

**NARGAN**  
ACADEMY



# Compressor Training Course

**CONTACT US:**



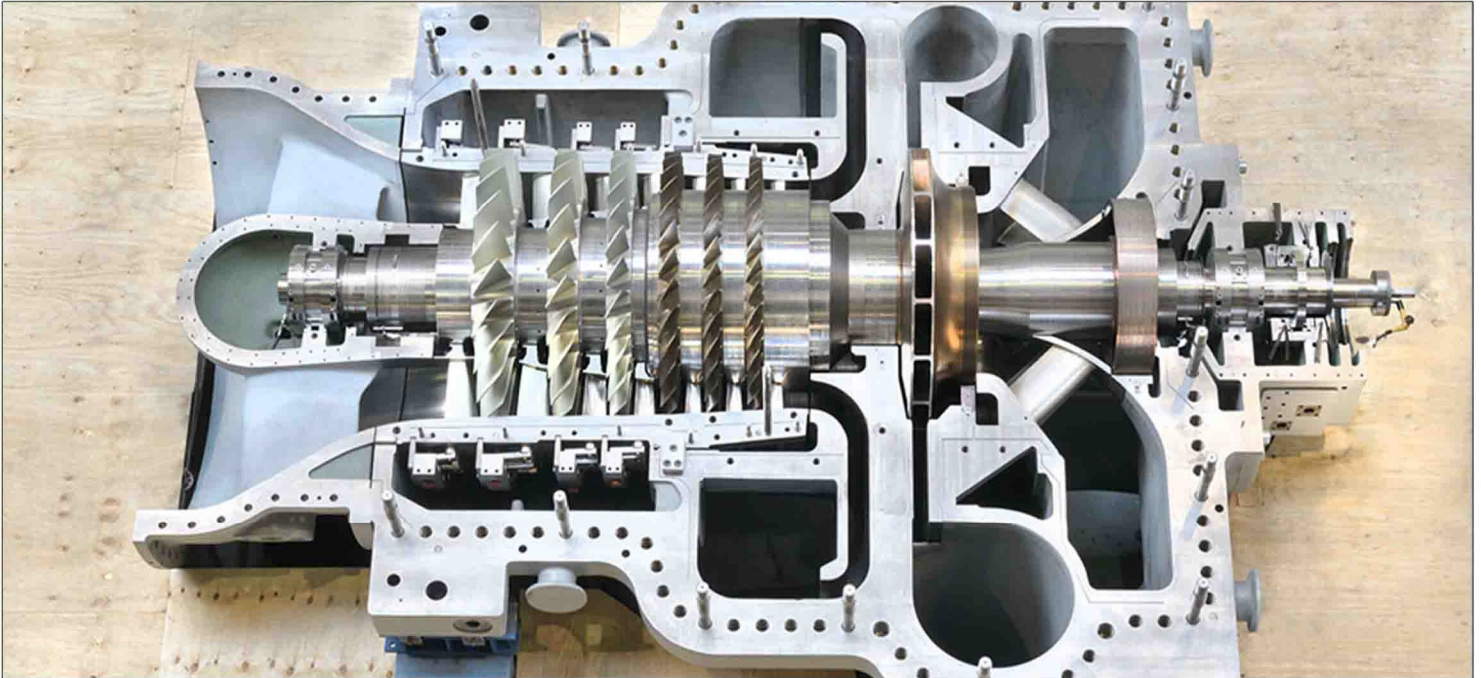
Nargan Academy



09336381443



[info@academy.nargan.com](mailto:info@academy.nargan.com)



### **WHY CHOOSE THIS TRAINING COURSE?**

Since the compressors are the most important, the most complicated and the most usable rotary equipment, improving the proficiency level in this field can have a remarkable attractiveness for participants. Additionally, the most of the plants in oil and gas industry require a compressed air and gas in order to their main functions get done and this issue has added to the importance of this course.

### **COURSE SYLLABUS (28 HOURS)**

- Compressor Applications
- Compressor Classification and Selection
- Theory of Compressor
- Reciprocating Compressor (Types, Main Characteristics, Components, Limitations, Capacity Control Methods)
- Screw Compressor (Types, Main Characteristics, Components, Capacity Control Methods)
- Centrifugal Compressor (Components, Limitations, Capacity Control Methods, Performance Curve)

### **WHO IS THIS TRAINING COURSE FOR?**

This course has been designed for supplying the engineers and experts of various disciplines' requirements working in vendor and EPC companies in oil and gas industry.

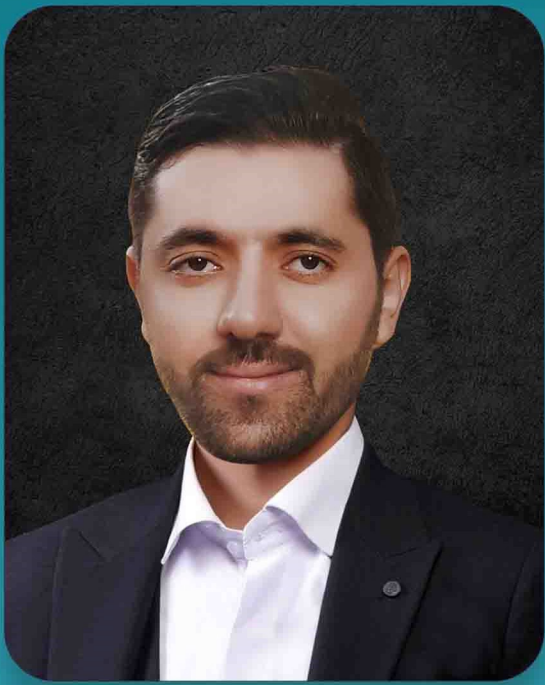
During this course, beside the professional topics, basic ones will be presented too, hence, it doesn't need to have a high knowledge of this field.

The only thing is needed to participate in this course is being familiar with Thermodynamics and fluids principles.

### **WHAT ARE THE GOALS?**

The main goal of this course is to improve the technical knowledge of the participants regarding optimal compressor type selection principles, operation and application of different types of compressors such as screw compressors, centrifugal compressors, etc., as well as their classification. Also, in this course, topics related to flooding, lubrication, vibrations of rotary equipment are also discussed.





## Muhammad Taghi Dalakeh

- M.Sc in Mechanical Engineering from University of Tehran
- Mechanical Department Engineer at Nargan Company with more than 6 years experience in the field of Rotary equipment.

Experienced in

- Programming and development of "CenTAr" software for design (Conceptual and detailed) of centrifugal compressor
- Program of pseudo 3-dimensional software for simulation of fluid flow and heat transfer of compressors (Funder of the project: MAPNA).
- Conceptual design of several multi-stage and integrally geared centrifugal compressors in oil, gas, and steel industries.
- Dynamic simulation of gas turbine with auxiliary system (oil, fuel, generator in addition to gas turbine)
- Root Cause Analysis of failure of integrally-gear compressors in steel industries.
- Revamp of Multi stage (up to 17 stage) Steam Turbines of Shazand Petrochemical.
- Experienced in revamp of compressors.
- Engineering of Reciprocating and Rotary lobe compressors in Dehloran Petrochemical
- Engineering of Turbo-compressors (steam turbines + centrifugal compressors) in Dehloran Petrochemical and Esfahan Refinery.

# THE COURSE CONTENT

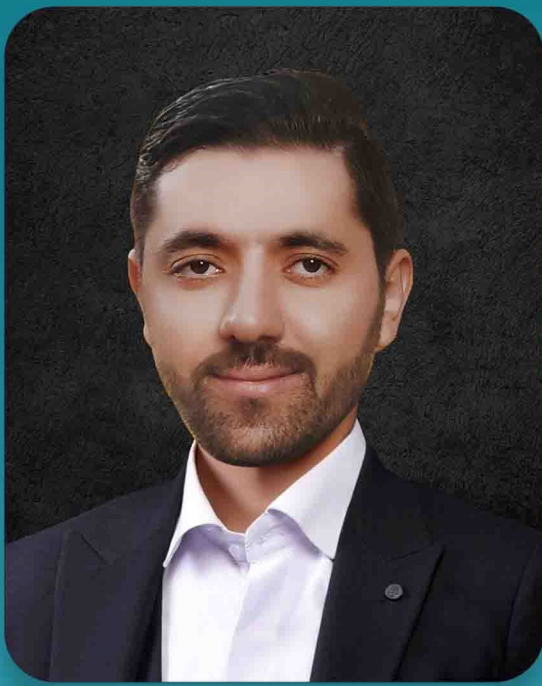
## Chapter 1

- Compressor Applications: Pneumatic, Compressed Air, Gas Pipeline, Gas Injection
- Fan, Blower, and compressors characteristics
- Roots Blower
- Compressor Function
- Compressor Types: Positive displacement, Dynamic.
- Introduction to Reciprocating Compressor: Double Acting Compressor, Single-Acting Compressor
- Introduction to Screw Compressors
- Introduction to Sliding-Vane Compressors
- Introduction to Dynamic Compressors (Axial- Centrifugal, Integrally-gear compressor)
- General Performance Curves
- Compressor Classification and Selection Procedure

## Chapter 2

Theory of compressor:

- Gas Laws for Ideal Gases
- Gas Laws for Real Gases
- Generalized Compressibility Chart
- Standard Flowrate Definition
- Thermodynamic Systems
- Polytropic process
- Isentropic process
- Using InterCooler for compression
- Shaft Power vs Gas Power
- Compressor power calculation
- Reciprocating Compressor Details:
  - Reciprocating Compressors Application
  - Reciprocating Compressors Classification
  - Single Stage and Multistage Compressors
  - Compressor Cylinder Arrangement
  - Reciprocating Compressor Parts



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## THE COURSE CONTENT

### Chapter 3

- Cross Head Type Reciprocating Compressor
- Pressure Packing
- Performance of Reciprocating Compressors
- Operation Limits of Reciprocating Compressor
- Capacity Control in Reciprocating Compressors

### Chapter 4

- Screw Compressor
- Operating principles
- Components
- Oil free screw compressor
- Oil lubricated screw compressor
- Multistage screw compressors
- Main parts of Screw compressor-Rotor
- Main parts of Screw compressor-Casing
- Capacity Control Methods
- Bearing
- Vibration Limit

### Chapter 5

- Centrifugal Compressor
- Integrally Geared Compressor
- Non-Integrally Geared Compressor:
  - Centrifugal Compressors Types
- Barrel type vs Horizontally Split type
- Basic Elements
- Working Principle
- Compression Cycle
- Choke Line, Surge Line
- Fan Laws
- Design Limit of centrifugal compressor
- Centrifugal compressors performance curves

### Chapter 6

- Capacity Control Methods
- Inlet Guide Vanes (IGV)
- Adjustable Diffuser Vanes, ADV
- Surge control
- Anti-Surge System
- Forces on Impeller(s) & Bearings
- Thrust balancing
- Compressor Arrangement