

# Mechanical Engineering



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# About Relevel by Unacademy

The coming decade is one of immense **opportunity for India** with a majority of our population under the age of 35 and the growing proliferation of global technology.

For a long time, India was known as the land of outsourced opportunities. The past decade however has shown that **Indians can build global products and businesses**. This is expected to grow manifold in the coming years provided we solve for one crucial element - **skilled talent**.

Today, there is a massive divide between aspirants looking for the **right opportunities** on one side, and companies vying for the best talent on the other. Historically exposure to opportunities has been defined by one's college, degree, or who they already knew in the industry. The events over the last year have only made the situation worse.

We believe it is high time that this changes for good! We believe that hiring should depend only on your capabilities and skills, not your college degree.

Being India's **Largest Learning Platform**, democratizing knowledge and access is a core tenet of the **Unacademy Group**. We are now extending that to opportunities through Relevel by leveling the playing field for millions of Indians. We imagine a future where candidates have a transparent path to the **career of their dreams**.

At Relevel, we believe **your history doesn't matter. Your skills do**. Your network doesn't matter. You do!

All the best. We know you can crack it!

# Why Mechanical Engineer?

Mechanical engineers play a vital role in a wide array of industries including automotive, aerospace, biotechnology, computer and electronics, nanotechnology, robotics & automation, production & manufacturing and healthcare. It's a career where each day brings unique challenges and new ways of putting your analytical as well as design skills to develop systems that solve human challenges.

- **Lead Innovation and Technological Advancements:** Design thinking and analytical abilities combined with your knowledge in mechanical engineering could enable you to change the world by developing systems of the future. From devising a next-generation AI-powered defence robot to developing unmanned air vehicles for last mile delivery, a mechanical engineer can introduce products that bring about positive changes in the lives of mankind.
- **Strategic Responsibilities and Limitless Opportunities:** The production efficiency of an organization is directly proportional to sustainable revenue generation and investor returns. This makes the role of Mechanical Engineers highly strategic and indispensable across organizations of any scale, be it a Fortune 500 corporate or a Series A startup. As a mechanical engineer, you create new systems as well as streamline existing processes that largely contribute to business growth through effective cost optimization.
- **Growth Potential:** The average starting salary of a Mechanical Engineer in India is INR 3 LPA. Moreover, the top 10% earn more than INR 10 LPA. Due to rapid advancement in the field of technology and the growing demand for automation, there is a huge demand for mechanical engineers all over the world.

# Why Relevel Courses?



500+ Hours of Live Learning



10 Industry Grade Projects



Placement Mentoring



Proctored Milestone Tests



Learn from the Best in the Industry



Merit-based Scholarships

# Learn: The Relevel Way



## **Doubt Solving Sessions**

Weekly educator-led doubt solving sessions along with Teaching Assistant-led doubt solving sessions 4-5 times a week ensure that your understanding is crystal clear.



## **Quizzes & Assignments**

Real learning happens only when we practice. Specially curated quizzes after each session for a life-long learning experience.



## **Periodic Proctored Tests**

Track how far you have come along in your endeavour to learn through these periodic tests.



## **Dedicated Success Managers**

To help you reach that finish line, and anything that comes enroute this journey.

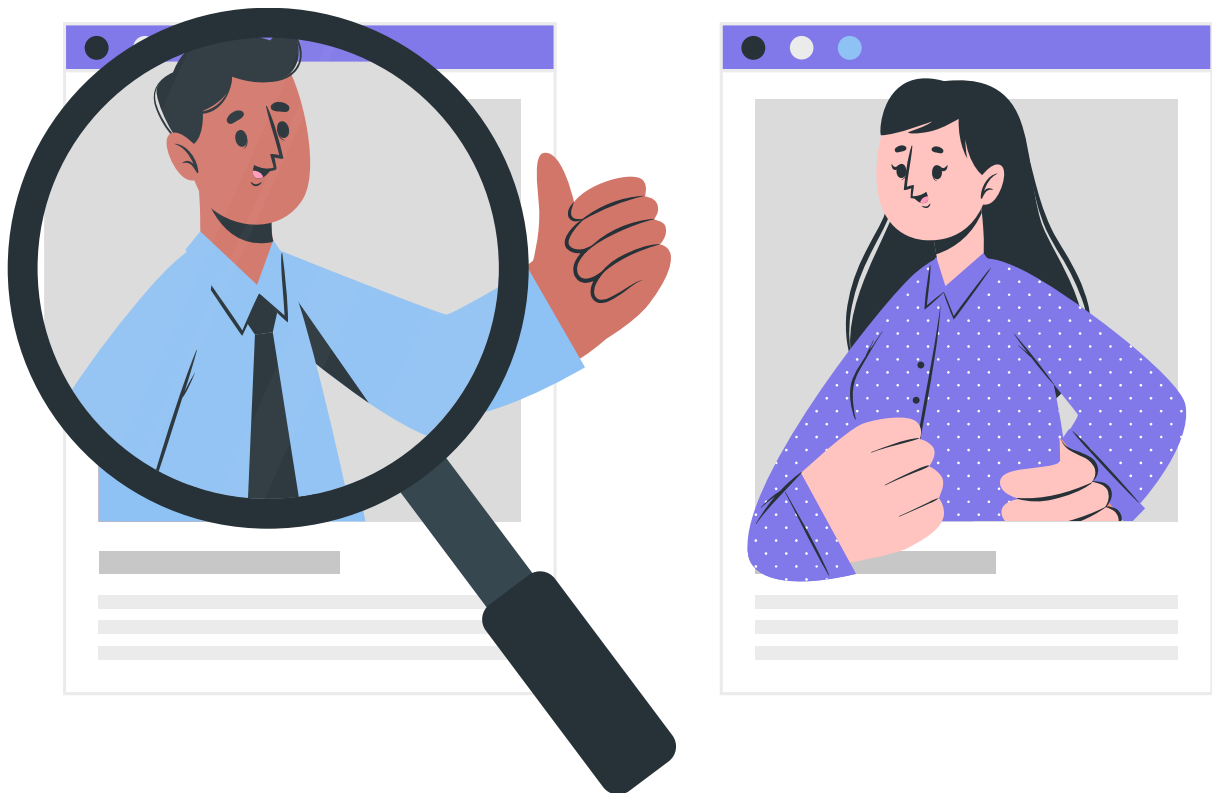


## **Community Access**

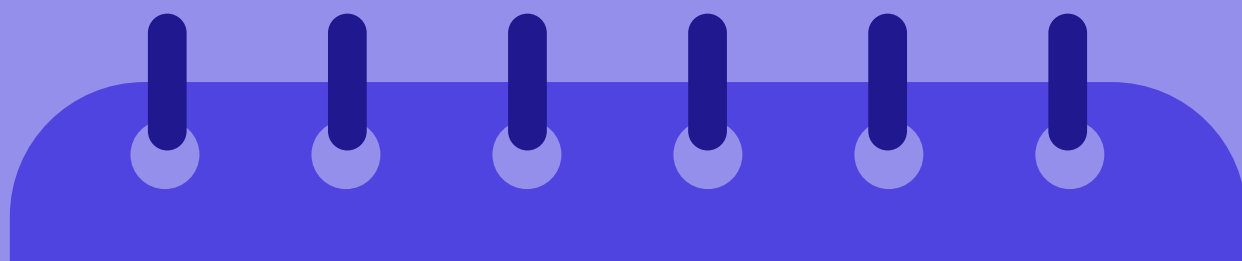
Learning by sharing. Connect with your peers and achieve your goals together.

# Is this for You?

If you have the dream of becoming an exceptional mechanical engineer with in-depth domain knowledge and the ability to crack interviews across multiple industries, you have come to the right place!



# Weekly Class Schedule

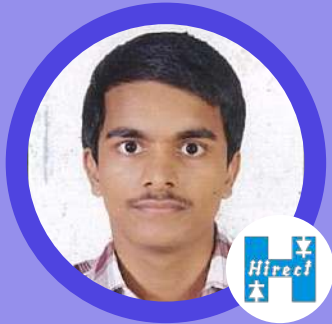


MON	TUE	WED	THU	FRI	SAT	SUN
<b>7 PM - 8 PM</b> Doubt Clearing Session by Teaching Assistant	<b>Off day for practice</b>	<b>7 PM - 8 PM</b> Doubt Clearing Session by Teaching Assistant	<b>Off day for practice</b>	<b>7 PM - 8 PM</b> Doubt Clearing Session by Teaching Assistant	<b>11 AM - 2 PM*</b> Session by Educator	<b>11 AM - 2 PM*</b>
<b>8 PM - 11 PM</b> Session by Educator		<b>8 PM - 11 PM</b> Session by Educator		<b>8 PM - 11 PM</b> Session by Educator	<b>7 PM - 8 PM</b> Doubt Clearing Session by Teaching Assistant	<b>Guest Lecture/ Event/Doubt Session with educators/ Test</b>

\*Weekend session timings may change depending on the availability of the educator.



# Classes by Experts



**Pratik P Dangar**  
Senior Design Engineer - R&D



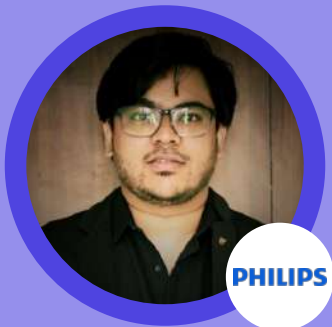
**Vinay Krishnamurthy**  
Product Design Engineer



**Sanjeev Kumar**  
Instructor- AME Department



**Nikesh Tandle**  
Senior Design Engineer



**Sagar Bodkhe**  
Mechanical Designer



**Hari K Reddy**  
Sr. Technical Manager

# Learn from Industry Leaders



**Kunjan Sanadhya**  
Senior Manager



**Manoj Rao**  
Assistant General Manager  
& Head

# Curriculum Snippet



# Module 1

## Engineering Mathematics

2 weeks

- Linear Algebra
- Calculus
- Vector Calculus
- Differential Equations
- Numerical Methods

# Module 2

## Applied Mechanics & Design

7.5 Weeks

- **Engineering Mechanics** - Free Body Diagrams, Equilibrium, Trusses, Kinematics & Kinetics of Rigid Body, Friction, Impulse & Momentum, Work-Energy Principle
- **Mechanics of Material** - Introductory concepts, Stress & Strain, Shear Force and Bending Moment Diagrams, Deflection & Stresses in Beams, Torsion, Columns, Pressure Vessels and Theory of Failures
- **Design of Machine Elements** - Introduction to Design Processes, Bearings, Chain Drives, Belt Drives, Gears, Joints, Shafts, Keys, Couplings, Springs, IC engine components
- **Theory of Machines and Vibrations** - Simple Mechanism, Gear & Gear Trains, Flywheel, Gyroscope, Governor, Balancing, Cams, Vibrations

# Module 3

## Fluid Mechanics and Thermal Sciences

11.5 Weeks

- **Fluid Mechanics & Turbomachinery** - Fluid Properties, Fluid Statics, Fluid Kinematics, Fluid Dynamics, Laminar & Turbulent Flow, Flow-Through Pipes, Boundary-Layer Concept, Hydraulic Turbines, Centrifugal & Reciprocating Pumps
- **Thermodynamics** - Basics of Thermodynamics, Work & Energy Transfer, Laws of Thermodynamics, Entropy, Availability & Irreversibility, Properties of Pure Substances, Ideal and Real Gas Properties
- **Refrigeration and Air Conditioning** - Refrigeration Cycles, Refrigerants, Psychrometry and its Properties, Air Conditioning
- **Powerplant Engineering** - Vapour Power Cycles, Layout of Power Plant, Components of Power Plant
- **Heat transfer** - Introduction, Conduction, Convection, Radiation, Heat Exchanger
- **Internal Combustion Engine** - Introduction, Air Standard Cycles, Combustion in SI & CI Engine, Testing and Performance of IC engine, Fuel Injection System Fuel Ignition System, Engine Cooling & Lubrication, Engine Emission and Control

# Module 4

## Automobile Engineering

1 week

- **Automobile engineering** - Automobile Components, Transmission System, Braking System, Vehicle Dynamics, Wheel Alignments

# Module 5

## Manufacturing and Industrial Engineering

8.5 Weeks

### Core Tenets of Materials, Manufacturing & Industrial Engineering

- Introduction to Materials, Different Methodologies used in Manufacturing Industry such as Lean, Six Sigma, 5S, Kaizen, Poka Yoke, Industry 4.0,
- Quality Control, Production Planning and Control, Inventory Control, Operations Research, Metrology, Metal Cutting, Machining, Metal Forming, Casting, Welding, Additive Manufacturing

### CNC programming

- Introduction to CNC, Basics of CNC Programming, Tool Offsets, Tool Selection, Special Programming Features, CAM

# Module 6

## Computer-Aided Design Softwares

13.5 Weeks

### Siemens NX- CAD

- Introduction, 2-D Sketching, Basic & Advanced Features: Part Modeling, Assembly, Drafting and Drawing Applications, Drafting Views, Detailing the Drawing, Surface Modeling, Sheet Metal Design, GD&T

### Solidworks

- Fundamentals, Part Modeling, Assembly Modeling, Surface Modeling, Drafting Views, Detailing the Drawing, Sheet Metal Design, Import/ Export File Management & PDM, Weldment Workbench, Photoworks

### CATIA

- Introduction to CATIA, Basic Part Feature Creation, Dress Up Feature, Duplicating Feature, Additional Features, Knowledge Tools, Assembly Modeling, Generative & Interactive Drafting, Real-Time Rendering, Surface Modeling, Sheet Metal Design

# Capstone Projects

Use your learnings to design and model different mechanical components.

## Design & Sheetmetal Modeling of a "Staircase" using Solidworks

Create a part from a conceptual sketch through solid feature-based modeling. Also, create general engineering assembly drawings through the assembly process by collaborating different parts modeled for the staircase.



## Design & Modeling of a "Clamshell Gate Assembly" using Solidworks

Create a "Clamshell Gate Assembly" used for bulk unloading of dust from the hopper in heavy engineering applications using Solidworks.



## Design & Surface Modeling of an "Aerospace Jet Engine" using NX CAD

Create a surface model of "Jet Engine Assembly" which is used to propel the Jet Aircraft. Utilise your understanding of the NX - CAD tool to draw 2D/3D models, create features and engineering drawings to generate realistic renderings through the assembly process by collaborating different parts modeled for the jet engine.



## Design & Modeling of a "Speed Reducer Gearbox" using NX CAD

Design a 3D assembly model of an enclosed "Mechanical Speed Reducer Gearbox" commonly used in today's automation control systems by using the NX CAD tool. Get an understanding of the functional requirements of the individual parts and examine their location thoroughly by noticing the external and internal features.



## Design & Modeling of a "6-cylinder Engine" using CATIA V5

Design the individual parts of a "6-cylinder Engine" and perform assembly modeling using CATIA software by bottom-up approach. Examine thoroughly the external and internal features of every part and study the exploded view of the engine assembly.



## Design & Sheetmetal Modeling of a "Stand & Cover" using CATIA V5

Create the assembly of a stand and electrical equipment cover using Sheet Metal tools in CATIA. Understand the manufacturing process and sequence of operations in creating sheet metal assemblies and forming units.



## Design Interpretation of GD&T on a given Weldment Part

Create GD&T for the given welding part of a primary boom machine which can assemble into top lever assembly. Select appropriate material for this Machined Weldment Part.



## Design Interpretation of GD&T on a given Machined Forming Part.

Create GD&T for the formed part of an engine stop ramp which can assemble into top lever assembly. Select appropriate material for this Machined Forming Part. Deep dive into the manufacturing methods employed during the forming of this part and during inspection





## **Formulate NC Program for an Aluminium Fixture which is used to make Aeroplane Components**

Create an NC program for a given fixture design using all possible G codes and M codes. Decide cutting tool diameter and the speed feed parameters for aluminium machining. Use basic machine commands like coolant ON/OFF, cutter compensation and canned cycles.



## **Formulate NC Program for a Steel Part which contains all possible Geometrical Features**

Create an NC program for a given design using all possible G codes and M codes. Decide cutting tool diameter and the speed feed parameters for steel machining. Use basic machine commands like coolant ON/OFF, cutter compensation and canned cycles.



# Placement and Career Support

With Relevel, you can now get a job in three simple steps



Qualify the Relevel Mechanical Engineering Test



Interview with a minimum of 5 companies



Receive an offer within 15 days!

# Course Details



Duration of the Course

11 months



Commitment Required

15 hours in a week

**What are you waiting for? Enroll now!**