VISION OF THE DEPARTMENT

To create students technologically predominant and ethically well-qualified engineers.

MISSION OF THE DEPARTMENT

1. Imparting quality education to the students and enhancing their skills to make them competitive mechanical engineers.
2. Maintaining vital, state-of-the-art research facilities to provide students and faculty with opportunities to create, interpret, apply and disseminate knowledge.

PROGRAM EDUCATIONAL OUTCOMES (PEO) FOR B.Tech. MECHANICAL ENGINEERING

1. Be able to employable as hardware & software professionals in reputed industries.
2. Be able to analyze the problems by applying the principles of Mechanical Engineering, mathematics, scientific investigation to design and implement industry accepted solutions by using latest technologies.
3. Be able to work productively in supportive and leadership roles on multidisciplinary teams with effective communication and team work skills by considering high regard to legal and ethical responsibilities.
4. Be able to embrace lifelong learning to meet ever changing developments in Mechanical Engineering

PROGRAM OUTCOMES (PO) FOR B.Tech. MECHANICAL ENGINEERING

1: Ability to apply Mathematics-Science-Engineering in job and life.

2: Ability to identify, formulate and solve engineering problems.

3: Ability to use the techniques, skills and modern engineering tools necessary for engineering practice.

4: Ability to design system/component/process with constraints to meet desired needs.

5: Ability to design divide and conquer experiments as well as analyze and interpret data.

6: Ability to function on multi disciplinary teams and to exhibit team culture.

7: Exposure necessary to understand the impact of engineering solutions in a global and societal context.

8: Recognition of the need for, and an ability to engage in life-long learning.

9: Ability for good and effective communication.

10: Expertise with knowledge of contemporary issues.

11: contributions to industry/academia.

12: Understanding and demonstration of professional and ethical responsibilities.

PROGRAM SPECIFIC OUTCOMES (PSO) FOR B.Tech. MECHANICAL ENGINEERING

1. Apply their understanding in the realm of Design, Production and thermal fluid sciences to solve engineering difficulties utilizing sophisticated technology.

2. Fruitfully apply the values of design, analysis and execution of mechanical systems/processes which have been feeded as a part of the curriculum.

3. Extend and implement new thoughts on product design and development with the aids of modern CFD and CAD/CAM tools, while ensuring best manufacturing practices.

Course Outcome	Year / Semester : I / I-Sem	Subject Name (Code): (B18MA01) Linear Algebra and Calculus	No. of Hours : L: 3 T: 1 P: 0 Total: 4	Credits: 4
After the completion of this course, the students should be able to				
1	Write the matrix representation of a set of linear equations and to analyze the solution of the system of equations			
2	Find the Eigen values and Eigen vectors			
3	Reduce the quadratic form to canonical form using orthogonal transformations			
4	Analyze the nature of sequence and series			
5	Solve the applications on the mean value theorems			
6	Evaluate the improper integrals using Beta and Gamma functions			
7	Find the extreme values of functions of two variables with/ without constraints			

Course Outcome	Year / Semester : I / I-Sem	Subject Name (Code): (B18EN01) English	No. of Hours : L: 2 T: 0 P: 0 Total: 2	Credits: 2
1	Use English Language effectively in spoken and written forms			
2	Comprehend the given texts and respond appropriately			
3	Communicate confidently in various contexts and different cultures			
4	Acquire basic proficiency in English including reading and listening comprehension, writing and speaking skills			

Course Outcome	Year / Semester : I / I-Sem	Subject Name (Code): (B18CH01) Engineering Chemistry	No. of Hours : L: 3 T: 1 P:0 Total: 4	Credits: 4
The basic concepts included in this course will help the student to gain				
1	The knowledge of molecular and electronic changes, band theory related to conductivity			
2	The knowledge of water treatment and corrosion			

3	The knowledge of organic reaction mechanisms and polymers
4	The required principles and concepts of electro chemistry and batteries

Course Outcome	**Year / Semester : I / I-Sem**	**Subject Name (Code): (**B18ME01**)** Engineering Graphics	**No. of Hours : L: 1 T: 0 P: 4 Total: 5**	**Credits: 3**
After the completion of this course, the students will be able to				
1	Analyze the Projections of Points.			
2	Understand the projections of solids.			
3	Estimate the use of drawings, dimensioning, scales and conic sections			
4	Modify the applications of this knowledge in computer graphics			
5	Compare the Conversion of Isometric views to Orthographic views			

Course Outcome	**Year / Semester : I / II-Sem**	**Subject Name (Code): (**B18MA02**)** Differential equations and vector calculus	**No. of Hours : L: 3 T: 1 P: 0 Total: 4**	**Credits: 4**
After learning the contents of this paper the student must be able to				
1	Identify whether the given differential equation of first order is exact or not			
2	Solve higher differential equation and apply the concept of differential equation to real world problems			
3	Evaluate the multiple integrals and apply the concept to find areas, volumes, centre of mass and gravity for cubes, sphere and rectangular parallel piped			
4	Evaluate the line, surface and volume integrals and converting them from one to another			

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Department of Mechanical Engineering

Course Outcome	**Year / Semester : I / II-Sem**	**Subject Name (Code): (**B18PH03**)** Engineering Physics	**No. of Hours : L: 3 T: 1 P: 0 Total: 4**	**Credits: 4**
After the completion of this course, the students should be able to				
1	The student learns about transformation concept learns basics of quantum mechanics.			
2	The student gains knowledge on basics of rigid body dynamics and lasers which leads to new innovations and improvements			
3	The knowledge of physics relevant to engineering is critical for converting ideas into technology			
4	Characterization and study of properties of optodevices helps the students to prepare new materials for various engineering applications			

Course Outcome	**Year / Semester : I / II-Sem**	**Subject Name (Code): (**B18CE01**)** Engineering Mechanics	**No. of Hours : L: 3 T: 1 P: 0 Total: 4**	**Credits: 4**
After the completion of this course, the students should be able to				
1	Know the fundamental knowledge of Specification of force vector.			
2	Compare Spatial Force systems			
3	Understand the Coplanar Force Systems.			
4	Apply Deformation of Stepped shaft due to axial loading in problems			
5	Evaluate Kinematics Problems and Kinetics Problems			

Course Outcome	**Year / Semester : I / II-Sem**	**Subject Name (Code): (**B18ME02**)** Engineering Work shop & IT workshop	**No. of Hours : L: 0 T: 0 P: 3 Total: 3**	**Credits: 1.5**
After the completion of this course, the students should be able to				
1	Know the fundamental knowledge of various trades and their usage in real time Applications			

2	Compare Foundry, Welding, Black smithy, Fitting, Machine shop and house wiring
3	Understand the basis for analyzing power tools in construction and wood working, electrical engineering and mechanical engineering
4	Apply basic concepts of computer hardware for assembly and disassembly

Course Outcome	**Year / Semester : I / II-Sem**	**Subject Name (Code): (**B18PH04**)** Engineering Physics Lab	**No. of Hours : L: 0 T: 0 P: 3 Total: 3**	**Credits: 1.5**
After the completion of this course, the students should be able to				
1	The laboratory course helps the student how to operate different equipments related to engineering.			
2	It also allows the student to develop experimental skills to design new experiments in engineering.			
3	The course enlightens the student about modern equipment like solar cell, optical fibre etc.,			
4	With the exposure to these experiments, the student can compare the theory and correlate with experiment			

Course Outcome	**Year / Semester : II / I-Sem**	**Subject Name (Code): (**B18EE44**)** Basic Electrical & Electronics Engineering	**No. of Hours : L: 3 T: 0 P: 0 Total: 3**	**Credits: 3**
After the completion of this course, the students should be able to				
1	Learn Basic circuit concepts such as electrical parameters, quantities , laws and network reduction techniques and apply the network theorems with DC excitation in the systems			
2	Analyze the steady state operation of single phase and three phase AC circuits and study the relationship between voltage and current for delta and star connections			
3	Explore the construction, working , control and testing of various DC and AC Machines			
4	Gain knowledge on basic electronic devices such as P-N junction Diode, rectifiers and filter with their V-I characteristics.			

5	Acquire extended knowledge on next generation of electronic devices such transistors, zener diode and SCR devices.

Course Outcome	**Year / Semester : II / I-Sem**	**Subject Name (Code): (B18ME03) METALLURGY AND MATERIAL SCIENCE**	**No. of Hours : L: 3 T: 0 P: 0 Total: 3**	**Credits: 3**
After the completion of this course, the students should be able to				
1	Understand the bond formation, grains and grain boundaries in crystalline metals.			
2	Apply lever rule in calculating the liquid and solid percentage.			
3	Apply heat treatment processes to different materials to get required properties			
4	Gain knowledge about advanced materials like composites & ceramics			
5	Analyze the applications and the properties of cast irons and steels.			

Course Outcome	**Year / Semester : II / I-Sem**	**Subject Name (Code): (B18ME04) MECHANICS OF SOLIDS**	**No. of Hours : L: 3 T: 1 P: 0 Total: 4**	**Credits: 4**
After the completion of this course, the students should be able to				
1	Understand the concepts of stress and strain in mechanics of solids and material properties.			
2	Apply the fundamental concepts of shear force & bending moment for Cantilever beam, simply supported beam & overhanging beam with point loads, UDL, gradually varying loads & their combination.			
3	Apply the fundamental concepts of Bending stresses & shear stresses for different Beams			
4	Apply the different methods to determine the deflection & slope of different beams like double integration method, Area moment method & Macaulay's method			

5	Apply the Lame's equation to determine stresses in Thick cylinders. To understand the concept of torsion and its application to circular shafts.

Course Outcome	**Year / Semester : II / I-Sem**	**Subject Name (Code): (B18ME05) THERMODYNAMICS**	**No. of Hours : L: 3 T: 0 P: 0 Total: 3**	**Credits: 3**
After the completion of this course, the students should be able to				
1	Understand the basic thermodynamic principles and their applications			
2	Apply the laws of thermodynamics for different thermal systems.			
3	Use mollier diagram and steam tables to find the properties of pure substances.			
4	Calculate different properties of perfect gases, real gases and mixtures of perfect			
5	Analyze different power cycles.			

Course Outcome	**Year / Semester : II / I-Sem**	**Subject Name (Code): (B18ME06) MACHINE DRAWING**	**No. of Hours : L: 1 T: 0 P: 2 Total: 3**	**Credits: 2**
After the completion of this course, the students should be able to				
1	Understand various conventions used in machine drawing			
2	Prepare the assembly and part drawings from component drawing.			
3	Identify the use of various machine components			
4	Interpret and make conclusions about a given drawing			
5	Apply the First angle projection			

Course Outcome	**Year / Semester : II / I-Sem**	**Subject Name (Code): (B18ME07) MECHANICS OF**	**No. of Hours : L: 0 T: 0 P: 3 Total: 3**	**Credits: 1.5**

		SOLIDS AND METALLURGY LAB		
After the completion of this course, the students should be able to				
1	Identify grain and grain boundary, crystal structure of different materials.			
2	Study the microstructure of various materials			
3	Analyze the correlation between Mechanical and Metallurgical properties			
4	Perform material testing and analyze various material properties			

Course Outcome	**Year / Semester : II/ I-Sem**	**Subject Name (Code): ((B18ME08) FUELS AND LUBRICANTS LAB**	**No. of Hours : L: 0 T: 0 P: 2 Total: 2**	**Credits: 1**
After the completion of this course, the students should be able to				
1	Apply different methods to determine the flash point & fire point of liquid fuels.			
2	Apply carbon residue test to determine carbon% in liquid fuels			
3	Apply Different methods to determine viscosity of Liquid lubricants			
4	Apply different methods to determine the calorific value of fuels			

Course Outcome	**Year / Semester : II/ I-Sem**	**Subject Name (Code): (**B18EE45**)** Basic Electrical & Electronics Engineering Lab	**No. of Hours : L: 0 T: 0 P: 3 Total: 3**	**Credits: 1.5**
After the completion of this course, the students should be able to				
1	Learn to simplify complex electric and electronic circuits by applying the KVL and KCL laws			

2	Identify the optimal loading on the system.
3	Analyze the performance of DC machines
4	Identify and analyze the performance and operation of semi conducting devices.

Course Outcome	**Year / Semester : II/ II-Sem**	**Subject Name (Code): (**B18MC07**)** Gender Sensitization	**No. of Hours : L: 2 T: 0 P: 0 Total: 2**	**Credits: 0**
After the completion of this course, the students should be able to				
1	Students will have developed a better understanding of important issues related to gender in contemporary India.			
2	Students will be sensitized to basic dimensions of the biological, sociological, psychological and legal aspects of gender. This will be achieved through discussion of materials derived from research, facts, everyday life, literature and films			
3	Students will attain a finer grasp of how gender discrimination works in our society and how to counter them.			
4	Students will acquire insights into the gendered division of labour and its relation to politics and economics.			
5	Men and women students and professionals will be better equipped to work and live in harmony. Students will develop a sense of appreciation of women in all walks of life.			

Course Outcome	**Year / Semester : II/ II-Sem**	**Subject Name (Code): (**B18MA05**)** Probability & Statistics	**No. of Hours : L: 3 T: 1 P: 0 Total: 4**	**Credits: 4**
After the completion of this course, the students should be able to				
1	Use probability theory and deals with modelling uncertainty and apply discrete and continuous probability, in order to evaluate the probability of real world events.			
2	Develop discrete probability distributions and its applications, and use these techniques to generate data from Binomial and Poisson Distributions.			
3	Develop continuous probability distributions and its applications, and use these techniques to generate data from Normal Distribution.			

4	Perform correlation analysis, in order to estimate the nature and the strength of the linear relationship that may exist between two variables of interest, Perform regression analysis to estimate the magnitude of change in one variable due to a given change in the other variable.
5	Construct confidence interval estimates for population parameters and conduct hypothesis tests concerning population parameters, for single and multiple populations based on sample data. And also perform Student T-test, F-test and X^2- test(chi-square)

Course Outcome	**Year / Semester : II/ II-Sem**	**Subject Name (Code): (**B18ME09**)** Fluid Mechanics And Hydraulic Machinery	**No. of Hours : L: 3 T: 0 P: 0 Total: 3**	**Credits: 3**
After the completion of this course, the students should be able to				
1	Apply mathematics and basic sciences and translates this knowledge to understand fluid flow principles and their applications.			
2	Understand fundamental knowledge of the mechanics of fluid at rest and in motion.			
3	Observe fluid phenomena by developing and using the principles, laws			
4	Analyze fluid interactions with natural and constructed systems.			
5	Associate fundamental knowledge & performance of different turbines & pumps.			

Course Outcome	**Year / Semester : II/ II-Sem**	**Subject Name (Code): (**B18ME10**)** Thermal Engineering-I	**No. of Hours : L: 3 T: 0 P: 0 Total: 3**	**Credits: 3**
After the completion of this course, the students should be able to				
1	Understand the concept and working of two and four strokes I.C. engines.			
2	Analyse the normal and abnormal condition for the combustion of SI and CI engines also the parameters which effect the combustion characteristics.			
3	Able to calculate the performance of the engine with different parameters.			
4	Get knowledge about compressors and their classifications.			
5	Differentiate various compressor on the basis of their working and requirement and can use suitable one.			

Course Outcome	**Year / Semester : II/ II-Sem**	**Subject Name (Code): (**B18ME11**)** Kinematics of Machines	**No. of Hours : L: 4 T: 0 P: 0 Total: 4**	**Credits: 4**

After the completion of this course, the students should be able to	
1	Identify the basic mechanisms involved in machines.
2	Develop familiarity with application of kinematics theories to real-world machines.
3	Identify the basic relations between distance, time, velocity and acceleration.
4	Understand analytical linkage analysis, determine cam profiles
5	Analyze gear trains and gear profiles.

Course Outcome	**Year / Semester : II/ II-Sem**	**Subject Name (Code): (**B18ME12**)** Production Technology	**No. of Hours : L: 3 T: 0 P: 0 Total: 3**	**Credits: 3**
After the completion of this course, the students should be able to				
1	Apply the knowledge of casting, welding joints and forces and power requirements in metal forming processes.			
2	Relate the melting, solidification, pattern allowances, gating and riser design of mold cavity, aspects of casting.			
3	Understand basic calculations of forces and power requirements in the metal forming operations.			
4	Differentiate the application of welding using the arc welding, gas welding, resistance welding, soldering and brazing.			
5	Survey the defects occurring in forging operation.			

Course Outcome	**Year / Semester : II/ II-Sem**	**Subject Name (Code): (**B18ME13**)** Fluid Mechanics and Hydraulic Machinery Lab	**No. of Hours : L: 0 T: 0 P: 3 Total: 3**	**Credits: 1.5**
After the completion of this course, the students should be able to				
1	Apply knowledge of fluid mechanics and hydraulic machines and translates this knowledge for understanding fluid flow principles and their application to experiments.			

2	Practical exposure by using components vacuum gauge, pressure gauge, manometers, pipes, motors, pumps & turbines.
3	Use comparison of theoretical values with the real parameters.
4	Know and understand the experimental analysis in turbines and pumps with parameters such as discharge, head of water, speed of brake drum.

Course Outcome	**Year / Semester : II/ II-Sem**	**Subject Name (Code): (**B18ME14**)** Production Technology Lab	**No. of Hours : L: 0 T: 0 P: 3 Total: 3**	**Credits: 1.5**
After the completion of this course, the students should be able to				
1	Understand basic knowledge and concepts of various experiments.			
2	Perform joining of materials (similar/dissimilar) using welding.			
3	Analyze the concepts of extrusion and design of die.			
4	Operate injection molding and blow molding machines.			

Course Outcome	**Year / Semester : III/ I-Sem**	**Subject Name (Code): (**B18ME15**)** Machine Tools & Metal Cutting	**No. of Hours : L: 3 T: 0 P: 0 Total: 3**	**Credits: 3**
After the completion of this course, the students should be able to				
1	Apply cutting mechanics to metal machining based on cutting force and power consumption.			
2	Operate lathe, milling machines, drill press, grinding machines, etc.			
3	Evaluate mach inability of different materials using specific cutting forces and surface finish.			
4	Understand Principles of design of Jigs and fixtures.			
5	Compare grinding, lapping and honing operations.			

Course Outcome	**Year / Semester :**	**Subject Name (Code): (**B18ME16**)**	**No. of Hours : L: 4 T: 0 P: 0**	**Credits: 4**

	III/ I-Sem	Dynamics of Machinery	**Total: 4**	
After the completion of this course, the students should be able to				
1	Analyze the forces and torques in mechanisms and machines in operation. Know the function of governors, clutches and bearings.			
2	Compute the frictional torque in clutches and braking torque in brakes.			
3	Design the flywheel for different IC engines.			
4	Evaluate the balancing masses in rotary and reciprocating balancing.			
5	Calculate the frequencies of different vibrations			

Course Outcome	**Year / Semester : III/ I-Sem**	**Subject Name (Code): (**B18ME17**)** Design of Machine Members-I	**No. of Hours : L: 3 T: 0 P: 0 Total: 3**	**Credits: 3**
After the completion of this course, the students should be able to				
1	Design a particular machine element and make use of standards parts and dimensions using design data book.			
2	Design of shafts , shaft couplings like flange couplings, flexible couplings.			
3	Determine the Stresses and deflections of bolded joints, keys, cotters, knuckle joints.			
4	Determine the Stresses and deflections of helical springs			
5	Design of riveted, welded joint and screwed joints			

Course Outcome	**Year / Semester : III/ I-Sem**	**Subject Name (Code): (**B18ME18**)** Metrology and Surface Engineering	**No. of Hours : L: 3 T: 0 P: 0 Total: 3**	**Credits: 3**
After the completion of this course, the students should be able to				
1	Apply mathematics to calculations of surface texture assessment by using C.L.A. and R.M.S. methods.			

2	Analyse principles of optics, interference, light to optical flats, interferometers, microscopes and optical measuring instruments.
3	Compare tabulated physical data that are useful to assembly of components, clearance, transition, interference fits.
4	Illustrate linear, angular measurement by using various micrometers, bevel protractor, auto collimator etc.
5	Classify the basic techniques of surface engineering, surface treatment, surface coatings, and surface cleanings

Course Outcome	**Year / Semester : III/ I-Sem**	**Subject Name (Code): (**B18ME19**)** Thermal Engineering-II	**No. of Hours : L: 3 T: 0 P: 0 Total: 3**	**Credits: 3**
After the completion of this course, the students should be able to				
1	Understand the basic concept behind the thermal power plant.			
2	Get knowledge about working of boilers with their specification.			
3	Analyze the importance of nozzle and condenser in steam power plant.			
4	Identify the different types of steam turbines and use accordingly to the requirement			
5	Get the concepts of gas power plant with its different components			

Course Outcome	**Year / Semester : III/ I-Sem**	**Subject Name (Code): (**B18ME20**)** Thermal Engineering Lab	**No. of Hours : L: 0 T: 0 P: 3 Total: 3**	**Credits: 1.5**
After the completion of this course, the students should be able to				
1	Identify various types of engines and their parts.			
2	Understand the power of different engine and where they can be used			
3	Estimate the performance of different engine and analyze them.			
4	Analyze engines to set better efficiencies by knowing Brake specific fuel consumption of the engines.			

Course Outcome	Year / Semester : III/ I-Sem	Subject Name (Code): (B18ME21) Metrology& Machine Tools Lab	No. of Hours : L: 0 T: 0 P: 3 Total: 3	Credits: 1.5
After the completion of this course, the students should be able to				
1	Use different types of measuring instruments			
2	Perform different operations on Lathe machines.			
3	Measure angles and taper measurements.			
4	Evaluate different heights by using Vernier height gauge.			

Course Outcome	Year / Semester : III / II-Sem	Subject Name (Code): (B18ME22) FINITE ELEMENT METHODS	No. of Hours : L: 3 T: 0 P: 0 Total: 3	Credits: 3
After the completion of this course, the students should be able to				
1	Student is able to analyze real time engineering objects and to present a well designed structures.			
2	Student can analyze bars beams, shafts and array symmetric solids			
3	Student is able to understand and analyze the heat flow and know the temperature distribution at various points on the components			
4	Student can analyze any complicated structure by utilizing the computer software like ANSYS instead of analytical methods			
5	Estimate Load vector and stresses in 2D problems			

Course Outcome	Year / Semester : III / II-Sem	Subject Name (Code): (B18ME23) DESIGN OF MACHINE MEMBERS – II	No. of Hours : L: 4 T: 0 P: 0 Total: 4	Credits: 4

After the completion of this course, the students should be able to				
1	Design journal and roller bearings,			
2	Design engine parts like connecting rod, crank pins, crank shafts, pistons, cylinder and cylinder liner			
3	Understand Power transmission system by belt drives and chain drives			
4	Understand the design of different gear.			
5	Understand the design of different power screws			

Course Outcome	**Year / Semester : III / II-Sem**	**Subject Name (Code): (**B18ME24) HEAT& MASS TRANSFER	**No. of Hours : L: 3 T: 0 P: 0 Total: 3**	**Credits: 3**
After the completion of this course, the students should be able to				
1	Understand the basics of heat transfer with good knowledge of conduction , construction and radiation.			
2	Identify the free convection and forced convection requirement for particular design.			
3	Analyse the concept of heat convection and get better result from free convection.			
4	To know the concept of hydrodynamics and thermal boundary in forced convection.			
5	Design effective heat exchanger by considering concepts of radiation heat transfer along with conduction and convection.			

Course Outcome	**Year / Semester : III / II-Sem**	**Subject Name (Code): (**B18MC02) Environmental Sciences	**No. of Hours : L: 3 T: 0 P: 0 Total: 3**	**Credits: 0**
After the completion of this course, the students should be able to				
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4				
5				

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Course Outcome	**Year / Semester : III / II-Sem**	**Subject Name (Code): (**B18MB05**)** Industrial Management	**No. of Hours : L: 3 T: 0 P: 0 Total: 3**	**Credits: 3**
After the completion of this course, the students should be able to				
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Course Outcome	**Year / Semester : III / II-Sem**	**Subject Name (Code): (**B18CS08**)** Data Base Management Systems	**No. of Hours : L: 3 T: 0 P: 0 Total: 3**	**Credits: 3**
After the completion of this course, the students should be able to				
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Course Outcome	**Year / Semester : III / II-Sem**	**Subject Name (Code): (**B18CE54**)** Disaster Management	**No. of Hours : L: 3 T: 0 P: 0 Total: 3**	**Credits: 3**

After the completion of this course, the students should be able to	
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Course Outcome	**Year / Semester : III / II-Sem**	**Subject Name (Code): (**B18ME25**)** Nano Technology	**No. of Hours : L: 3 T: 0 P: 0 Total: 3**	**Credits: 3**
After the completion of this course, the students should be able to				
1	Understand the fundamentals of Nanotechnology			
2	Know the different classes of nano materials			
3	Impart basic knowledge on various synthesis and characterization techniques involved in Nanotechnology			
4	Make the learner familiarize with nanotechnology potentialities.			
5	Apply transfer interdisciplinary systems engineering approaches to the field of nanotechnology			

Course Outcome	**Year / Semester : III / II-Sem**	**Subject Name (Code): (**B18ME26**)** Mechatronics	**No. of Hours : L: 3 T: 0 P: 0 Total: 3**	**Credits: 3**
After the completion of this course, the students should be able to				
1	Use the control system; mechatronics design systems and measurement systems.			
2	Work on various actuating systems			
3	Convert the signals from one form to another form			

4	Estimate the micro controllers and micro processors
5	Develop the simple programming code for PLC's

Course Outcome	**Year / Semester : III / II-Sem**	**Subject Name (Code): (**B18ME27**)** Automobile Engineering	**No. of Hours : L: 3 T: 0 P: 0 Total: 3**	**Credits: 3**
After the completion of this course, the students should be able to				
1	Understand the various part used in automotive pollution standards.			
2	Understand different types of fuel injection system and pump system			
3	Analyze the cooling systems depending upon the cooling requirements for particular automobile and Understand different types of ignition systems used in case of an automobile			
4	Understand the power transmission in automobile gearbox and clutch system.			
5	Understand various transmission systems, steering systems and suspension and breaking systems			

Course Outcome	**Year / Semester : III / II-Sem**	**Subject Name (Code): (**B18ME28**)** Maintenance and Safety Engineering	**No. of Hours : L: 3 T: 0 P: 0 Total: 3**	**Credits: 3**
After the completion of this course, the students should be able to				
1	Understand The maintenance in equipment life cycle.			
2	Analyse the preventive and corrective measures in maintenance			
3	Estimate The inventory control in maintenance			
4	Classify The incosting and budget preparation			
5	Compare the reliability measures, reliability networks and reliability analysis techniques			

Course Outcome	Year / Semester : III / II-Sem	Subject Name (Code): (B18ME29) Mechanics of Composite Materials	No. of Hours : L: 3 T: 0 P: 0 Total: 3	Credits: 3
After the completion of this course, the students should be able to				
1	Highlight the appropriate use of composite materials in the industry			
2	Understand the significance of replacing existing metal structures with composite materials whenever beneficial			
3	Comprehend the complexity of design of composite materials and structures			
4	Apply knowledge of mechanics of composite materials for analyzing advanced materials involved in current trends and research area			
5	Apply the knowledge of composite materials for designing structures for aerospace applications and smart structures			

Course Outcome	Year / Semester : III / II-Sem	Subject Name (Code): (B18ME30) Refrigeration and Air Conditioning	No. of Hours : L: 3 T: 0 P: 0 Total: 3	Credits: 3
After the completion of this course, the students should be able to				
1	Understand all the basic principles of refrigeration.			
2	Prepare a model refrigeration system and designing various components according to the requirement			
3	Design an A.C. unit by calculating the heat loads			
4	Observe and analyze large capacity units like ice plants, cold storages and central A.C. units.			
5	Know all Psychrometric properties and processes			

Course Outcome	Year / Semester : III / II-Sem	Subject Name (Code): (B18ME31) Heat Transfer Lab	No. of Hours : L: 0 T: 0 P: 3 Total: 3	Credits: 1.5
After the completion of this course, the students should be able to				

1	Student is able to analyze and conduct the experiments to know the heat transfer and temperatures.
2	Student is able to interpret the experimental knowledge in the real life situation like in, electric iron, and refrigerator
3	Student is able to possess the application knowledge of engine radiation, air condition chambers, solar collectors etc
4	Student can design a heat transfer system to cool the given component to required temperature within the desired time
5	

Course Outcome	**Year / Semester : III / II-Sem**	**Subject Name (Code): (**B18EN03**)** Advanced English Communications Skills Lab	**No. of Hours : L: 0 T: 0 P: 3 Total: 3**	**Credits: 1.5**
After the completion of this course, the students should be able to				
1	Developing effectively and appropriate vocabulary to be used contextually.			
2	Inculcating flair for Writing and felicity in written expression.			
3	Enhancing job prospects			
4	Acquiring effective speaking abilities			
5				

Course Outcome	**Year / Semester : IV/ I-Sem**	**Subject Name (Code): (**B18ME32**)** CAD/CAM	**No. of Hours : L: 3 T: 0 P: 0 Total: 3**	**Credits: 3**
After the completion of this course, the students should be able to				
1	Observe the various input and output devices used in CAD/CAM systems.			
2	Understand 2D and 3D transformations problems			
3	Write the programs for different models by using NC part programming			
4	Analyze the Group Technology (GT)			

5	Differentiate CAQC (Computer Aided Quality Control) and CIM (Computer Integrated Manufacturing) systems

Course Outcome	**Year / Semester : IV / I-Sem**	**Subject Name (Code): (**B18ME33**)** Instrumentation & Control Systems	**No. of Hours : L: 3 T: 0 P: 0 Total: 3**	**Credits: 3**
After the completion of this course, the students should be able to				
1	Gain knowledge on various parts of machine and IC engine. Understand the design construction of machine parts.			
2	To gain knowledge of functioning of parts such as connecting rod, eccentric etc.			
3	To understand how heat and electricity are combined in calibrating thermoelectric devices, especially resistance temperature detector, thermo couple.			
4	To measure the displacement using LVDT transducer. To gain knowledge on flow measurement using rotometer			
5	Classify Open and closed systems Servomechanisms			

Course Outcome	**Year / Semester : IV/ I-Sem**	**Subject Name (Code): (**B18ME34**)** Unconventional Machining Process.	**No. of Hours : L: 3 T: 0 P: 0 Total: 3**	**Credits: 3**
After the completion of this course, the students should be able to				
1	Understand selection of processes.			
2	Design the components of Abrasive Jet machining process			
3	Observe surface properties after machining without destructing the material			
4	Select the material with respect to process.			
5	Apply plasma for machining like Magnetic abrasive finishing, Abrasive flow finishing etc			

Course Outcome	Year / Semester : IV/ I-Sem	Subject Name (Code): (B18ME35) Design for Manufacturing	No. of Hours : L: 3 T: 0 P: 0 Total: 3	Credits: 3
After the completion of this course, the students should be able to				
1	Classify the steps in design process			
2	Understand the overview of various machining processes			
3	Apply the factors in design of weldments			
4	Analyse general design recommendations of extrusion			
5	Compare the development of systematic dfa methodology			

Course Outcome	Year / Semester : IV/ I-Sem	Subject Name (Code): (B18ME36) Power Plant Engineering	No. of Hours : L: 3 T: 0 P: 0 Total: 3	Credits: 3
After the completion of this course, the students should be able to				
1	Understand the different types of operation takes place in the power plant with its plant layout			
2	Got knowledge about internal combustion power plants and their uses			
3	Explore the opportunities to improve the capacity and the efficiency of hydro electric power plant.			
4	Understand the concept of nuclear power generation and find out the better way against radiation hazards.			
5	Analyze the plant economics and the environmental considerations for the establishment of plant.			

Course Outcome	Year / Semester : IV/ I-Sem	Subject Name (Code): (B18ME37) Production Planning & Control	No. of Hours : L: 3 T: 0 P: 0 Total: 3	Credits: 3
After the completion of this course, the students should be able to				

1	Design and plan an economical production system.
2	Learn about effective utilization of plant resources
3	Provide alternate production strategies
4	Guide shop floor people for manufacturing products of required quantity
5	Define dispatcher and its procedures

Course Outcome	**Year / Semester : IV / I-Sem**	**Subject Name (Code): (**B18ME38**)** Robotics	**No. of Hours : L: 3 T: 0 P: 0 Total: 3**	**Credits: 3**
After the completion of this course, the students should be able to				
1	Apply the knowledge of robotics in real time human life applications.			
2	Analyse the concept of CAD/CAM and automation to the robotics.			
3	Compare knowledge of robot applications in manufacturing like, material handling, loading and unloading etc.			
4	Experiment the robotics to the spot and continuous arc welding and spray painting.			
5	Relate the Robot Application in Manufacturing			

Course Outcome	**Year / Semester : IV / I-Sem**	**Subject Name (Code): (**B18ME39**)** Computational Fluid Dynamics	**No. of Hours : L: 3 T: 0 P: 0 Total: 3**	**Credits: 3**
After the completion of this course, the students should be able to				
1	Describe Governing equations of CFD.			
2	Analyze problems with Euler and Navier Stokes Eqns			
3	Evaluate CFD codes.			
4	Analyze different models with different algorithms			
5	Understand Finite volume formulations for diffusion equation			

Course Outcome	Year / Semester : IV/ I-Sem	Subject Name (Code): (B18ME40) Automation In Manufacturing	No. of Hours : L: 3 T: 0 P: 0 Total: 3	Credits: 3
After the completion of this course, the students should be able to				
1	Analyse necessity of automating any industry and procedure to be adopted for automation.			
2	Define different types of automated flow lines, transfer lines.			
3	Associate all types of material handling systems and adaptive control systems			
4	Choose packages available for advanced techniques available in mechanical engineering.			
5	Discuss the Techniques of Rapid Proto typing.			

Course Outcome	Year / Semester : IV/ I-Sem	Subject Name (Code): (B18ME41) Non Conventional Energy Sources	No. of Hours : L: 3 T: 0 P: 0 Total: 3	Credits: 3
After the completion of this course, the students should be able to				
1	Apply the technology to capture the energy from the renewable sources like sun, Wind, ocean, biomass, geothermal. .			
2	Use different renewable energy sources to produce electrical power minimize the use of conventional energy sources to produce electrical energy			
3	Identify the fact that the conventional energy resources are depleted			
4	Understand direct energy conversion			
5	Learn different methods in solar energy system			

Course Outcome	Year / Semester : IV/ I-Sem	Subject Name (Code): (B18ME42) Mechanical Vibrations	No. of Hours : L: 3 T: 0 P: 0 Total: 3	Credits: 3
After the completion of this course, the students should be able to				

1	Students acquire the ability to format mathematical models of problems in vibrations
2	Students will have an abiliy to obtain the complete solution for the motion of vibrator systems (damped & undamped subjected to non periodic forcing functions)
3	Students will be able to obtain design parameters and indicate methods of solutions for complicated vibratory problems.
4	Students will be able to solve the vibrations probems for multi degrees of freedom
5	Students will be able to obtain numerical solutions in vibrations problems.

Course Outcome	**Year / Semester : IV/ I-Sem**	**Subject Name (Code): (**B18ME43) CAD/CAM Lab	**No. of Hours : L: 0 T: 0 P: 3 Total: 3**	**Credits: 1.5**
After the completion of this course, the students should be able to				
1	Draw the part drawings which are utilized in real time applications.			
2	Understand the different types of stress analysis, load calculations by using ANSYS software.			
3	Analyze 2D and 3D part drawings using AutoCAD, CREO software packages			
4	Develop and understand the NC part program generation by using CADEM packages.			

Course Outcome	**Year / Semester : IV/ I-Sem**	**Subject Name (Code): (**B18ME44**)** Instrumentation & Control Systems Lab	**No. of Hours : L: 0 T: 0 P: 3 Total: 3**	**Credits: 1.5**
After the completion of this course, the students should be able to				
1	Identify the different pressure gauges			
2	Understand the different types of temperature measurements.			
3	Analyze the calibration of capacitive transducer for angular displacement			
4	Evaluate seismic pickup for the measurement of vibration amplitude			

Course Outcome	Year / Semester : IV/II-Sem	Subject Name (Code): (B18ME47) Plant Layout & Material Handling	No. of Hours : L: 3 T: 0 P: 0 Total: 3	Credits: 3
After the completion of this course, the students should be able to				
1	Get the knowledge of various types of material handling systems.			
2	Understand applications of different types of plant layouts.			
3	Get the knowledge of applications of ergonomics in material handling			
4	Get the knowledge of designing of cost effective material handling systems			
5	Understand merits of different types of plant layouts			

Course Outcome	Year / Semester : IV/II-Sem	Subject Name (Code): (B18ME48) . CNC Technology	No. of Hours : L: 3 T: 0 P: 0 Total: 3	Credits: 3
After the completion of this course, the students should be able to				
1	Understand the basic procedures and concepts of programming, set up and operation of a CNC Machining Center.			
2	Identify and understand the basic programming codes.			
3	Create geometry and tool paths from the specifications on a blueprint for simple parts using Master cam programming software.			
4	Identify and define the functions of the CNC machine control.			
5	Analyze the CNC machining center for manufacturing simple parts.			

Course Outcome	Year / Semester : IV/II-Sem	Subject Name (Code): (B18ME49) Jet Propulsion & Rocket Engineering	No. of Hours : L: 3 T: 0 P: 0 Total: 3	Credits: 3

After the completion of this course, the students should be able to	
1	Compare the characteristics & performance of aerospace propulsion systems.
2	Estimate their Performance and behavior of ramjets.
3	Analyze preliminary designs of rocket to meet specified requirements.
4	Identify testing and instrumentation methods for cryogenics like nuclear and plasma and propulsion
5	Understand the fundamentals of turbojet, ramjet and their performance evaluation.