



**Chemical, Mechanical Engineering**



**SCANDINAVIAN ACADEMY**  
Training and Development

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# Course: Process Engineering Essentials

Code	City	hotel	Start	End	price	Hours
567	Frankfurt (Germany)	Hotel Meeting	2024-08-05	2024-08-09	5950 €	25

## Why Choose this Course?

This course is well-matched to those professionals and practitioners who require familiarity not only with chemical engineering principles, but also with many of the other engineering disciplines including mechanical, electrical and instrumentation. This is essential since Process Engineering is at the heart of much of the chemical, oil, gas, and petrochemical industries. Process Engineers are interested in the transportation and transformation of solids, liquids and gases. In the oil and gas sector, of specific importance are separation processes including distillation, heat transfer, hydraulics and fluid flow, reaction engineering, but also process control and economics. This seminar focuses on the central areas of process engineering and guides the delegates in developing both fundamental and practical understandings of key issues.

**This course will feature:**

- A practical introduction to the fundamentals of process engineering
- Key areas applicable to major process industries especially oil, gas & petrochemical
- Process Engineering influence on Safety and Risk
- Optimisation of process design and control.
- Costs and project costing

## What are the Goals?

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

- Understand fundamental principles used in processes and facilities.
- Apply practical understanding of hydraulics and fluid flow.
- Apply learning from historical safety incidents.
- Perform relevant calculations & analyses to assist in operation, sizing, & troubleshooting.
- Develop perspective & focus from a company viewpoint of interaction of different engineering disciplines.

## Who is this Course for?

**This course is suitable to a wide range of professionals but will greatly benefit Technical and non-technical personnel in the chemical, petrochemical, oil and process industries with a need to understand and discuss fundamental process engineering**



#### issues:

- Plant/Operations Personnel and Managers
- Petroleum Engineers
- Production Engineers
- Trainee Process Engineers
- R&D Chemists, Plant Chemists
- Economists and Business Managers

### How will this be Presented?

This course will utilise a variety of proven adult learning techniques to ensure maximum understanding, comprehension and retention of the information presented. This includes formal lectures and discussions, active participation through the use of problem-solving exercises, videos, group discussions, analysis of real-life case studies, and industry best practices. Case studies and examples will cover a range of levels, making the course also suitable non-technical staff.

### The Course Content

#### Day One

##### Introduction and Fundamentals of Process Engineering

- Mass and energy balances
- Reactor types
- Process & Engineering Diagrams
- Flammability
- Electrical area classification
- Risk Management and Hazard Studies

#### Day Two

##### Hydraulics and Fluid flow

- Pressure and head & Bernoulli's theorem
- Flow of liquids, Reynolds number and pressure drop in pipes
- Two-phase and multi-phase flow
- Enthalpy and thermodynamics
- Principle of process relief devices and process design of relief systems
- Mechanical Equipment – Pumps, Compressors & Mixers



### **Day Three**

#### **Heat Transfer and Reaction Engineering**

- Heat Transfer Mechanisms
- Heat transfer coefficients and calculation
- Heat exchangers, type and sizing
- Catalysis and Reaction Engineering
- Chemical reactions & kinetics
- Green Chemistry & Engineering and Sustainability

### **Day Four**

#### **Distillation Processes and Equipment**

- Phase behavior and vapour/liquid equilibria
- Gas/Liquid separation
- Distillation equipment - Columns and vessels
- Troubleshooting of process equipment
- Overview of Other Separation Processes
- Effluent treatment [in refinery and petrochemical] industries

### **Day Five**

#### **Process Control and Economics**

- Classification of control systems
- Measured variables
- Simple feedback control
- Preliminary economic analysis
- Fixed and variable costs, break even analysis

#### **Estimating the cost of process equipment and plants**



**The Scandinavian Academy employs modern methods in training and skills development, enhancing the efficiency of human resource development. We follow these practices:**

- **Theoretical Lectures:**
  - We deliver knowledge through advanced presentations such as PowerPoint and visual materials, including videos and short films.
- **Scientific Assessment:**
  - We evaluate trainees skills before and after the course to ensure their progress.
- **Brainstorming and Interaction:**
  - We encourage active participation through brainstorming sessions and applying concepts through role play.
- **Practical Cases:**
  - We provide practical cases that align with the scientific content and the participants specific needs.
- **Examinations:**
  - Tests are conducted at the end of the program to assess knowledge retention.
- **Educational Materials:**
  - We provide both printed and digital scientific and practical materials to participants.
- **Attendance and Final Result Reports:**
  - We prepare detailed attendance reports for participants and offer a comprehensive program evaluation.
- **Professionals and Experts:**
  - The programs scientific content is prepared by the best professors and trainers in various fields.
- **Professional Completion Certificate:**
  - Participants receive a professional completion certificate issued by the Scandinavian Academy for Training and Development in the Kingdom of Sweden, with the option for international authentication.
- **Program Timings:**
  - Training programs are held from 10:00 AM to 2:00 PM and include buffet sessions for light meals during lectures.