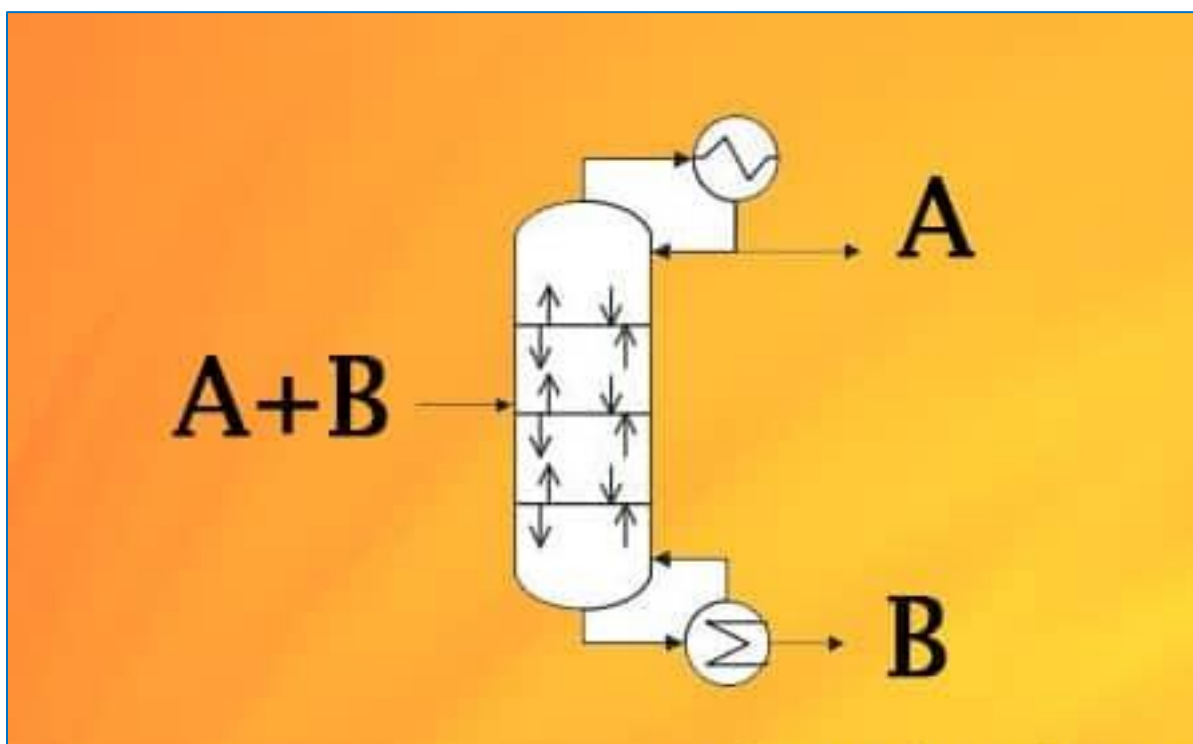




PE318: Process Unit Operations & Optimization

Training Description:

This intensive five-day training course provides in-depth knowledge of major refinery and petrochemical process unit operations, their integration, and methods for performance optimization. It covers essential operating principles, process flow schemes, troubleshooting techniques, and advanced optimization strategies. Participants will learn how to identify operational inefficiencies, interpret process data, and apply optimization tools to improve throughput, yield, energy efficiency, and overall plant reliability. The training course blends theoretical concepts with practical case studies to ensure direct applicability in the workplace.

Training Objectives:

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

- ✓ Understand the operating principles and functions of key process units in refineries and petrochemical plants
- ✓ Interpret process flow diagrams (PFDs) and piping and instrumentation diagrams (P&IDs) for operational insights
- ✓ Identify performance bottlenecks and apply troubleshooting techniques
- ✓ Utilize process data to perform optimization for efficiency, yield, and cost reduction
- ✓ Implement best practices in monitoring, controlling, and optimizing unit operations
- ✓ Enhance collaboration between operations, maintenance, and process engineering teams

Training Designed for:

This training course is intended for Process, operations, and production engineers, Refinery and petrochemical plant supervisors and managers, Process optimization and performance engineers, Control room operators seeking deeper technical understanding, Maintenance engineers involved in operational support, Technical service engineers and process consultants.

Training Requirement:

“Hand’s 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:

❖ Fundamentals of Process Unit Operations

- Overview of refinery and petrochemical process units and their integration
- Types of process units: separation, conversion, treating, blending
- Process flow diagrams (PFDs) and P&IDs: reading and interpretation
- Key process parameters: temperature, pressure, flow, level, composition
- Understanding heat and mass balance in process units
- **Case Study:** Mass balance calculation for a crude distillation unit (CDU)

DAY TWO:

❖ Key Refinery and Petrochemical Units

- Crude Distillation Unit (CDU) operation and optimization
- Vacuum Distillation Unit (VDU) principles and performance control
- Catalytic Reforming and Hydrocracking operations
- Fluid Catalytic Cracking Unit (FCCU) operation and performance indicators
- Role of treating units (hydrotreaters, amine, sulfur recovery) in product quality
- **Interactive Exercise:** Identifying bottlenecks in a CDU case study

DAY THREE:

❖ Performance Monitoring & Troubleshooting

- Process monitoring tools and performance KPIs
- Common operational problems and root causes in major units
- Fouling, corrosion, and catalyst deactivation issues
- Troubleshooting techniques and systematic approach
- Data collection and process historian systems
- **Workshop:** Diagnosing FCCU performance problems using operational data

DAY FOUR:

❖ Process Optimization Strategies

- Concept of process optimization: economic vs operational objectives
- Energy optimization: heat integration, steam management
- Yield optimization: maximizing high-value products
- Constraint analysis and debottlenecking
- Advanced process control (APC) and optimization tools
- **Case Study:** Optimization of a hydrotreating unit for improved diesel yield

DAY FIVE:

❖ Integration, Best Practices, and Future Trends

- Integration of unit operations for overall refinery optimization
- Best practices for operational excellence and reliability
- Impact of digitalization and Industry 4.0 on process optimization
- Use of simulation software for process improvement
- Emerging trends: energy transition, hydrogen economy, and sustainable refining
- **Exercise:** Developing an optimization action plan for a hypothetical refinery

❖ 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.

Group and Corporate Discounts:

- We offer group and corporate discounts on many courses. These discounts are available for clients who want to maximize their return on investment.

Individual Discounts:

- We offer individual discounts on many courses for people who are self-sponsored and make their payment in full and upfront at the time of registration

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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