PROJACS ACADEMY
by egis

Project Budgeting, Cost Estimating and Value Engineering - Certified Program

تقدير وضبط تكاليف المشاريع والهندسة القيمية – معتمد عالمياً

04 - 15 September 2023

Amsterdam / Netherlands

Introduction

The cost of a project is the most significant factor in its becoming a reality. Costs are dealt with at the beginning of a project by preparing a “budget cost estimate” incorporating relevant historical cost data and the creative skill of a seasoned estimator with similar project experience. This is the most important, as well as the most difficult, type of estimate to prepare accurately.

The increasing demands for capital projects are placing greater stress on available funding resources. In this period of belt-tightening and reduced budgets, it is imperative to find ways of doing more with less. Value Engineering (VE) has proved to be a valuable tool in stretching capital, construction, operation and maintenance dollars to achieve the required goals for reduced costs, both in the public and private sector. Use of VE techniques also typically results in improvements in facility performance, even at these lesser costs.

Objectives

This course will provide a basis for the many areas of estimating that may be faced by the design and construction professional. It will provide "hands on" examples to facilitate a familiarity with different types of estimates and their components. With this basis, a person, through research, study and practical application, can further expand their cost estimating skills relative to their own profession or branch out into new areas of estimating. Other methods of cost control, such as value engineering.

Upon completion of this training course, participants will know:

- Mitigation of risk by selection of the most suitable project design type
- Methods of selection of the most suitable building systems
- Terms and conditions - examples of commercial terms
- Reducing total cost of project without any changes of functions and quality
- Developing better building functions
- How to determine fair and reasonable prices and times
- Structuring economic price adjustments
- Negotiation planning and strategies
- Value Engineering management techniques

Who Should Attend?

This course is targeted for:

- Chief Executive Officers
- Finance Managers
- Human Resources Managers
- Project Managers
- Planners
- Information Technology Managers.
- Architectural engineers
- Structural design engineers
- Construction engineers
- Mechanical engineers
- Electrical engineers
- Process / operation engineers

Course Outline

Day One

Welcome & Introductions

- Welcome & Opening Remarks
- Participant Introductions
- Objectives of Training Course
- Course Organization & Agenda

Cost Management Process in Planning & Design
Introduction to Project Budgeting & Concept Estimating (CH 1 + 2)

- Budget Elements
- Design Phases
- Cost Control Concept
- Historical Budget Techniques
- Estimating Standards
- The Uniformat Elemental Classification

Capitalized Approach to Project Budgeting (CH 3)
Sample Project Cost Plan / Cost Model

- **Construction Market Survey**
- Regional & National Market Conditions, Potential Bidders
- Labor Availability, Productivity and Union Rates
- Material Availability and Unit Price Summary
- Market Analysis Survey Questionnaire

Fixing Project Scope (CH 4)

- Facilities Functional & Technical Programs
- Key Cost Drivers

Computing Program Area Requirements (CH 5)

- Space Efficiency
- Rules of Measurement
- Converting Net of Gross

Case Studies – Example Estimates

- Case Study 1: Historical Comparative Budget Estimate (UDM)
- Case Study 2: Parametric Budget Estimate (EMU)
- Case Study 3: Parametric Concept Design Estimate (4th Precinct):

Assignment Reading Assignment, Chapters 1-6

Day Two

Discuss Reading Assignment
Budget Estimating Approaches

- Capitalized Approach to Project Budgeting (CH 3)

- Historical Projects, Comparable Costs (Per UM) + Summary Level 1
- Parametric Uniformat Level 3 Systems + Summary Level 1

Case Study Project Budgeting (DTF Office)

- Team Formation & Project Familiarization
- Project Scope (CH 4)
- Program Area Requirements (CH 5)

Historical Comparative Budget Estimate

- Office Historical Costs
- Estimate Summary Assumptions

Project Workshop

- Determine Average Historical Costs
- Complete Budget Estimate Summary (Level 1)

Parametric Systems Budget Estimate
Establishing Configuration / Massing (CH 6)

- Sitting the Building/ Configuration
- Statistical Configuration Process
- Building Statistical Description Summary

Project Workshop
Determine & Document Configuration Quantities
Documenting Quality (CH 8)

- Quality Standards / Levels
- Sample Documentation by Element

Project Workshop

- Determine & Document Quality

Parametric Systems Budget Estimate Completion

- Uniformat Systems & Quantities

Project Workshop

- Determine & Document Systems Level 3 Costs
- Complete Project Summary Level 1

Assignments

- Project Assignments
- Reading Assignment, Chapter 7

Day Three

Discuss Project Assignment/ Turn-in
Concept Design Estimating Approaches

- Parametric Uniformat Level 4 & 5
- Quantity Take-off Cost Items
- Summary Level 1 Uniformat

Case Studies - Concept Estimating (Multi-Tower, NPS, PAAET)

- Team Formation
- Project Familiarization

- Project Scope (CH 4)
- Program Area Requirements (CH 5)

Project Workshop

Determine Configuration Quantities

Determining Quantities/ Costs for Structural Elements (CH 7)

- System 01 – Foundation
- System 02 – Substructure
- System 03 – Superstructure

Project Workshop

- Determine Quantities/ Costs, systems 01-03

Determining Quantities/Costs for Architectural Elements (CH 7)

- System 04 – Exterior Closure
- System 05 – Roofing
- System 06 – Interior Construction

Project Workshop

- Determine Quantities/ Costs, systems 04-06

Assignments

- Project Assignments
- Reading Assignment, Chapter 7

Day Four

Discuss Project Assignment/ Turn-in

Determining Quantities/Costs for Mechanical Elements (CH 7)

- System 07 – Conveying Systems
- System 081 – Plumbing
- System 082 – HVAC
- System 083 – Fire Protection
- System 084 - Special Mechanical Systems

Project Workshop

- Determine Quantities/ Costs, Systems 07-084

Determining Quantities/Costs for Electrical Elements (CH 7)

- System 091 – Primary Power & Distribution
- System 092 –Lighting & Secondary Distribution
- System 093 – Special Electrical Systems

Project Workshop

- Determine Quantities/ Costs, Systems 091-093

Assignments

- Project Assignments
- Reading Assignment, Chapters 10-11

Determining Quantities/ Costs for Equip./ Site Work Elements (CH 7)

- System 11 – Equipment
- System 121 – Site Preparation

- System 122 – Site Improvements
- System 123 – Site Utilities
- System 124 – Off-site Work

Project Workshop

- Determine Quantities/ Costs, Systems 11-12

Assignments

- Project Assignments
- Reading Assignment, Chapters 10, 11

Day Five

Discuss Project Assignment/ Turn-in

Project Management Plan (CH 10)

- Methods of Accomplishment
- Scheduling
- Uniformat Elemental Specifications

Budget Development Remaining Items (CH 11)

- General Conditions, OH&P, System 10
- Contingencies, Types & Use
- Escalation
- Design & Management Costs
- Management Costs during Construction
- Real Estate Costs
- Reservations

Project Workshop

- Determine Quantities/ Costs, Remaining Items

Closing the Loop – Recycling Cost Data (CH 12)

- Controlling Design Work
- Estimates at SD, DD, CD, Bids, Change Orders
- Historical Data

Life Cycle Costing (LCC)

- Methodology and techniques of life cycle costing
- LCC case studies (building systems, layout alternatives)
- Computer template for analyzing the life cycle costs of alternatives

Value Engineering

- Assuring best value for dollars spent
- Value methodology process & tools

Open Forum

- Questions & Answers
- Course Evaluation
- Certificates upon Successful Course Completion
- Next Steps

Day Six and Seven (WEEKEND)

Day Eight

1. INTRODUCTION
   - Course Objectives
2. VALUE ENGINEERING BRIEFING
   - Definition of Value Analysis/ Engineering
   - Results of VA/ VE Programs
   - History of Value Analysis/ Engineering
   - Reasons for Unnecessary Cost
   - All Cost is for Function
   - Value Methodology
   - Case Studies
3. INFORMATION PHASE
   - Project Selection, VE Objectives, VE Team Selection
   - Information Requirements for VE
   - Workshop Logistics
   - Workshop Information Phase
4. PROJECT WORKSHOP – INFORMATION PHASE
   - Organize Into Project Teams (4-6 People Each)
   - Select Team Leader & Recorder
   - Project Overview, Design Documents, Cost Estimate
   - VE Objectives

Day Nine

5. FUNCTION ANALYSIS PHASE
   - Function Models:
   - Cost, Quality, Risk, LEED (Sustainability)
   - Function Analysis Process
   - Function, Cost, Worth Worksheet
   - FAST Diagramming
   - Level of Abstraction
   - Development of Worth
   - Function, Cost, Worth Worksheet
   - FAST Diagramming
6. PROJECT WORKSHOP - FUNCTION ANALYSIS PHASE
   - Function Cost Model
   - Quality, Risk and Other Function Models

Day Ten

7. CREATIVE PHASE
   - In-Depth Brainstorming
   - Delphi Technique
   - Force Field Analysis
   - Other Creativity Techniques
8. PROJECT WORKSHOP - CREATIVE PHASE
   - Idea Generation for Basic Function(s)
   - Force Field Analysis
   - Other Creativity Techniques
9. EVALUATION PHASE
   - Idea Generation - Advantages/Disadvantages
   - Cost Estimating
   - Matrix Evaluation Techniques
   - Sample Projects
   - Class Exercise

Day Eleven

10. PROJECT WORKSHOP - EVALUATION PHASE
    - Idea Comparison
    - Idea Ranking
    - Initial Criteria Evaluation
    - Cost Estimating
    - Initial Matrix Evaluation
11. SPECIAL TOPIC: “VE IN DESIGN BUILD”
12. DEVELOPMENT PHASE
    - Life Cycle Costing Techniques
    - Manual Method Using Short Format
      - Annualized & Present Worth Methods
      - Inflation & Escalation
    - Computer Spreadsheet Approach to LCC
    - Exercise – Life Cycle Cost Analysis
13. PROJECT WORKSHOP - DEVELOPMENT PHASE
    - Life Cycle Cost of Alternates
    - Evaluation Matrix
    - Life Cycle Cost of Alternates
    - Weighted Evaluation
    - Proposal Sketches, Narratives, etc.

Day Twelve

14. PRESENTATION PHASE
    - Salesmanship, Overcoming Resistance to Change

- Oral Presentation
- Written Proposal
- Sample Projects

15. PROJECT WORKSHOP - PRESENTATION PHASE
    - Individual Counseling Sessions - Optional
    - Complete Written Proposals
    - Prepare Oral Presentations
    - Instructor Review of Proposals
    - Team Oral Presentations
16. CERTIFICATES/ CLOSING REMARKS

Training Method

- Pre-assessment
- Live group instruction
- Use of real-world examples, case studies and exercises
- Interactive participation and discussion
- Power point presentation, LCD and flip chart
- Group activities and tests
- Each participant receives a 7” Tablet containing a copy of the presentation, slides and handouts
- Post-assessment

Program Support

This program is supported by interactive discussions, role-play, case studies and highlight the techniques available to the participants.

Schedule

The course agenda will be as follows:

- Technical Session 08.30-10.00 am
- Coffee Break 10.00-10.15 am
- Technical Session 10.15-12.15 noon
- Coffee Break 12.15-12.45 pm
- Technical Session 12.45-02.30 pm
- Course Ends 02.30 pm

Course Fees*

- **8,500 USD**
  **VAT is Excluded If Applicable*

المقدمة

تكلفة المشـــروع هو أهم عامل في تقريرها بأن تصـــبح حقيقة واقعة. يتم التعامل مع التكاليف في بداية المشروع من خلال إعداد "تقدير تكلفة الميزانية " ودمج البيانات ذات الصلة بالتكلفة والمهارة الإبداعية من مقدر تكاليف محنك مع خبرة سـابقة في مشـروع مماثل. هذا هو الأهم، وكذلك الأكثر صـعوبة، وهو إعداد تقدير تكاليف المشروع بدقة.

تؤدي الطلبات المتزايدة على المشـاريع الرأسـمالية إلى زيادة الضـغط على موارد التمويل المتاحة. في هذه الفترة من شـد الحزام والميزانيات المخفضـة، من الضـروري إيجاد طرق للقيام بالمزيد بموارد أقل. أثبتت الهندســة القيمية (VE) أنها أداة قيّمَة في زيادة رأس المال والبناء والتشــغيل والصــيانة لتحقيق الأهداف المطلوبة لتخفيض التكاليف، في كل من القطاعين العام والخاص. عادةً ما يؤدي اسـتخدام تقنيات الهندسـة القيمية إلى تحسينات في أداء المرافق، حتى في هذه التكاليف الأقل.

الأهداف

هذا البرنامج سـوف يوفر أسـاسـا لكثير من مجالات تقدير التكاليف التي قد يواجهها مهنيي التصـميم والبناء. وسـوف توفر أمثلة لتسـهيل التوصـل إلى ألفة مع أنواع مختلفة من التقديرات ومكوناتها. من خلال تطبيق البحث والدراسـة والعملية، ويمكن توسـيع المهارات بطريقة ملحوظه. وسـيتم أيضـا دراسـة وسـائل أخرى لمراقبة التكاليف، مثل الهندسة القيمية.

عند الانتهاء من هذا البرنامج التدريبي، سوف يتعلم المشاركون:

- التخفيف من المخاطر عن طريق اختيار أنسب نوع تصميم المشروع
- طرق اختيار أنسب أنظمة البناء
- الشروط والأحكام - أمثلة على الشروط التجارية
- تخفيض التكلفة الإجمالية للمشروع دون أي تغييرات في الوظائف والجودة
- تطوير وظائف بناء أفضل
- كيفية تحديد أوقات وأسعار عادلة ومعقولة
- هيكلة تعديلات الأسعار الاقتصادية
- تخطيط واستراتيجيات التفاوض
- تقنيات إدارة الهندسة القيمية

الحضور

يستهدف هذا البرنامج:

- المدراء التنفيذيين
- مدراء المالية
- مدراء الموارد البشرية
- مديري المشاريع والمهندسين
- المخططين
- مديري تكنولوجيا المعلومات
- المهندسين المعماريين
- مهندسو التصميم الإنشائي
- مهندسو البناء
- المهندسين الميكانيكيين
- المهندسين الكهربائيين
- مهندسو العمليات