Cost Engineering for Process Industry Capital Projects Training Course



Ref: #ACE7242

Course Introduction / Overview:

This comprehensive training course provides a deep dive into the critical discipline of cost engineering and capital project estimation, specifically tailored for the process industries. In sectors where capital expenditures are immense and project complexity is high, the ability to accurately estimate, control, and forecast costs is paramount to organizational success and profitability. This program, offered by BIG BEN Training Center, is meticulously designed to equip participants with the methodologies and best practices essential for managing the financial lifecycle of capital projects. Drawing upon established frameworks like AACE International's Total Cost Management, the course navigates from foundational principles to advanced analytical techniques. We will explore concepts detailed in seminal works such as the "Cost Estimator's Reference Manual" by Rodney D. Stewart, ensuring a robust theoretical and practical understanding. Participants will learn to develop reliable cost estimates, implement stringent cost control measures, and make informed economic decisions, thereby minimizing financial risks and maximizing project value from conception to completion. This course is the definitive guide for professionals seeking to master the art and science of cost engineering in a dynamic industrial landscape.

Target Audience / This training course is suitable for:

- Project Managers and Directors.
- Cost Engineers and Cost Estimators.
- Project Control Professionals.
- Quantity Surveyors.
- Process and Chemical Engineers.
- Financial Analysts and Planners involved in capital projects.
- Procurement and Contracts Managers.
- Engineering and Construction Managers.
- Capital Planning and Asset Managers.
- Operations Managers overseeing plant modifications and expansions.

Target Sectors and Industries:

- Oil and Gas (Upstream, Midstream, and Downstream).
- Petrochemicals and Chemicals Manufacturing.
- Pharmaceuticals and Biotechnology.
- Power Generation and Utilities.
- Mining, Minerals, and Metals Processing.
- Water and Wastewater Treatment Facilities.
- Pulp and Paper Manufacturing.
- Food and Beverage Processing.
- Governmental agencies overseeing public infrastructure and industrial projects.

Target Organizations Departments:

- Project Management Office (PMO).
- Engineering and Design.
- Finance and Accounting.
- Procurement and Supply Chain Management.
- Contracts and Commercial Departments.
- Capital Planning and Budgeting.
- Operations and Maintenance.
- Risk Management.
- Strategic Planning.

Course Offerings:

By the end of this course, the participants will have able to:

- Develop a comprehensive Cost Breakdown Structure (CBS) aligned with the Work Breakdown Structure (WBS).
- Apply various cost estimation techniques, from conceptual to definitive, with confidence.
- Analyze and calculate direct, indirect, fixed, and variable project costs.
- Incorporate risk and contingency planning into project cost estimates using probabilistic methods.
- Establish and manage a project budget and cash flow forecast effectively.
- Implement Earned Value Management (EVM) for integrated project performance measurement.
- Control project costs through effective change management and variance analysis.
- Evaluate the economic feasibility of capital projects using key financial metrics.
- Optimize project costs through value engineering and lifecycle cost analysis.
- Prepare and present comprehensive cost reports to stakeholders.

Course Methodology:

The training methodology at BIG BEN Training Center is designed to be highly interactive, engaging, and practical, ensuring that participants can immediately apply their learning in the workplace. This course moves beyond traditional lectures to create a dynamic learning environment. We utilize a blended approach that includes expert-led presentations on core cost engineering principles, in-depth analysis of real-world case studies from the process industries, and hands-on workshops where participants will develop cost estimates and control plans. Collaborative group exercises and problem-solving sessions encourage peer-to-peer learning and the exchange of diverse perspectives. Participants will engage in simulations that mirror the challenges of capital project costing, allowing them to practice decision-making in a risk-free setting. Continuous feedback is provided by the instructor, a seasoned industry expert, to guide learning and reinforce key concepts. The program fosters a participatory atmosphere, encouraging questions and discussions to address the specific challenges faced by attendees in their professional roles.

Course Agenda (Course Units):

Unit One: Fundamentals of Cost Engineering and Project Economics

- Introduction to Cost Engineering and Total Cost Management (TCM).
- The Project Lifecycle in Process Industries.
- Understanding the Work Breakdown Structure (WBS) and Cost Breakdown Structure (CBS).
- Key Economic Concepts for Capital Projects (e.g., Time Value of Money).
- Cost Terminology and Classifications (Direct, Indirect, Fixed, Variable).
- Introduction to Cost Estimating Classes (AACE Classification System).
- The Role of the Cost Engineer in the Project Team.

Unit Two: Cost Estimation Techniques and Methodologies

- Conceptual and Feasibility Cost Estimating (Order of Magnitude).
- Analogous and Parametric Estimating Techniques.
- Detailed Bottom-Up Estimating (Definitive Estimates).
- Factoring Methods and Equipment Factored Estimates.
- Understanding and Applying Location and Escalation Factors.
- Data Analysis and Sources for Cost Estimation.
- Software and Tools for Cost Estimation.

Unit Three: Capital Project Budgeting and Financial Analysis

- Developing the Project Cost Baseline and Budget.
- Contingency and Management Reserve Determination.
- Cash Flow Analysis and Forecasting.
- Capital Cost vs. Operating Cost (CAPEX vs. OPEX).
- Project Feasibility Studies and Economic Evaluation Metrics (NPV, IRR, Payback Period).
- Lifecycle Costing Principles and Application.
- Funding Allocation and Budget Authorization Processes.

Unit Four: Cost Control, Monitoring, and Forecasting

- The Principles of Project Cost Control.
- Earned Value Management (EVM) for Performance Measurement.
- Calculating and Interpreting Cost and Schedule Variances (CV, SV, CPI, SPI).
- Forecasting Techniques (Estimate at Completion - EAC).
- Change Management and Control Procedures.
- Productivity Analysis and its Impact on Cost.
- Developing and Presenting Project Cost Reports.

Unit Five: Advanced Topics in Strategic Cost Management

- Risk Analysis in Cost Estimating (e.g., Monte Carlo Simulation).
- Value Engineering Workshops and Methodology.
- Procurement and Contracting Strategies for Cost Optimization.
- Managing Supplier and Contractor Costs.
- Project Closeout, Auditing, and Historical Data Collection.
- Integrating Cost Management with Scheduling and Quality.
- Future Trends and Digitalization in Cost Engineering.

FAQ:

Qualifications required for registering to this course?

There are no requirements.

How long is each daily session, and what is the total number of training hours for the course?

This training course spans five days, with daily sessions ranging between 4 to 5 hours, including breaks and interactive activities, bringing the total duration to 20 - 25 training hours.

Something to think about:

In an era of rapid technological advancement and volatile markets, how can traditional cost engineering principles be adapted to effectively manage the uncertainties of innovative, first-of-a-kind process industry projects?

What unique qualities does this course offer compared to other courses?

This course distinguishes itself through its specialized focus on the unique challenges of capital projects within the process industries, such as oil and gas, petrochemicals, and pharmaceuticals. Unlike generic project management or cost estimation courses, every module, case study, and exercise is tailored to the complexities of this high-stakes environment, addressing factors like complex equipment, stringent safety regulations, and long project lifecycles. The curriculum provides a holistic perspective, seamlessly integrating cost engineering with project economics, risk analysis, and strategic procurement. It moves beyond teaching mere calculation techniques to foster a deep analytical mindset, enabling participants to understand the 'why' behind the numbers and make strategic financial decisions. The program emphasizes the practical application of globally recognized standards, such as those from AACE International, ensuring the skills learned are relevant and transferable. By focusing on developing a strategic cost management competency rather than just tool proficiency, this course equips professionals to not only control costs but to actively drive value and profitability throughout the entire project lifecycle.