

EXPRESS ENGINEERING SOLUTIONS



COMBO ROTARY EQUIPMENT DESIGN



**CENTRIFUGAL PUMPS
IN OIL & GAS INDUSTRY**

&

CENTRIFUGAL COMPRESSOR

No one can de-code the code like us...!



+91 9921229232



training@express-engg.com

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CLICK THE TOPICS FOR DETAILS



Course Content



About Us



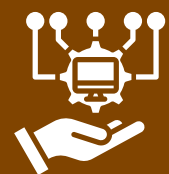
Know The Trainer



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Course?



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Course Content

1

Rotary Equipment Design

(34.5 hrs)

Lecture No	Topics CLICK ON TOPICS FOR DETAILS	Hours (hrs)
1	Introduction	2
2	Design & Engineering Stages	0.7
3	Design Codes & Standards	0.8
4	Definition Of Key Terms	1
5	Pump Performance & Performance Curve	1.6
6	Pump Configurations As Per API 610	3
7	Basic Design Of Components	0.2
8	Basic Design Of Pressure Casing	1.6
9	Basic Design Of Rotor	1.5
10	Bearings Design	0.6
11	Driver Sizing	0.9
12	Coupling Design	0.9
13	Coupling Guard	0.2
14	Mechanical Seal	4.7
15	Baseplate Design	0.4
16	Material Of Construction	1

Course Content

1

Rotary Equipment Design

Lecture No	Topics CLICK ON TOPICS FOR DETAILS	Hours (hrs)
17	Inspection Requirement	0.7
18	Testing Requirement	2
19	Equipment Selection Criteria	0.5
20	Documents Requirement at Site	0.5
21	Equipment Datasheet Preparation	2
22	Technical Specification Preparation	1
23	Material Requisition Preparation	1
24	Vendor Data & Document Requirement	1
25	Design Cases for various Flow & Head Combinations	1.5
26	Technical Bid Evaluation	1.2
27	Purchase Order Preparation	0.5
28	Communication & Role of Rotary Equipment Engineer	1.5

Rotary Equipment Design

1 Introduction (2 hrs)

- What is Engineering & Why It Is Required
- Design & Engineering Stages
- Design Codes and Standards
- Definition Of Key Terms
- Pump Performance Curve
- Pump Configurations As Per API 610
- Basic Design Of Components
- Commonly Used Seal Flushing Plans
- Accessories
- Material Of Construction
- Inspection & Performance Test
- Salient Features of Engineering
- Equipment Selection Criteria
- Design Cases
- Communication with Inter-discipline
- Communication With Bidders/Vendors/Client
- Role of Rotary Equipment Engineer

2 Design & Engineering Stages (0.7 hrs)

- Concept Select
- Front End Engineering And Design
- Basic Design Engineering Package
- Detailed Design And Engineering

3 Design Codes & Standards (0.8 hrs)

- For API Pumps
- For Non-API Pumps
- For Accessories - Driver
- For Accessories - Mechanical Seal
- For Accessories - Coupling
- For Accessories - Machine Monitoring System
- For Dynamic Balancing of Rotating Components
- For Flanges



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Rotary Equipment Design

4 Definition Of Key Terms (1 hrs)

- Definitions As Per API 610

5 Pump Performance & Performance Curve (1.6 hrs)

- What is Pump Performance
- Suction Specific Speed Calculation
- NPSHA Calculation
- How To Plot & Read Pump Performance Curve
- Significance of Performance Curve

6 Pump Configurations As Per API 610 (3 hrs)

- Overhung Type (OH)
- Between Bearing Type (BB)
- Vertically Suspended/Submerged (VS)

7 Basic Design Of Components (0.2 hrs)

- Pressure Casing/ Rotor/ Bearings/ Mechanical Seal

8 Basic Design Of Pressure Casing (1.6 hrs)

- Pressure Casing Design Criteria
- Maximum Allowable Working Pressure
- Casing Nozzles - Size & Rating
- Pressure Casing - Allowable Nozzle Loads
- Co-ordinate System for Nozzle Forces & Moments



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Rotary Equipment Design

9

Basic Design Of Rotor

(1.5 hrs)

- Rotor Design Criteria
- Dynamic Balancing & Balancing Grades of Rotor
- Critical Speed
- Vibrations

10

Bearings Design

(0.6 hrs)

- Bearing Types
- Bearing Selection Criteria

11

Driver Sizing

(0.9 hrs)

- Driver Rating Selection
- Fixed Speed Drive
- Why Variable Speed Drive

12

Coupling Design

(0.9 hrs)

- Coupling Type
- Coupling Design Criteria
- Coupling Selection

13

Coupling Guard

(0.2 hrs)

- Coupling Guard

14

Mechanical Seal

(4.7 hrs)

- Mechanical Seal Types
- Various Seal Plans & Associated Numbers
- Seal plans for Single Seal
- Seal Plans for Double Seal
- Mechanical Seal Designation Code As Per API 682



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Rotary Equipment Design

15 Baseplate Design (0.4 hrs)

- Baseplate Design Criteria
- Baseplate API Numbers

16 Material Of Construction (1 hrs)

- Material selection Criteria for Pump Components

17 Inspection Requirement (0.7 hrs)

- Radiography Test
- Magnetic Particle Test
- Liquid Penetrant Test
- Ultrasonic Test
- PMI TEST
- Material Test Certificates - Type
- Material Test Certificates Criteria

18 Testing Requirement (2 hrs)

- Hydrostatic Test
- Performance Test
- NPSH Test
- Mechanical Run Test
- Complete Unit Test
- Noise Test

19 Equipment Selection Criteria (0.5 hrs)

- Factors Affecting Equipment Selection



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Rotary Equipment Design

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Documents Requirement at Site

(0.5 hrs)

- Key Documents & Their Significance

21

Equipment Datasheet Preparation

(2 hrs)

- Mechanical Datasheet for Pump& Mechanical Seal

22

Technical Specification Preparation

(1 hrs)

- Technical Specifications for Pump & Auxiliaries

23

Material Requisition Preparation

(1 hrs)

- Material or Enquiry Requisition

24

Vendor Data & Document Requirement

(1 hrs)

- During Bid Stage/Pre-Order Stage
- Post Order Stage
- As-Built

25

Design Cases for various Flow & Head Combinations

(1.5 hrs)

- Pump Type Selection for Various Flow & Head Combinations

26

Technical Bid Evaluation

(1.2 hrs)

- Bidders' Offer Review
- Technical Queries Preparation
- Technical Bid Evaluation Summary



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Rotary Equipment Design

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Purchase Order Preparation

(0.5 hrs)

- Mechanical Datasheet & Technical Specification

28

Communication & Role of Rotary Equipment Engineer

(1.5 hrs)

- Communication - Interdiscipline
- Communication - With Bidders (Pre-order)
- Communication - With Vendor (Post-order)
- Communication - With Client
- Role of Rotary Equipment Engineer



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Course Content

1 CENTRIFUGAL COMPRESSOR (32 hrs)

- ➡ What is EPC & EPCM & their role in Oil & Gas sector.
- ➡ Basics of Centrifugal Compressor – Gas Equation & Polytropic Head Calculation.
- ➡ Salient Features of Engineering.
- ➡ Design & Engineering Stages.
- ➡ Design Codes & Standards
- ➡ Definition of Key Terms.
- ➡ Centrifugal Compressor Calculations
- ➡ Centrifugal Compressor Configurations..
- ➡ Basic Design of Components.
- ➡ Dry Gas Sealing Arrangement.
- ➡ Material of Construction.
- ➡ Equipment Selection Criteria.
- ➡ Auxiliary Equipment Design Requirement .
- ➡ Various Steps during Detail Engineering & Procurement.
 - 1) Mechanical Datasheet & Specification Preparation as a part of RFQ.
 - 2) Technical Bid Evaluation.
 - 3) Purchase Requisition Preparation.
 - 4) Vendor Data Review.
- ➡ Inspection & Testing Requirement.
- ➡ Spare Parts Requirement.
- ➡ Importance of communication with Stakeholders.
- ➡ Role of Rotary Equipment Engineer.



About Us



Why Choose Us

With vast domain experience, highly capable & equipped Engineering Team we are specialized in providing the most professional Engineering services with fast turn around time. We also help businesses meet their goals with our cutting edge Engineering & Training services.



Mission

Our mission is to deliver world-class engineering solutions with simplicity, precision, and speed, while empowering professionals through comprehensive training that meets global industry standards.



Vision

To create a future where our cutting-edge expertise in engineering solutions and professional training empowers both clients and the industry, making us an indispensable partner in their success.



Our Core Values

1) INNOVATION

We consistently challenge the status quo by exploring new ideas & technologies to deliver creative, cutting-edge solutions.

2) INTEGRITY

We operate with unwavering honesty & transparency, building lasting trust with every client and partner.

3) CUSTOMER FOCUS

We are committed to understanding our clients' unique challenges & providing tailored, value-driven solutions.

4) ETHICS

We collaborate & support one another, believing our collective strength drives the best results for our clients.



Know The Trainer



Profile Highlights

Vikas is a highly motivated engineering professional and passionate trainer with an exceptional career spanning more than **28 years**. He holds a B.E. in Mechanical Engineering & an M. Tech. in Hydraulic Machines, providing him with a profound academic & technical foundation in rotary and package equipment engineering.

As a veteran in the field, Vikas possesses extensive working knowledge of international codes & standards, including **API & ISO**. His career includes significant contributions to major sectors such as oil & gas exploration, refineries, petrochemical projects, & Green H₂/NH₃ generation FEED projects. He has served esteemed operating companies & global firms including SABIC, Reliance Industries, Fluor Daniel, Jacobs Engineering, & Sulzer Pumps.

Vikas is recognized for his specialized expertise in a wide range of critical equipment, including API 610 Process Pumps, Centrifugal and Screw Compressors, Steam Turbines, & various Utility Packages. He has successfully delivered high-impact training modules on Centrifugal Pumps, Compressors, & Steam Turbines for both in-house teams & as a specialized freelancer.

With a focus on mentoring fresh & early-career engineers, Vikas has successfully upskilled & empowered over 100+ professionals through both online & offline platforms. His training is characterized by a logical, analytical approach to problem-solving & technical troubleshooting, ensuring that participants—ranging from entry-level to those with 15 years of experience—gain the practical, "real-world" skills required to manage complex rotary systems.

His vast experience and dedication to inclusive growth make him an invaluable asset to any engineering professional looking to master the intricacies of Rotary Design and Engineering.



Who Should Do This Course?



How We Can Help..!

This course is ideal for professionals who are involved with or aspiring to work in the **design, engineering, procurement, & operation of centrifugal compressors in the oil & gas, process, & related industries**. Specifically, it is suited for:

- **Mechanical / Rotary Equipment Engineers** – Looking to deepen their understanding of centrifugal compressor design, calculations, configurations, & auxiliary equipment.
- **Project Engineers & Design Engineers** – Working in EPC/EPCM projects, involved in detailed engineering, procurement, & vendor evaluation processes.
- **Piping & Process Engineers** – Who want to understand compressor behaviour, system integration, & design requirements.
- **Procurement & Technical Evaluation Professionals** – Responsible for mechanical datasheets, RFQ specifications, bid evaluation, & vendor data review for compressors.
- **Inspection & Quality Engineers** – Focused on inspection, testing, & verification of compressors & their components.
- **Operations & Maintenance Engineers** – Who need to understand dry gas sealing, materials of construction, & spare parts requirements for reliable operation.
- **Engineering Students & Fresh Graduates** – Aspiring to enter the oil & gas or process industry & gain practical, industry-relevant knowledge about centrifugal compressors.

Why Take This Course:

This course **bridges the gap between theoretical knowledge & practical application**. Participants will learn not only the fundamentals of centrifugal compressors but also the **critical engineering, procurement, & stakeholder communication aspects** required for **real-world EPC/EPCM projects**.



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Design Services

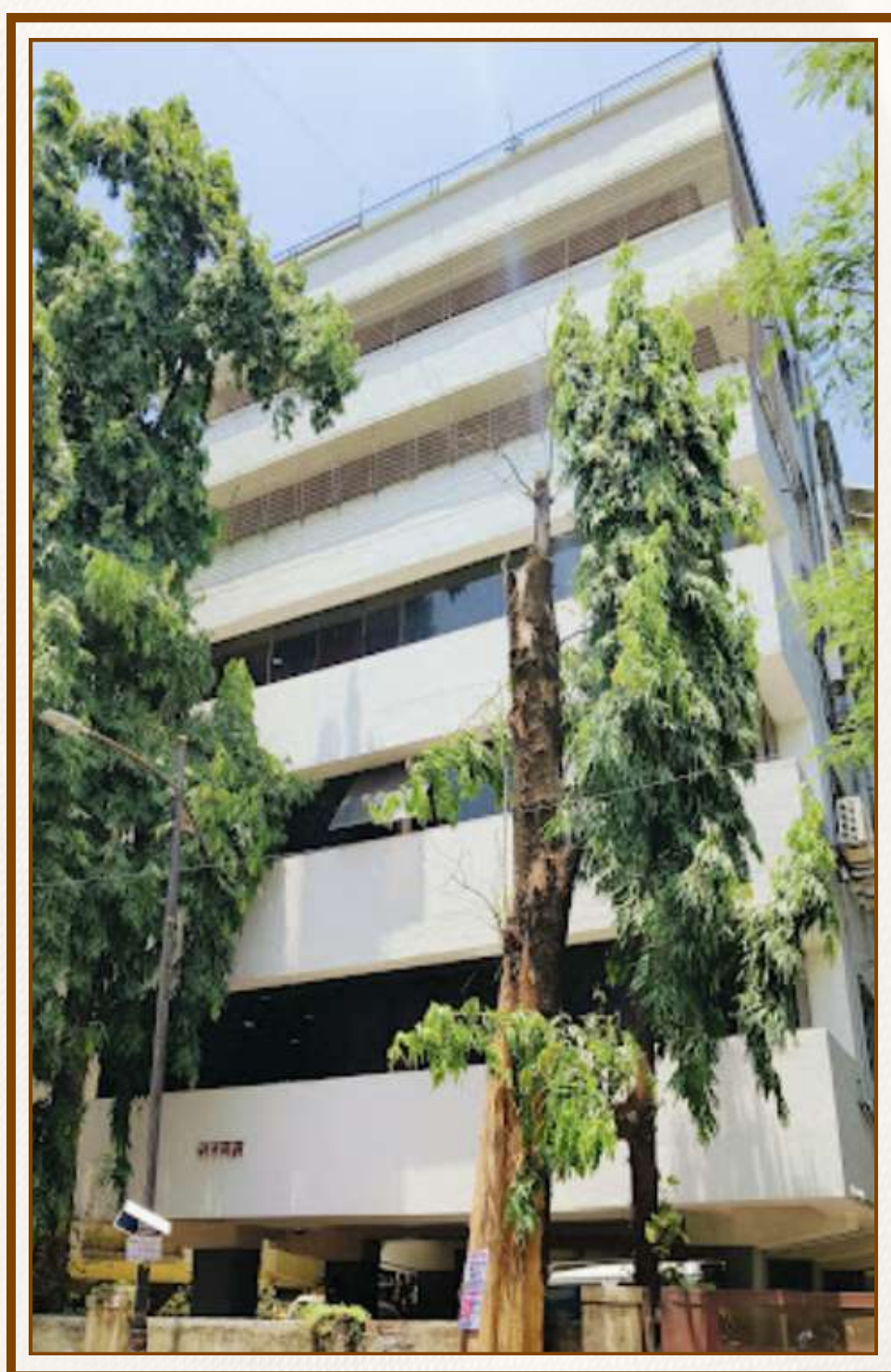
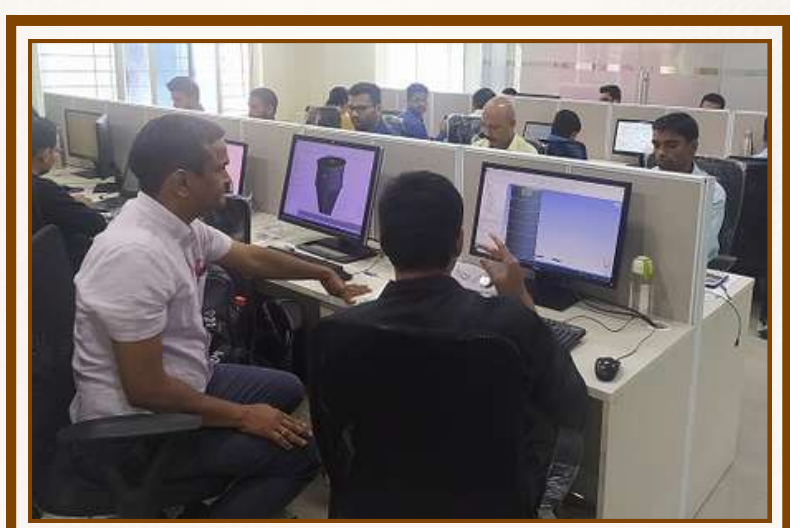


About Us

With vast experience in Static Equipment Engineering, we offer the best, cost-efficient solutions to our customers. Our Engineering team is capable to deliver Design of Pressure Vessel, Heat Exchanger, Condenser, Reactor, Column, Storage Tank, and other static equipment, as per various national and international codes and standards.

The team is well experienced and trained to deliver Design as per ASME Sec VIII Div-1, Div-2, PED, ADMerk Blatter, PD5500, AS1210, GOST, TEMA, API 660, API 650, API 620, IBR, EN13445, etc.

We have successfully completed many ASME U-stamp audits and worked on hundreds of U-stamp vessels closely with many certifying agencies.



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Training Services



About Us

Our training program offers a unique and professional platform for engineers to master their skills to meet the demanding requirements of industries. As an Authorized Training Provider for ASME, we stand firmly behind our mission: **“No one can decode the code like us.”** This expertise is rooted in our deep understanding of various national and international standards, delivered by **seasoned industry veterans** who are currently active in their fields to bridge the gap between theory and real-world application.

Drawing on extensive multi-disciplinary expertise, we provide **comprehensive** courses tailored to the rigorous demands of today’s market. In a remarkably short time, our **commitment to excellence** has established us as the most trusted and preferred training partner for leading corporations and ambitious individuals globally.



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Corporate Training



Onsite Corporate Trainings

We have been instrumental in developing the workforce for organizations through our onsite training under our corporate training program. These training has helped the corporates to develop the skills and knowledge of their resources and as a result increase the output with better and optimized design of equipment.



Our Customers



Our Corporate/Individual Customers

We have been instrumental in developing the workforce for organizations through our onsite training under our corporate training program. These training has helped the corporates to develop the skills & knowledge of their resources & as a result increase the output with better & optimized design of equipment.



Our Track Record

How We Have Been Doing..!

- 

100+

Corporate Customers
- 

4000+

Satisfied Trained Individual
Online & Offline Combined
- 

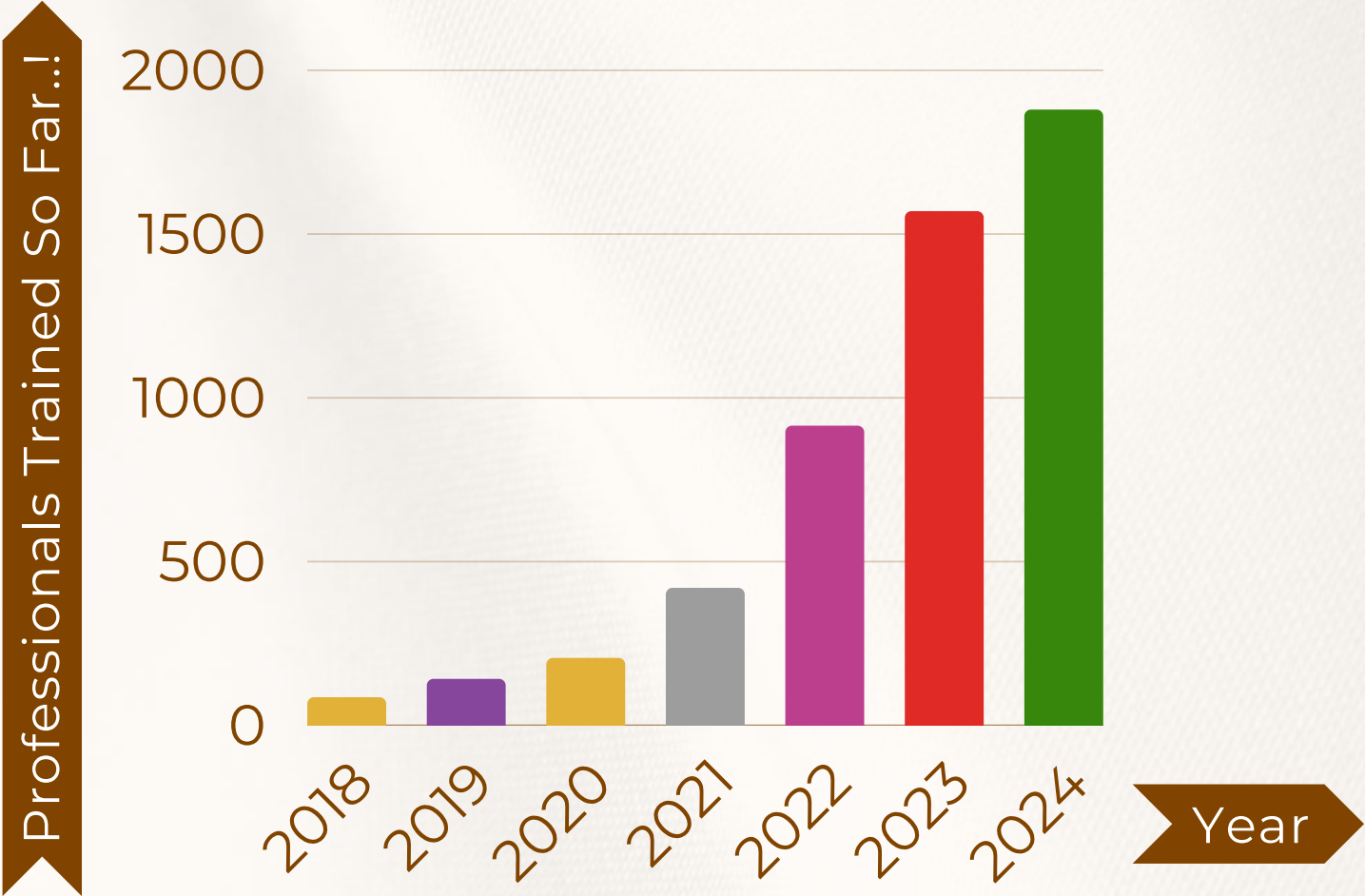
20+

Countries With Beneficiaries
Across The Globe
- 

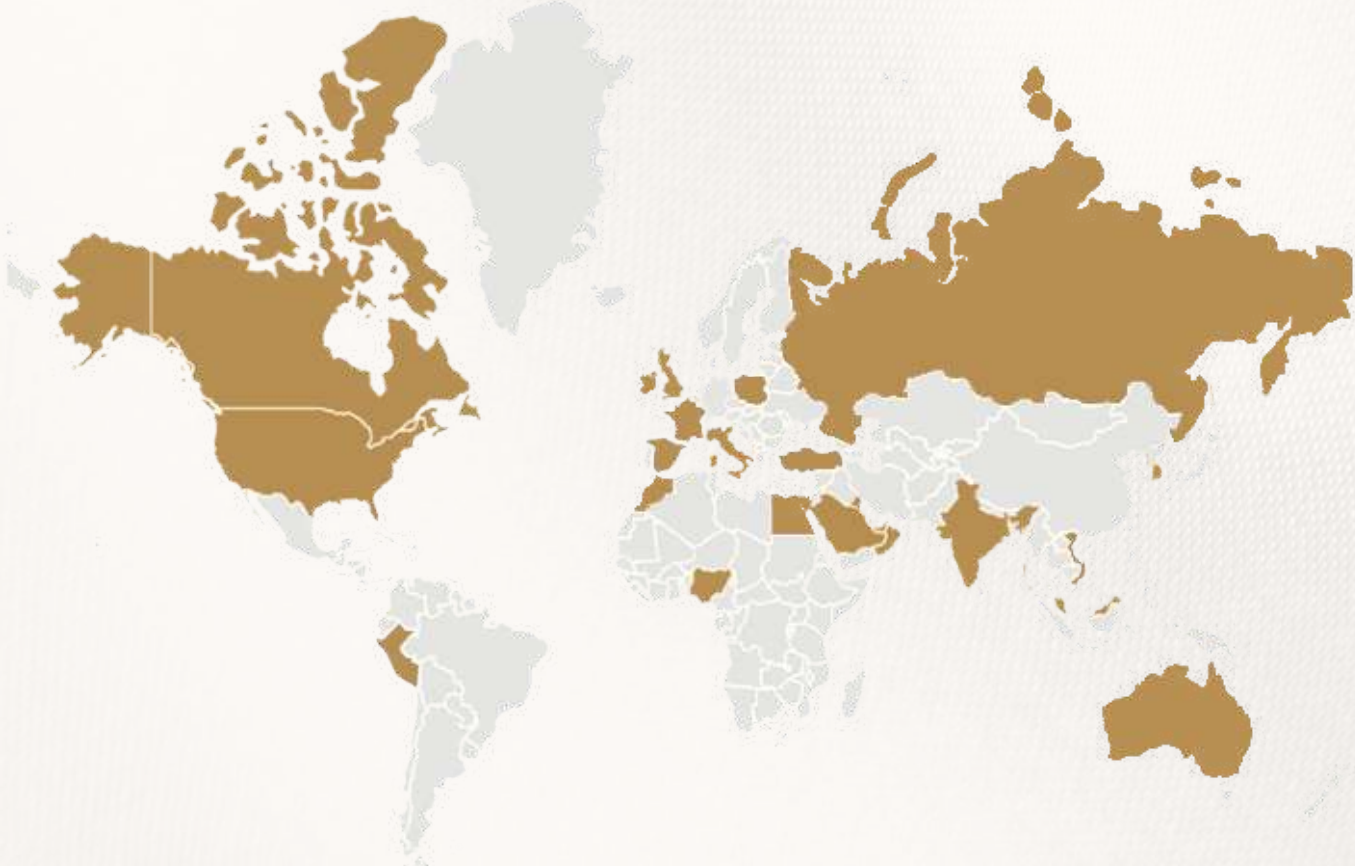
0-28

Experience Range Of
Engineers Trained

Over The Year...!



Beneficiaries Across The Globe



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About Training Platform



Mobile & Laptop/ Desktop

Expert and Professional training available at your convenience, with our Mobile & Desktop application.



WATCH FREE LECTURE VIDEOS



GET IT ON Google Play





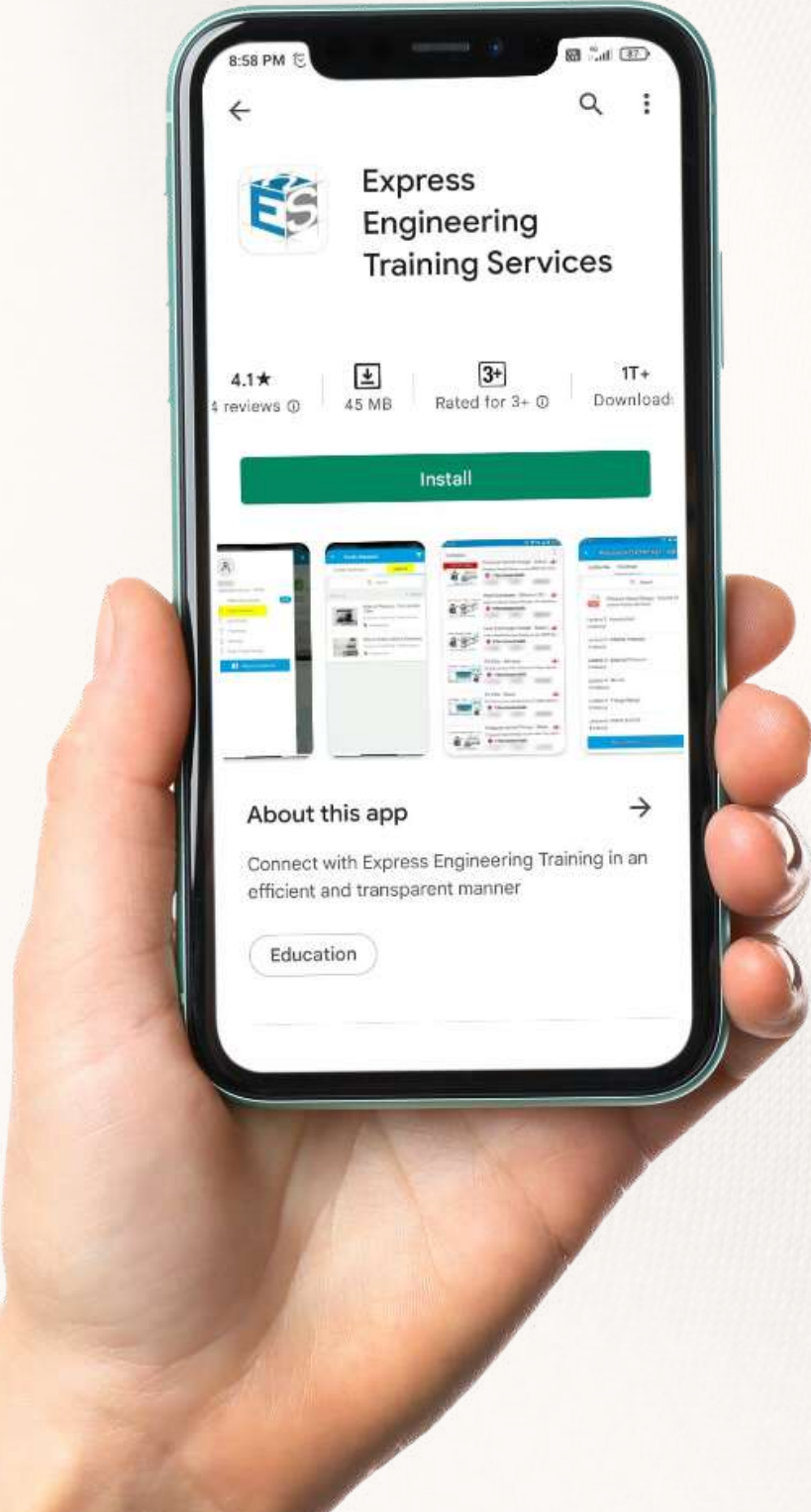
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IOS APP
use organization code **yatgi**

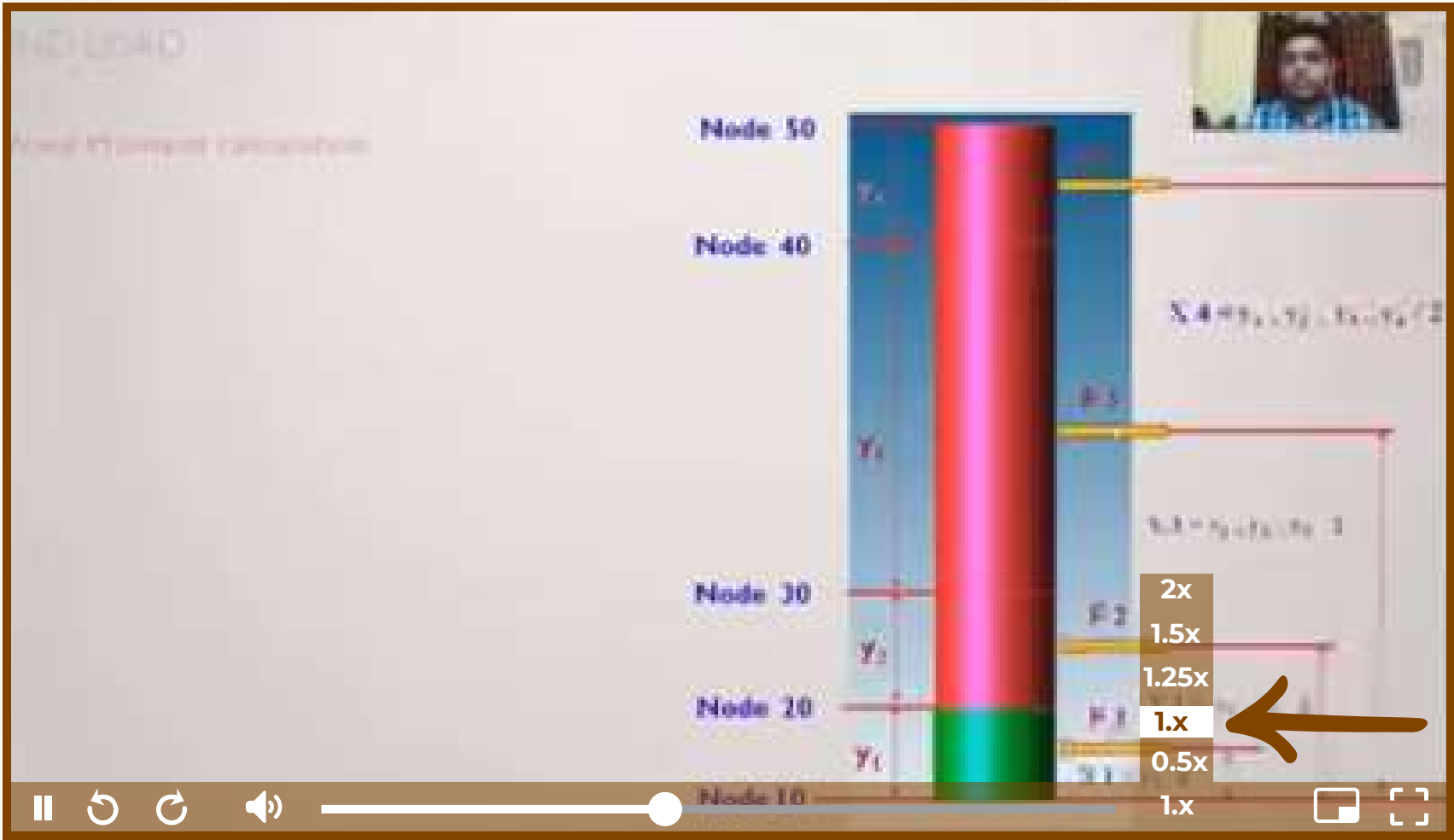


About Training Platform

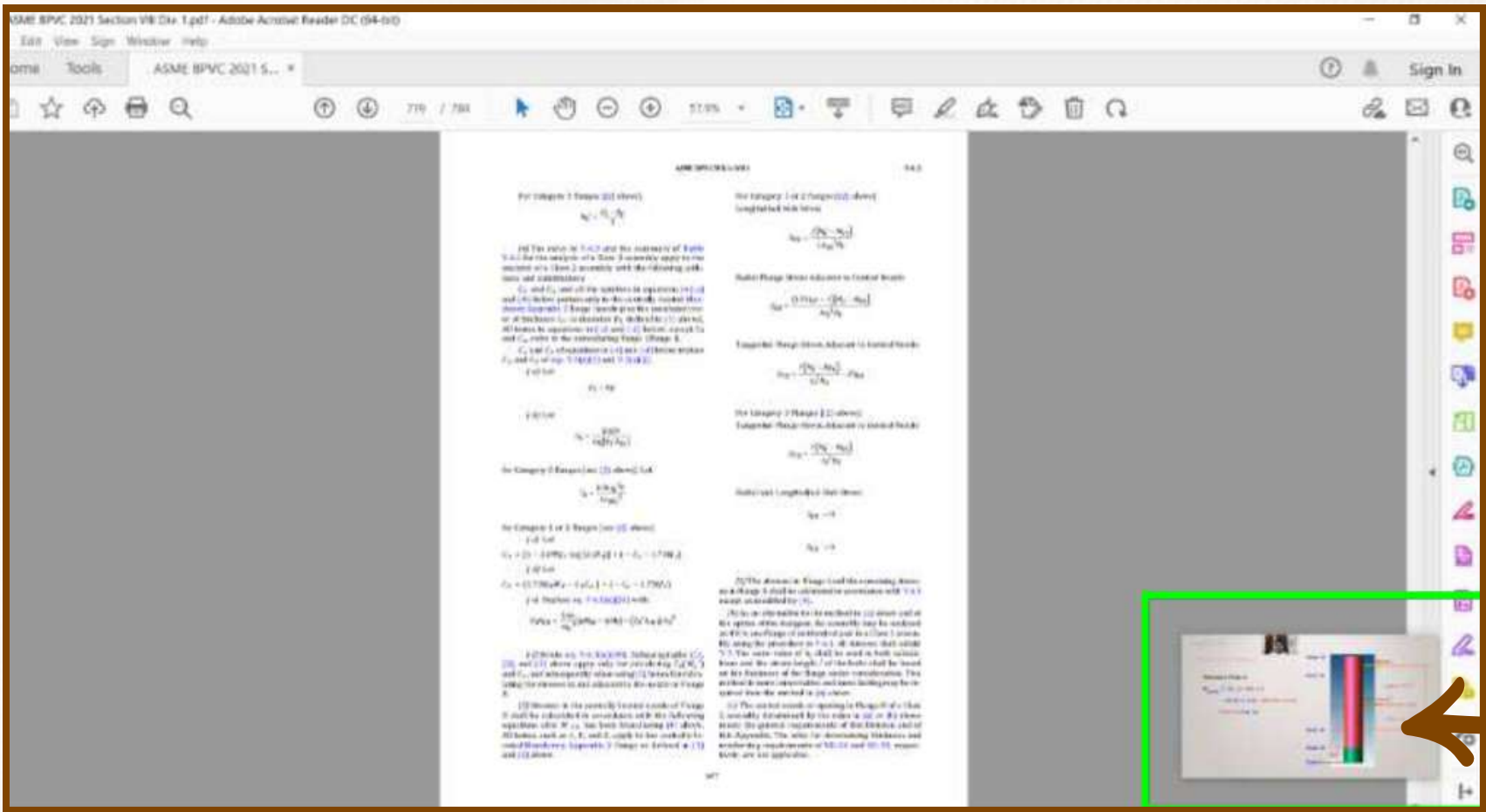


Special Features

It has never been so convenient to learn...! Check out some special features of our Training Platform. Adjust video speed from 0.5x to 2x to suit your requirement.



PIP mode enables you to work or practice simultaneously while watching the lectures.



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Advantages Over Offline Courses



Benefits Of Online Training

Offline

Online

No more compromise on work or personal schedule

Getting late for the class. **Need to rush** or I'll miss the lecture.



I can **save travelling time** and **avoid stress** by watching lectures online **as per my convenience**.



Get answers on the go...!

I am stuck in the Project. But this topic is scheduled after 4 weeks in the live class. **How can I solve it now?**



I was stuck..! But I **just watched this topic online** and bingo..! **the problem is solved**. I simply love this platform.



Live Q&A session every week

The Classes are over. **Whom can I ask** the questions now?



My Course **validity is 18 months**. Also the **live Q&A session is twice a week**. I can get all the answers.



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Advantages Over Offline Courses



Benefits Of Online Training

Offline

Online

Never Miss Out On Any Lectures

I **missed** the last lecture, now I **cannot understand** this...!



This is so cool..! I can **watch any lecture anytime**.



Learn At Your Own Pace

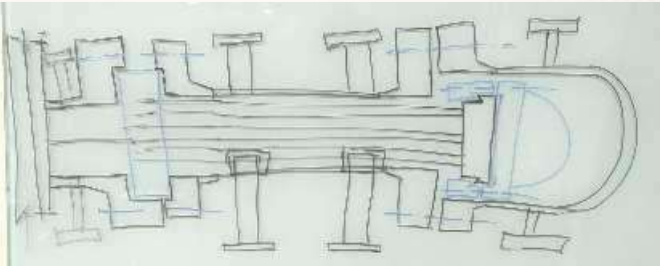
He is teaching **so fast**. It is **very difficult to understand**...!



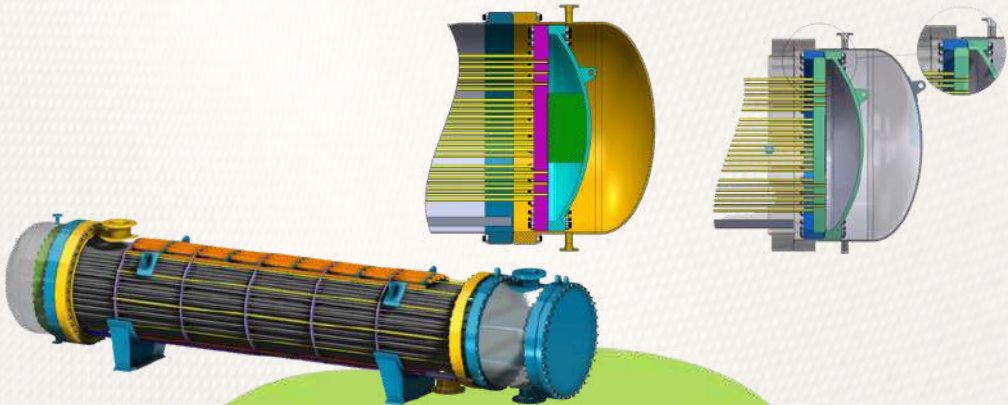
I can **speed up or speed down** the lecture videos as per my convenience.



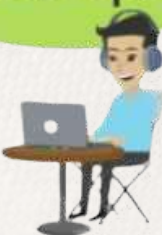
No Disturbances | Video Lectures | Animations



This is so **disturbing**...! **Not able to visualize** the concept with these 2d hand sketches



Such **easy to understand** demonstrations with **3d animations** help me to visualize and clear my concepts..!



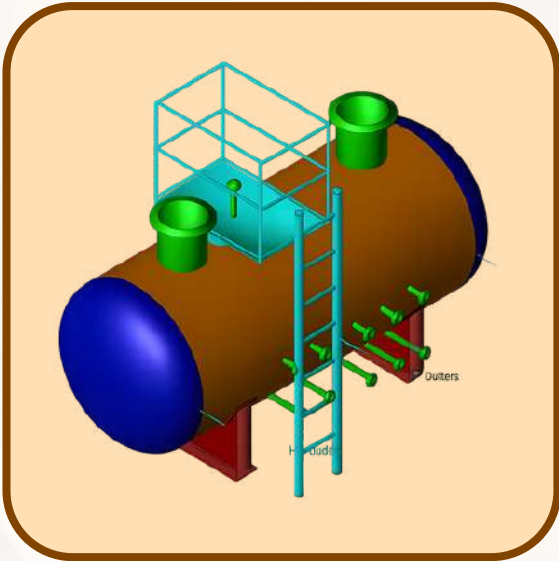
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Our Other Courses



STATIC EQUIPMENT DESIGN



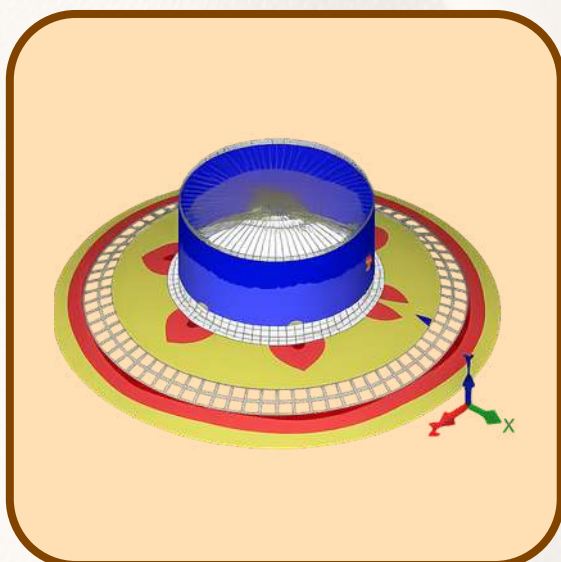
PRESSURE VESSEL
DESIGN (DIV 1)



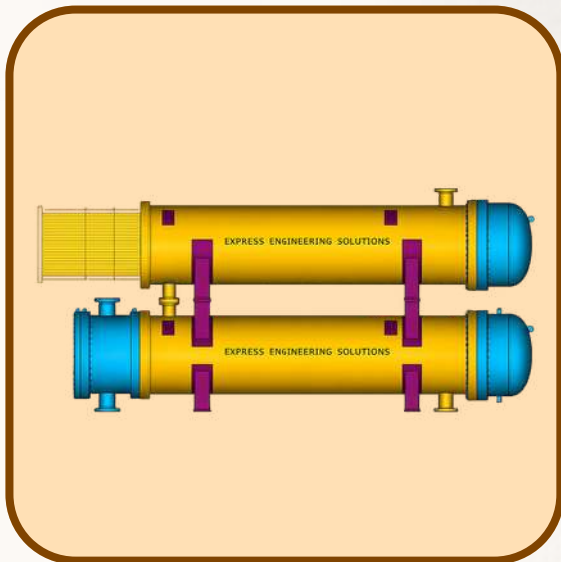
PRESSURE VESSEL
DESIGN (DIV 2)



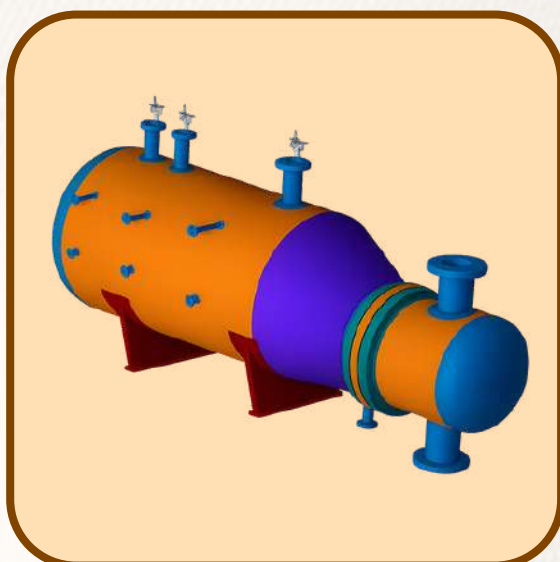
PREMIUM COMBO



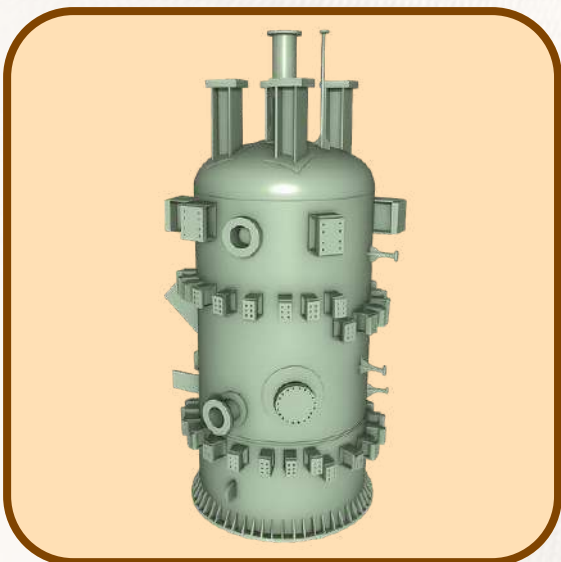
NOZZLE PRO FEA



HEAT EXCHANGER
DESIGN



PV ELITE
SOFTWARE



DIV 1 & DIV 2
COMBO



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Our Other Courses



ASME AUTHORIZED COURSE



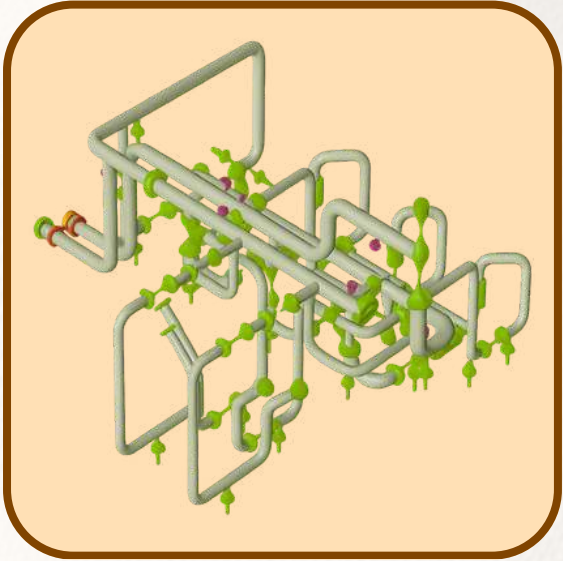
ASME PD442 



PIPE STRESS ANALYSIS



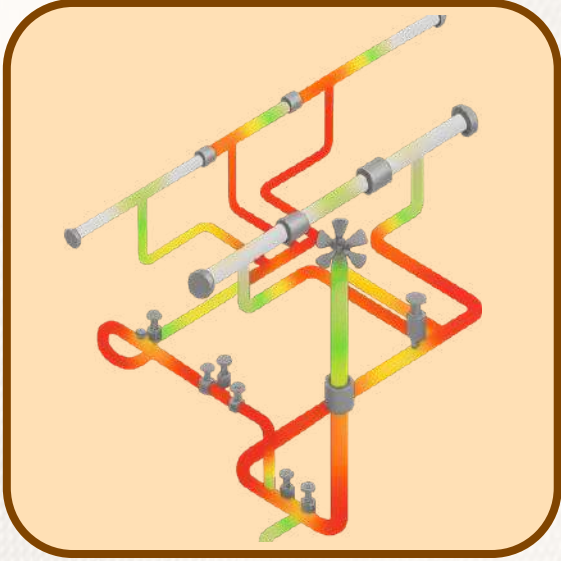
BASIC PIPE STRESS ANALYSIS 



ADVANCE PIPE STRESS ANALYSIS 



BURIED PIPELINE STRESS ANALYSIS 



COMBO PIPING & PIPELINE STRESS ANALYSIS 

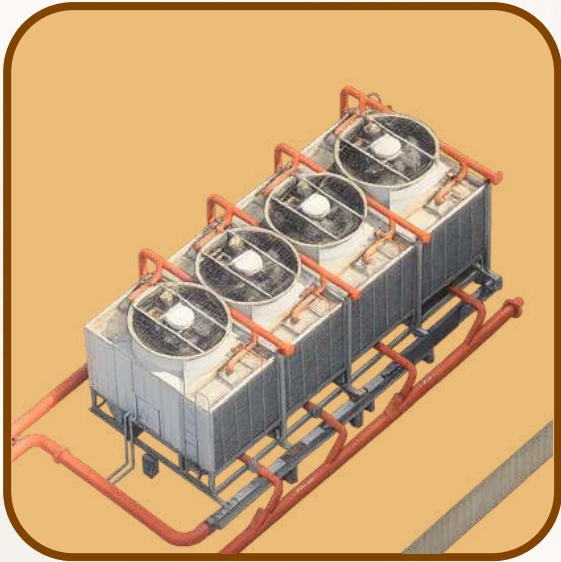


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Our Other Courses

THERMAL DESIGN



AIR-COOLED
HEAT EXCHANGER
(ACHE) 



SHELL & TUBE
HEAT EXCHANGER
(STHE) 

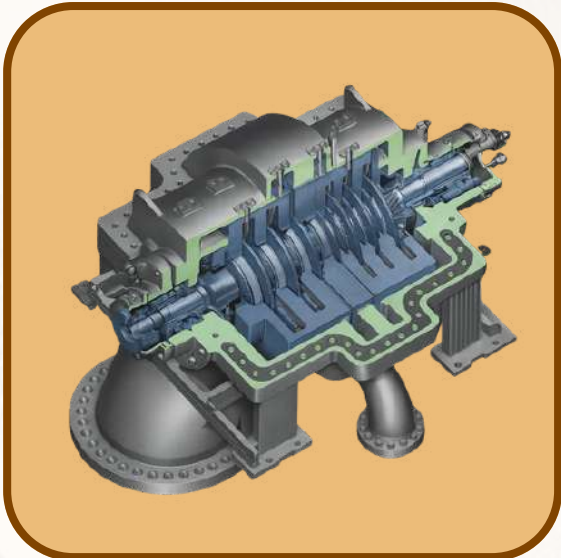


THERMAL DESIGN
COMBO
(STHE & ACHE) 



Our Other Courses

OTHER COURSES



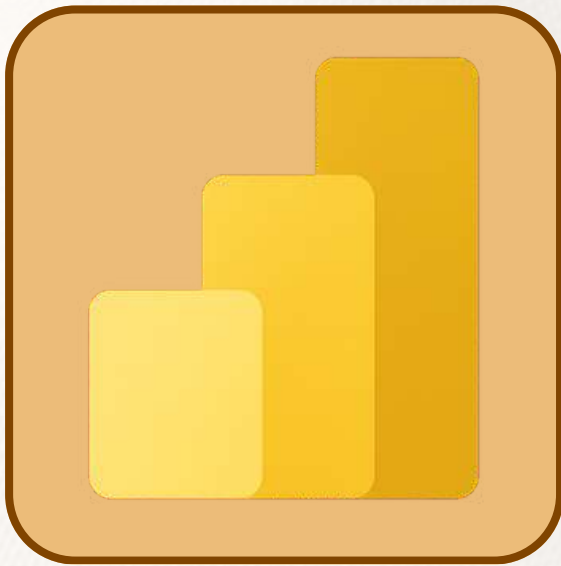
CENTRIFUGAL COMPRESSOR 



**CENTRIFUGAL PUMPS
IN OIL & GAS
INDUSTRY** 



MS EXCEL 



POWER BI 



GD&T (BASIC) 



GD&T (ADVANCE) 



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PUNE

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Survey No - 43/1-9, Behind Girija
Hotel, DP Road, Near Rajaram
Bridge, Karvenagar, Pune - 411 052



SURAT

348, Green Palladia, Opposite Raj World,
Near Gaurav Path Road, Palanpore,
Surat, Gujarat - 395009



SCAN FOR
WEBSITE 



CLICK FOR
WEBSITE 

