



Khalsa College of Engineering & Technology
Ranjit Avenue, C-Block, Amritsar-143001
0183-5030765



Department of Mechanical Engineering

Course Outcomes

S.No.	Name of the Course	CO Code	Course Outcomes
1	Fluid Mechanics	BTME301-18	1. Understand the concept of fluids and their properties.
			2. Apply the concept to solve the problems related to statics, dynamics and kinematics of fluids.
			3. Use and apply dimensional analysis and similitude techniques to various physical fluid phenomena.
			4. Distinguish various types of flows and learn flow measurement methods.
2	Theory of Machines - I	BTME302-18	1. Understand constructional and working features of important machine elements.
			2. Design belt, rope and chain drives for transmission of motion from one shaft to another.
			3. Identify different Cam and follower pairs for different applications and construct cam profile for required follower motion.
			4. Understand the function of brakes, dynamometers, flywheel and governors.
3	Machine Drawing	BTME303-18	1. Read, draw and interpret the machine drawings and related parameters.
			2. Use standards used in machine drawings of machine components and assemblies.
			3. Learn the concept of limits, fits and tolerances in various mating parts.
			4. Visualize and generate different views of a component in the assembly.
			5. Use CAD tools for making drawings of machine components and assemblies.
4	Strength of Materials- I	BTME304-18	1. Understand the concepts of stress and strain at a point, in the members subjected to axial, bending, torsional loads and temperature changes.
			2. Determine principal stresses, maximum shearing stress and their angles, and the stresses acting on any arbitrary plane within a structural element.
			3. Find bending moment and shear force over the span of various beams subjected to different kinds of loads.
			4. Calculate load carrying capacity of columns and struts and their buckling strength.



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			5. Evaluate the slope and deflection of beams subjected to loads.
5	Basic Electronics Engineering	BTEC305-18	Understand construction of diodes and their rectifier applications. 2. Appreciate the construction and working bipolar junction transistors and MOSFETs. 3. Design Op-Amp IC based fundamental applications. 4. Comprehend working of basic elements of digital electronics and circuits. 4. Comprehend working of basic elements of digital electronics and circuits.
6	Basic Thermodynamics	BTME305-18	1. Apply energy balance to Systems and Control Volumes in situations involving heat and work interactions 2. Evaluate changes in thermodynamic properties of substances. 3. Evaluate performance of energy conversion devices. 4. Explain and apply various gas power and vapor power cycles.
7	Strength of Material (Lab)	BTME306-18	1. Measure the various mechanical properties such as tensile and compressive strength, impact strength, torsion strength and fatigue strength and hardness of brittle and ductile materials. 2. Calculate load carrying capacity of long columns and their buckling strength.
8	Theory of Machine (Lab)	BTME307-18	1. Determine gyroscopic couple, balancing of rotating masses and Cam profile analysis. 2. Determine gear- train value of compound gear trains and epicyclic gear trains.
9	Fluid Mechanics (Lab)	BTME308-18	1. Distinguish various type of flows and flow measurement methods and concept of statics and dynamics of liquids. 2. Determine discharge and head loss, hydraulic and friction coefficient, for different types of flow in pipe and open channels.
10	Applied Thermodynamics-2	BTME401-18	1. Learn the functioning and performance evaluation of reciprocating air compressors. 2. Analyze the combustion phenomenon in boilers and I.C. engines. 3. Use of Steam Tables and Mollier Chart to solve vapour power cycle problems. 4. Explain the constructional features and working of steam power plants and to evaluate their performance.
11	Fluid Machines	BTME402-18	1. Recognize basic components of turbo machines and understand related fundamental laws/ principles and apply



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			<p>these for calculation of various parameters like work done, force efficiency etc.</p> <p>2. Know about constructional details, working and design aspects of runner/wheel and evaluate the performance of various turbines like Pelton, Kaplan and Francis.</p> <p>3. Know about constructional details, working and evaluate the performance of centrifugal pump under different vane shape conditions.</p> <p>4. Know about constructional details, working and evaluate the performance of reciprocating pump and evaluate the effect of various deviations from the ideal conditions on the work done.</p> <p>5. Know about constructional details and working of hydraulic devices like fluid coupling, accumulator and intensifier.</p>
12	Strength of Materials II	BTME403-18	<p>1. Apply the basics to find stresses in various applications (shells, curved beams and rotating discs).</p> <p>2. Analyse the change in dimensions of shells, curved beams and rotating discs under operation.</p> <p>3. Determine stresses, deflection and energy stored in various kinds of springs subjected to load and twist.</p> <p>4. Understand the concept of failure theories and strain energy.</p> <p>5. Evaluate shearing stress variation in beams of different cross-section and materials.</p>
13	Materials Engineering	BTME404-18	<p>1. Understand the significance of structure-property-correlation for engineering materials including ferrous and nonferrous.</p> <p>2. Explain the use and importance of various heat treatment processes used for engineering materials and their practical applications.</p> <p>3. Understand the various structural changes occurred in metals with respect to time temperature transformations.</p> <p>4. Understand the significance of Fe-C and TTT diagram for controlling the desired structure and properties of the materials.</p>
14	Theory of Machines- II	BTME405-18	<p>1. Understand the basic concepts of inertia forces & couples applied to reciprocating parts of a machine.</p> <p>2. Understand balancing of rotating and reciprocating parts of machines.</p> <p>3. Select suitable type of gears for different application and analyse the motion of different elements of gear trains.</p>
15	Environmental Science	EVS101-18	<p>1. Students will enable to understand environmental problems at local and national level through literature and general awareness.</p> <p>2. The students will gain practical knowledge by visiting wildlife areas, environmental institutes and various personalities who have done practical work on various environmental Issues.</p>



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			<p>3. The students will apply interdisciplinary approach to understand key environmental issues and critically analyze them to explore the possibilities to mitigate these problems.</p> <p>4. Reflect critically about their roles and identities as citizens, consumers and environmental actors in a complex, interconnected world</p>
16	Applied Thermodynamics	BTME406-18	<p>1. Understand the construction and working of IC engines, and evaluate their performance.</p> <p>2. Identify the various types of boilers & condensers.</p>
17	Fluid Machines (Lab))	BTME407-18	<p>1. Conduct experiments on scaled down models or on actual size hydraulic machines and evaluate results in terms of unit or specific quantities for comparison purpose.</p> <p>2. Understand the working of various hydraulic machines (turbines and pumps) and can suggest remedial solutions for various faults.</p>
18	Material Engineering (Lab)	BTME408-18	<p>1. Analyse the microstructure of different ferrous and non-ferrous samples.</p> <p>2. Explore the effect of heat treatment on various engineering materials by analysing its microstructure and hardness.</p>
19	Heat Transfer	BTME501-18	<p>1. To teach students the basic principles of conduction, radiation, and convection heat transfer. Students will demonstrate an understanding of the basic concepts of conduction, radiation, and convection heat transfer.</p> <p>2. To extend the basic principle of conservation of energy to systems that involve conduction, radiation, and heat transfer. Students will demonstrate an understanding of the concept of conservation of energy and its application to problems involving conduction, radiation, and/or convection heat transfer. This principle will be used to formulate appropriate mathematical models and associated thermal boundary conditions.</p> <p>3. To train students to identify, formulate, and solve engineering problems involving conduction heat transfer. Students will demonstrate the ability to formulate practical conduction heat transfer problems by transforming the physical system into a mathematical model, selecting an appropriate solution technique, and evaluating the significance of results.</p> <p>4. To train students to identify, formulate, and solve engineering problems involving forced convection heat transfer, natural convection heat transfer, and heat exchangers. Students will demonstrate the ability to formulate practical forced and natural conduction heat transfer problems by transforming the physical system into a mathematical model, selecting an appropriate solution technique, and evaluating the</p>



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			<p>significance of results. Students will also demonstrate an ability to analyze the performance of heat exchangers</p> <p>5. To train students to identify, formulate, and solve engineering problems involving radiation heat transfer among black surfaces and among diffuse gray surfaces. Students will demonstrate the ability to formulate practical radiation heat transfer problems by transforming the physical system into a mathematical model, selecting an appropriate solution technique, and evaluating the significance of results.</p>
20	Design of Machine Elements	BTME502-18	<p>1. Demonstrate recalling and applying knowledge of Basic Sciences, Graphics & Drawing, Basic Manufacturing Processes and Material Science, for design procedures of various Mechanical components.</p> <p>2. Comprehend the effect of different stresses and strains under various loading conditions on the mechanical components and identify the mechanism/mode of failure.</p> <p>3. Examine and solve design problems involving machine elements on the basis of various theories of failure.</p> <p>4. Synergize forces, moments and strength information to develop ability to analyze, design and/or select machine elements aiming for safety, reliability, and sustainability.</p>
21	Manufacturing Processes	BTME503-18	<p>1. Upon completion of this course, students will be able to understand the different conventional and unconventional manufacturing methods employed for making different products.</p> <p>2. Obtain knowledge of key manufacturing technologies and their underlying principles applied in current manufacturing industry.</p>
22	Management and Engineering Economics	BTME504-18	<p>1. Explain the development of management and the role it plays at different levels in an organization.</p> <p>2. Comprehend the process and role of effective planning, organizing and staffing for the development of an organization.</p> <p>3. Understand the necessity of good leadership, communication and coordination for establishing effective control in an organization.</p> <p>4. Understand engineering economics demand supply and its importance in economics decision making and problem solving.</p> <p>5. Calculate present worth, annual worth and IRR for different alternatives in economic decision making.</p> <p>6. Understand the procedure involved in estimation of cost for a simple component, product costing and depreciation, its methods.</p>



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23	Heat Transfer (Lab)	BTME505-18	1. Design and fabricate the experimental setups related to heat transfer phenomena.
			2. Measure and analyse different heat transfer parameters.
			3. Apply finite difference methods to solve simple heat transfer problems.
24	Manufacturing Processes (Lab)	BTME506-18	1. Determine/calculate the clay content, moisture content, hardness, permeability and grain fineness number of moulding sand sample.
			2. Use oxy-acetylene gas welding, manual arc welding, MIG, TIG and spot-welding processes to make various joints.
			3. Use machine tools such as lathe, shaper and milling machine for machining/cutting various profiles on work pieces.
			4. Learn about the constructional features and working of grinding machines, hydraulic press, draw bench, rolling mills, drawing and extrusion equipment.
25	Numerical Methods (Lab)	BTME507-18	1. Understand different implementation modes of numerical methods.
			2. Use the numerical methods with the understanding of limitations of these methods for solving problems.
			3. Develop and implement their own computer programs.
			4. Solve problems more accurately and efficiently in low computational time.
			5. Handle the problems conveniently which are difficult to deal with manually.
26	Refrigeration and Air conditioning	BTME601-18	1. Illustrate the fundamental principles and applications of refrigeration and air conditioning system
			2. Obtain cooling capacity and coefficient of performance by conducting test on refrigeration systems.
			3. Calculate the energy requirements of cooling and heat equipment for air conditioning applications.
			4. Explain the properties, applications and environmental issues of different refrigerants.
			5. Demonstrate an ability to analysis psychrometric processes and cycles of air conditioning systems.
27	Mechanical Measurements & Metrology	BTME602-18	1. Interpret characteristics of measuring instruments.
			2. Describe various industrial metrological instruments for measuring linear, angular, screw thread and gear profiles.
			3. Apply the fundamental principles for measurement of various mechanical quantities like Force/torque etc.
			4. Develop an ability of problem solving and decision making by identifying and analyzing the cause for variation and recommend suitable corrective actions for quality measurements.



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28	Automobile Engineering	BTME603-18	1. Identify the different parts of the automobile.
			2. Explain the working of various parts like engine, transmission, clutch, brakes, steering and the suspension systems.
			3. Develop a strong base for understanding vehicle safety systems and future developments in the automobile industry.
29	Introduction to Industrial management.	BTME604-18	1. Understand the complexities associated with management in the organizations and integrate the learning in handling these complexities.
			2. Demonstrate the roles, skills and functions of management.
			3. Understand the concepts related to industrial management.
30	Non-Conventional Energy Resources.	BTME615-18	1. Address smart energy and green infrastructure
			2. Build models that simulate sustainable and renewable green technology systems
			3. Understand the history, global, environmental and economical impacts of green technology
			4. Address nonrenewable energy challenges
31	Refrigeration and Air Conditioning Lab	BTME605-18	1. Conduct and analyze the experimental data of performance of vapour compression refrigeration system in domestic refrigerator and water cooler.
			2. Conduct and analyze the experimental data of performance of Electrolux Refrigerator.
			3. Conduct the performance of window type room air conditioner and system.
			4. Analyze the industrial set up for the working and use of vapour compression refrigeration system in cold storage.
32	Mechanical Measurements & Metrology (Lab)	BTME606-18	1. Demonstrate the use of instruments for measuring linear (internal and external), angular dimensions and surface roughness.
			2. Identify proper measuring instrument and know requirement of calibration, errors in measurement etc.
			3. Apply analytical and experimental methods to make measurements and to find and correct defects in measurement systems.
33	Auto. Engg. (Lab)	BTME607-18	1. Identify Construction, working, preventive maintenance, trouble shooting and diagnosis of various Automobile Systems.
			2. Understand importance and features of different systems like axle, differential, brakes, steering, suspension, and balancing etc.
			3. Identify Modern technology and safety measures used in Automotive Vehicles