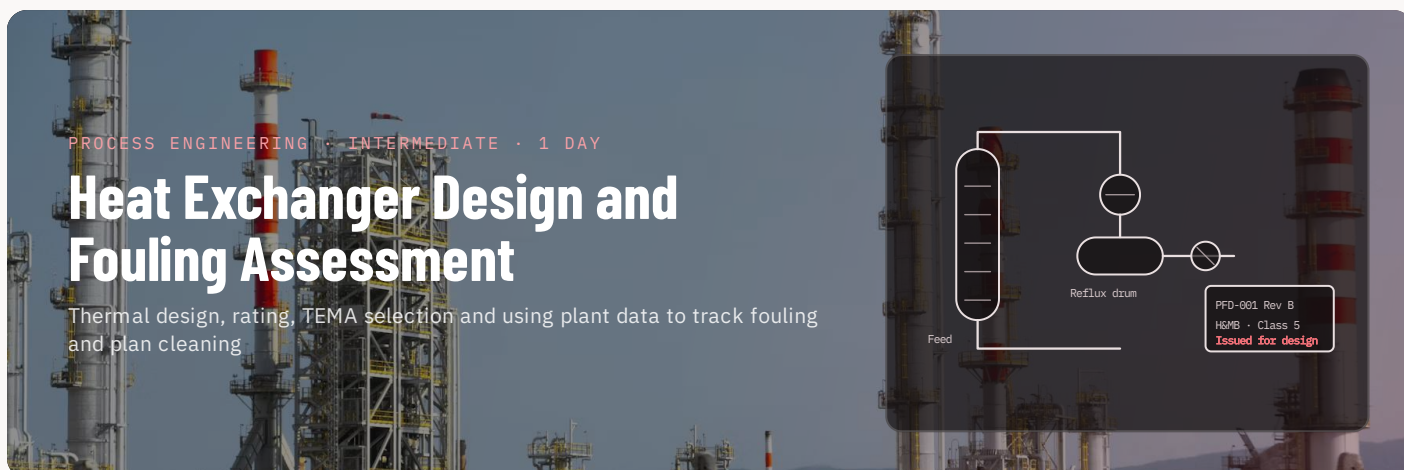




PROCESS ENGINEERING · INTERMEDIATE · 1 DAY

Heat Exchanger Design and Fouling Assessment

Thermal design, rating, TEMA selection and using plant data to track fouling and plan cleaning

DURATION
1 day

LEVEL
Intermediate

FORMAT
On-site classroom · virtual instructor-led

LANGUAGE
English

MAX. PARTICIPANTS
16

6

exchanger rating cases

1

fouling-monitoring method with historian data

TEMA

types and their selection

Overview

Exchangers are specified once and then blamed for the next twenty years. This course covers enough thermal design to write a good data sheet and check a vendor's rating — LMTD, effectiveness, film coefficients, pressure drop, vibration — then turns to the operating question: how to calculate the fouling resistance from historian data, when to clean, and what the process can do to slow it down.

Learning outcomes

- Select the exchanger type and TEMA configuration for a given duty and fouling service
- Perform a rating calculation and check tube-side and shell-side pressure drop and velocities
- Review a vendor thermal design against API 660 / 661 and the process data sheet
- Calculate the actual overall coefficient and fouling resistance from plant data
- Set up a fouling-monitoring trend and a cleaning-interval economics calculation
- Diagnose common problems: temperature cross, vibration, maldistribution, tube leaks

Who should attend

Process and mechanical engineers specifying, rating or troubleshooting shell-and-tube, air-cooled and plate exchangers; energy and reliability engineers

Course outline

MORNING

Heat-transfer basics: LMTD, F factor, NTU-effectiveness · film coefficients and controlling resistance · shell-and-tube geometry and TEMA types · air-cooled exchangers and plate exchangers · process data sheet content · rating exercise and vendor design review (API 660 / 661)

AFTERNOON

Fouling mechanisms: crude preheat, cooling water, crystallisation, coking · calculating U and R_f from historian data · fouling-monitoring trends and cleaning-interval economics · mitigation: velocity, temperature, chemistry, design features · troubleshooting cases: cross, vibration, maldistribution, leaks · workshop on participants' exchangers

Standards referenced

TEMA API 660 API 661 ASME BPVC Section VIII
HTRI / HTFS design practice

Tools & exercises

Rating exercises on the client's thermal design software; fouling trends from historian data

What's included

- ✓ Course manual and slide pack
- ✓ Software access for the course
- ✓ Post-course Q&A with the instructor
- ✓ Exercise and case-study pack
- ✓ Competency quiz and certificate
- ✓ Templates used in the exercises

PREREQUISITES

Chemical or mechanical engineering degree

CERTIFICATION

Certificate of completion

INSTRUCTORS

Practising engineers — TÜV HAZOP Leader, CCPSC and IEC 61511 Functional Safety certified — with 200+ years of cumulative plant experience.

Book this course or build a custom curriculum

On-site at your plant or virtual · in-house groups · competency assessment included

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