

ROTATING MACHINERY BOOTCAMP COMPRESSORS & PUMPS

(With Digital Enablement and IIoT Focus)

A THREE-DAY WORKSHOP

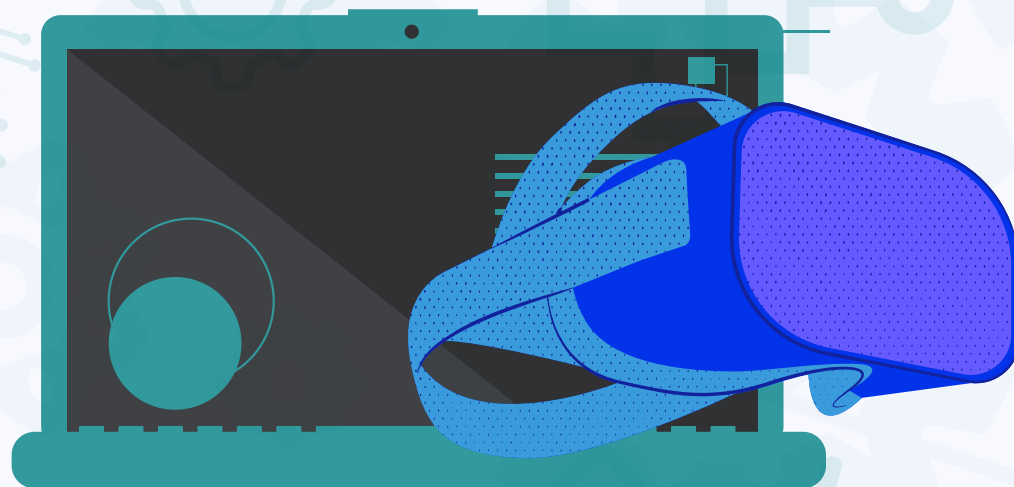
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भारी उद्योग मंत्रालय
MINISTRY OF
HEAVY INDUSTRIES

Course developed as part of the SamridDHI Skill-building Initiative of
Ministry of Heavy Industries, under mentorship of
Indian Institute of Science (IISc), Bengaluru.

Faculty Mentor : Prof. Pramod Kumar, Dept. of Mechanical Engineering, IISc.



Online
Course Material
Available for
90 Days

All participants will
receive a certificate*

**"Last Date For Registration :
28th August 2025**

**REGISTER
NOW!**

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NIT ROURKELA
STUDENTS:
ZERO
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AVAILABLE

**2nd SEPTEMBER - 4th SEPTEMBER
2025**

Conducted Jointly By:



Foundation for Science Innovation
and Development - IISc



NIT Rourkela



ModeliCon InfoTech LLP,
Bengaluru

VENUE

**ME-001, Seminar Room , Department of
Mechanical Engineering, NIT Rourkela.**

Contact Us for Registration:



skilling.modelicon.in



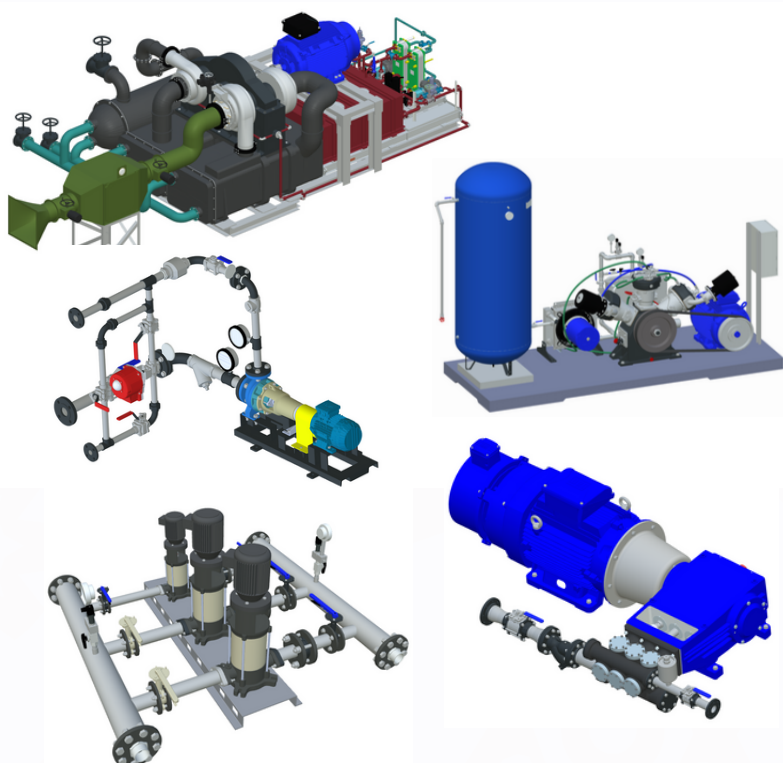
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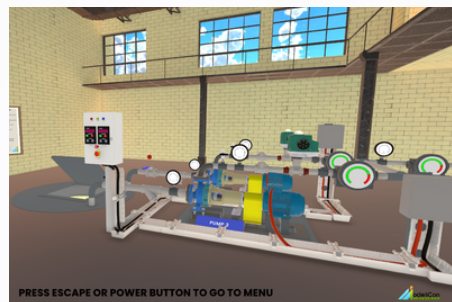
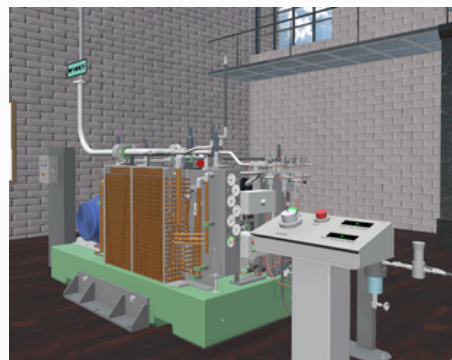
* A Participation Certificate will be provided to all attendees,
and a Completion Certificate will be awarded to participants
who qualify in the online assessment test.



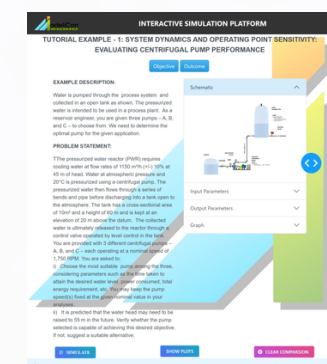
HIGHLIGHTS



3D Interactive Models



Virtual Reality



Hands-on tutorial



BACKGROUND

The Compressor and Pump Bootcamp workshop offers a comprehensive foundation on compressors and pumps in industrial applications. Starting with the fundamentals of rotating machinery, the course explores everything from basic unit systems to rotor dynamics and diagnostics. The Compressor module covers various type of compressors, including compressor maps, selection, and sizing. The course covers essential procedures such as pre-start checks, startup and shutdown processes and performance testing. Compressor selection strategies and performance control methods are explained in detail. The Pump module covers various types of pumps, fluid dynamic concepts, pump performance parameters and characteristic phenomena such as NPSH issues and cavitation. Pump selection, system design considerations, performance control and fault diagnostics are explained in detail. Apart from fundamental concepts, the applications of emerging technologies such as modelling and simulation, Digital Twins, IIoT-based remote monitoring and AI/ML assisted diagnostics are illustrated through the course materials. This integrated approach ensures that participants gain fundamental understanding of the rotating machines while learning about the latest, technology-enabled solutions to manage such critical assets effectively.



OBJECTIVE

- Understand rotating machinery basics, including rotor dynamics and design.
- Identify critical speeds and methods to avoid resonance issues.
- Learn about pump types and their applications.
- Use pump system maps to analyze performance.
- Optimize pump performance under off-design conditions.
- Grasp gas compression principles and their impact on compressors.
- Interpret key compressor performance metrics.
- Consider factors for selecting and sizing compressors.
- Explore strategies for optimizing compressor control.



KEY TAKEAWAYS

- Understand rotating machines, including types, mechanics, dynamics, materials, and instrumentation.
- Explore compressor applications in industries and basic gas compression principles.
- Assess compressor performance metrics like capacity, power, and efficiency for suitability.
- Consider factors for compressor selection, sizing, and control to ensure optimal performance.
- Classify pumps by their principles, construction, and applications for optimal selection.
- Analyze pump performance - flow rate, head, power consumption, and efficiency for better operation.
- Manage pumps under off-design conditions and develop effective strategies.
- Understand the Digital Transformation happening in rotating machinery domain through emerging technologies such as Simulation, Digital Twin, IIoT and AI/ML.



SCHEDULE

DAY 1 : ROTATING MACHINERY MODULE

TIME	ACTIVITY	TIME	ACTIVITY
09:00 - 09:15	Course Introduction	13:15 - 14:00	Lunch Break
09:15 - 10:45	Basics of Rotating Machinery	14:00 - 16:00	Monitoring and Diagnostics of Rotating Machinery
10:45 - 11:00	3D Interactive Visualization of Rotating Machinery	16:00 - 16:15	Tea Break
11:00 - 11:15	Tea Break	16:15 - 16:45	Rotating Machinery Computations
11:15 - 13:15	Design and Operational considerations of Rotating Machinery	16:45 - 17:30	Applications of IIoT and Digital Twin in Rotating Machinery Domain

DAY 2 : COMPRESSORS MODULE

TIME	ACTIVITY	TIME	ACTIVITY
09:15 - 10:30	Basics of Compressors	12:45 - 13:15	Compressor Computations (Part-1)
10:30 - 11:00	3D Interactive Visualization of Compressors	13:15 - 14:00	Lunch Break
11:00 - 11:15	Tea Break	14:00 - 15:00	Operation, Monitoring and Control of Compressors
11:15 - 12:45	Operating Characteristics, Performance and Selection of Compressors	15:00 - 15:30	Compressors Computations Part 2
		15:30 - 16:00	Introduction to VR

DAY 3 : VIRTUAL REALITY

TIME	ACTIVITY
09:00- 14:00	VR Introduction and Practice
14:00 - 15:00	Lunch Break
15:00 - 16:00	Assessment
16:00 - 17:00	Closing Remarks

For Venue-related Enquiries:

Prof. Suraj Kumar Behera
Department of Mechanical Engineering

+91 90408 93760

hod.mech@coeptech.ac.in

For Registration-related Enquiries:

+91 6361328813

skilling@modelicon.in





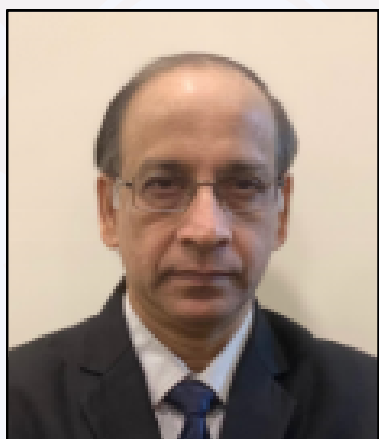
MEET THE EXPERTS

INTRODUCING THE CORE FACULTY & INDUSTRY MENTORS



Dr. Sunil Shah

CEO of ModeliCon InfoTech LLP, Dr. Shah brings 30+ years of experience in system modeling, control, and gas separation technologies. A PhD from IIT Bombay, he is a prolific innovator and trainer with global industrial exposure and 9 patents.



Dr. Barun Chakrabarti

Managing Director at Bonitas Consulting and Executive Director of TSI, Dr. Barun has 36+ years in machinery diagnostics, asset integrity, and R&D across major industries. He is a Fellow of the Council of Vibration Specialists and a respected academic collaborator.



Mr. Shankar Balakrishnan

With over 45 years of experience, Shankar is a specialist in process automation, system integration, and special-purpose machine design. He has led technical initiatives across India and the Middle East and currently mentors through Autocon Technologies and GLG.



Dr. Pavanraj Rangegowda

Dr. Pavanraj is a Senior Systems Engineer at ModeliCon, with expertise in control systems, IIoT, and digital twin technologies. He holds a PhD from HBNI (BARC) and has published extensively in international journals and IFAC conferences.



Mr. Nikhil Sharma

A senior process systems engineer at ModeliCon, Nikhil specializes in chemical process modeling and simulation. He holds an M.Tech from IIT Gandhinagar and is pursuing a PhD from IIT Bombay.