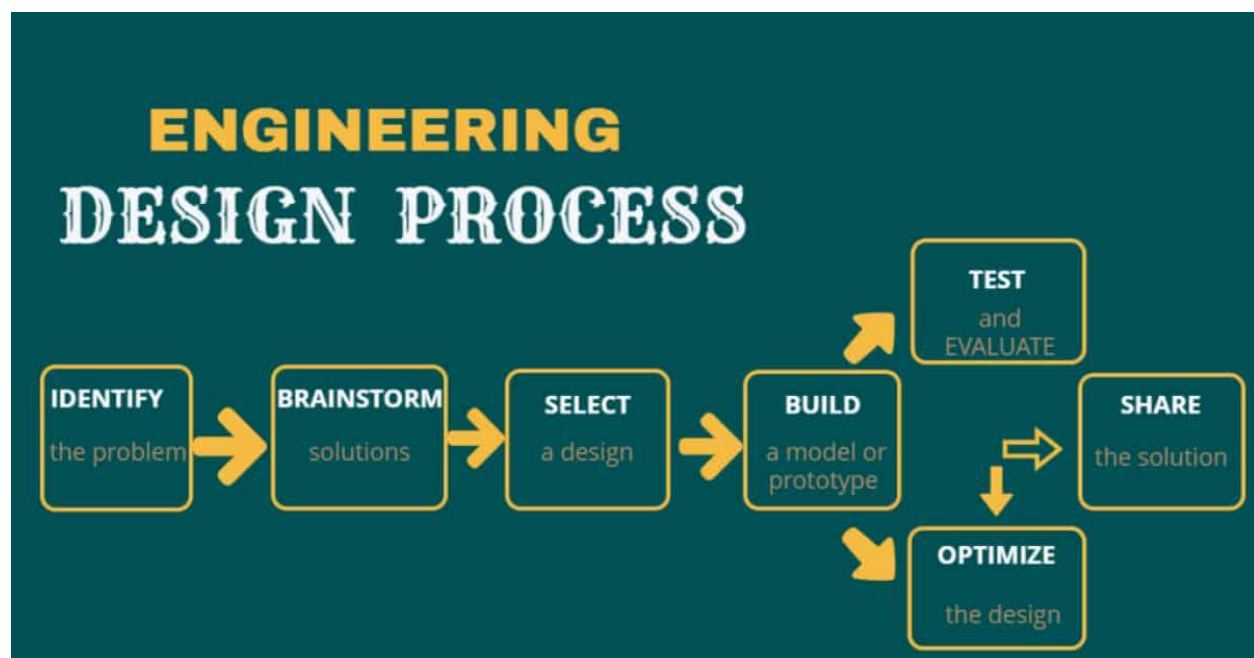




PE372: Process Design Essentials

Training Description:

Process design sits at the heart of engineering, manufacturing, energy, chemical processing, utilities, and many industrial operations. Whether designing a new facility, modifying an existing system, or troubleshooting performance issues, professionals must understand how processes are conceived, analyzed, optimized and translated into workable designs.

This training course provides a structured, practical introduction to process design fundamentals. Participants will learn how to move from concept to design by understanding process requirements, material and energy balances, equipment selection, safety considerations, control philosophy, and economic evaluation. The training course bridges theory with real-world application, ensuring that attendees gain usable skills rather than abstract knowledge.

Through examples, case discussions, and guided exercises, participants will develop the ability to interpret process requirements, create design bases, evaluate alternatives and communicate designs effectively across technical and non-technical stakeholders.

Training Objectives:

By the end of the training, participants will be able to:

- ✓ Understand the role and lifecycle of process design within industrial projects and operations
- ✓ Develop and interpret process design bases and specifications
- ✓ Perform and apply material and energy balances
- ✓ Understand core equipment selection principles and design considerations
- ✓ Recognize the integration of safety, operability and control in process design
- ✓ Evaluate design alternatives from technical and economic perspectives
- ✓ Identify common design challenges and practical solutions

Training Outcome:

Participants leave the program with a clear understanding of how processes are defined, analyzed, designed, and evaluated. More importantly, they gain a practical mindset that helps them approach design challenges systematically rather than reactively.

Training Designed for:

This training course is designed for professionals involved in design, operation, maintenance, optimization, or management of industrial processes, including; Process Engineers, Mechanical Engineers, Chemical Engineers, Plant Engineers, Operations & Production Engineers, Maintenance Engineers, Project Engineers, Technical Supervisors & Managers and Professionals transitioning into process-related roles.

No advanced design background is required, though basic engineering knowledge is beneficial.

Training Requirement:

"Hands on practical sessions, equipment and software will be applied during the course if required and as per the client's request."

Contents can be adapted to your specific wishes. It is therefore possible to focus on specific modules of the training course as per client's learning needs and objectives. Further, it should be forwarded to us a month prior to the course dates.

Training Program:

DAY ONE:

- ❖ **Foundations of Process Design**
 - The role of process design in industrial systems
 - Process design vs detailed engineering
 - Understanding process requirements and objectives
 - Design basis development
 - Process description and process flow diagrams (PFDs)
 - Introduction to key design documentation
 - Common design constraints and trade-offs
- ❖ **By the end of the day, participants understand how a design evolves from an idea into a structured technical definition.**

DAY TWO:

- ❖ **Material & Energy Balances**
 - Principles of mass conservation
 - Steady-state vs dynamic considerations
 - Energy balance fundamentals
 - Heat effects and thermodynamic considerations
 - Process streams and flow calculations
 - Practical balancing techniques
 - Identifying inconsistencies and errors
 - Application to typical industrial processes
- ❖ **Participants practice translating process descriptions into quantitative understanding.**

DAY THREE:

- ❖ **Equipment & System Design Considerations**
 - Equipment selection philosophy
 - Understanding process equipment roles
 - Design considerations for common equipment
 - Sizing concepts and key parameters
 - Pressure, temperature and flow considerations
 - Utility requirements
 - Integration of equipment into systems
 - Reliability and operability aspects
- ❖ **The focus remains on decision-making rather than detailed design calculations.**

DAY FOUR:

- ❖ **Safety, Control & Operability**
 - Process safety fundamentals
 - Hazards in process systems
 - Designing for safe operation

- Introduction to risk and hazard analysis concepts
- Control philosophy basics
- Process control objectives
- Designing for stability and flexibility
- Operability and maintainability considerations

❖ Participants learn how design decisions directly impact safety and plant performance.

DAY FIVE:

❖ Design Evaluation & Practical Applications

- Design alternatives and trade-off analysis
- Economic considerations in design
- Cost vs performance decisions
- Common design pitfalls
- Troubleshooting design issues
- Case studies and applied discussions
- Integrating technical, safety, and economic perspectives
- Best practices in process design

❖ The training concludes with a holistic view of process design as both a technical and strategic discipline.

❖ Course Conclusion

❖ POST-ASSESSMENT and EVALUATION

Training Methodology:

This interactive training course includes the following training methodologies as a percentage of the total tuition hours:

- 30% Lectures, Concepts, Role Play
- 70% Workshops & Work Presentations, Techniques, Based on Case Studies & Practical Exercises, Gamification, Software & General Discussions
- Pre and Post Test

Training Certificate(s):

CMCT Internationally recognized certificate(s) will be issued to each participant who completed the course.

Training Fees:

TBA as per the course location - This rate includes participant's manual, hand-outs, buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

Note: The 5% VAT (Value Added Tax), will be effective starting 01st of January 2018 as per the new regulation from the UAE Government. The VAT applies for all quotation both for local and abroad.

Training Timings:

Daily Timings:

07:45 - 08:00	Morning Coffee / Tea
08:00 - 10:00	First Session
10:00 - 10:20	Recess (Coffee/Tea/Snacks)
10:20 - 12:20	Second Session
12:20 - 13:00	Recess (Prayer Break & Lunch)
13:00 - 14:00	Last Session

For training registrations or in-house enquiries, please contact:

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