

# ***Fundamentals of Cost Estimating***

<b>Date</b>	<b>Venue</b>	<b>Fees(US\$)</b>
7 - 11 Jun	Kuala Lumpur	4450
1 - 5 Nov	London	4450

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## **THE COURSE**

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The development of reliable cost estimates during the design and early conceptual stages of a proposed project are of critical importance.

The decision to proceed with a project is often based almost exclusively on early conceptual cost estimates, and these estimates provide the basis for the cash flow projections and 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.

In addition to the potential financial losses suffered by the organization, many such projects subsequently fail to deliver the required quality of outcomes intended for the project as a direct consequence of poor estimating. Budgeting inaccuracies inevitably result in lower quality workmanship and materials.

The estimating techniques and processes covered in this course will provide delegates with the necessary skills 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.

This brand new day course will significantly enhance the skills and knowledge of delegates and improve their ability to perform estimates at both the conceptual and detailed levels, and to compare feasible alternatives quickly and efficiently.

## **THE DELEGATES**

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This course is designed for project cost estimators, project designers, project planners and schedulers, contracts professionals, project procurement and purchasing staff, and project control and business services professionals who have the responsibility for preparing cost estimates and project proposals in client and contracting companies.

## **THE GOALS**

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***The Primary Objectives of the Seminar 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

## **THE PROCESS**

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Delegates will develop advanced project cost estimating and cost management skills and knowledge through formal and interactive learning methods. The program includes individual exercises, team projects, applicable case studies, group discussions and video material that bring to life the skills acquired throughout the course.

The material has been designed to enable delegates to apply all of the material with immediate effect at the office.

Additionally, the seminar does not assume prior knowledge of the topics covered in the course. New concepts and tools are introduced gradually to enable delegates to progress from the fundamental to the advanced concepts of project risk management.

## THE BENEFITS

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- This Fundamental Program takes the practice of project estimating to a new level to ensure maximum results
- The most recent developments in the field are included to provide fresh inputs to your project management efforts
- The course takes a practical rather than a theoretical approach by introducing a case study so that new skills can be applied with immediate effect
- High quality videos of substantial projects of different kinds are screened and discussed during the seminar
- Group activities and exercises will ensure mastery of the practical application of new skills learned
- The use of software programs to facilitate the incorporation of many advanced techniques are introduced
- Related project management fields such as risk are continuously incorporated to provide an integrated view of the total project management process
- Delegates will have excellent opportunities for interaction and discussion of best practices at their respective organizations
- This course will equip delegates with the skills and knowledge to significantly improve all levels of project estimating and control in the organization
- The program will be an important stepping stone in terms of personal career development in that it prepares delegates for the internationally recognized Project Management Professional (PMP) exam

## THE RESULTS

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This intensive 5-day seminar will provide delegates with a proven set of critical skills and techniques to improve the accuracy and reliability of conceptual and detailed estimates used for project proposals and final estimates, and will enable delegates 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
- 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

## **CORE COMPETENCIES**

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- Developing an initial project budget for the owner
- Determining project feasibility
- Designing the project within the owner's budget
- Evaluating alternative design concepts and project components
- Preparing bids
- Preparing cost proposals
- Establishing project budgets
- Determining the cost impacts of change orders
- Substantiating claims and resolving disputes
- Preparing a Schedule of Values
- Creating historical cost databases to improve future estimating accuracy

## **PROGRAMME CONTENT**

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### **DAY ONE**

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#### ***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)
- Quantity take-off
  - Basic procedures
- Types of construction contracts
  - Lump-sum contracts
  - Unit-price contracts
  - Cost-plus contracts
  - Cost-plus contract with guaranteed maximum price (GMP)
  - Time-and-materials contracts

- Procurement methods
  - Bid method
  - Negotiated method
- 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
  - Adjustments for Location
    - Location Index for Construction
  - Adjustments for Size
  - Combined Adjustments
  - Economic Price Adjustment
  - Unit-Cost Adjustments
  - Learning Curves
    - Estimating Durations based on the Learning Curve Effect
    - Estimating Costs based on the Learning Curve Effect

## **DAY TWO**

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### ***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
- Estimating subcontractor work
  - Subcontractor work
- Estimating General Conditions
  - Project summary schedule
  - Alternative techniques
  - Elements of the general conditions estimate
- Completing the estimate
  - Final document review
  - Completing the bid summary
  - Final mark-ups
  - Sales tax
  - Validating the estimate

## **DAY THREE**

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### ***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
- Cost proposals for negotiated contracts
  - 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

## **DAY FOUR**

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### ***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-Plus Contracts
  - Cost Reimbursement
  - Cost Plus Award Fee
  - Cost Plus Fixed Fee
- Time-and-Materials

## **DAY FIVE**

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**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
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