ESWAR COLLEGE OF ENGINEERING

(Approved by AICTE, & Affiliated to JNTUK, A.P.)

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DEPARTMENT OF AUTOMOBILE ENGINEERING

COURSE OUTCOMES

A.Y:- 2020-2021

Year/Sem: II B.Tech I SEM

Course Name:METALLURGY & MATERIALS SCIENCE	
Course Code: AME2101	
AME2101.1	Understand the crystalline structure of different metals and study the stability of phases in different alloy systems
AME2101.2	Describe behavior of ferrous and non ferrous metals and alloys and their application in different domains.
AME2101.3	Able to understand the effect of heat treatment
AME2101.4	Able to understand the addition of alloying elements on properties of ferrous metals.
AME2101.5	Clarify the Grasp the methods of making of metal powders and applications of powder metallurgy
AME2101.6	Comprehend the properties and applications of ceramic, composites and other advanced methods.

Course Name: MECHANICS OF SOLIDS	
Course Code: AME2102	
AME2102.1	Model & Analyze the behavior of basic structural members subjected to various loading and support conditions based on principles of equilibrium.
AME2102.2	to analyze and design structural members and machine parts under axial, shear and bending loads, moment and torsional moment.
AME2102.3	analyze beams, columns, frames for normal, shear, and torsion stresses and to solve deflection problems in preparation for the design of such structural components.
AME2102.4	analyse beams and draw correct and complete shear and bending moment diagrams for beams.
AME2125.5	Able to understanding of the loads, stresses, and strains acting on a structure and their relations in the elastic behavior
AME2102.6	Design and analysis of Industrial components like pressure vessels.

Course Name: THERMODYNAMICS	
Course Code: AME2103	
AME2103.1	Describe basic concepts of thermodynamics.
AME2103.2	Able to Laws of thermodynamics.
AME2103.3	Explain Concept of entropy.

AME2103.4	Evaluation of vapors and their depiction in tables .
AME2123.5	Evaluation of charts.
AME2103.6	Evaluation of properties of perfect gas mixtures.

Course Name: Fluid Mechanics & Hydraulic Machines	
Course Code: AME2104	
AME2104.1	Able to know the basic concepts of fluid properties.
AME2104.2	Explain the mechanics of fluids in static and dynamic conditions.
AME2104.3	Clarify Boundary layer theory, flow separation and dimensional analysis.
AME2104.4	Describe Hydrodynamic forces of jet on vanes in different positions.
AME2104.5	Explain Working Principles and performance evaluation of hydraulic pump
AME2104.6	Describe Working Principles and performance evaluation of hydraulic turbines.

Course Name: BASIC ELEMENTS OF AUTOMOBILE CHASSIS	
Course Code: AME2105	
AME2105.1	Identify the different types of frame and chassis used in Automotive.
AME2105.2	Relate different types of drive lines and drives used in Automotive.
AME2105.3	Acquire knowledge about different types of front axle and rear axles used in motor vehicles.
AME2105.4	Examine the working principle of conventional and independent suspension systems.
AME2105.5	Apply knowledge on working principles of brake and its subsystems.
AME2105.6	Able to know the Suspension System

Course Name: COMPUTER AIDED ENGINEERING PRACTICE	
Course Code: AME2106	
AME2106.1	Able to draw projections of regular solids inclined to both planes, including auxiliary views.
AME2106.2	Analyze and illustrate the interpenetration of right regular solids, including the intersection of cylinder vs. cylinder, cylinder vs. prism, and cylinder vs. cone.
AME2106.3	Able to understand the basics of perspective projections, including points, lines, plane figures, and simple solids, using vanishing point methods
AME2106.4	Able to AutoCAD commands to draw geometric entities, create 2D and 3D wireframe models, and perform dimensioning
AME2106.5	Able to display the created models as isometric, orthographic, or perspective projections.

AME2106.6	Demonstrate the ability to create geometrical models of simple solids and machine parts using computer-aided solid modeling techniques.

Course Name: AUTOMOTIVE COMPONENTS LAB	
Course Code: AME2107	
AME2107.1	Able to Dismantle and Assemble the automobile chassis and Engine components
AME2107.2	Identify & differentiate components of SI & CI engines
AME2107.3	Able to understand working of braking, steering, clutch, transmission, Suspension systems.
AME2107.4	Differentiate various subsystems of two, three & Four wheeler vehicles
AME2107.5	Develop skills in Dismantling and assembling of chassis components.
AME2107.6	Describe Correct minor repairs and trouble shoots the breakdowns

Course Name:MECHANICS OF SOLIDS AND METALLURGY LAB	
Course Code: AME2108	
AME2108.1	Determine Mechanical properties and Elastic Constants
AME2108.2	Appraise the students with the use of testing machines
AME2108.3	Characterize the microstructures of different ferrous and non ferrous metals.
AME2108.4	Identify the effect of heat treatment and cooling rates on the properties of steels
AME2108.5	Clarify Hardeneability of steels by Jominy End QuenchTest
AME2108.6	Able to know the Microstructure of Mild steels, low carbon steels, high – Csteels

Year/Sem: II B.Tech II SEM

Course Name: KINEMATICS OF MACHINERY	
Course Code: AME2201	
AME2201.1	Contrive a mechanism for a given plane motion with single degree of freedom.
AME2201.2	Analyze a mechanism for a given straight line motion and automobile steering motion.
AME2201.3	Analyze the motion (velocity and acceleration) of a plane mechanism.
AME2201.4	Suggest and analyze mechanisms for a prescribed intermittent motion like opening and closing of IC engine valves etc.

AME2201.5	Able to Select a power transmission system for a given application
AME2201.6	Analyze motion of different transmission systems

Course Name: Applied Thermodynamics	
Course Code: AME2202	
AME2202.1	Expected to learn the working of steam power cycles and also should be able to analyze and evaluate the performance of individual components
AME2202.2	Able to learn the principles of combustion ,stochiometry and flue gas analysis
AME2202.3	Able to design the components and calculate the losses and efficiency of the boilers.
AME2202.4	Able to design the components and calculate the losses and efficiency of the nozzles.
AME2202.5	Able to design the components and calculate the losses and efficiency of the turbines and condensers**.**
AME2202.6	Able to learn various types of compressors, principles of working and their performance evaluation.

Course Name: AUTOMOBILE ENGINES	
Course Code: AME2203	
AME2203.1	Define engine glossaries, identify various components of SI and CI engines and its sub-systems Ignition, cooling and lubrication
AME2203.2	Able to understand the actual engine working principle and its thermochemistry of fuel-air mixtures
AME2203.3	Able to know the understand basic knowledge on SI and CI engine combustion and its related parameters
AME2203.4	Able to apply their knowledge in analyzing the engine performance and pollution characteristics

Course Name: PRODUCTION TECHNOLOGY

AME2203.5	Exposed to gain knowledge on recent developments of prime sources
AME2203.6	Explain methods to improve engine performance

Course Code: AME2204	
AME2204.1	Able to design the patterns and core boxes for metal casting processes
AME2204.2	Able to design the gating system for different metallic components
AME2204.3	Know the different types of manufacturing processes
AME2204.4	Able to use forging, extrusion processes
AME2204.5	Learn about the different types of welding processes used for special fabrication.
AME2204.6	Explain about Sheet metal forming

Course Name: AUTOMOBILE ELECTRICAL AND ELECTRONICS	
Course Code: AME2205	
AME2205.1	Understand the Lead Acid Battery and Lighting System
AME2205.2	Know the Starting System and Starter Motor
AME2205.3	Understand the Charging System and Alternators
AME2205.4	Know the Electronic Dashboard Instruments and Onboard Diagnostic System.
AME2205.5	Understand the Types of Sensors
AME2205.6	Know the actuators

Course Name: Automobile Assembly Drawing	
Course Code: AME2206	
AME2206.1	Explain the conventional representation of materials and common machine elements such as screws, nuts, bolts, keys, gears, webs, and ribs.
AME2206.2	Demonstrate proficiency in drawing sections and auxiliary sectional views, while understanding parts that are typically not sectioned.
AME2206.3	Able to understand the purpose, size, and location of title boxes on engineering drawings.
AME2206.4	Able to understanding and drawing practice of various joint and simple mechanical parts.
AME2206.5	Ability to draw assemblies from individual part drawings.
AME2206.6	Create assembled views for machine parts such as engine components

Course Name:THERMAL ENGINEERING LAB	
Course Code: AME2207	
AME2207.1	Analyze and draw valve and port timing diagrams for various types of engines.
AME2207.2	Able to conduct and interpret fuel tests accurately.
AME2207.3	Methods for exhaust emission measurements and evaluating engine performance.
AME2207.4	Able to calculate and analyze friction power losses in engines.
AME2207.5	Determining friction power using retardation or motoring tests on IC engines.
AME2207.6	Analyze heat distribution curves and understand the energy balance within

	the engine.

Year/Sem: III B.Tech I SEM

Course Name: DYNAMICS OF MACHINERY	
Course Code: AME3101	
AME3101.1	Analyze stabilization of sea vehicles, aircrafts and automobile vehicles
AME3101.2	Compute frictional losses, torque transmission of mechanical systsms.
AME3101.3	Analyze dynamic force analysis of slider crank mechanism and design of flywheel.
AME3101.4	Able to understand how to determine the natural frequencies of continuous systems starting from the general equation of displacement.
AME3101.5	Able to understand balancing of reciprocating and rotary masses.
AME3101.6	Able to know the vibrations

Course Name: FUELS AND COMBUSTION	
Course Code: AME3102	
AME3102.1	Able to understand the various kinds of fuels
AME3102.2	Able to understand the characteristics and origin
AME3102.3	Able to understand the thermodynamics behind combustion
AME3102.4	Clarify the flame propagation
AME3102.5	Able to know the choice of combustion systems
AME3102.6	Define combustion and chemical kinetics.

Course Name: DESIGN OF MACHINE ELEMENTS	
Course Code: AME3103	
AME3103.1	able to understand the concepts of various theories of failure
AME3103.2	Clarify factors of safety
AME3103.3	Able to Design for strength and rigidity
AME3103.4	Define used to design mechanical parts such as joints, shafts couplings
AME3103.5	Able to know the fundamentals of lubrication, various bearings and estimation of bearing life.
AME3103.6	design concepts to design various engine components.

Course Name: VEHICLE TRANSPORT MANAGEMENT	
Course Code: AME3104	
AME3104.1	Able to understand the need of preventive maintenance.
AME3104.2	Administration and inter departmental liaison

AME3104.3	Able how to prevent accidents by recording and estimating using different mechanisms.
AME3104.4	Able understand the vehicle schedule and crew timings and fare collection systems.
AME3104.5	Derive fare structure by estimating the operating costs for various types of vehicles.
AME3104.6	Estimate the operating cost by considering factors like depreciation, obsolescence, life of vehicles and wages

Course Name: HEAT TRANSFER	
Course Code: AME3105	
AME3105.1	Represent the physical problems of heat transfer in terms of governing equations or mathematical models
AME3105.2	Differentiate between different boundary conditions and apply the same for solving heat transfer problems
AME3105.3	Design thermal systems applying the concepts of heat transfer under steady state and well as unsteady state conditions
AME3105.4	Design, select and analyze the heat exchangers
AME3105.5	Apply the radiation concepts to the engineering devices
AME3105.6	Able to know the Radiation Heat Transfer

Course Name: AUTOMOTIVE ENGINES LAB AND FUELS LABORATORY	
Course Code: AME3106	
AME3106.1	Able to know the principles in assembly & dismantling of Single cylinder two and four stroke engines
AME3106.2	Able to know the assembly & dismantling of Carburetor and Fuel injection pump
AME3106.3	Able to know the assembly & dismantling of Lubrication system and Cooling system
AME3106.4	Clarify the Flash and Fire points of petrol and diesel
AME3106.5	Describe the viscosity of lubricants & Fuels
AME3106.6	Able to know the Cloud and Pour point Test

Course Name: HEAT TRANSFER LAB	
Course Code: AME3107	
AME3107.1	Determine the overall heat transfer coefficient of composite slabs.
AME3107.2	Analyze the effects of insulation on heat transfer and quantify the reduction in heat loss.
AME3107.3	Calculate Heat Transfer Coefficients And Understand The Principles Of Heat Transfer In Spherical Geometries.
AME3107.4	Measure heat transfer coefficients in forced convection experiments under different flow conditions.

AME3107.5	Understand the principles of blackbody radiation and its significance in thermal radiation.
AME3107.6	Identify the conditions under which boiling transitions occur and the implications for heat transfer applications.

Course Name: PRODUCTION TECHNOLOGY LAB	
Course Code: AME3108	
AME3108.1	apply some of the manufactures process directly in the industry for preparation of complicated jobs
AME3108.2	various jobs using various manufacturing process
AME3108.3	preparation of jobs can be extended to implement in the preparation of complicated jobs.
AME3108.4	Pattern Design and making and Sand properties testing
AME3108.5	Able to know the elding
AME3108.6	Explain the metal forming process

Year/Sem: III B.Tech II SEM

Course Name : MACHINE TOOLS & METROLOGY	
Course Code: AME3201	
AME3201.1	Define fundamentals of metal cutting and forces
AME3201.2	Explain Engine Lathe and its various operations
AME3201.3	Describe Shaping, Slotting, and Planning, Drilling and boring machines and its various operations
AME3201.4	Able to know the Milling machines, grinding machines and its various operations
AME3201.5	Explain systems of limits and tolerances and measurement instruments.
AME3201.6	Able to know the optical measuring instruments and surface measurement instruments.

Course Name: INSTRUMENTATION & CONTROL SYSTEMS	
Course Code: AME3202	
AME3202.1	Definition and fundamental principles of measurement systems.
AME3202.2	Explain Various temperature measurement devices such as expansion, electrical resistance, thermistors, thermocouples, and pyrometers.
AME3202.3	Measurement of speed using mechanical tachometers, electrical tachometers, stroboscopes, and non-contact tachometers.
AME3202.4	Able to know the Application of strain gauges for measuring torque and the usage of strain gauge rosettes
AME3202.5	Measurement of humidity, including moisture content of gases and various devices like sling psychrometers, absorption psychrometers, and dew point meters.
AME3202.6	Explain Introduction to control systems, their importance, and classification into open and closed systems.

Course Name: AUTOMOTIVE ELECTRICAL AND ELECTRONICS	
Course Code: AME3203	
AME3203.1	Able to understand the different automotive electrical systems
AME3203.2	Define energy storages and ignition systems
AME3203.3	Explain electronic components involved
AME3203.4	Able to identify the fault diagnosis and preventive measures.
AME3203.5	Describe understand the dash board units and electrical accessories
AME3203.6	Determine Binary numbers and conversions

Course Name: ALTERNATIVE ENERGY SOURCES FOR AUTOMOBILES	
Course Code: AME3204	
AME3204.1	Able to understand the ever increasing quality of life
AME3204.2	Explain this phenomenon imposes high demand on conventional fossil fuels
AME3204.3	Describe search for alternate fuels is a continuous phenomenon.
AME3204.4	Able to various alternate fuels along with their merits and limitations.
AME3204.5	Explain hydrogen fuel usage
AME3204.6	Able to know the use of turbines in automobiles

Course Name: AUTOMOTIVE EMISSION AND POLLUTION CONTROL	
Course Code: AME3205	
AME3205.1	Explain air pollution and pollutants, their sources & their effects.
AME3205.2	Describe different parameters responsible for pollutant formation.
AME3205.3	Choose instruments for pollution measurements.
AME3205.4	Analyze measurement of pollutants
AME3205.5	Explain Constant Volume Sampling I and 3
AME3205.6	Able to know the Encapsulation technique for noise reduction

Course Name: AUTOMOTIVE ELECTRICAL AND ELECTRONICS LAB	
Course Code: AME3206	
AME3206.1	Able to know the batteries and starter motor testing
AME3206.2	Alarifty the alternator testing and wiring system
AME3206.3	Describe Battery Ignition System and different Electrical Equipment's
AME3206.4	Able to know the different sensors and various electronics system
AME3206.5	Describe the lighting system of two wheeler and FourWheeler
AME3206.6	Define the Automotive Electronics

Course Name: METROLOGY AND MACHINE TOOLS LAB

Course Code: AME3207	
AME3207.1	Explain hands on experience on lathe machine to perform turning, facing, threading operations.
AME3207.2	Explain flat surface machining, milling and grinding operations.
AME3207.3	Able to know the drilling and threading operations.
AME3207.4	Describe Linear and angular measurements exposure.
AME3207.5	Describe machine tool alignment test on the lathe
AME3207.6	Able to operate various precession measuring instruments and working and operations of various machines tools

Course Name: AUTO SCANNING & VEHICLE TESTING LAB	
Course Code: AME3208	
AME3208.1	Able tounderstand automotive scan tools
AME3208.2	Diagnostic equipment for fault diagnosis and troubleshooting
AME3208.3	Computerized engine analyzer and wheel balancing machine
AME3208.4	Describe Two wheeler chassis dynamometer
AME3208.5	Explain Head light focusing test andVisibility test
AME3208.6	Able to know the bus depots and service station workshop layouts

Year/Sem: IV B.Tech I SEM

Course Name: AUTOMOTIVE CHASSIS & SUSPENSION	
Course Code: AME4101	
AME4101.1	Explain different chassis layouts and frames, Suspensions, Wheels and Tyres
AME4101.2	Determine stability and weight distribution and suitability of frames.
AME4101.3	Describe, about various Front Axles, factors of wheel alignment Steering Systems and Calculate dimensions of Front Axle
AME4101.4	Able to know Front Wheel Mounting
AME4101.5	Able to know the brakes and its components
AME4101.6	Describe Classification of two and three wheelers

Course Name: VEHICLE DYNAMICS	
Course Code: AME4102	
AME4102.1	Understand the principles underlying the development and design of road vehicles under the influence of dynamic loads
AME4102.2	Analyze the performance and establish the design specifications for the acceleration and braking conditions.
AME4102.3	Model, simulate and analyze the conventional road vehicles for better ride comfort.
AME4102.4	Analyze the cornering forces and effects of tractive forces on cornering
AME4102.5	Analyze the cornering effects of tractive forces on cornering

AME4102.6	Design suspension systems for better damping and comfort

Course Name: CAD/CAM	
Course Code: AME4103	
AME4103.1	Describe the mathematical basis in the technique of representation of geometric entities including points, lines, and parametric curves,
AME4103.2	Describe the surfaces and solid, and the technique of transformation of geometric entities using transformation matrix
AME4103.3	Describe the use of GT for the product development
AME4103.4	Describe the use of CAPP for the product development
AME4103.5	Able to know the Identify the various elements
AME4103.6	Able to know the activities in the Computer Integrated Manufacturing Systems.

Course Name: FINITE ELEMENT METHODS	
Course Code: AME4104	
AME4104.1	Understand the concepts behind variational methods and weighted residual methods in FEM
AME4104.2	Identify the application and characteristics of FEA elements such as bars, beams, plane and isoparametric elements, and 3-D element
AME4104.3	Develop element characteristic equation procedure and generation of global stiffness equation will be applied.
AME4104.4	Able to apply Suitable boundary conditions to a global structural equation, and reduce it to a solvable form.
AME4104.5	Able to identify how the finite element method expands beyond the structural domain, for problems involving dynamics, heat transfer, and fluid flow.
AME4104.6	Analysis of Steady state heat transfer

Course Name: VEHICLE BODY ENGG. & SAFETY	
Course Code: AME4105	
AME4105.1	Classify the vehicles and define basic terms
AME4105.2	Able to know the Select appropriate body materia
AME4105.3	Calculate various aerodynamic forces and moments acting on vehicle
AME4105.4	Calculate load distribution in vehicle body
AME4105.5	Explain the ergonomics, stability the vehicle.
AME4105.6	Identify the various safety aspects in a given vehicle.

Course Name: CONDITION MONITORING	
Course Code: AME4106	
AME4106.1	Gaining invaluable insights into the benefits of Condition Monitoring
AME4106.2	Understanding the reasons for selecting particular maintenance strategies

AME4106.3	Understanding effective methodologies for implementing Condition Monitoring Techniques
AME4106.4	Identifying the optimum maintenance strategy for different types of equipment
AME4106.5	Gaining practical approaches to minimise the risk of plant and machinery breakdowns
AME4106.6	Awareness of International Standards covering asset management

Course Name: AUTOMOBILE CHASSIS LAB & INSTRUMENTATION LAB	
Course Code: AME4107	
AME4107.1	Calibration of Pressure Gauges and transducer
AME4107.2	Able to know the servicing the generators and batteries and ignition systems.
AME4107.3	Able to know temperature detector for temperature measurement
AME4107.4	calibration of a rotometer for flow measurement
AME4107.5	Able to measurement of vibration amplitude of an engine bed at various loads.
AME4107.6	Explain Mcleod gauge for low pressure

Course Name: CAD/CAM LAB	
Course Code: AME4108	
AME4108.1	Able to appreciate the utility of the tools like ANSYS or FLUENT in solving real time problems and day to day problems.
AME4108.2	Able to know the Use of these tools for any engineering and real time applications
AME4108.3	Able to know the Development of part drawings for various components
AME4108.4	Generation of various 3D models through protrusion
AME4108.5	Determination of deflection and stresses in 2D and 3D trusses and beams
AME4108.6	Acquire knowledge on utilizing these tools for a better project in their curriculum as well as they will be prepared to handle industry problems with confidence when it matters to use these tools in their Employment

Year/Sem: IV B.Tech II SEM

Course Name: AUTOMOTIVE CONTROL SYSTEMS	
Course Code: AME4201	
AME4201.1	Define current state of automotive control systems
AME4201.2	Explain basic Engine Operation: Effective Work, Air-Fuel Ratio, Combustion, and Energy conversion.
AME4201.3	Able to know the Engine control systems
AME4201.4	Explain Diagnosis of automotive engines
AME4201.5	Able to know the Vehicle modelling and Road and driver models
AME4201.6	Describe Introduction to Mechatronics

Course Name: VEHICLE MAINTENANCE	
Course Code: AME4202	
AME4202.1	Able to know the maintain various records
AME4202.2	Clarify scheduled and unscheduled maintenance
AME4202.3	They are also expected to maintain of various systems of a vehicle.
AME4202.4	Describe repair of various systems of a vehicle.
AME4202.5	Able to service of various systems of a vehicle
AME4202.6	Explain Wheel Alignment

Course Name: PRODUCT DESIGN AND ASSEMBLY AUTOMATION	
Course Code: AME4203	
AME4203.1	Understand the mechanics of vibratory conveying and the principles behind vibrator feeders
AME4203.2	Analyze the effect of active orienting devices on feed rate and the performance of orienting systems
AME4203.3	Discuss the development process of assembly automation and factors influencing the choice of assembly method
AME4203.4	Analyze assembly processes and derive general rules for product design for automation
AME4203.5	Discuss the role of design for assembly (DFA) in the design process and general guidelines for manual assembly.
AME4203.6	Evaluate the performance and economics of assembly systems, including indexing machines, free transfer machines, and robot assembly

Course Name: AUTOMOBILE AIR CONTIDITIONING	
Course Code: AME4204	
AME4204.1	Understand the basic principles of air conditioning systems
AME4204.2	Identify and explain the components of air conditioning systems including compressors, evaporators, condensers, and expansion devices.
AME4204.3	Evaluate the factors influencing the load on refrigeration and air conditioning systems.
AME4204.4	Analyze the layout of duct systems in automobiles and their effects on load calculations.
AME4204.5	Define objectives of air routing and temperature control in air conditioning systems.
AME4204.6	Able to know the maintenance and servicing tasks for air conditioning systems, including leak testing, system discharging, evacuating, and charging.