

LABORATORIES

NAME OF LAB	FACILITIES	MAJOR EQUIPMENT AVAILABLE
Fundamentals of Mechanical Engineering (FME) Lab	All experimental facilities are available related with fundamentals of Mechanical Engineering	Jib Crain, Screw Jack, Beam and support, Fly wheel and Friction apparatus etc.
Workshop	All required facilities for students to perform basic mechanical operations	Lathe, milling, shaper, hack saw, hand drill, double wheel grinder etc.
Drawing Lab	To draw drawings of Engineering Drawing and Machine Drawing objects	Drawing boards
Engineering Thermodynamics Lab	Study of different models	Models of steam turbines, steam Engine, Stop Valve, Blow of Cock, Different Boilers, Valves etc.
Mechanical Measurements & Metrology Lab	To measure various dimensions of objects	Tool maker's microscope

Fluid mechanics/ machinery Lab	To perform various experiments of fluid mechanics and machinery	Bernoulli's Apparatus, Metacentric Height, Free and forced vortex flow apparatus, Determination of critical velocity apparatus, coefficient of discharge apparatus, calibration of venturimeter apparatus, multistage centrifugal pump test rig.
Computer Aided Design and Manufacturing (CAD/CAM) Lab	Drawing and simulation of different objects, process	ANSYS, SOLID WORKS, C and C++ etc.
Theory of Machines (TOM) Lab	Perform different experiments on theory of machines	Universal vibration apparatus, whirling of shaft, static and dynamic balancing apparatus, epicyclic gear train, gyroscope apparatus, governor apparatus with differential attachment.
STM lab	To find out various thermo physical properties of materials	Brinell hardness testing machine, Column testing machine, compression testing machine, cupping testing machine, fatigue testing machine, impact testing machine, spring testing machine, torsion testing machine etc.
Heat and Mass Transfer (HMT) Lab	To perform various experiments on heat transfer	Heat pipe demonstrator, heat transfer exchangers, thermal conductivity apparatus, pin fin apparatus, emissivity test apparatus, pool boiling apparatus, composite wall apparatus, heat insulator.

Automobile Engineering Lab	To study various models and perform experiments on engines	Air brake system, automatic transmission system, disc brake system, petrol and diesel engine test rig models of differential, gear box, drum brake unit, chassis steering gear box, clutch system etc.
Refrigeration & Air-conditioning (RAC) Lab	To perform various experiments on Refrigeration and Air conditioning test	Vapour compression test rig, vapour absorption test rig, Domestic refrigerator, air conditioning test rig, cooling tower test rig, air conditioning simulator test rig etc.

Besides this the Department is having all basic computational facilities such as latest version of computers in HOD lab as well as faculty room, three sets of printers, lecture capturing devices etc.

S. No.	Semester	Name of lab	No. of students per setup (per batch)	Subject code	Equipment/Machines/Instruments/Tools/Software available	Weekly Utilization Status	Name and designation of the technical Staff	Qualification
1	1 st and 2 nd	Workshop Practice/ Manufacturing Process	5(60)	A000224 (037)	Carpentry Shop: - Mortise Machine, Wood planer	20 Hours	Mr. M S Dhruw, Lab Technician	ITI
					Fitting Shop			
					Lathe Machine			
					Shaper Machine			
					Drilling Machine			
					Milling Machine			
					Welding Shop: - Welding transformer, Arc welding equipment			
					Grinding			
					Power saw machine			
	Engineering Graphics and Design	5(35)	A000124 (037)	Desktop: Intel core i5 , 3.7GHz, 16GB RAM, 512 GB ssd, 18" colour monitor, CD RW, Laser Scroll Mouse	06 Hours	Mr Shrikant Vaishnav, Lab Technician	B.Sc.	
Desktop: Intel core i7 , 3.7GHz, 16GB RAM, 512 GB hdd, 18" colour monitor, CD RW, Laser Scroll Mouse								
Drafting Software: AutoCAD								
2	3 rd	Computer Aided Machine	2 (35)	B037321(037)	Desktop: Intel core i5 , 3.7GHz, 16GB RAM, 512 GB ssd, 18" colour monitor, CD RW, Laser Scroll Mouse	10 Hours	Mr. Satish Chandrakar	Diploma

		Drawing Laboratory			Desktop: Intel core i7 , 3.7GHz, 16GB RAM, 512 GB hdd, 18" colour monitor, CD RW, Laser Scroll Mouse			
					Software: AutoCAD, Solid Works, Ansys Spaceclaim			
		Engineering Thermodynamics Laboratory	5(35)	B037323(037)	Pressure gauge	06 Hours	Mr. Shrikant Vaishnav	B.Sc.
					Safety valves (cut section models): a) Lever type b) Spring loaded type c) Dead weight type d) High steam and low water type			
					Steam stop valve			
					Feed check valve			
					Blow off cock			
					Air preheater			
					Economizer			
					Superheater			
					Feed Pump			
					Steam Ejector			
					Cochran boiler			
					Lancashire boiler			
					Simple steam engine			
					Surface steam condenser			
		Jet steam condenser						
		Babcock and Wilcox boiler						
		Steam turbine						
		5(35)	B037322(037)	Vernier Callipers	06 Hours		B.E.	

3		Mechanical measurement & Metrology Laboratory			Vernier Height Gauge		Mr. RiteshBanjare	
					Depth Micrometres			
					Bevel Protractor			
					Combination Set			
					Surface plates			
	Software Lab	2 (35)	B037324(037)	Desktop: Intel core i5 , 3.7GHz, 16GB RAM, 512 GB ssd, 18" colour monitor, CD RW, Laser Scroll Mouse	10 Hours	Mr. Satish Chandrakar	Diploma	
				Desktop: Intel core i7 , 3.7GHz, 16GB RAM, 512 GB hdd, 18" colour monitor, CD RW, Laser Scroll Mouse				
				Software: AutoCAD, Solid Works, Ansys Spaceclaim				
	Fluid Mechanics Laboratory	5(35)	B037421(037)	Apparatus for determination of metacentric height	06 Hours	Mr. RiteshBanjare Lab Technician	B.E.	
				Bernoulli's apparatus				
Venturi meter								
Mouthpiece apparatus with the provision for determination of hydraulic coefficient Cc, Cd & Cv								
Vortex flow apparatus								
Reynold's apparatus								
Materials Testing Laboratory	5(35)	B037422(037)	Universal Testing Machine	10 Hours	Mr. Shrikant Vaishnav	B.Sc.		
			Impact Testing Machine					
			Fatigue Testing Machine					
			Spring Testing Machine					
			Torsion Testing Machine					
4 th								

					Cupping Testing Machine			
					Rockwell Hardness Testing Machine			
					Brinell Hardness Machine			
					Vickers Hardness Machine			
					Column Testing Machine			
		Virtual Lab	2(35)	B037424(037)	Desktop: Intel core i5 , 3.7GHz, 16GB RAM, 512 GB ssd, 18” colour monitor, CD RW, Laser Scroll Mouse	10 Hours	Mr Ritesh Banjare	B.E.
					Desktop: Intel core i7 , 3.7GHz, 16GB RAM, 512 GB hdd, 18” colour monitor, CD RW, Laser Scroll Mouse			
					Internet Connectivity			
		Manufacturing Science Laboratory	5(35)	B037423(37)	Lathe machine	20 Hours	Mr. Ritesh Banjare	B.E.
					Shaper machine			
	Drilling Machine							
	Milling Machine							
	Arc welding equipment							
	Grinding							
Power saw machine								
4	5 th	Dynamics of Machines Laboratory	5(35)	C037522(037)	Universal Vibration Apparatus	06 Hours	Mr. Satish Chandrakar Lab Technician	ITI
					Whirling of Shaft Apparatus.			
					Balancing Apparatus (Both Static & Dynamic)			
					Epicyclic Gear Train and Holding Torque Apparatus			
					Gyroscope apparatus			
					Governor apparatus with differential attachments			
	Fluid Machine Laboratory	5(35)	C037523(037)	Centrifugal Compressor	06 Hours	Mr. Shrikant Vaishnav	B.Sc.	
				Francis Turbine				
				Pelton Wheel Turbine				

							Lab Technician	
		Internal Combustion Engine Laboratory	5(35)	C037521(037)	Cut section of actual 4-stroke single cylinder diesel engine Cut section of actual 4-stroke single cylinder petrol engine Cut section of actual 4-stroke 4-cylinder car engine (petrol) Cut section of actual 2-stroke single cylinder diesel engine Cut section of actual 2-stroke single cylinder petrol engine Demonstration board of fuel supply system of petrol engine Cut section of actual pump Demonstration board of fuel supply system of diesel engine Demonstration board of ignition system of 4-wheeler automobile Demonstration board of electronic ignition system of 4-wheeler automobile Cut section model of alkaline Battery 4-stroke 2-cylinder vertical water-cooled diesel engine test rig Variable compression ratio petrol engine test rig Working model of 4-stroke 4-cylinder MPFI car engine petrol 4-stroke single cylinder diesel engine for plotting valve timing diagram 4-stroke single cylinder diesel engine for plotting valve timing diagram	06 Hours	Mr. Upendra Kumar Raghuwanshi, Lab Technician	11 th Pass

					2-stroke 2-cylinder diesel engine for plotting valve timing diagram			
					2-stroke 2-cylinder petrol engine for plotting valve timing diagram			
					Cut section model of turbocharger			
					Cut section model of five speed manual transmission			
5	6th	Heat & mass Transfer Laboratory	5(35)	C037623 (037)	Thermal conductivity of insulating powder apparatus	06 Hours	Mr. RiteshBanjare	B.E.
					Thermal conductivity of metal bar apparatus			
					Thermal conductivity of liquid apparatus			
					Transfer rate and temperature distribution for a pin fin apparatus			
					Emissivity of the test plate surface apparatus			
					Stefen-Boltzman constant of radiation of heat transfer apparatus			
					Surface heat transfer coefficient for heated vertical cylinder in natural convection apparatus			
					Heat transfer coefficient in drop wise and film wise condensation apparatus			
					Critical heat flux in saturated pool boiling apparatus			
					Performance of different heat pipe apparatus			
					Heat transfer rate through heat exchanger apparatus			
					Heat transfer coefficient in forced convection of air in a tube apparatus			
					Heat transfer through composite wall apparatus			
					Thermal conductivity of insulating slab apparatus			
					Heat transfer through lagged pipe apparatus			
					Unsteady state heat transfer apparatus			

					Testing and performance test rig for heat insulators			
		Virtual Lab 2	2(35)	C037624(037)	Desktop: Intel core i5 , 3.7GHz, 16GB RAM, 512 GB ssd, 18" colour monitor, CD RW, Laser Scroll Mouse	10 Hours	Mr Ritesh Banjare	B.E.
					Desktop: Intel core i7 , 3.7GHz, 16GB RAM, 512 GB hdd, 18" colour monitor, CD RW, Laser Scroll Mouse			
					Internet Connectivity			
		Computer Aided Modeling and Analysis Lab	2(35)	C037622(037)	Desktop: Intel core i5 , 3.7GHz, 16GB RAM, 512 GB ssd, 18" colour monitor, CD RW, Laser Scroll Mouse	10 Hours	Mr Ritesh Banjare	B.E.
					Desktop: Intel core i7 , 3.7GHz, 16GB RAM, 512 GB hdd, 18" colour monitor, CD RW, Laser Scroll Mouse			
					Software: Solid Works			
6	7 th	Refrigeration & Air Conditioning Laboratory	5(35)	D037721(037)	Domestic Refrigerator	06 Hours	Mr. RiteshBanjare Lab Technician	B.E.
					Hermitically Sealed Compressor			
					Mechanical Heat pump			
					Air & Water Heat Pump			
					Refrigeration tutor test rig			
					Air Conditioning Test Rig			
					Cooling Tower Test Rig			
					Air Conditioning simulator test rig			
		Simple Absorption System Test Rig						
				CIM and Automation Lab	5(35)	D037722(037)	Desktop: Intel core i5 , 3.7GHz, 16GB RAM, 512 GB ssd, 18" colour monitor, CD RW, Laser Scroll Mouse	10 Hours
					ANSYS 18.0			
					CNC lathe			

					CNC milling			
7	8 th	Finite Element Methods laboratory	5(35)	337862(37)	Intel core i3 , 3.7GHz, 4GB RAM, 500 GB HDD, 18” colour monitor, CD RW, Laser Scroll Mouse ANSYS 18.0	10 Hours	Mr. RiteshBanjare Lab Technician	B.E.
S. No.	Semester	Name of lab	No. of students per setup (per batch)	Subject code	Equipment/Machines/Instruments/Tools/Software available	Weekly Utilization Status	Name and designation of the technical Staff	Qualification
1	1 st and 2 nd	Workshop Practice/ Manufacturing Process	5(60)	A000224 (037)	Carpentry Shop: - Mortise Machine, Wood planer	20 Hours	Mr. M S Dhruw, Lab Technician	ITI
					Fitting Shop			
					Lathe Machine			
					Shaper Machine			
					Drilling Machine			
					Milling Machine			
					Welding Shop: - Welding transformer, Arc welding equipment			
					Grinding			
					Power saw machine			
		Engineering Graphics and Design	5(35)	A000124 (037)	Desktop: Intel core i5 , 3.7GHz, 16GB RAM, 512 GB ssd, 18” colour monitor, CD RW, Laser Scroll Mouse	06 Hours	Mr Shrikant Vaishnav, Lab Technician	B.Sc.
Desktop: Intel core i7 , 3.7GHz, 16GB RAM, 512 GB hdd, 18” colour monitor, CD RW, Laser Scroll Mouse								
Drafting Software: AutoCAD								

2	3 rd	Computer Aided Machine Drawing Laboratory	2 (35)	B037321(037)	Desktop: Intel core i5 , 3.7GHz, 16GB RAM, 512 GB ssd, 18” colour monitor, CD RW, Laser Scroll Mouse	10 Hours	Mr. Satish Chandrakar	Diploma
					Desktop: Intel core i7 , 3.7GHz, 16GB RAM, 512 GB hdd, 18” colour monitor, CD RW, Laser Scroll Mouse			
					Software: AutoCAD, Solid Works, Ansys Spaceclaim			
		Engineering Thermodynamics Laboratory	5(35)	B037323(037)	Pressure gauge	06 Hours	Mr. Shrikant Vaishnav	B.Sc.
					Safety valves (cut section models): a) Lever type b) Spring loaded type c) Dead weight type d) High steam and low water type			
					Steam stop valve			
	Feed check valve							
	Blow off cock							
	Air preheater							
	Economizer							
	Superheater							
	Feed Pump							
	Steam Ejector							
	Cochran boiler							
Lancashire boiler								
Simple steam engine								
Surface steam condenser								
Jet steam condenser								
Babcock and Wilcox boiler								

3	4 th	Mechanical measurement & Metrology Laboratory	5(35)	B037322(037)	Steam turbine	06 Hours	Mr. RiteshBanjare	B.E.
					Vernier Callipers			
					Vernier Height Gauge			
					Depth Micrometres			
					Bevel Protractor			
					Combination Set			
					Surface plates			
		Software Lab	2 (35)	B037324(037)	Desktop: Intel core i5 , 3.7GHz, 16GB RAM, 512 GB ssd, 18” colour monitor, CD RW, Laser Scroll Mouse	10 Hours	Mr. Satish Chandrakar	Diploma
					Desktop: Intel core i7 , 3.7GHz, 16GB RAM, 512 GB hdd, 18” colour monitor, CD RW, Laser Scroll Mouse			
					Software: AutoCAD, Solid Works, Ansys Spaceclaim			
		Fluid Mechanics Laboratory	5(35)	B037421(037)	Apparatus for determination of metacentric height	06 Hours	Mr. RiteshBanjare Lab Technician	B.E.
					Bernoulli’s apparatus			
Venturi meter								
Mouthpiece apparatus with the provision for determination of hydraulic coefficient Cc, Cd &Cv								
Vortex flow apparatus								
Reynold’s apparatus								
Materials Testing Laboratory	5(35)	B037422(037)	Universal Testing Machine	10 Hours	Mr. Shrikant Vaishnav	B.Sc.		
			Impact Testing Machine					
			Fatigue Testing Machine					

					Spring Testing Machine			
					Torsion Testing Machine			
					Cupping Testing Machine			
					Rockwell Hardness Testing Machine			
					Brinell Hardness Machine			
					Vickers Hardness Machine			
					Column Testing Machine			
	Virtual Lab	2(35)	B037424(037)	Desktop: Intel core i5 , 3.7GHz, 16GB RAM, 512 GB ssd, 18” colour monitor, CD RW, Laser Scroll Mouse	10 Hours	Mr Ritesh Banjare	B.E.	
				Desktop: Intel core i7 , 3.7GHz, 16GB RAM, 512 GB hdd, 18” colour monitor, CD RW, Laser Scroll Mouse				
				Internet Connectivity				
	Manufacturing Science Laboratory	5(35)	B037423(37)	Lathe machine	20 Hours	Mr. Ritesh Banjare	B.E.	
				Shaper machine				
				Drilling Machine				
				Milling Machine				
Arc welding equipment								
Grinding								
Power saw machine								
4	5 th	Dynamics of Machines Laboratory	5(35)	C037522(037)	Universal Vibration Apparatus	06 Hours	Mr. Satish Chandrakar Lab Technician	ITI
					Whirling of Shaft Apparatus.			
					Balancing Apparatus (Both Static & Dynamic)			
					Epicyclic Gear Train and Holding Torque Apparatus			
					Gyroscope apparatus			
					Governor apparatus with differential attachments			
		5(35)	C037523(037)	Centrifugal Compressor	06 Hours		B.Sc.	

		Fluid Machine Laboratory			Francis Turbine		Mr. Shrikant Vaishnav Lab Technician	
					Pelton Wheel Turbine			
		Internal Combustion Engine Laboratory	5(35)	C037521(037)	Cut section of actual 4-stroke single cylinder diesel engine	06 Hours	Mr. Upendra Kumar Raghuwanshi, Lab Technician	11 th Pass
					Cut section of actual 4-stroke single cylinder petrol engine			
					Cut section of actual 4-stroke 4-cylinder car engine (petrol)			
					Cut section of actual 2-stroke single cylinder diesel engine			
					Cut section of actual 2-stroke single cylinder petrol engine			
					Demonstration board of fuel supply system of petrol engine			
					Cut section of actual pump			
					Demonstration board of fuel supply system of diesel engine			
					Demonstration board of ignition system of 4-wheeler automobile			
					Demonstration board of electronic ignition system of 4-wheeler automobile			
					Cut section model of alkaline Battery			
					4-stroke 2-cylinder vertical water-cooled diesel engine test rig			
					Variable compression ratio petrol engine test rig			
					Working model of 4-stroke 4-cylinder MPFI car engine petrol			
					4-stroke single cylinder diesel engine for plotting valve timing diagram			

					4-stroke single cylinder diesel engine for plotting valve timing diagram			
					2-stroke 2-cylinder diesel engine for plotting valve timing diagram			
					2-stroke 2-cylinder petrol engine for plotting valve timing diagram			
					Cut section model of turbocharger			
					Cut section model of five speed manual transmission			
5	6th	Heat & mass Transfer Laboratory	5(35)	C037623 (037)	Thermal conductivity of insulating powder apparatus	06 Hours	Mr. RiteshBanjare	B.E.
					Thermal conductivity of metal bar apparatus			
					Thermal conductivity of liquid apparatus			
					Transfer rate and temperature distribution for a pin fin apparatus			
					Emissivity of the test plate surface apparatus			
					Stefen-Boltzman constant of radiation of heat transfer apparatus			
					Surface heat transfer coefficient for heated vertical cylinder in natural convection apparatus			
					Heat transfer coefficient in drop wise and film wise condensation apparatus			
					Critical heat flux in saturated pool boiling apparatus			
					Performance of different heat pipe apparatus			
					Heat transfer rate through heat exchanger apparatus			
					Heat transfer coefficient in forced convection of air in a tube apparatus			
					Heat transfer through composite wall apparatus			
					Thermal conductivity of insulating slab apparatus			

					Heat transfer through lagged pipe apparatus				
					Unsteady state heat transfer apparatus				
					Testing and performance test rig for heat insulators				
		Virtual Lab 2	2(35)	C037624(037)		Desktop: Intel core i5 , 3.7GHz, 16GB RAM, 512 GB ssd, 18” colour monitor, CD RW, Laser Scroll Mouse	10 Hours	Mr Ritesh Banjare	B.E.
						Desktop: Intel core i7 , 3.7GHz, 16GB RAM, 512 GB hdd, 18” colour monitor, CD RW, Laser Scroll Mouse			
						Internet Connectivity			
		Computer Aided Modeling and Analysis Lab	2(35)	C037622(037)		Desktop: Intel core i5 , 3.7GHz, 16GB RAM, 512 GB ssd, 18” colour monitor, CD RW, Laser Scroll Mouse	10 Hours	Mr Ritesh Banjare	B.E.
						Desktop: Intel core i7 , 3.7GHz, 16GB RAM, 512 GB hdd, 18” colour monitor, CD RW, Laser Scroll Mouse			
						Software: Solid Works			
6	7 th	Refrigeration & Air Conditioning Laboratory	5(35)	D037721(037)	Domestic Refrigerator	06 Hours	Mr. RiteshBanjare Lab Technician	B.E.	
					Hermitically Sealed Compressor				
					Mechanical Heat pump				
					Air & Water Heat Pump				
					Refrigeration tutor test rig				
					Air Conditioning Test Rig				
					Cooling Tower Test Rig				
					Air Conditioning simulator test rig				
		Simple Absorption System Test Rig							
		CIM and Automation Lab	5(35)	D037722(037)		Desktop: Intel core i5 , 3.7GHz, 16GB RAM, 512 GB ssd, 18” colour monitor, CD RW, Laser Scroll Mouse	10 Hours	Mr. RiteshBanja	B.E.

					ANSYS 18.0		re Lab Technician	
					CNC lathe			
					CNC milling			
7	8 th	Finite Element Methods laboratory	5(35)	337862(37)	Intel core i3 , 3.7GHz, 4GB RAM, 500 GB HDD, 18" colour monitor, CD RW, Laser Scroll Mouse	10 Hours	Mr. RiteshBanjare Lab Technician	B.E.
					ANSYS 18.0			