Sri Vasavi Engineering College (Autonomous)

(Sponsored by Sri Vasavi Educational Society)

(Approved by AICTE, New Delhi & Permanently affiliated to JNTUK, Kakinada)

(Accredited by NBA & NAAC with 'A' Grade, Recognized by UGC Under Section 2(f) & 12(B))

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DEPARTMENT OF MECHANICAL ENGINEERING

Course Outcomes (V18 Regulation)

B.Tech. III Semester

Name of the Course: PROBABILITY AND STATISTICS (Common for CIVIL, EEE, ME & CSE)

Course Code: V18MAT04

After successful completion of the course, the student will be able to:

CO No.	Course Outcome	Knowledge Level
CO1	Find measures of central tendency and dispersion for real data sets	K3
CO2	Find parameters of given function	K3
CO3	Apply probability distribution to real time problems	K3
CO4	Plot a best fit curve to an experimental data and find the correlation and regression	K3
CO5	Create good estimators to various parameters	K6
CO6	Apply the principles of Statistical Inference to practical problems	K3

Name of the Course: ENGINEERING MECHANICS (Common for ME & CE)

Course Code: V18MET03

After successful completion of the course, the student will be able to:

CO No.	Course Outcome	Knowledge Level
CO1	Compute the resultant force of a given system of forces	K3
CO2	Calculate the forces in the different types of plane trusses	K3
CO3	Find the Centroid, Center of Gravity and Moment of Inertia for plane figures and bodies	K3
CO4	Illustrate the different types of plane motions of a particle to compute its velocity, acceleration and force.	K3
CO5	Illustrate the concept of Work and Energy	K3
CO6	Apply the principle of Virtual Work to stability of equilibrium of beams and trusses	K3

Name of the Course: THERMODYNAMICS

Course Code: V18MET04

After successful completion of the course, the student will be able to:

CO No.	Course Outcome	Knowledge Level
CO1	Describe the basic terms related to work and heat	K2
CO2	Explain first law of thermodynamics and internal energy.	K2
CO3	Apply the second law of thermodynamics to basic thermal systems.	K3
CO4	Explain the concept of entropy.	K2
CO5	Illustrate various thermodynamic cycles.	K2
CO6	Discuss about pure substance.	K2

Name of the Course: FLUID MECHANICS AND FLUID MACHINES

Course Code: V18MET05

After successful completion of the course, the student will be able to:

CO No.	Course Outcome	Knowledge Level
CO1	Understand the basic concepts of fluid properties and to determine hydrodynamic forces on submerged bodies.	K3
CO2	Apply the flow field phenomena and the basic governing equations in solving fluid flow problems.	K3
CO3	Calculate the various losses occurring when the fluid flowing in closed conduit and measure the discharge by different apparatus.	K3
CO4	Understand the concept of boundary layer theory and to find out major and minor losses.	K3
CO5	Determine the forces in the operation of jets and turbines and to determine efficiencies of turbines.	K3
CO6	Interpret the operation of pumps and hydraulic systems and to find efficiencies of pumps.	K3

Name of the Course: MATERIALS ENGINEERING

Course Code: V18MET09

After successful completion of the course, the student will be able to:

CO No.	Course Outcome	Knowledge Level
CO1	Explain the types of bonds in solids and crystallization of metals.	K2
CO2	Construct phase diagrams for the study of alloys and phase transformation reactions.	K2
CO3	Distinguish Cast Irons and Steels.	K2
CO4	Identify suitable heat treatment process to achieve desired properties of metals and alloys.	K2
CO5	Discriminate different non ferrous metals and their alloys	K2
CO6	Illustrate the properties and applications of composites and ceramic materials and understand the concepts of powder metallurgy.	K2

Name of the Course: MACHINE DRAWING

Course Code: V18MEL02

After successful completion of the course, the student will be able to:

CO No.	Course Outcome	Knowledge Level
CO1	Describe the drawing and develop ability to represent any matter/symbol with the help of picture in CAD.	K2
CO2	Develop primary knowledge on machine drawings and the representation of tolerance on dimensions.	K3
CO3	Show the hidden objects by sectional views of different machine parts and their geometry representation.	K3
CO4	Identify the different joining methods to assemble the machine parts .	K3
CO5	Develop skill to produce assembly drawings from detailed drawings of machines parts.	K3
CO6	Construct press tools and their assemblies in 3D.	K3

Name of the Course: FLUID MECHANICS AND FLUID MACHINES LAB

Course Code: V18MEL03

After successful completion of the course, the student will be able to:

CO No.	Course Outcome	Knowledge Level
CO1	Employ the basic principles of Fluid mechanics to assess discharge with different devices and different losses in a pipe line.	K3
CO2	Calculate the performance parameters of Reciprocating and Centrifugal pumps.	K3
CO3	Calculate the performance parameters of different types of turbines.	K3

Name of the Course: Professional Communication Skills - I

Course Code: V18ENT03

After successful completion of the course, the student will be able to:

CO No.	Course Outcome	Knowledge Level
CO1	Summarize one's introduction in an appropriate manner, exhibit grammatical competence through correction of sentences, analyze noun and pronoun dispositions and develop pre-reading strategies to improve comprehension skills.	K5
CO2	Distinguish singular and plural in different contexts and display knowledge through accurate usage of sentences, build conversations which befit the situations, comprehendthe passages well and, use different kinds of idioms.	K4
CO3	Classify various kinds of adjectives and adverbs, learn natural occurrence of paired words of native speakers, infer the referential and inferential aspects of the passages and make use of idioms while narrating personal experiences.	K4
CO4	Judge and assess the behaviour of people in day to day life using kinesics and proxemics that disclose their disposition and be aware of their personal traits that promote good relations.	K2
CO5	Articulate their goals and have a constructive plan of executing them properly and become adept in oral presentations as well as poster presentations that enhance their professional skills.	K3
CO6	Evaluate various happenings by thinking out of the box and display their latent talent. They can also reduce the stress levels by applying various stress management techniques.	K4

B.Tech. IV Semester

Name of the Course: APPLIED THERMODYNAMICS

Course Code: V18MET07

After successful completion of the course, the student will be able to:

CO No.	Course Outcome	Knowledge Level
CO1	Illustrate the working of various IC engines.	K2
CO2	Classify the working of various steam boilers, mountings, accessories and draught systems.	K2
CO3	Demonstrate about steam nozzles	K2
CO4	Calculate the performance of steam turbines	K3
CO5	compute the performance of steam condensers	K3
CO6	Illustrate the performance parameters of gas turbines	K3

Name of the Course: MECHANICS OF SOLIDS

Course Code: V18MET08

After successful completion of the course, the student will be able to:

CO No.	Course Outcome	Knowledge Level
CO1	Explain concept of stress and strain of composite bars.	K2
CO2	Find the shear force and bending moment in a beams.	K3
CO3	Calculate flexural and shear stresses in a beam and understand applications of various springs.	K3
CO4	Estimate the principal stresses in structural members.	K3
CO5	Determine the torsional rigidity of shaft and buckling load capacity of columns.	K3
CO6	Estimate the hoop and longitudinal stress and strains in thin and thick cylinders.	K3

Name of the Course: THEORY OF MACHINES-I

Course Code: V18MET06

After successful completion of the course, the student will be able to:

CO No.	Course Outcome	Knowledge Level
CO1	Explain the inversion of the four bar, slider crank and double slider chains.	K2
CO2	Determine the velocities and accelerations in mechanisms by graphical method.	K3
CO3	Explain the working of copying mechanism, straight line motion mechanisms, steering gears and Hooke's joint.	K2
CO4	Draw the cam profiles for given follower motions.	K3
CO5	Compare tooth profiles for gears and compute performance characteristics.	K2
CO6	Describe gear trains and compute the velocity ratio and torque in gear trains and calculate various parameters related to belts.	K3

Name of the Course: MANUFACTURING PROCESSES

Course Code: V18MET14

After successful completion of the course, the student will be able to:

CO No.	Course Outcome	Knowledge Level
CO1	Understand fundamentals of casting-patterns and its materials, Gating System	K3
CO2	Choose the elements of casting and introduce other casting processes	K3
CO3	Distinguish various arc and solid state welding processes and select a suitable process based on the application and requirements	K3
CO4	Understand the principles of advanced welding processes and their applications, welding defects and its testing methods	K3
CO5	Establish the knowledge on Hot working and Cold Working Process	K3
CO6	Understanding of various bulk forming processes, sheet metal forming and processing of plastics.	K3

Name of the Course: INSTRUMENTATION AND CONTROL SYSTEMS

Course Code: V18MET11

After successful completion of the course, the student will be able to:

CO No.	Course Outcome	Knowledge Level
CO1	Discuss about the basic concepts of Linear measuring Instruments	K2
CO2	Explain various types of Temperature and Pressure measuring Instruments	K2
CO3	Understand the working of flow, Speed, Acceleration and Vibration measuring devices	K2
CO4	Illustrate various types of Strain measuring Instruments	K2
CO5	Explain the Humidity, Force, Torque, and Power measuring Instruments	K2
CO6	Describe various types of control system and its Elements	K2

Name of the Course: MECHANICS OF SOLIDS & MATERIALS ENGINEERING LAB

Course Code: V18MEL05

After successful completion of the course, the student will be able to:

CO No.	Course Outcome	Knowledge Level
CO1	Assess the Mechanical properties of different metals.	K3
CO2	Examine the microstructures of different ferrous and non ferrous metals.	K3
CO3	Identify the effect of heat treatment and cooling rates on the properties of steels.	K4

Name of the Course: MANUFACTURING PROCESSES LAB

Course Code: V18MEL11

After successful completion of the course, the student will be able to:

CO No.	Course Outcome	Knowledge Level
CO1	Design and Make a pattern.	K3
CO2	Test the properties of sand and prepare a casting.	K3
CO3	Perform Arc welding, Spot welding, TIG, MIG welding and Plasma Arc Cutting operations	K3
CO4	Perform blanking, piercing, Drawing and bending operations.	K3
CO5	Operate injection and blow moulding machines to manufacture plastic components	K3

Name of the Course: CONSTITUTION OF INDIA

Course Code: V18ENT11

After successful completion of the course, the student will be able to:

CO No.	Course Outcome	Knowledge Level
CO1	Summarize the evolution and historical importance of Indian constitution from 1858 to 1947.	K2
CO2	Explain various stages in the composition of Indian Constitution.	K2
CO3	Develop awareness about their primary rights and duties & build up their civic sense.	K3
CO4	Comprehend the distribution of powers between the center and states.	K4
CO5	Summarize and sketch the specific roles of heads of Nation and the functioning of legislative bodies.	K2
CO6	Explain the role of local self-government in strengthening democracy.	K1

Name of the Course: PROFESSIONAL COMMUNICATION SKILLS - II

Course Code: V18ENT04

After successful completion of the course, the student will be able to:

CO No.	Course Outcome	Knowledge Level
CO1	Correlate individual words into one whole sentence using new vocabulary and focus on the error analysis of prepositions and conjunctions.	K4
CO2	Distinguish and acquire knowledge of using words of same category in a sentence and learn new words that promote communicative finesse.	K5
CO3	Find errors in sentences where the modifiers are misplaced and put them at the appropriate place, use hit pair words and send an email that is concise and lucid.	K5
CO4	Interpret the importance of Attire and Etiquette in societal context and manage their time.	K2
CO5	Discover the team working abilities among themselves and display their leadership qualities.	K3
CO6	Identify various elements of emotional balance that have positive impact on work-life-balance. (K2)	K2

B.Tech. V Semester

Name of the Course: HEAT TRANSFER

Course Code: V18MET13

After successful completion of the course, the student will be able to:

CO No.	Course Outcome	Knowledge Level
CO1	Illustrate the basic modes of heat transfer, basic laws of heat transfer and to develop solution for one dimensional steady state heat conduction problems.	K3
CO2	Interpret the heat transfer through extended surfaces, to find solution for one dimensional extended surfaces and unsteady state heat conduction problems.	K3
CO3	Illustrate convective heat transfer and to apply Dimensional analysis concept to convective heat transfer.	K3
CO4	Apply empirical correlations for forced and free convection to compute values for the convection heat transfer coefficient.	K3
CO5	Apply empirical correlations for phase change process to calculate values for the convection heat transfer coefficient and to Illustrate Heat Exchangers.	K3
CO6	Employ the principles of radiation heat transfer, to find the shape factor and heat transfer rate through radiation.	K3

Name of the Course: INTERNAL COMBUSTION ENGINES (ELECTIVE-I)

Course Code: V18MET37

After successful completion of the course, the student will be able to:

CO No.	Course Outcome	Knowledge Level
CO1	Understand the affects of various losses that occur in the actual engine operation and the working principles of I.C.Engines.	K2
CO2	Illustrate the function of fuel supply and ignition systems.	K2
CO3	Understand the function and necessity of lubrication, cooling and governing systems.	K2
CO4	Interpret the combustion phenomena in S.I. and C.I. Engines and effect of various engine operating parameters on it.	K3
CO5	Calculate the performance parameters of I.C.Engines.	K3
CO6	Assess the emission parameters and alternate fuels used in I.C.Engines.	K3

Name of the Course: NANO TECHNOLOGY (ELECTIVE-I)

Course Code: V18MET38

After successful completion of the course, the student will be able to:

CO No.	Course Outcome	Knowledge Level
CO1	Understand the essential concepts used in nanotechnology	K2
CO2	Identify the various nanomaterials properties	K2
CO3	Describe the syntheses and fabrication methods	K2
CO4	Expand the various characterization Techniques	K2
CO5	Examine the Carbon nano technology and applications	K3
CO6	Use of the various applications of Nano technology	K3

Name of the Course: THEORY OF MACHINES – II

Course Code: V18MET15

After successful completion of the course, the student will be able to:

CO No.	Course Outcome	Knowledge Level
CO1	Apply gyroscopic effect for stabilization of sea vehicles, aircrafts and automobile vehicles etc.,	K3
CO2	Compute friction for torque transmission of mechanical systems	K3
CO3	Interpret dynamic force analysis of slider crank mechanism in design of flywheel.	K3
CO4	Examine the performance of different types of Governors	K3
CO5	Illustrate balancing of reciprocating and rotary masses.	K3
CO6	Calculate the natural frequencies of Discrete systems starting from the general equation of displacement.	K3

Name of the Course: DESIGN OF MACHINE ELEMENTS- I

Course Code: V18MET16

After successful completion of the course, the student will be able to:

CO No.	Course Outcome	Knowledge Level
CO1	Calculate the stresses in the design of machine elements.	K3
CO2	Develop various criteria for designing the machine elements subjected to varying loads	K3
CO3	Examine the strength of bolted joints under different loads	K3
CO4	Examine the strength of welded and riveted joints under different loads	K3
CO5	Illustrate design of various types of Keys and different joints	K3
CO6	Apply different type of loads on shafts and different couplings	K3

Name of the Course: METAL CUTTING & MACHINE TOOLS

Course Code: V18MET17

After successful completion of the course, the student will be able to:

CO No.	Course Outcome	Knowledge Level
CO1	Examine the mechanism of chip formation in machining and explain different parameters involved in machining process	K3
CO2	Describe various types of lathe machines and their operations	K3
CO3	Explain the construction and working of shaper, slotter, planar, drilling and boring.	K2
CO4	Explain the construction and working of various milling and grinding machines	K2
CO5	Illustrate the basic principle and working of Ultrasonic machining, Abrasive jet machining and Electrochemical machining.	K3
CO6	Illustrate the basic principle and working of Electric discharge machining, electron beam machining, Laser beam machining.	K3

Name of the Course: THERMAL ENGINEERING LAB

Course Code: V18MEL10

After successful completion of the course, the student will be able to:

CO No.	Course Outcome	Knowledge Level
CO1	Demonstrate the valve timing diagram & port timing diagram of IC engines	K3
CO2	Test the performance of I.C. Engines.	K4
CO3	Test the performance of compressors.	K4

Name of the Course: METAL CUTTING & MACHINE TOOLS LAB

Course Code: V18MEL16

After successful completion of the course, the student will be able to:

CO No.	Course Outcome	Knowledge Level
CO1	Examine the various mechanisms used in different machine tools	K3
CO2	Operate different machine tools to prepare different jobs	K3
CO3	Demonstration of simulation of metal cutting	K3

Name of the Course: PYTHON PROGRAMMING LAB

Course Code: V18CSL05

After successful completion of the course, the student will be able to:

CO No.	Course Outcome	Knowledge Level
CO1	Demonstrate Basic Python Programs	K3
CO2	Construct control structures in python	K3
CO3	Demonstrate functions and packages.	K3
CO4	Construct python programs using structured data types.	K3
CO5	Demonstrate Text Files	K3

Name of the Course: INTELLECTUAL PROPERTY RIGHTS AND PATENTS

Course Code: V18MET46

After successful completion of the course, the student will be able to:

CO No.	Course Outcome	Knowledge Level
CO1	Understand the different types & basics of Intellectual Property Rights .	K2
CO2	Understand the principle and registration of copyrights.	K2
CO3	Understand the principle and registration of patents.	K2
CO4	Understand the principle and registration of trademark.	K2
CO5	Understand the principle and registration of trade secrets.	K2
CO6	Understand IT Act and Cyber Law.	K2

Name of the Course: PROFESSIONAL COMMUNICATION SKILLS – III

Course Code: V18ENT05

After successful completion of the course, the student will be able to:

CO No.	Course Outcome	Knowledge Level
CO1	Distinguish the subtle meanings of various words in different contexts, recognize similar words as well as words with contrast meanings and use them appropriately.	K2
CO2	Interpret the passage using different strategies and answer the questions with ease.	K3
CO3	Compare different pairs of words and draw analogy between the words. Choose an appropriate word to make a sentence meaningful.	K4
CO4	Recognize the easiest and best possible way of solving problems in the area of NNumber and Letter Series, Analogy, Classification, Coding & Decoding Symbols, a Ranking and Analytical Reasoning.	K1
CO5	Investigate the different types of logics involved in Mirror and Water Images, Logical Reasoning & Arithmetical Reasoning.	K4
CO6	Find the common traps in the questions and errors likely to be made from the concepts of Blood Relations, Directions, Average, Clock and Calendar, Data Sufficiency, Permutations-Combinations and Probability.	K3

B.Tech. VI Semester

Name of the Course: METROLOGY

Course Code: V18MET10

After successful completion of the course, the student will be able to:

CO No.	Course Outcome	Knowledge Level
CO1	Apply tolerances and fits for selected product quality.	K3
CO2	understand the standards of length, angles and various limit gauges	K2
CO3	Understand the optical measuring instruments and their applications	K2
CO4	Explain the measurement of surface finish with various comparators	K2
CO5	Use appropriate method and instruments for inspection of various gear elements and thread elements.	K3
CO6	Describe the flatness measurement and machine tool alignment tests	K2

Name of the Course: DESIGN OF MACHINE ELEMENTS- II

Course Code: V18MET18

After successful completion of the course, the student will be able to:

CO No.	Course Outcome	Knowledge Level
CO1	Apply the concepts of different types of Bearings for design	K3
CO2	Illustrate the design concept of IC Engine Parts	K3
CO3	Employ the design concepts to curved beams	K3
CO4	Examine different Transmissions Systems and power screws	K2
CO5	Analyze the design of Spur & Helical Gears	K4
CO6	Calculate various parameters of mechanical springs	K3

Name of the Course: ROBOTICS

Course Code: V18MET19

After successful completion of the course, the student will be able to:

CO No.	Course Outcome	Knowledge Level
CO1	Describe various robot configuration and components	K2
CO2	Select appropriate actuators and sensors for a robot based on specific application	K3
CO3	Apply kinematic and dynamic analysis for simple serial kinematic chains	K3
CO4	Explain trajectory planning for a manipulator	K2
CO5	Understand the Robot Actuators And Feed Back Components	K2
CO6	Illustrate various applications of robots in manufacturing	K3

Name of the Course: MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS

Course Code: V18MBET51

After successful completion of the course, the student will be able to:

CO No.	Course Outcome	Knowledge Level
CO1	Understanding the basic concepts of managerial economics, demand, and elasticity of demand and methods of demand forecasting.	K2
CO2	Estimating the production function with one, two and infinite variables. Understanding various cost concepts and calculating breakeven point.	K2
CO3	Understanding and showing a price output determination in different types of market structures and knowing various pricing methods.	K2
CO4	Understanding various forms of business organizations.	K2
CO5	Preparation of financial statements and its analysis.	K3
CO6	Appraising the projects by using various capital budgeting methods.	K4

Name of the Course: BASIC MECHANICAL ENGINEERING (OPEN ELECTIVE-I)

Course Code: V18MEOE1

After successful completion of the course, the student will be able to:

CO No.	Course Outcome	Knowledge Level
CO1	Understand classification and working of major components in thermal power plants.	K2
CO2	Discuss various metal joining processes	K2
CO3	Classify types of air compressors and refrigeration systems.	K2
CO4	Illustrate the working of internal combustion engines	K2
CO5	Understand basics of heat transfer	K2
CO6	Discuss about functions and operations of machine tools including milling, shaping, grinding and lathe machines	K2

Name of the Course: GREEN ENGINEERING SYSTEMS (OPEN ELECTIVE-I)

Course Code: V18MEOE2

After successful completion of the course, the student will be able to:

CO No.	Course Outcome	Knowledge Level
CO1	Understand about solar radiation and its collection	K2
CO2	Discuss about various solar energy storage systems and applications.	K2
CO3	Explain about bio-mass, geothermal energy and ocean energy	K2
CO4	Classify the energy efficient systems.	K2
CO5	Describe different energy efficient processes.	K2
CO6	Discuss about features of green buildings	K2

Name of the Course: INTRODUCTION TO ROBOTICS (OPEN ELECTIVE-I)

Course Code: V18MEOE3

After successful completion of the course, the student will be able to:

CO No.	Course Outcome	Knowledge Level
CO1	Explain various automations and components.	K2
CO2	Discuss the anatomy of the robot with its components	K2
CO3	Illustrate robot configurations	K3
CO4	compute trajectory planning system	K3
CO5	Discuss various robot actuation and feedback sensors	K2
CO6	Explain different robot applications in industrial purpose	K2

Name of the Course: METROLOGY AND INSTRUMENTATION & CONTROL SYSTEMS LAB

Course Code: V18MEL06

After successful completion of the course, the student will be able to:

CO No.	Course Outcome	Knowledge Level
CO1	Experiment and examine errors in calibration of various instruments	K3
CO2	Explain the working principle of metrology and measuring equipments.	K2
CO3	Compute distance, angle and surface finish by using standard measuring equipments	K3

Name of the Course: THEORY OF MACHINES LAB

Course Code: V18MEL08

After successful completion of the course, the student will be able to:

CO No.	Course Outcome	Knowledge Level
CO1	Understand the concepts on various machine elements such as governors, springs, flywheel and cam & follower	K2
CO2	Examine the motion of gyroscope and static & dynamic balancing of masses	K3
CO3	Apply the principles of various power transmission systems such as shafts, gears and belt & pulley	K3

Name of the Course: HEAT TRANSFER LAB

Course Code: V18MEL09

After successful completion of the course, the student will be able to:

CO No.	Course Outcome	Knowledge Level
CO1	Evaluate the amount of heat exchange in various modes of heat transfer for several geometries.	K4
CO2	Evaluate the amount of heat exchange in condensation & boiling processes and for heat exchangers.	K4

Name of the Course: PROFESSIONAL COMMUNICATION SKILLS – IV

Course Code: V18ENT06

After successful completion of the course, the student will be able to:

CO No.	Course Outcome	Knowledge Level
CO1	Express writer's tone and relevant ideas using different types of writing skills and prepare resume to show case skills and accomplishments.	K2
CO2	Organize thoughts in the discussions and express views without reticence and face interviews with aplomb.	K3
CO3	Infer the meaning of the picture by thinking out of the box and speak without inhibitions.	K4
CO4	Demonstrate problem solving skills through the concepts of Percentages, Profit and loss, Simple Interest & Compound Interest and Allegation.	K3
CO5	Analyze appropriate methods of logical thinking on Ratio and Proportion, Partnership, LCM and HCF, Number System, Areas & Volumes.	K4
CO6	Calculate the end results of Cubes, Dice and Data Analysis, Time & Work, Time & Distance, Race & Games.	K4

Name of the Course: INTERNET OF THINGS Open Elective- I

Course Code: V18ECTOE1

After successful completion of the course, the student will be able to:

CO No.	Course Outcome	Knowledge Level
CO1	Describe M2M and IOT Technologies.	K2
CO2	Identify the layers and protocols in IOT.	K2
CO3	Describe various communication technologies used in IOT.	K2
CO4	Demonstrate various hardware components required for IOT applications.	K2
CO5	Identify the cloud technologies.	K2
CO6	Explain the applications of IoT.	K2

B.Tech. VII Semester

Name of the Course: Automation in Manufacturing

Course Code: V18MET20

After successful completion of the course, the student will be able to:

CO No.	Course Outcome	Knowledge Level
CO1	Understand the basic types, levels, strategies of automation.	K2
CO2	Identify the basic components and their functions of automated production line system.	K2
CO3	Differentiate various automated assembly systems.	K4
CO4	Compute various storage system and transportation requirements of automated systems.	K3
CO5	Apply appropriate process control strategy to an automated system.	K3
CO6	Illustrate the concepts of CIM..	K3

Name of the Course: Operation Research

Course Code: V18MET21

After successful completion of the course, the student will be able to:

CO No.	Course Outcome	Knowledge Level
CO1	Understand the formulating of LPP and solve LPP by Simplex methods, artificial variables techniques.	K2
CO2	Solve Transportation and assignment problems.	K3
CO3	Explain the concept of Sequencing and replacement of item.	K2
CO4	Understand the concept of queues with single server, solution of games with and without saddle points.	K2
CO5	Apply the concept of inventory models in solving EOQ problems.	K3
CO6	Solve the issues of dynamic programming and simulation.	K3

Name of the Course: Industrial Engineering and Management (Professional Elective –II)

Course Code: V18MET22

After successful completion of the course, the student will be able to:

CO No.	Course Outcome	Knowledge Level
CO1	Design and conduct experiments, analyze, interpret data and synthesize valid conclusions	K4
CO2	Design a system, component, or process, and synthesize solutions to achieve desired needs	K4
CO3	Use the techniques, skills, and modern engineering tools necessary for engineering practice with appropriate considerations for public health and safety, cultural, societal, and environmental constraints	K3
CO4	Examine effectively within multi-disciplinary teams and understand the fundamental precepts of effective project management	K3
CO5	Understand quality and quality management	K2
CO6	Understand concepts on recourse management	K2

Name of the Course: Composite Materials (Professional Elective –II)

Course Code: V18MET23

After successful completion of the course, the student will be able to:

CO No.	Course Outcome	Knowledge Level
CO1	Explain the required properties, reinforcements and uses of various composites.	K2
CO2	Explain how common fibers are produced and how the properties of the fibers are related to the internal structure and the interfaces obtained.	K2
CO3	Illustrate the processing techniques for polymer matrix, ceramic matrix and metal matrix composites and list out their properties and applications	K3
CO4	Analyze different ceramic composite materials	K4
CO5	Examine the processing of ceramic matrix composites	K3
CO6	Evaluate mechanical properties of composite materials	K5

Name of the Course: Refrigeration & Air Conditioning (Professional Elective –II)

Course Code: V18MET24

After successful completion of the course, the student will be able to:

CO No.	Course Outcome	Knowledge Level
CO1	Apply the concept of refrigeration to various systems.	K3
CO2	Employ the methods to improve performance of vapor compression systems.	K3
CO3	Identify eco-friendly refrigerants and understanding various VCR System Components.	K2
CO4	Describe vapour absorption systems.	K2
CO5	Analyze cooling and heating loads in an air conditioning system.	K4
CO6	Explain various air conditioning systems.	K2

Name of the Course: Total Quality Management (Professional Elective –III)

Course Code: V18MET25

After successful completion of the course, the student will be able to:

CO No.	Course Outcome	Knowledge Level
CO1	Understand the importance of significance of quality & to understand the concept of Quality.	K2
CO2	Develop quality improvement teams & to implement Quality Implementation Programs.	K3
CO3	Identify requirements of quality improvement programs & bench marketing	K2
CO4	Apply the tools and techniques of quality management to manufacturing and services processes.	K3
CO5	Apply the concepts of comprehensive quality management and the challenges of putting them into practice.	K3
CO6	Apply the quality management methods for analysing and solving problems of organization.	K3

Name of the Course: Finite Element Methods (Professional Elective –III)

Course Code: V18MET26

After successful completion of the course, the student will be able to:

CO No.	Course Outcome	Knowledge Level
CO1	Use the concepts of variational methods and weighted residual methods in FEM.	K3
CO2	Use Finite Element Formulation for solving the problems.	K3
CO3	Solve the problems of Truss elements by FEM.	K3
CO4	Solve the problems of Beam s elements by FEM.	K3
CO5	Use FEM to solve 2D CST problems.	K3
CO6	Analyze finite element method for problems involving dynamics and heat transfer.	K4

Name of the Course: Micro Electro Mechanical Systems (MEMS) (Professional Elective –III)

Course Code: V18MET27

After successful completion of the course, the student will be able to:

CO No.	Course Outcome	Knowledge Level
CO1	Understand about the basics of MEMS, Methods of Micro machining.	K2
CO2	Interpret various Mechanical sensors & Actuators	K3
CO3	Illustrate the working principles of various Thermal sensors and Actuators & its applications.	K3
CO4	Differentiate between different types of MOEMS devices	K2
CO5	Illustrate and explain various Magnetic sensors and Actuators & its applications	K3
CO6	Illustrate and explain various micro-fluidic devices & its applications	K3

Name of the Course: Artificial Intelligence (Open Elective – II)

Course Code: V18CSTOE05

After successful completion of the course, the student will be able to:

CO No.	Course Outcome	Knowledge Level
CO1	Illustrate the concept of intelligent systems and current trends in AI.	K2
CO2	Apply Problem solving, Problem reduction and Game Playing techniques in AI.	K3
CO3	Illustrate the Logic concepts in AI.	K2
CO4	Explain the Knowledge representation techniques in AI.	K2
CO5	Describe Expert systems and their applications.	K2
CO6	Illustrate Uncertainty Measures.	K2

Name of the Course: Simulation Lab

Course Code: V18MEL12

After successful completion of the course, the student will be able to:

CO No.	Course Outcome	Knowledge Level
CO1	Apply the tools like ANSYS or FLUENT in solving real time problems and day to day problems.	K3
CO2	Develop drawings for various components.	K3
CO3	Practice programming on CNC Machines.	K3

Name of the Course: Production Drawing Lab

Course Code: V18MEL13

After successful completion of the course, the student will be able to:

CO No.	Course Outcome	Knowledge Level
CO1	Recognise the need of limits, fits and tolerances, and apply the same on part drawings for manufacturing.	K2
CO2	Illusttrate the Geometric Dimensioning and tolerancing, able to apply GD&T to a part drawing.	K3
CO3	Indicate various surface roughness symbols on part drawings for manufacturing.	K2
CO4	Assess the raw material requirements, final cost of the component and heat treatment process.	K3
CO5	Develop skill to produce detailed drawings from assembly drawings.	K3
CO6	Construct press tools, die-casting dies and jigs and fixtures using computer aided design software.	K3

B.Tech. VIII Semester

Name of the Course: Automobile Engineering

Course Code: V18MET28

After successful completion of the course, the student will be able to:

CO No.	Course Outcome	Knowledge Level
CO1	Understand various components in four wheel automobile.	K2
CO2	Differentiate between different types of transmission systems used in automobile.	K4
CO3	Examine steering geometry and steering systems used in automobile.	K3
CO4	Interpret suspension, breaking and electrical systems in automobile.	K3
CO5	Understand various safety systems used in automobile.	K2
CO6	Practice engine service for different components in automobile.	K3

Name of the Course: Process Planning & Cost Estimation (Professional Elective – IV)

Course Code: V18MET31

After successful completion of the course, the student will be able to:

CO No.	Course Outcome	Knowledge Level
CO1	Understand the basic concepts of production, steps involved in types of process planning.	K2
CO2	Calculate the process parameters for various production processes.	K3
CO3	Prepare the types of estimates.	K3
CO4	Calculate depreciation cost and explain about different costs.	K3
CO5	Estimate production cost in forging, welding and foundry.	K2
CO6	Determine the machining time of different machining operations.	K4

Name of the Course: Non Destructive Evaluation (Professional Elective – IV)

Course Code: V18MET32

After successful completion of the course, the student will be able to:

CO No.	Course Outcome	Knowledge Level
CO1	Identify the flaws in manufacturing process through radiographic inspection	K2
CO2	Explain the theory of wave propagation and inspect the components using ultrasonic test	K2
CO3	Identify various surface, subsurface flaws with LPT and ECT	K2
CO4	Explain the principle of eddy current test system, flaw detection and evolution	K2
CO5	Demonstrate the flaw detection using IRT test	K2
CO6	Find the industrial applications in railways, nuclear, aerospace etc	K3

Name of the Course: Industrial Hydraulics and Pneumatics (Professional Elective – IV)

Course Code: V18MET33

After successful completion of the course, the student will be able to:

CO No.	Course Outcome	Knowledge Level
CO1	Understand the fundamentals of Fluid Power Systems	K2
CO2	Develop general concepts associated with Hydraulic actuators and cylinders.	K3
CO3	Identify Hydraulic elements in the design of circuits	K2
CO4	Illustrate various accumulators & intensifiers	K3
CO5	Develop the operation of pnuematics circuits andcomponents typically used in industry.	K3
CO6	Examine the applications of Industrial Hydraulics and Pneumatics.	K3

Name of the Course: Computational Fluid Dynamics (Professional Elective – V)

Course Code: V18MET34

After successful completion of the course, the student will be able to:

CO No.	Course Outcome	Knowledge Level
CO1	Apply techniques in the numerical solution of fluid equations	K3
CO2	Apply numerical modeling and its role in the field of heat transfer and fluid flow.	K3
CO3	Develop methodologies used in CFD	K3
CO4	Comapre various discretization methods and solving methodologies.	K4
CO5	Apply skills in the actual implementation of CFD methods (e.g. boundary conditions, different numerical schemes etc.	K3
CO6	Apply the finite element methods in the application of CFD analysis to real life engineering designs.	K3

Name of the Course: Production Planning and Control (Professional Elective – V)

Course Code: V18MET35

After successful completion of the course, the student will be able to:

CO No.	Course Outcome	Knowledge Level
CO1	Generalise structure, elements and functions of Production planning and Control.	K2
CO2	Apply the principles of different forecasting methods.	K3
CO3	Analyze principles of different inventory control systems.	K4
CO4	Generalise Routing, its procedure, factors affecting Routing procedure.	K2
CO5	Explain Scheduling methods, Planning and controlling aspects.	K2
CO6	Understand Dispatching procedure, types of follow up, applications of computers in production planning and control.	K2

Name of the Course: Energy Conservation and Management (Professional Elective – V)

Course Code: V18MET36

After successful completion of the course, the student will be able to:

CO No.	Course Outcome	Knowledge Level
CO1	Understand the principles of Energy.	K2
CO2	Evaluate thermal Performance.	K5
CO3	Illustrate Energy Conservation Program.	K3
CO4	Predict the Energy Conservation Options	K2
CO5	Recognise the Strategies for Electricity and Management	K2
CO6	Express the Importance and Role of Energy Management	K2

HoD - ME

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