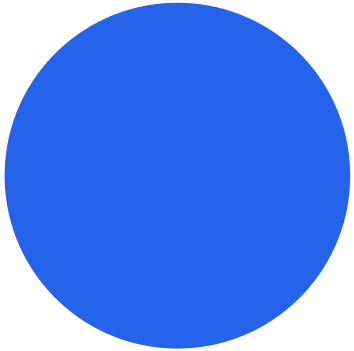
Facilities & Technical Support

Department of Mechanical Engineering

Dr. M.G.R. Educational and Research Institute



Labs & Tech Manpower

Additional Facilities

Maintenance & Safety

Research Labs & CoE

7.1 Laboratory Infrastructure Overview

1	2	3	4	5
IC Engines Lab	**Machine Shop**	**Automation Lab**	**Dynamics Lab**	**Heat Transfer Lab**
30 students / batch	30 students / batch	30 students / batch	30 students / batch	30 students / batch
20h/week	**18h/week**	**18h/week**	**16h/week**	**20h/week**

6	7	8	9	10
CAM Lab	**CAD Lab**	**Metrology Lab**	**Metallurgy Lab**	**Foundry & Welding Lab**
30 students / batch	30 students / batch	30 students / batch	30 students / batch	30 students / batch
20h/week	**24h/week**	**18h/week**	**22h/week**	**20h/week**

Machine Shop & IC Engines Lab

MACHINE SHOP

30 students / batch | 18 hrs/week

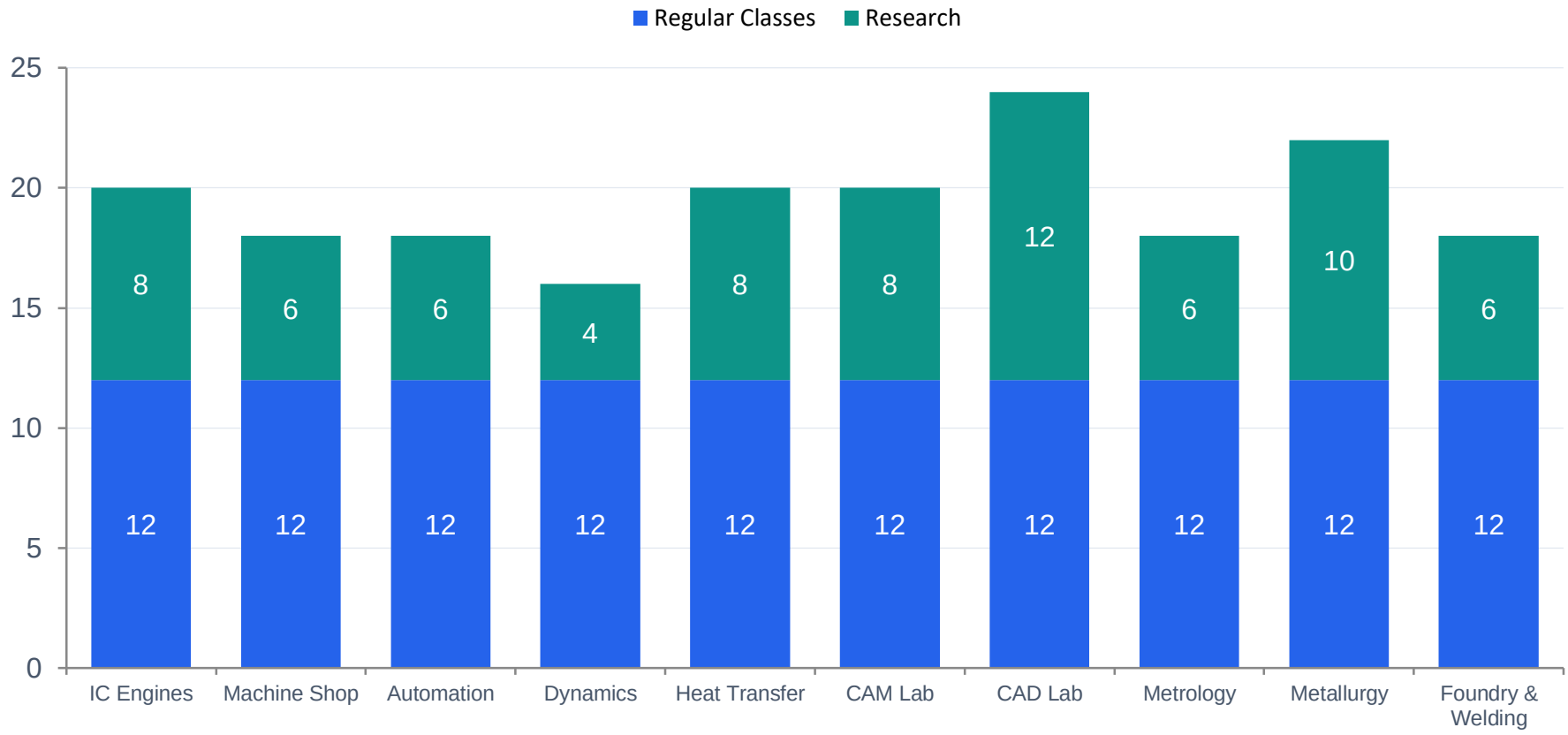
- Centre Lathe (5 nos)
- Milling Machine
- Cylindrical Grinder
- Surface Grinder
- Gear Hobbing Machine
- FDM 3D Printer
- CNC Lathe (advanced)

IC ENGINES LAB

30 students / batch | 20 hrs/week

- 4-stroke 4-cyl petrol engine + hydraulic dynamometer
- 4-stroke diesel engine + eddy current dynamometer
- Diesel engine + rope brake (2 nos.)
- Petrol engine + AC generator
- Cut-section engine models (4 nos.)
- Two-stroke petrol engine models

7.1 Lab Utilization Hours Per Week



7.1 Technical Supporting Staff

8 qualified technical staff members across all labs

1

Mr. K. Raju

C.T.I (Fitter)

IC Engines Lab

2

Mr. L. D. Thirunavukkarasu

I.T.I

Machine Shop

3

Mr. N. Siva

DME, M.A

Dynamics & Automation Labs

4

Mr. Jebin Vijayakumar

M.E (CAD)

CAM & CAD Lab

5

Mr. K.R. Nagenthiran

B.Tech (IT)

System Admin – CAD/CAM

6

Mr. S. Venugopal

C.T.I, DAE

Metallurgy Lab

7

Mr. R. Sarangapani

I.T.I (Fitter)

Metrology Lab

8

Mr. N. Palanivel

I.T.I (Welder)

Foundry & Welding Lab

7.2 Additional Facilities for Enhanced Learning

01

Twin Cylinder Diesel Engine

Twin-cylinder arrangement & performance study

PO1, PO3, PSO1, PSO2

02

CNC Lathe

Advanced CNC manufacturing operations

PO1, PO3, PSO2

03

ANSYS R2 Software

Engineering simulation & virtual analysis

PO4, PO5, PSO2

04

3D Printer

Rapid prototyping and additive manufacturing

PO1, PO3, PSO2

05

5-Axis Industrial Robot

Pick and place automation operations

PO1, PO3, PSO2

06

Computerized Imaging System

Microstructure analysis & material characterization

PO4, PO5, PSO2

07

Pensky-Martens Apparatus

Flash & fire point testing of oil samples

PO3, PO6, PSO4

08

DC Inverter (TIG Welding)

Advanced TIG welding for students

PO1, PO2, PSO3

7.3 Laboratory Maintenance & Ambiance

1

Routine Cleaning & Housekeeping

Daily cleaning of surfaces, instruments & floors. Dust covers, air filter cleaning, proper waste disposal.

2

Equipment Handling & Storage

Gloves for precision tools, designated storage areas. Safety manuals available and users trained.

3

Calibration & Testing

Regular calibration of measuring instruments, thermocouples & sensors. Records maintained.

4

Preventive Maintenance

Monthly/quarterly checks for wear, lubrication, firmware updates, wiring and power inspection.

5

Safety & Ambiance

Fire extinguishers, first aid kits, emergency cut-offs. Adequate lighting, ventilation & air conditioning.

6

Documentation & Compliance

Maintenance logs for all major equipment. Compliance with AICTE/NBA/ISO standards.

7.4 Safety Measures in Laboratories

✓ KEY DO's

- ✓ Wear appropriate PPE (goggles, gloves, safety shoes)
- ✓ Follow Standard Operating Procedures (SOPs)
- ✓ Inspect machines and tools before use
- ✓ Use calibrated measuring instruments
- ✓ Know location of fire extinguishers & first aid kits
- ✓ Ensure good ventilation in Welding/Foundry labs
- ✓ Report damaged equipment immediately
- ✓ Switch off power when machine not in use

✗ KEY DON'TS

- ✗ Never operate machines without training or authorization
- ✗ Do not wear loose clothing near rotating machinery
- ✗ No mobile phones during machine operation
- ✗ Never touch hot surfaces or molten metal bare-handed
- ✗ Do not exceed machine capacity or force cutting
- ✗ Avoid eating/drinking inside the laboratory
- ✗ Do not tamper with safety valves or system settings
- ✗ Never stand close to high-speed rotating equipment

7.5 Research Labs: AR/VR & Drone Technology Centre

AR/VR INNOVATION LAB

Industry 4.0 Emerging Technology

- Computer Systems: 20 nos.
- Meta Quest-2 Headsets: 1 no.
- PGVR-PM-366 with HD Lens: 200 nos.
- Google AR/VR Mobile: 4 nos.
- VR Pro PGVR-Pro-133D: 5 nos.
- Laptop: 1 no.

Applications: Gaming • Healthcare • Manufacturing
Education • Automotive • Assembly

DR. M.G.R. ACS DRONE TECH CENTRE

UAV Research & Innovation Hub

- Human Resource Development in UAV tech
- Research projects for analytics & monitoring
- Collaborative R&D with defense & agencies
- National capacity building in drone design
- Technical consultancy for govt & private sector
- Promote safe & responsible drone practices

Core Team: Dr. M. Chandran | Dr. J. Jayaprakash | Dr. A. Kandasamy

7.5 Centre of Excellence: Green & Bio Materials Manufacturing

AIM

Advanced Composites + Additive Manufacturing facility for research in green materials (natural fibers/resins) and biocompatible materials for medical applications.

KEY RESEARCH AREAS

- Material Development (metals, polymers, ceramics, biomaterials)
- Process Optimization (SLS, FDM, SLA techniques)
- Design for Additive Manufacturing (topology optimization)
- Post-Processing & Finishing (heat treatment, coating)
- Bioprinting for medical implants & tissue engineering
- Sustainability & Recycling of AM waste materials

FACILITIES AT COE

Universal Testing Machine	Compression Molding Machine
FDM 3D Printer	DLP / Resin 3D Printer
3D Scanner	Hot Air Oven
Board Cutting Machine	

CORE TEAM MEMBERS

- Dr. N. Ethiraj — Professor & Dean
- Dr. K. Rajan — Professor & Head
- Dr. K.R. Vijaya Kumar — Professor
- Dr. J. Jayaseelan — Professor