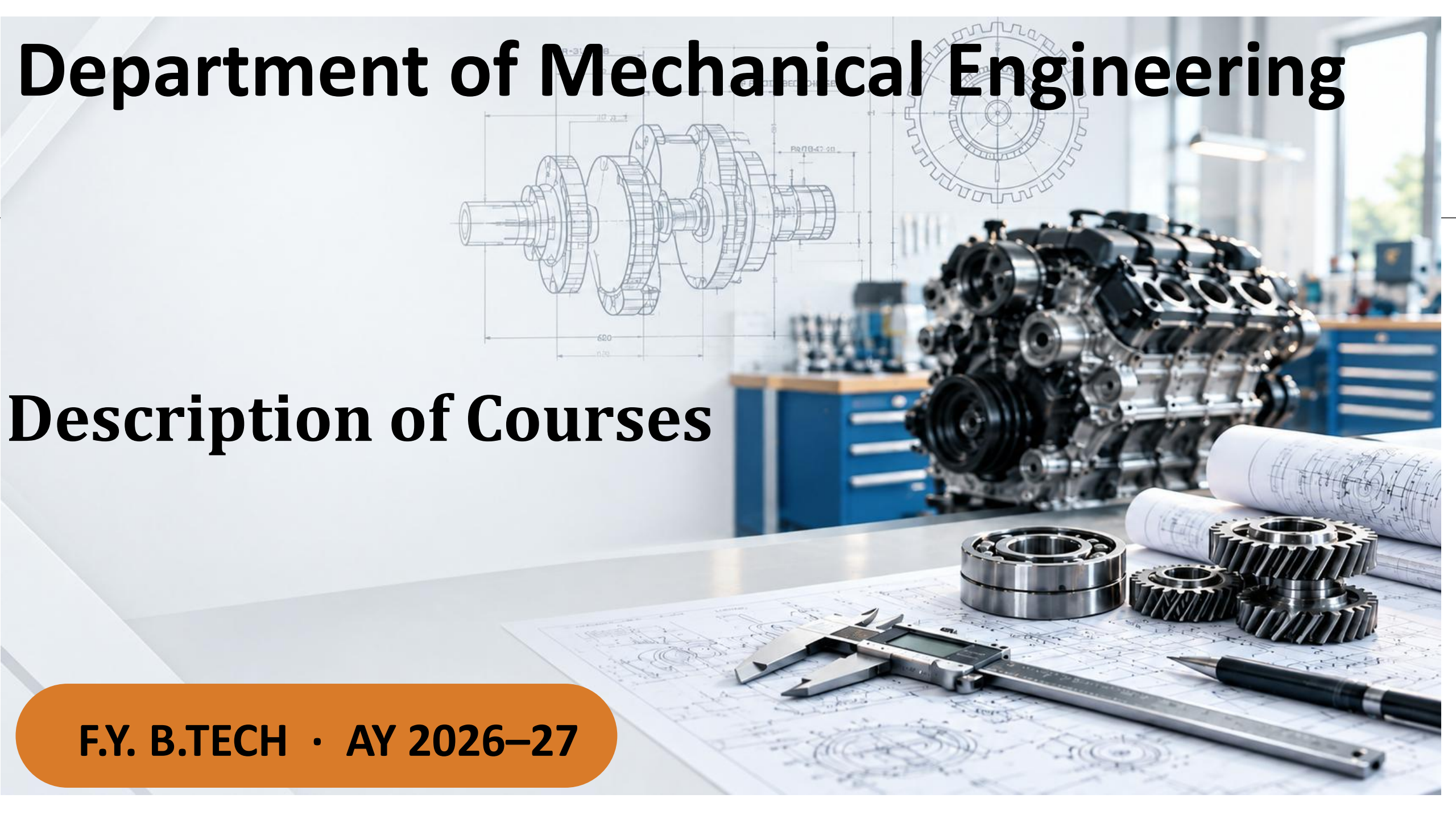


Department of Mechanical Engineering

The background of the slide is a composite image. It features a large, detailed mechanical engine in the center-right, likely a V-engine. To the left of the engine, there are technical drawings, including a cross-section of a gear assembly and a circular gear diagram. In the foreground, there are several mechanical gears of different sizes, a digital caliper, a ruler, and a pen resting on a technical drawing. The overall scene is a workshop or laboratory setting.

Description of Courses

F.Y. B.TECH · AY 2026–27

Courses Offered in Semester I and II



(I) The following subjects are offer to the students of Mechanical Engineering Department:

- | | |
|--------------------------------------|-----------|
| ▶ Systems in Mechanical Engineering | 3 credits |
| ▶ Computer-Aided Engineering Drawing | 3 credits |



(II) The following subjects are offer to the students of other branch's:

- | | |
|--|-----------|
| ▶ Foundation in Mechanical Engineering | 3 credits |
| ▶ Engineering Graphics | 3 credits |
| ▶ Computer-Aided Drafting | 2 credits |



(III) The below subject is offer to the all branch students:

- | | |
|---------------------------------|-----------|
| ▶ Electric Vehicle Architecture | 2 credits |
|---------------------------------|-----------|

Your First Year at a Glance

MECHANICAL
ENGINEERING
BEGINS HERE

Six course across two semesters to build your Mechanical Foundation



6

COURSES



15

TOTAL CREDITS



2

SEMESTERS



5

LAB COMPONENTS

SEMESTER I



Systems in
Mechanical Eng.



Foundation in
Mechanical Eng.



Engineering
Graphics



Computer-Aided
Drafting



Electric Vehicle
Architecture

SEMESTER II



Foundation in
Mechanical Eng.



Computer-Aided
Engineering
Drawing



Computer-Aided
Drafting



Electric Vehicle
Architecture

WHY IT MATTERS

Systems in Mechanical Engineering

The single most critical foundation of your entire undergraduate degree.



Work, heat & efficiency — the basis for engines, power plants, refrigerators and renewable systems



Energy conversion & efficiency in HVAC, thermal, nuclear and gas-turbine power plants



Machine elements — gears, belts, pulleys and chains that transfer motion to real applications



Manufacturing processes such as casting, forging and welding, and where they're used

Systems in Mechanical Engineering

Theory Evaluation (100 Marks)

Teaching Scheme

L -3 T-0 P-2 S-1



MSE · 30

TA · 20

ESE · 50

Lab · Continuous Internal Evaluation — **100 Marks**

What You'll Learn

- Understand the fundamental concepts of mechanical engineering.
- Apply the laws of thermodynamics to energy conversion devices.
- Learn how power transmission systems and machine tools work.

Broad Contents

- ➊ Introduction to Thermodynamics
- ➋ Energy Conversion Devices
- ➌ Machine Elements
- ➍ Introduction to Manufacturing

SYSTEMS IN Mechanical Engineering

How this course **connects** to Mechanical Engineering



1  This course is the single most **critical foundation** of your entire undergraduate degree.

2  It introduces the concepts of **work, heat, and efficiency**. This is the foundation required to understand how car engines, power plants, refrigerators, and renewable energy systems operate.

3  To analyze **energy conversion** and **improve efficiency** in engines, HVAC systems, thermal, nuclear, and gas-turbine power plants.

4  To study the role of **machine elements** such as gears, belt and pulley, chain and sprocket wheels in transferring motion from power source to its final applications.

5  Understanding different **manufacturing processes** such as casting, forging, welding etc. and their application.



WHY IT MATTERS

Foundation in Mechanical Engineering

Build the core. Enable the future.



Understand the fundamentals of mechanics, thermodynamics, fluid mechanics and materials



Develop problem-solving and analytical skills for real-world engineering challenges



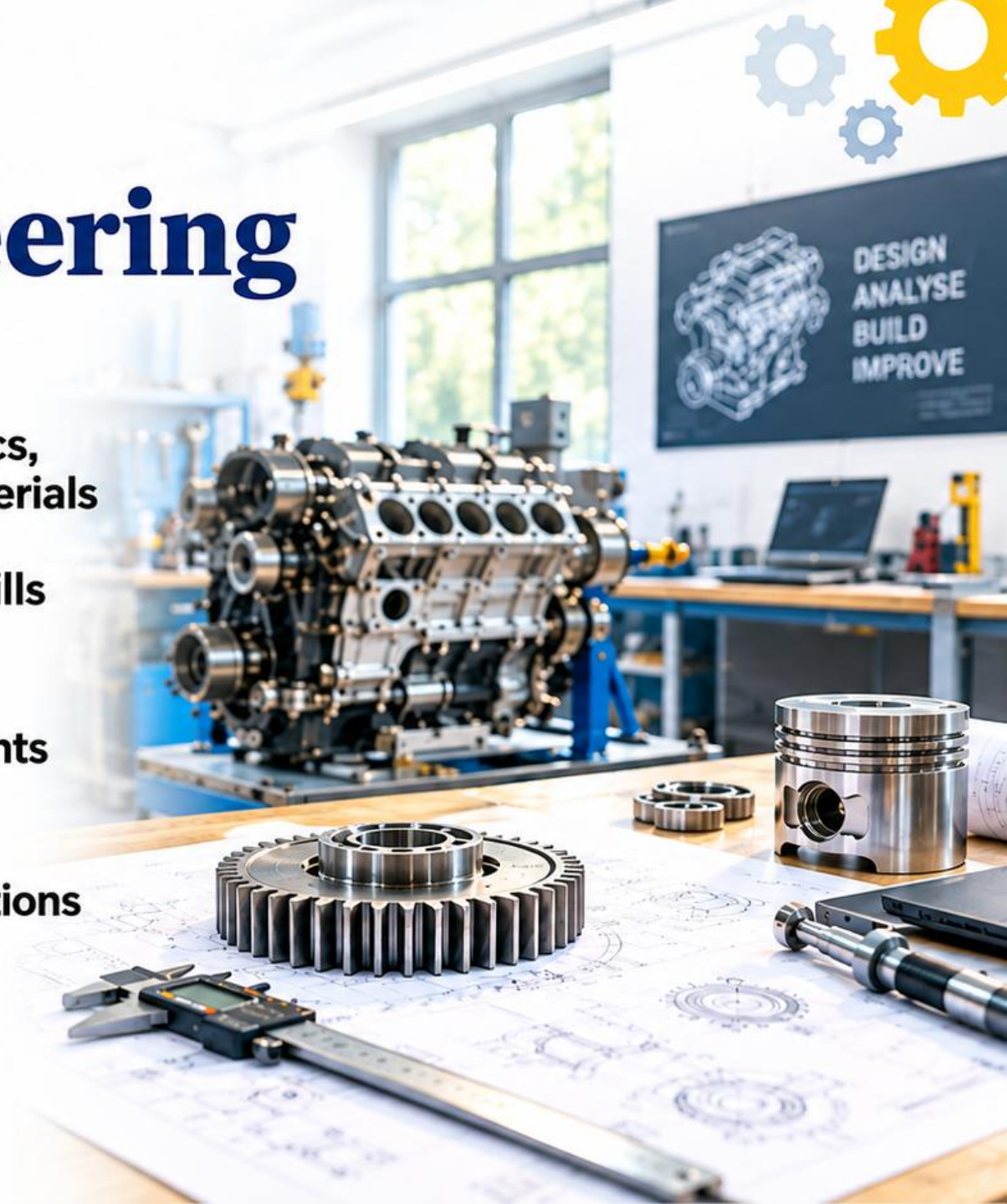
Work with hands-on projects, lab experiments and design-build experiences



Build a strong base for advanced specialisations and industry applications



Create, innovate and contribute to a more efficient and sustainable tomorrow



Foundation in Mechanical Engineering

Theory Evaluation (100 Marks)

Teaching Scheme

L -3 T-0 P-0 S-1



What You'll Learn

- Apply thermodynamics to energy conversion & heat exchange.
- Learn manufacturing processes and real industry applications.
- Compare power-transmission elements for industrial use.
- Understand the role of renewable energy sources.

Broad Contents

1. Thermodynamics.
2. Energy Conversion Devices.
3. Heat Transfer.
4. Machine Elements.
5. Manufacturing.
6. Nonconventional Energy Sources.

WHY IT MATTERS

Foundation in Mechanical Engineering

How this course connects to every branch of engineering



Electronics

Mechanical knowledge helps you design effective heat sinks and cooling airflow pathways to prevent system failure due to overheating of microcontrollers, power transistors, and LEDs.



Computer

Modern automation requires combining circuits with moving parts, gears, and sensors. You cannot program a robot efficiently without understanding its physical weight and joint limits. Developing software for cars, medical devices, or aircraft requires an understanding of the mechanical systems



Electrical

Wind turbines and hydroelectric plants rely heavily on fluid dynamics and structural mechanics alongside generator wiring. Electrical engineers frequently work in plants / Industry alongside mechanical systems.



Manufacturing

Designing factory workflows requires a deep understanding of how CNC machines, lathes, mills, and cutting tools function to maintain precise tolerances. To Create the jigs, fixtures, moulds, and dies used in mass production.



Civil

For designing safe buildings, bridges, and infrastructure as they are constantly subjected to dynamic physical forces, fluid pressures, and temperature changes. Designing water supply networks, sewage systems, dams, and drainage relies heavily on fluid dynamics which is core mechanical concept.



Metallurgy

Help you calculate the forces, stresses, and pressures required to shape metal without causing unwanted cracks. Thermodynamics helps you understand heat transfer rates, cooling curves, and thermal stresses during hot and cold working processes

WHY IT MATTERS

Engineering Graphics

The visual language that turns ideas into reality.



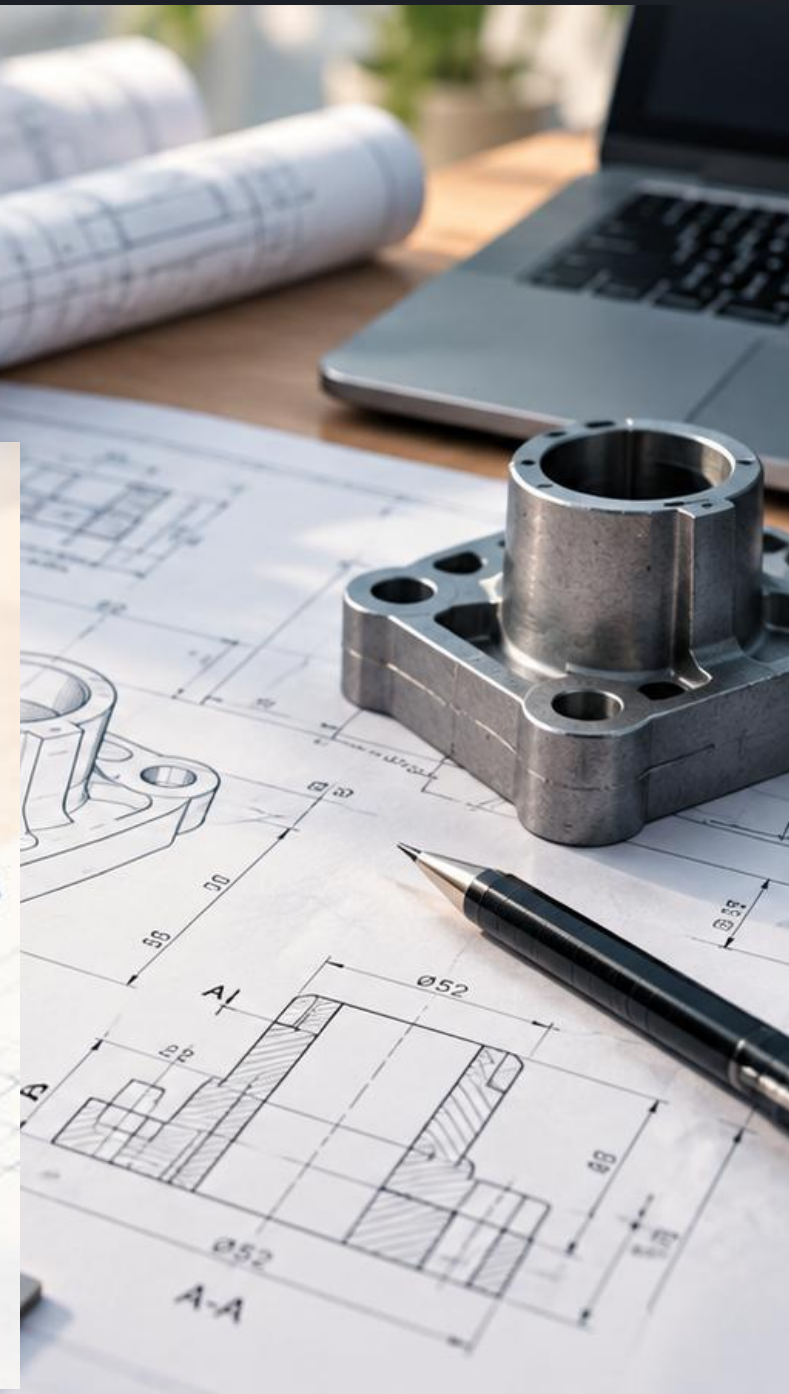
Converts theory into the practical visual language behind engines & products



Trains you to mentally convert gearboxes, pistons & linkages into 2D drawings — and back



The mandatory prerequisite for advanced CAD tools like SolidWorks, CATIA & Inventor



Engineering Graphics

Theory Evaluation (100 Marks)

Teaching Scheme

L-2 T-0 P-2 S-1



MSE · 30

TA · 20

ESE · 50

Lab · Continuous Internal Evaluation — **100 Marks**

What You'll Learn

- Use drawing tools and standards to construct engineering geometries.
- Convert 3D shapes into 2D orthographic views, and back.
- Draw the development of lateral surfaces for real applications.

Broad Contents

1. Introduction to Engineering Drawing
2. Orthographic Projections
3. Isometric Projections.
4. Development of Lateral Surfaces

WHY IT MATTERS

Engineering Graphics

How this course connects to every branch of engineering



Manufacturing

It provides the universal language needed to transform conceptual designs into physical products



Electrical

To prepare a layout of the electrical system for technicians and workers, guiding them during installation and providing a map for future maintenance and troubleshooting.



Metallurgy

It gives spatial visualization skills and technical communication tools needed to design metal casting moulds, read plant machinery blueprints, and collaborate with mechanical and structural engineers on industrial projects.



Electronics

To prepare a layout of the electrical system for technicians and workers, guiding them during installation and providing a map for future maintenance and troubleshooting.



Civil

To communicate complex design ideas, specifications, and details for construction projects like buildings, bridges and roads.



Computer

It develop strong visualization and spatial reasoning skills for software design and 3D applications.

WHY IT MATTERS

Computer-Aided Drafting

Bringing ideas to life with precision, speed and accuracy.



Create accurate 2D & 3D drawings using industry-standard software like AutoCAD, SolidWorks and more.



Improve design accuracy, reduce errors and save time with digital drafting tools.



Build real-world skills for mechanical, civil, electrical and product design projects.



Work with professional file formats and collaborate seamlessly across teams.



VSEC

Computer-Aided Drafting

Evaluation — Fully Internal

SEM I & II

2 CREDITS

THEORY + LAB

Teaching Scheme

L-1

T-0

P-2

S-0

100%

THEORY · INTERNAL

100%

LAB · INTERNAL

What You'll Learn

- Draw 2D geometric figures using CAD software
- Create and modify 3D models with precise dimensions
- Apply dimensioning, plotting and formatting commands

Broad Contents

- 1 Orthographic Projections
- 2 Fundamentals of CAD Setup
- 3 Draw, Zoom & Format Commands
- 4 Edit & Modify Commands
- 5 Dimensioning, Text & Plotting
- 6 Introduction to 3D Modeling

Computer-Aided Drafting

How this course connects to every branch of engineering



Manufacturing

Enables engineers to create detailed 2D drawings and 3D models with exact dimensions, tolerances, and material details which is required to transform conceptual designs into physical products.



Metallurgy

It gives spatial visualization skills and technical communication tools needed to design metal casting moulds, read plant machinery blueprints, and collaborate with mechanical and structural engineers on industrial projects.



Civil

Enables precise drafting of floor plans, elevations, cross-sections, and structural details for buildings and infrastructure. To communicate complex design ideas, specifications, and details for construction projects like buildings, bridges and roads.



Electrical

To prepare a layout of the electrical system for technicians and workers, guiding them during installation and providing a map for future maintenance and troubleshooting



Electronics

It provide a concise visual representation of electrical circuits, signal flows, and system layouts, making it easier for engineers to understand. Enables the creation of complex PCBs.



Computer

It develop strong visualization and spatial reasoning skills for software design and 3D applications. Provides foundational geometric modelling skills used to build assets for Reality (AR), Virtual Reality (VR), and video game engines

WHY IT MATTERS

EV Architecture

Smarter systems. Cleaner mobility. A sustainable future.



Battery Systems

Understand battery chemistry, management and thermal control for optimal performance and longevity.



Electric Drivetrains

Explore motors, inverters, reduction gears and power electronics.



Charging Infrastructure

Study charging standards, grid integration and fast-charging technologies.



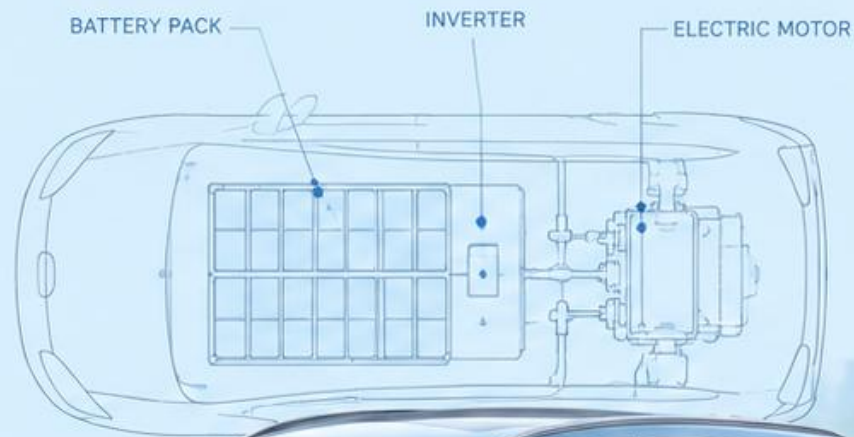
Vehicle Integration

Learn about energy flow, thermal management, BMS, and overall vehicle systems.



Sustainable Mobility

Design for efficiency, lower emissions and a greener tomorrow.



ELECTRIC / EFFICIENT / SUSTAINABLE



Electric Vehicle Architecture

Evaluation — Fully Internal

Teaching Scheme

L-1

T-0

P-2

S-0

100%**THEORY** · INTERNAL**100%****LAB** · INTERNAL

What You'll Learn

- Get hands-on with EV batteries, motors and charging setups
- Simulate EV architecture using tools and small-scale models
- Measure, test and analyse real EV parameters as a team

Broad Contents

- 1 Introduction to Automobiles
- 2 Suspension & Tyres for EVs
- 3 Introduction to Electric Vehicles
- 4 EV Components & Working Principles
- 5 EV Industry & Future Trends

WHY IT MATTERS

Electric Vehicle Architecture

How this course connects to every branch of engineering



Manufacturing

EVs completely redefine factory layouts, assembly lines, and production processes compared to traditional internal combustion engine vehicles.



Electrical

EV is essentially a high-power, mobile electrical grid on wheels, completely shifting focus from mechanical systems to advanced electrical networks. Teaches the integration of high-voltage systems containing the main battery pack, traction inverter, and electric motor.



Metallurgy

Transition to EVs is completely reshaping the global demand for advanced metals, alloys. Helps metallurgists to develop ultra-high-strength steels and light weight magnesium/aluminum alloys for structural frames.



Electronics

Teaches the architecture of dozens of interconnected Electronic Control Units (ECUs) that manage everything from ride control to cabin infotainment.



Civil

Prepares Civil engineers for the increased dead-weight loads of EVs in multi-story parking garages. Teaches the structural and civil engineers to plan requirements for fast Charging stations on highways, parking structures, and commercial hubs.



Computer

Modern EVs are "computers on wheels." The automotive industry has shifted from hardware-defined mechanical machines to software-defined vehicles (SDVs), making computer engineers central to EV development.

PCC

SEM II

3 CREDITS

THEORY + LAB

Computer-Aided Engineering Drawing

Theory Evaluation (100 Marks)

Teaching Scheme

L-2

T-0

P-2

S-0



■ MSE · 30

■ TA · 20

■ ESE · 50

Lab · Continuous Internal Evaluation — **100 Marks**

What You'll Learn

- Visualize and communicate 3D shapes as 2D orthographic views
- Draw isometric projections from orthographic views
- Represent assemblies & cut sections for engineering applications

Broad Contents

- 1 Introduction to Engineering Drawing
- 2 Orthographic & Isometric Projections
- 3 Development & Antidevelopment of Surfaces
- 4 2D & 3D Views Using CAD Software
- 5 Introduction to Machine Drawing

Computer Aided Engineering Drawing

How this course connects to Mechanical engineering

- It transitions students from theoretical physics to the practical visual language used to build machines, engines, and consumer products.
- It trains engineers to mentally convert complex 3D physical mechanisms (like gearboxes, pistons, or linkages) into accurate 2D technical drawings and vice versa.
- Acts as the mandatory prerequisite for mastering advanced 3D parametric CAD modelling software (such as SolidWorks, CATIA, or Autodesk Inventor).

Mechanical Engineering Department

F.Y. B.Tech • A.Y. 2026–27



Six Courses. One Foundation.

**Everything you learn this year becomes
the language every engineering branch
shares.**

