ESWAR COLLEGE OF ENGINEERING

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

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DEPARTMENT OF AUTOMOBILE ENGINEERING

COURSE OUTCOMES

A.Y:- 2022-2023

Year/Sem: II B.Tech I SEM

Course Name: MATHEMATICS-III(Vector Calculus, Transforms and PDE)	
Course Code: AME2101	
AME2101.1	Able to Interpret the physical meaning of different operators such as gradient, curl and divergence (L5)
AME2101.2	Estimate the work done against a field, circulation and flux using vector calculus (L5)
AME2101.3	Apply the Laplace transform for solving differential equations (L3)
AME2101.4	Find or compute the Fourier series of periodic signals (L3)
AME2101.5	Know and be able to apply integral expressions for the forwards and inverse Fourier transform to a range of non-periodic waveforms (L3)
AME2101.6	Identify solution methods for partial differential equations that model physical processes (L3)

Course Name: THERMODYNAMICS	
Course Code: AME2102	
AME2102.1	Define basic concepts of thermodynamics.
AME2102.2	Describe Laws of thermodynamics.
AME2102.3	Explain Concept of entropy.
AME2102.4	Evaluation of vapors and their depiction in tables .
AME2125.5	Evaluation of charts.
AME2102.6	Evaluation of properties of perfect gas mixtures.

Course Name: MECHANICS OF SOLIDS	
Course Code: AME2103	
AME2103.1	Model & Analyze the behavior of basic structural members subjected to various loading and support conditions based on principles of equilibrium.
AME2103.2	Able to Understand the apply the concept of stress and strain to analyze and design structural members and machine parts under axial, shear and bending loads, moment and torsional moment.
AME2103.3	Analyze beams, columns, frames for normal, shear, and torsion stresses and to solve deflection problems in preparation for the design of such structural components.
AME2103.4	Analyse beams and draw correct and complete shear and bending moment diagrams for beams.
AME2103.5	Able to understanding of the loads, stresses, and strains acting on a structure

	and their relations in the elastic behavior
AME2103.6	Design and analysis of Industrial components like pressure vessels.

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: Components of Automobile Chassis	
Course Code: AME2105	
AME2105.1	Identify the different types of frame and chassis used inAutomotive.
AME2105.2	Able to know relate different types of drive lines and drives used inAutomotive.
AME2105.3	Acquire knowledge about different types of front axle and rear axles used in motor vehicles.
AME2105.4	Acquire knowledge about different types of rear axles used in motor vehicles.
AME2105.5	Examine the working principle of conventional and independent suspension systems .
AME2105.6	Apply knowledge on working principles of brake and its subsystems.

Course Name: Mechanics of Solids & Metallurgy Lab	
Course Code: AME2106	
AME2106.1	Determine Mechanical properties and Elastic Constants
AME2106.2	Appraise the students with the use of testing machines
AME2106.3	Characterize the microstructures of different ferrous and non ferrous metals.
AME2106.4	Identify the effect of heat treatment and cooling rates on the properties of steels
AME2106.5	Clarify Hardeneability of steels by Jominy End QuenchTest
AME2106.6	Able to know the Microstructure of Mild steels, low carbon steels, high – Csteels

Course Name: Automobile Chassis lab	
Course Code: AME2107	
AME2107.1	Able to know the understand working of braking, , Suspension systems.
AME2107.2	Describe understand working of steering.
AME2107.3	Define understand working of clutch.
AME2107.4	Explain working of transmission.
AME2107.5	Differentiate various subsystems of two, three & Four wheeler vehicles
AME2107.6	Develop skills in Dismantling and assembling of chassis components.

Course Name: Fluid Mechanics & Hydraulic Machines lab	
Course Code: AME2108	
AME2108.1	To gain practical exposure on the performance evaluation methods of Turbine flow meter
AME2108.2	To gain practical exposure on the performance evaluation methods of Pelton Wheel
AME2108.3	To gain practical exposure on the performance evaluation methods of Francis Turbine
AME2108.4	To gain practical exposure on the performance evaluation methods of Reciprocating pump
AME2108.5	To gain practical exposure on the performance evaluation methods of Venturimeter
AME2108.6	To gain practical exposure on the performance evaluation methods of Centrifugal pump

Course Name: COMPUTER AIDED DRAFTING AND MODELLING LAB	
Course Code: AME2109	
AME2109.1	Able to use software like AutoCAD, Invertor/ Pro E/ Unigraphics.
AME2109.2	Learned basic concept to drawing, edit, dimension, hatching etc. to develop 2D Modelling.
AME2109.3	Learned basic concept to drawing, edit, dimension, hatching etc. to develop 3D Modelling.
AME2109.4	Able to make 3D assembling of different machine components
AME2109.5	Able to make 3D modelling, modification & manipulation along with detailing.

AME2109.6	Able to prepare surface modelling and sheet metal operations through various exercises

Year/Sem: II B.Tech II SEM

Course Name: Applied Thermodynamics	
Course Code: AME2201	
AME2201.1	Expected to learn the working of steam power cycles and also should be able to analyze and evaluate the performance of individual components
AME2201.2	Able to learn the principles of combustion ,stochiometry and flue gas analysis
AME2201.3	Able to design the components and calculate the losses and efficiency of the boilers.
AME2201.4	Able to design the components and calculate the losses and efficiency of the nozzles.
AME2201.5	Able to design the components and calculate the losses and efficiency of the turbines and condensers.
AME2201.6	Able to learn various types of compressors, principles of working and their performance evaluation.

Course Name: COMPLEX VARIABLES AND STATISTICAL METHODS	
Course Code: AME2202	
AME2202.1	Apply Cauchy-Riemann equations to complex functions in order to determine whether a given continuous function is analytic (L3)
AME2202.2	Find the differentiation and integration of complex functions used in engineering problems (L5)
AME2202.3	Make use of the Cauchy residue theorem to evaluate certain integrals (L3)
AME2202.4	Apply discrete and continuous probability distributions (L3)
AME2202.5	Design the components of a classical hypothesis test (L6)
AME2202.6	Infer the statistical inferential methods based on small and large sampling tests (L4)

Course Name: AUTOMOBILE ENGINES	
Course Code: AME2203	
AME2203.1	Able to know the Air Standard and Actual Cycles
AME2203.2	Explain the Four Stroke and Two Stroke Engines
AME2203.3	Able to know about the Lubrication, Cooling systems, Supercharging and Turbocharging
AME2203.4	Describe the Carburetor and its types

AME2203.5	Define the Homogeneous Charge Compression Ignition(HCCI), Reactivity Controlled Compression Ignition (RCCI) Technologies and Pre-mixed Charge Compression (PCCI)
AME2203.6	Able to know the Emission Effects on Health & Environment

Course Name: AUTOMOBILE ELECTRICAL AND ELECTRONICS	
Course Code: AME2204	
AME2204.1	Ableto know the Lead Acid Battery and Lighting System
AME2204.2	Explain the Starting System and Starter Motor
AME2204.3	Define the Charging System and Alternators
AME2204.4	Describe the Electronic Dashboard Instruments and Onboard Diagnostic System.
AME2204.5	Explain the Types of Sensors
AME2204.6	Able to know the actuators

Course Name: Operations Research	
Course Code: AME2205	
AME2205.1	**Formulate the resource management problems and identify appropriate methods to solve them**
AME2205.2	**Apply LPP.**
AME2205.3	**Apply transportation and assignment models to optimize the industrial resources**
AME2205.4	**Solve decision theory problems through the application of game theory**
AME2205.5	**Apply the replacement and queuing models to increase the efficiency of the system**
AME2205.6	**Model the project management problems through CPM and PERT**

Course Name: Automobile Assembly Drawing	
Course Code: AME2206	
AME2206.1	Describe various joint, simple mechanical parts Selection of Views
AME2206.2	Explain machine elements and parts with every drawing proportions.
AME2206.3	Able to Shaft coupling, spigot and socket pipejoint
AME2206.4	able to draw the assembly from the individual part drawing
AME2206.5	Explain the Drawings of assembled views for the part drawings
AME2206.6	Able to know the spring loaded safety valve, feed check valve and air cock, Controlvalves

Course Name: Automobile Engines & Fuels Lab	
Course Code: AME2207	
AME2207.1	Expected to know the principles in assembly.
AME2207.2	Able to know the principles in dismantling of engine components.
AME2207.3	Describe the Dismantle and Assemble of Agriculture single Cylinder and Multi- Cylinder Automotive Engines

AME2207.4	Explain characteristics automobile
AME2207.5	Able to know the fuels.
AME2207.6	Explain lubricants used in automobile

Course Name: Automobile Electrical & Electronics Lab	
Course Code: AME2208	
AME2208.1	**Able to know the batteries and starter motor testing**
AME2208.2	**Alarifty the alternator testing and wiring system**
AME2208.3	**Describe Battery Ignition System and different Electrical Equipment's**
AME2208.4	**Able to know the different sensors and various electronics system**
AME2208.5	**Describe the lighting system of two wheeler and FourWheeler**
AME2208.6	**Define the Automotive Electronics**

Course Name: MACHINE TOOLS AND METROLOGY LAB	
Course Code: AME2209	
AME2209.1	Explain hands on experience on lathe machine to perform turning, facing, threading operations.
AME2209.2	Explain flat surface machining, milling and grinding operations.
AME2209.3	Able to know the drilling and threading operations.
AME2209.4	Describe Linear and angular measurements exposure.
AME2209.5	Describe machine tool alignment test on the lathe
AME2209.6	Able to operate various precession measuring instruments and working and operations of various machines tools

Year/Sem: III B.Tech I SEM

Course Name: THEORY OF MACHINES	
Course Code: AME3101	
AME3101.1	Demonstrate the fundamentals of mechanisms and their applications and able to analyse the kinematic properties of mechanism such as displacement, velocity and acceleration
AME3101.2	Analyze the effect of friction in machines such as belt drives, clutches and brakes
AME3101.3	Able to know the the basic nomenclature of gears and analyze gear kinematics.
AME3101.4	Analyze velocity and acceleration
AME3101.5	Analysis of cam and demonstrate the balancing of any kinematic system
AME3101.6	Analyze different types of Vibrations

Course Name: PRODUCTION TECHNOLOGY	
Course Code: AME3102	
AME3102.1	Able to design the patterns and core boxes for metal casting processes
AME3102.2	Able to design the gating system for different metallic components

AME3102.3	Describe the different types of welding processes
AME3102.4	Explain the Principles of Gating
AME3102.5	Learn about plastic deformation processes
AME3102.6	Explain about the Sheet metal forming

Course Name: VEHICLE DYNAMICS	
Course Code: AME3103	
AME3103.1	Able to know the different types of forces, loads and fundamental dynamics variables acting on vehicle
AME3103.2	Derivation of expression for braking and acceleration parameters on vehicle such as constant retardation wind resistance and having knowledge on brakes
AME3103.3	Determination of different types of road loads acting on a vehicle
AME3103.4	Describe rolling resistance and factors effecting on it
AME3103.5	Identify and understand the Vehicle response properties
AME3103.6	Derivation of steady state cornering parameters

Course Name:Basic Automobile Engineering	
Course Code: AME3104	
AME3104.1	Able to know the course, shall learn about transmission,
AME3104.2	Learn about oil filters, oil pumps and crank case ventilation
AME3104.3	Analysis the steering
AME3104.4	Able to know the suspension system
AME3104.5	Explain the braking and safety
AME3104.6	Able to know the vehicle troubleshooting.

Course Name: Two and Three Wheelers	
Course Code: AME3105	
AME3105.1	Able to know the different frames
AME3105.2	Learn about suspension system
AME3105.3	Learn about transmission unit used in various two and three wheeler vehicles
AME3105.4	Describe ignition systems electrical &braking systems
AME3105.5	Explain about three wheeler vehicles
AME3105.6	Able to know the wheels and tyres

Course Name: PRODUCTION TECHNOLOGY LAB	
Course Code: AME3106	
AME3106.1	Able to Design and manufacture simple patterns
AME3106.2	Control sand properties in foundry

AME3106.3	Operate arc welding, gas welding and resistance welding equipment
AME3106.4	Describe blow moulding and injection moulding equipment
AME3106.5	Able to know the sheet metal operations
AME3106.6	Explain brazing and soldering

Course Name: THEORY OF MACHINES LAB	
Course Code: AME3107	
AME3107.1	Able to Evaluate performance of a Hartnel governor
AME3107.2	Determine the frequencies of vibration in case of free and forced vibrations of a spring- mass system and whirling speed of a shaft
AME3107.3	Determine motion characteristics of a slider crank mechanism and cam-follower mechanism
AME3107.4	Demonstrate various mechanical power transmission devices
AME3107.5	Explain Components like screw jack and gears.
AME3107.6	Define moment of inertia of a flywheel

Course Name: VEHICLE DESIGN AND ANALYSIS LAB	
Course Code: AME3108	
AME3108.1	Able to visualize the automotive components with the help of modelling software.
AME3108.2	Make the modifications instantly if required at the initial stage itself.
AME3108.3	Demonstrate the knowledge on designing components to withstand the loads and deformations.
AME3108.4	Synthesize, analyze and document the design of the various components
AME3108.5	Demonstrate the ability to use engineering techniques for developing vehicle components with industry standards.
AME3108.6	Able to understanding Vehicle Aerodynamics

Year/Sem: III B.Tech II SEM

Course Name: Automobile Components and Chassis Design	
Course Code: AME3201	
AME3201.1	Identifying the constructional details of chassis and components
AME3201.2	Explain various steering systems, steering linkages and steering gear boxes
AME3201.3	Able to understand the principle of suspension system
AME3201.4	Derivation of steering kinematics parameters
AME3201.5	Describe Knowledge on gearbox design
AME3201.6	Explain the working of CVT

Course Name: Automobile Transmission systems	
Course Code: AME3202	
AME3202.1	Able to know the the concept of hydrodynamic transmissions.

AME3202.2	Explain the Planetary gear trains
AME3202.3	Describe automatic and hydrostatic transmissions and their performance.
AME3202.4	Explain about the epi-cyclic gear boxes
AME3202.5	Describe the electric drives
AME3202.6	Clarify Know about the advantages and disadvantages of electric drives

Course Name: Vehicle Body Engineering	
Course Code: AME3203	
AME3203.1	Describe car body details
AME3203.2	Explain the vehicle aero dynamics
AME3203.3	Define bus body details
AME3203.4	Able to know the commercial vehicle details
AME3203.5	Describe the the Wind Tunnel Testing
AME3203.6	Explain the body materials, trim and mechanisms

Course Name: Alternative Fuels for Automobiles	
Course Code: AME3204	
AME3204.1	Possess a comprehensive understanding of available alternative fuels for IC engines.
AME3204.2	Able to know the different biofuels, modifying them and using them in IC engines
AME3204.3	Acquire the skills in developing new technologies for alternative fuels efficiently in IC engines.
AME3204.4	Demonstrate the importance of using alternative fuels for sustainable energy supply and for emission control in IC engines.
AME3204.5	Describe combustion and emission Characteristics in engines
AME3204.6	Explain Biogas, Compressed Natural gas (CNG) and LPG

Course Name: Mechatronics	
Course Code: AME3205	
AME3205.1	Able to use the various mechatronics systems devices
AME3205.2	Components in the design of electro mechanical systems.
AME3205.3	Able to Know the programmable logic controllers
AME3205.4	Explain the System and interfacing and data acquisition
AME3205.5	Describe the System Digital Signal Processing
AME3205.6	Able to Know the Dynamic models and analogies, System response

Course Name: AUTO SCANNING & VEHICLE TESTING LAB
Course Code: AME3206

AME3206.1	Able tounderstand automotive scan tools
AME3206.2	Diagnostic equipment for fault diagnosis and troubleshooting
AME3206.3	Computerized engine analyzer and wheel balancing machine
AME3206.4	Describe Two wheeler chassis dynamometer
AME3206.5	Explain Head light focusing test andVisibility test
AME3206.6	Able to know the bus depots and service station workshop layouts

Course Name: VEHICLE MAINTENANCE LABORATORY	
Course Code: AME3207	
AME3207.1	Acquire the fundamental knowledge in evaluation and maintenance
AME3207.2	Understand the various methods of maintaining vehicles and their subsystems
AME3207.3	Know the Fault diagnosis and service of vehicle air conditioning system
AME3207.4	Understand Minor and major tune up of gasoline and diesel engines and Calibration of Fuel injection pump
AME3207.5	Know the Removal and fitting of tire and tube
AME3207.6	Know the Fault diagnosis of brake/clutch

Course Name: VEHICLE EVALUATION LAB	
Course Code: AME3208	
AME3208.1	Know the Brake Performance Evaluation
AME3208.2	Understand Grade ability and Coast Down Test for all Vehicles
AME3208.3	Know the Speedometer Calibration
AME3208.4	Understand the Bus body, Truck and Ambulance code
AME3208.5	Know the Acceleration performance of 2 wheeler
AME3208.6	Students at the end of the course will be able to gain knowledge on various standards used for testing of vehicles.

Course Name: SOFT SKILLS	
Course Code: AME3209	
AME3209.1	Use language fluently, accurately and appropriately in debates and group discussions
AME3209.2	Exhibit interview skills and develop soft skills
AME3209.3	Understand how to making meeting effective, Negotiation skills

AME3209.4	Use their skills of listening comprehension to communicate effectively in cross-cultural contexts
AME3209.5	Learn and use new vocabulary
AME3209.6	Write resumes, project reports and reviews.

Year/Sem: IV B.Tech I SEM

Course Name: INDUSTRIAL ENGINEERING AND MANAGEMENT	
Course Code: AME4101	
AME4101.1	Design and conduct experiments, analyse, interpret data and synthesise valid conclusions
AME4101.2	Design a system, component, or process, and synthesise solutions to achieve desired needs
AME4101.3	Use the techniques, skills, and modern engineering tools necessary for engineering practice with appropriate considerations for public health
AME4101.4	Use the techniques, skills, and modern engineering tools necessary for engineering practice with appropriate considerations for safety, cultural, societal, and environmental constraints
AME4101.5	Function effectively within multi-disciplinary teams
AME4101.6	Understand the fundamental precepts of effective project management

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. CO3 CO5
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: Vehicle Body Engineering	
Course Code: AME4103	
AME4103.1	Describe car body details
AME4103.2	Explain the vehicle aero dynamics
AME4103.3	Define bus body details

AME4103.4	Able to know the commercial vehicle details
AME4103.5	Describe the the Wind Tunnel Testing
AME4103.6	Explain the body materials, trim and mechanisms

Course Name: ALTERNATIVE ENERGY SOURCES FOR AUTOMOBILES	
Course Code: AME4103	
AME4104.1	Possess a comprehensive understanding of available alternative fuels for IC engines.
AME4104.2	Able to knowledge on producing different biofuels, modifying them and using them in IC engines
AME4104.3	Acquire the skills in developing new technologies for alternative fuels efficiently in IC engines.
AME4104.4	Demonstrate the importance of using alternative fuels for sustainable energy supply and for emission control in IC engines.
AME4104.5	Able to combustion and emission Characteristics in engines
AME4104.6	Explain Working of LPG and CNG

Course Name: TWO AND THREE WHEELERS	
Course Code: AME4105	
AME4105.1	Able to know the different frames
AME4105.2	Learn about suspension system
AME4105.3	Learn about transmission unit used in various two and three wheeler vehicles
AME4105.4	Describe ignition systems electrical &braking systems
AME4105.5	Explain about three wheeler vehicles
AME4105.6	Able to know the wheels and tyres

Course Name: MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS	
Course Code: AME4106	
AME4106.1	Able to the knowledge of estimating the Demand and demand elasticities for a product.
AME4106.2	Describe Input-Output-Cost relationships and estimation of the least cost combination of inputs
AME4106.3	Able to understand the nature of different markets and Price Output determination under various market conditions
AME4106.4	Define knowledge of different Business Units
AME4106.5	Able to prepare Financial Statements and the usage of various Accounting tools for Analysis.
AME4106.6	Evaluate various investment project proposals with the help of capital budgeting techniques for decision making.

Course Name: VEHICLE DESIGN AND SIMULATION LAB

Course Code: AME4107	
AME4107.1	Make the modifications instantly if required at the initial stage itself
AME4107.2	Demonstrate the knowledge on designing components to withstand the loads and deformations.
AME4107.3	Synthesize, analyze and document the design of the various components
AME4107.4	Demonstrate the ability to use engineering techniques for developing vehicle components with industry standards.
AME4107.5	Able to design and Modeling of rear axle
AME4107.6	Derive mathematical problems in matlab

Year/Sem: IV B.Tech II SEM

Course Name: NOISE, VIBRATIONS AND HARSHNESS	
Course Code: AME4201	
AME4201.1	Demonstrate a clear understanding of the sources, effects, prediction, control techniques
AME4201.2	Measurement techniques of noise
AME4201.3	Able to vibration pertain to an automobile
AME4201.4	Explain Vibration Prediction and Control
AME4201.5	Describe Metrology and Traceability of Vibration and Shock Measurements
AME4201.6	Explain Interior Transportation Noise and Vibration Sources

Course Name: VEHICLE MAINTENANCE	
Course Code: AME4202	
AME4202.1	Able to maintain various records
AME4202.2	Describe scheduled and unscheduled maintenance
AME4202.3	Able to maintain of various systems of a vehicle.
AME4202.4	Describe repair of various systems of a vehicle.
AME4202.5	Explain service of various systems of a vehicle
AME4202.6	Able to Rims classification, wheel balancing types.

Course Name: CERTIFICATION AND HOMOLOGATION	
Course Code: AME4203	
AME4203.1	Able to know the Regulations overview(ECE,EEC, FMVSS, AIS, CMVR, ADR)
AME4203.2	Explain the operation of full load and part load conditions
AME4203.3	Describe wind tunnel testing, road testing, test tracks
AME4203.4	Explain Wheel rim testing for cornering and radial fatigue
AME4203.5	Describe Size and Ply rating of tyres, Safety Glasses
AME4203.6	Able to know the SAE standards

Course Name: SPECIAL PURPOSE VEHICLES	
Course Code: AME4204	
AME4204.1	After the completion of the course, the student will be able to acquire the knowledge about the various equipments used in earth moving,

	applications.
AME4204.2	Understand the construction and working of the vehicle for constructional application
AME4204.3	Describe the working nature of farm equipment's based on their application.
AME4204.4	Discriminate the various industrial vehicles based on the purpose.
AME4204.5	Acquire the knowledge on the functioning of military vehicle.
AME4204.6	Know material handlers, recliners, Street sweepers