and-materials contracts
- Bid method
- Negotiated method
- Quantity take-off
- Types of construction contracts
- Procurement methods
- Pre-construction services

- Risk analysis and contingencies

Broad Scope Cost Estimating Techniques

- Adjustments to Project Cost for Broad Scope Estimates
- PERT Project Cost Analysis
    - PERT Unit Cost Estimates
        - Formulae for Cost Estimating
        - The Normal Distribution Curve
        - Z-Value Table
        - The Probability of Project Completion within Budget
        - Estimating Project Unit Cost by Using the Standard Deviation
        - Estimating the Project Unit Cost at a Required Probability
        - The Probability of Completing the Project at a Required Cost
        - PERT vs. Standard Deviation & Z-Values
        - Adjustments to Estimates Based on Previous Projects
    - Adjustments for Time
    - Review: Future Value of Money
    - Review: Present Value of Money
    - Equivalent Annual Interest Rate
    - Index to Adjust for Time
    - Equivalent Compound Interest
    - Location Index for Construction
    - Adjustments for Location
    - Adjustments for Size
    - Combined Adjustments
    - Economic Price Adjustment
    - Estimating Durations based on the Learning Curve Effect
    - Estimating Costs based on the Learning Curve Effect
    - Unit-Cost Adjustments
    - Learning Curves

Budget Estimating Process

- Estimating by design phase
    - Programming budget estimates
    - Schematic design budget estimates
    - Design development budget estimates
- Estimating pre-construction services
- Request for proposal
- Development of pre-construction services estimate
- Pre-construction services contract
- Budget control log

Bid Contract Estimating Process

- Pre-estimate activities
    - Estimating process
    - Solicitation of lump-sum bids
    - Order-of-Magnitude estimates
    - Work Breakdown Structure
    - Estimating team
    - Scheduling the estimating work
    - Subcontractors and major suppliers
    - Estimating forms
    - Accuracy and error prevention
- Pricing self-performed work
- Recap sheet
- Materials
- Labour
- Applying pricing factors
- Summary recap
- Subcontractor work
- Project summary schedule
- Alternative techniques
- Elements of the general conditions estimate
- Final document review

- Completing the bid summary
- Final mark-ups
- Sales tax
- Validating the estimate
- Estimating subcontractor work
- Estimating General Conditions
- Completing the estimate

Unit Price Estimates

- Unit price bid forms
- Direct cost estimation
    - Materials
    - Labour
    - Indirect labour
    - Subcontractors
    - Recap summary sheet
    - Direct-to-indirect cost factor
- Mark-up determination
- Variation-in-quantity contract provision
- Risk analysis
- Bid finalisation

Negotiated Contract Estimating

- Guaranteed Maximum Price Estimates
    - Contract procurement process
    - Documents
    - Strategies
    - Estimating process
    - Contingencies
- Fee determination for negotiated contracts
- Reimbursable versus Non-reimbursable costs

- Home office overhead
- Risk evaluation
- Fee structure
- Cost savings split
- Strategies for responding to the Request for Proposal
- Documents to be included with the Request for Proposal
- General Contractor interview and selection process
- Negotiated subcontracts
- Cost proposals for negotiated contracts

Contract Types and Compensation Arrangements

- Risk distribution in contracting
- Project risk profiles
- Contract types according to risk distribution
- Fixed Price Contracts
    - Firm Fixed Price
    - Fixed Price with Economic Adjustment
- Incentive Contracts
- Fixed Price Incentive
- Cost Plus Incentive
- Cost Reimbursement
- Cost Plus Award Fee
- Cost Plus Fixed Fee
- Cost-Plus Contracts
- Time-and-Materials

Narrow Scope Cost Estimating Techniques

- Power-sizing techniques (Capacity Ratios)
- Factor estimates
- Cost estimating relationships (CER)
- Design-to-cost-estimates

- Target cost estimates
- Adjusting for Project Type and Quality Level
- Features Determining the Quality Level (Grade) of a Structure
- Adjusting for Quality Level by Using a Costing Publication
- Economic Constraints
- Parametric Cost Estimating
- Analysis of Estimating Accuracy

Module 2:Value Engineering Skills

Framework for Applying Value Engineering in Projects

- What is Value Engineering? Why is it important?
- Defining Value Engineering concepts and principles
- Purpose of Value Engineering and Value Analysis
- Strengths and Weaknesses of Value Engineering
- How and When is Value Engineering applied?
- Project definition and initiation
- Project scope and charter development
- Life-cycle costing techniques
- Project stakeholders analysis and management
- Identifying relationships between Value, Cost and Worth
- Initiating Value Engineering Process
- Overview of Different Value Engineering Phases
- The Information Phase – steps and procedures
- Developing Value Engineering Job Plan

The Function Analysis Phase - Expressing Project Functional Needs and Constraints

- The need for Function Analysis in projects

- Defining project constraints – relationships and tradeoffs
- Conceptual project cost estimating techniques
- Function-Cost-Worth Analysis
- Developing FAST Diagrams to identify critical project components
- The Technical FAST Model to perform project value analysis
- Case Study
- Cross-Functional Project Team Approach

The Creative Phase - Inspiring Creativity in Your Project Team

- Creativity and Creative thinking within the project environment
- Individual vs. Group thinking to improve the quality of project decisions
- Creativity techniques as applied to optimize project value
- Blocks to creativity within the project team
- Brainstorm project solutions
- Reaching consensus and leveraging the power of project team collaboration
- Project risk perception and identification
- Project prioritization process using the Delphi technique
- The use of Force-field analysis in project problem solving
- Output of the Creative Phase

The Evaluation Phase -Making Informed Project Decisions

- Project ideas screening
- Project evaluation methods
- Quantitative evaluation using objective data
- Subjective evaluation – project-related criteria weighting
- Revisiting project life-cycle costing analysis
- Incorporating inflation in project economic analysis
- Performing project risk and scenario analyses
- Risk Life-cycle simulation modelling - best and worst project cost scenarios
- Pitfalls associated with the use of existing economic models
- Incremental benefit-cost analysis for project evaluation

- Effective Decision-making in project environment
- Output of the Evaluation Phase

The Planning and Reporting Phases -Getting Results through Effective Communication

- Develop and assess VE proposals to optimize project value
- Develop action plans and assign project roles and responsibilities
- Reporting VE findings to Senior Management and project stakeholders
- Mastering oral presentation techniques & interpersonal skills
- Strategies for project plan execution
- Incorporating VE into the early project phases
- Integrating VE with Continuous Improvement Techniques
- Wrap-up

The Scandinavian Academy for Training Center adopts the latest scientific and professional methodologies in training and human resource development, aiming to enhance the efficiency of individuals and organizations. Training programs are delivered through a comprehensive approach that includes:

- Theoretical lectures supported by PowerPoint presentations and visual materials (videos and short films).
- Scientific evaluation of participants before and after the program to measure progress and knowledge acquisition.
- Brainstorming sessions and practical role-playing to simulate real-life scenarios.
- Case studies tailored to align with the training content and participants work nature.
- Assessment tests conducted at the end of the program to evaluate the achievement of training objectives.

Each participant receives the training material (both theoretical and practical) in printed form and saved on a CD or flash drive. Detailed reports, including attendance records, final results, and overall program evaluations, are also provided.

Training materials are prepared professionally by a team of experts and specialists in various fields. At the end of the program, participants are awarded a professional attendance certificate, signed and accredited by the Scandinavian Academy for Training Center.

Program Timings: 9:00 AM to 2:00 PM

The program includes:

- A daily buffet provided during the sessions to ensure participants comfort.
- A closing ceremony on the final day to distribute certificates and celebrate participants achievements.
- **Note: All prices are exclusive of 15% Value Added Tax (VAT).**

Our Success Partners

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