



Lokmanya Tilak Jankalyan Shikshan Sanstha's
PRIYADARSHINI BHAGWATI COLLEGE OF ENGINEERING
Harpur Nagar, Umred Road (Near Bada Tajbagh), Nagpur-24
(Approved by AICTE, New Delhi, Govt. of Maharashtra
and affiliated to Rashtrasant Tukdoji Maharaj Nagpur University)
Email: principalpbcoe@gmail.com, Website: www.pbcoe.edu.in
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Department of Mechanical Engineering

Course Outcomes

B. Tech. Fifth Semester (CBCS)

Course Name: Heat Transfer	
Code: BTME501T	
At the end of the course student will be able to :	
C01	Students will be able to define and compare the different modes of heat transfer and calculation of thermal resistance and heat transfer through plane and composite wall, cylinder and sphere with and without thermal contact resistances.
C02	Students will be able to apply the concept of internal heat generation for the calculation of heat transfer for plane wall, cylinder and sphere and also learn about various types of fins and their significance in steady state conduction heat transfer calculations. It will also help them understand the concept of unsteady state heat transfer.
C03	Students will be able to select and apply appropriate empirical correlations to estimate forced convection and free convection heat transfer, for internal and external flows.
C04	Students will be able to evaluate heat transfer rate by radiation from ideal and actual surfaces and enclosures of different geometries.
C05	Students will be able to evaluate heat exchanger performance for the given geometry and boundary conditions and design suitable heat exchanger geometry to deliver a desired heat transfer rate.

Course Name: Energy Conversion-I	
Code: BTME502T	
At the end of the course student will be able to :	
C01	Explain, classify, analyze the steam generators (i.e. Boilers), boiler mountings & accessories. Also evaluate the performance parameters of boiler.
C02	Explain the concepts of fluidized bed boilers and various draught system and evaluate performance parameters of natural draught system (i.e. chimney).
C03	Explain the importance of steam nozzle and determine its throat area, exit area, exit velocity. Also compare impulse and reaction steam turbines and explain the concept of governing of steam turbine.
C04	Explain the methods of compounding of steam turbine, various energy losses in steam turbine and able to draw velocity diagrams of steam turbine blades to analyze the angles of the blades, work done, thrust, power, efficiencies of turbine.
C05	Explain, classify the steam condensers, cooling towers and evaluate performance parameters of surface condenser.



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Course Name: Design of Machine Elements	
Code: BTME503T	
At the end of the course student will be able to :	
C01	Apply principals of static loading for design of Cotter joint, Knuckle joint
C02	Design bolted, welded joints, power screws & pressure vessels
C03	Design the power transmission shaft & coupling
C04	Design components subjected to fatigue or fluctuating stresses. Also, will be able to apply principles for determining bending stresses for design of curved beams e.g. crane hook, C-Frame.
C05	Design clutches, brakes and springs

Course Name: Industrial Economics & Management	
Code: BTME504T	
At the end of the course student will be able to :	
C01	Understand the concept of demand and supply and its relationship with the price
C02	Relate various factors of production with reference to different economic sectors
C03	Analyze the causes and effects of inflation and understand the market structure
C04	Acquire knowledge of various functions of management and marketing management
C05	Perceive the concept of financial management for the growth of business

Course Name: Mechanical Measurement and Metrology	
Code: BTME505T	
At the end of the course student will be able to :	
C01	Students will be able to analyze statistical characteristic of systems.
C02	Students will be able asses the system response.
C03	Students will be able to understand the instrumentation process.
C04	Students will be able to understand limits fits and tolerance.
C05	Students will learn the basics of various metrology measurement terms and techniques.



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Course Name: Heat Transfer Lab	
Code:BTME501P	
At the end of the course student will be able to :	
C01	Understand common design patterns in the context of incremental/iterative development.
C02	Exploit well-known Creational design patterns.
C03	Distinguish between different types of structural design patterns.
C04	Remember the appropriate design patterns, purpose and methods and use of Behavioral Design Pattern to solve object oriented design problems.
C05	Demonstrate and understanding of Behavioral and other useful design patterns

Course Name: Mechanical Measurement and Metrology	
Code:BTME505P	
At the end of the course student will be able to :	
C01	Students will be able to perform the instrumentation.
C02	Students will be able to use the instrumentation for measurement of thermal properties.
C03	Students will be able obtain the response from the instruments also can be able to calibrate the instruments.
C04	Students will be able to calculate the limits and allowances to obtain the proper fit.
C05	Students will able to identify the surface roughness using optical flat.

Course Name: Industrial Visit	
Code:BTME506P	
At the end of the course student will be able to :	
C01	Opportunity to interact with Industry Experts
C02	Learning experience.
C03	Enhanced employability and PPO's.
C04	Interpersonal skills enhancement.
C05	Acquire in depth knowledge about industries & innovative technologies employed.

Course Name: Performing Art	
Code: BTME507P	
At the end of the course student will be able to :	
C01	An Arts and Science course helps the students to empower themselves with problem solving skills. The ability to analyze things and communicate them in the right way is taught. These skills are very much essential to get employed in reputed companies and most of the companies prefer candidates with the mentioned skills. The students also have a variety of career options to choose for the future



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B. Tech. Sixth Semester (CBCS)

Course Name: AUTOMATION IN PRODUCTION	
Code: BEME601T	
At the end of the course student will be able to :	
CO1	Get Acquainted With Automation, Its Type's ,Strategies , Assembly Line Balancing And Its Analysis, Methods Of Work Part Transport
CO2	Recognize fundamentals and constructional features of N.C, CNC and D.N.C machines and prepare a CNC program for given part.
CO3	Get Acquainted With The Robotic Configuration, Types Of Links, Joints, Grippers, Industrial Robotics And Robot Applications.
CO4	Cultivate Information About Automated Material Handling Systems, Automated Storage And Retrieval System (AGVS,AS/RS) Its Analysis
CO5	Get Acquainted With Automated Inspection (CAPP, CAQC, CMM) And

Course Name: AUTOMATION IN PRODUCTION	
Code: BEME601P	
At the end of the course student will be able to :	
CO1	Recognize automation, corroborating this knowledge with case studies on automation systems. study and analyze the material handling systems, robots and GT
CO2	Demonstrate NC programming (manual/apt)
CO3	Simulate program on CNC milling/ lathe
CO4	Work on CNC milling/ lathe
CO1	Recognize automation, corroborating this knowledge with case studies on automation systems. study and analyze the material handling systems, robots and GT

Course Name: Energy Conversion-II	
Code: BEME602T	
At the end of the course student will be able to :	
CO1	Classify various types of I.C. Engines and explain the working of its various components and systems.
CO2	Analyze the effect of various operating variables on engine performance
CO3	Understand the working of Gas Turbine and Jet propulsion system
CO4	Analyze the vapour compression refrigeration system and psychometric process.
CO5	Understand the working of various types of compressors



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Course Name: Energy Conversion-II Lab	
Code: BEME602P	
At the end of the course student will be able to :	
C01	Identify different components of IC engine, type of compressor , VCR system
C02	Demonstrate and Determine performance of I,C, engine ,compressor and VCR system
C03	Construct Heat balance sheet for single/multi cylinder CI and SI engine.
C04	Apply Mores Test on Multi cylinder S.I. Engine
C05	Analyze the thermodynamic performance of Gas turbine

Course Name: Dynamics ofMachines	
Code: BEME603T	
At the end of the course student will be able to :	
C01	Comprehend the machine dynamics through basic principles to interpret their application
C02	Analyze dynamic force conditions in planer linkages and cams to determine required driving torque condition (graphically/ analytically).
C03	Estimate the unbalanced forces due to rotating and reciprocating masses in a mechanicalsystem and calculate (graphically/ analytically) the balancing masses required for safe/ smooth operation of these mechanical systems.
C04	Identify the requirement of flywheel, brakes, and dynamometers in a mechanical systemand calculate inertia of flywheel and braking condition to be incorporated in engines and machines.
C05	Recognize and interpret the concept of vibration in various mechanical systems anddistinguish vibration characteristics for 1 & 2 DOF systems to evaluate the conditions for its control/ use.

Course Name: Operation Research (Elective-I)	
Code: BEME604T	
At the end of the course student will be able to :	
C01	Recognize the importance and value of Operations Research and mathematical modelingin solving practical problems in industry
C02	convert given situation to mathematical form and determine optimal settings.
C03	understand Operations Research models and apply them to real-life problems;
C04	manage projects for minimum total cost and smooth level of resources.
C05	make decisions related to age of replacement of equipment



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Course Name: Production Planning and Control (Elective-I)	
Code: BEME604T	
At the end of the course student will be able to :	
C01	Understand need of various functions in production planning and control for better management of manufacturing and/or service systems.
C02	Use qualitative and quantitative forecasting techniques for short, medium, and long range forecasting.
C03	Develop material requirements plans (MRP) as part of resource requirements planning systems.
C04	Use heuristic decision rules to make lot-sizing decisions.
C05	Develop capacity requirements plans as part of resource requirements planning systems.
C06	Develop quantitative models to manage independent demand inventory systems.

Course Name: Advanced Manufacturing Techniques (Elective II)	
Code: BEME605T	
At the end of the course student will be able to :	
C01	Understand and compare the different Non-Traditional machining process with their need, economics and application as well as historical development. Understand the basics of High speed grinding, Hot and Cold machining.
C02	Understand the basics of Abrasive Jet Machining (AJM), Ultrasonic Machining process and Water Jet Machining.
C03	Get acquainted with the Electro-Chemical Machining, Electrochemical Grinding, Electric Discharge Machining. Get acquainted with the Electron Beam, Laser Beam and Plasma Arc Machining.
C04	Know the basics of unconventional welding techniques and Solid Phase welding techniques.
C05	Get acquainted with the basics of advance casting processes.

Course Name: CNC & Robotics (Elective-II)	
Code: BEME605T	
At the end of the course student will be able to :	
C01	Understand fundamentals of NC, CNC and DNC.
C02	Understand basic drives and work holding devices used in CNC
C03	Understand NC programming.
C04	Understand history and classification of robots
C05	Understand Robot end effectors, motion control, programming languages and



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Course Name: Advance IC Engines [Elective - II]	
Code: BEME603P	
At the end of the course student will be able to :	
C01	Demonstrate the concept of gyroscopic effect through the working model.
C02	Analyze the performance of mechanisms and Perform dynamic force analysis of linkages and cams.
C03	Demonstrate record and interpret data of vibration characteristics of mechanical vibratory systems.
C04	Perform analysis of brakes, dynamometers and flywheels.
C05	Identify the importance of safety, team work and effective communication for conduction of activity.