



# PE060: Process Equipment Design, Applications, Maintenance & Troubleshooting: *Rules of Thumb for Process Engineers*



## Training Description:

This intensive course is designed to provide chemical and process engineers with a lot of common-sense techniques, shortcuts and calculations to quickly and accurately solve day-to-day design, operations and equipment problems. The practical tips, handy formulas, correlations, curves, charts, tables, and shortcut methods presented in this course will save engineers valuable time and effort.

This course covers rules of thumb applicable to fluid flow, heat exchangers, fractionators, absorbers, pumps, drivers, separators/accumulators, boilers & cooling towers.

## Training Objectives:

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

- ✓ Apply the rules of thumb for chemical and process engineering including fluid flow, gas flow, velocity head, piping pressure, compressible flow, sonic velocity, metering and valves
- ✓ Employ the rules of thumb for heat exchangers and command the TEMA standards and selection guides
- ✓ Perform rules of thumb for fractionators & absorbers and explain their design, control schemes & optimization techniques
- ✓ Use the rules of thumb for pumps including affinity laws, horsepower, efficiency minimum flow & suction system and recognize the various construction materials used in pumps
- ✓ Implement the rules of thumb for drivers and determine their ranges of application, efficiency & service factors
- ✓ Apply rules of thumb for separators/accumulators such as liquid & vapour residence time, calculation methods, pressure drop, vessel thickness, gas scrubbers & reflux drums and employ the general vessel design tips
- ✓ Carry out the rules of thumb for boilers and acquire knowledge on thermal efficiency, stack gas enthalpy & quantity, steam drum stability, blowdown control, caustic embrittlement, etc.
- ✓ Perform rules of thumb for cooling towers and analyze its system balances, temperature data & transfer units

## Training Designed for:

This course is intended for all process, maintenance, production, operations, plant and Field Managers, Superintendents, Supervisors, Engineers, Technicians and Operators. This is also applicable to plant and shift foremen as well as to other technical staff.

## Training Program:

### DAY ONE:

- ❖ PRE-TEST
- ❖ Introduction
- ❖ Equipment Design
  - Fluid Flow
  - Heat Exchangers
  - Fractionators
  - Absorbers



- Pumps
- Compressors
- Drivers
- Separators/Accumulators
- Boilers
- Cooling Towers

#### DAY TWO:

##### ❖ Process Design

- Refrigeration
- Gasification
- Gas Treating
- Vacuum Systems
- Pneumatic Conveying
- Blending

#### DAY THREE:

##### ❖ Plant Design

- Process Evaluation
- Reliability
- Metallurgy
- Safety
- Controls

#### DAY FOUR:

##### ❖ Operations

- Troubleshooting
- Startup
- Energy Conservation

#### DAY FIVE:

##### ❖ Operations (continuation)

- Shortcut Methods for Decisions
- Process Modeling Using Linear Programming
- Properties
- Approximate Conversion Factors

##### ❖ Course Conclusion

##### ❖ POST-TEST and EVALUATION

### 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”.

Please note that the above topics can be amended as per client’s learning needs and objectives. Further, it should be forwarded to us a month prior to the course dates.



## 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, Software & General Discussions
- Pre and Post Test

## Training Certificate(s):

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

## Training Fees:

**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 - 13:30	Recess (Prayer Break & Lunch)
13:30 - 15:00	Last Session

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

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Training & Career Development Department