COURSE OUTCOMES (COs)

Department	B.E. Automobile Engineering
Sem I	Course Outcome
COs	HS6151 Technical English - 1
1	The course is designed in such a way that the students, after completing the course, will able to speak fluently.
2	Student will able to write fluently
3	They may also acquire the skills in reading and listening of Technical English
4	Students learnt about the logical evolution of thought and content.
5	Because of exposure to basics of English they may acquire skills in technical writing
COs	MA6151 Mathematics-1
1	Seeks to apply mathematical techniques to problems in a wide range of practical
2	Constructs arguments to prove and justify results
3	Manipulates algebraic expressions involving exponential functions
4	Manipulates algebraic expressions involving logarithmic functions
5	Uses techniques of integration to calculate areas and volumes
COs	PH6151 Engineering physics –I
1	Understand the use of divergence theorem to relate the electric flux density and charge density.
2	Calculate the electric field potential due to discrete, line, surface and volume charge distributions.
3	Calculate static capacitance of for simple conducting systems.
4	Understand the relationship between steady current elements and the magnetic field.
5	Understand the relationship between the electric field and the potential difference and the use of divergence theorem to relate the electric flux density and charge density.
COs	CY6151 Engineering chemistry –I
1	Students will gain an understanding of oxidation reactions as they relate to engineering applications, such as corrosion.
2	Students will gain an understanding of reduction reactions as they relate to engineering applications, such as corrosion.
3	Students will learn to balance chemical equations, using proper nomenclature.
4	Students will perform laboratory experiments related to solubility and pK.
5	Students will perform laboratory experiments in electrochemist
COs	GE6152 Computer Programming
1	Understand fundamentals of programming such as variables, conditional and iterative execution, methods, etc.
2	Be aware of the important topics of software development
3	Understand the principles of software development
4	Understand fundamentals of object-oriented programming in Java
5	Understand of defining classes, invoking methods, using class libraries, etc.
COs	GE6152 Engineering graphics
1	Students will able to Identify the different drafting tool machines and computer programs
2	Understand about usage of triangles, protractors, compasses.
3	Understand about usage of, French curves, parallel rulers, T-squares, erasers, erasing shields, templates.
4	Start-up AutoCAD program, create drawing file, recall drawing file.
5	Identify all the components of the computer equipment required to perform computer

	assisted drawing.
COs	**GE6161 Computer practice laboratory**
1	To enable the student to learn the major components of a computer system
2	To Know the correct the efficient ways of solving problems
3	To learn to use office automation tools
4	To learn to program in c
5	Understand about various variable of Programme in C
COs	**GE6162 Engineering Practices Lab**
1	Design different philosophies for steel structures and the basic steps in the design process
2	Develop problem solving skills, including the ability to convert an open-ended problem statement into a statement of work and/or a set of design specifications
3	Understand the plumbing and carpentry components of residential and industrial buildings
4	Students will able to learnt welding and basic machinary
5	Understand about various recent tools in mechanical engineering
COs	**GE6163 Physics and Chemistry Laboratory - I**
1	Analyze and determine many physical quantities
2	Determine various determinations and estimations of chemical contents in water
3	Obtain knowledge to solve engineering problems.
4	Be able to design and conduct experiments, as well as to analyze and interpret data.
5	Recognize the needs and challenges of our age and to assess the global and social impacts of engineering solutions.
Sem II	**Course outcome**
COs	**HS6251 Technical English - II**
1	Students develop listening skills for academic and professional purposes.
2	Students acquire the ability to speak effectively in English in real-life situations.
3	Inculcate reading habit and to develop effective reading skills.
4	Students improve their active and passive vocabulary
5	Students write letters and reports effectively in formal and business situations
COs	**MA6251 Mathematics-II**
1	Students will be able to learn ordinary differential equation
2	Students will be able to learn ordinary Vector calculus
3	Students will be able to learn ordinary analytic function
4	Students will be able to learn ordinary complex integration
5	Students will be able to learn ordinary laplace transform
COs	**PH6251 Engineering physics –II**
1	Understand the use of magnetic materials.
2	Understand the use of semiconducting materials.
3	Know about modern engineering materials
4	Understand dielectric materials.
5	Students will learnt about modern engineering tools
COs	**CY6251 Engineering chemistry –II**
1	Students will gain an understanding of oxidation reactions as they relate to engineering applications, such as corrosion.
2	Students will gain an understanding of reduction reactions as they relate to engineering applications, such as corrosion.
3	Students will learn to balance chemical equations, using proper nomenclature.
4	Students will perform laboratory experiments in electrochemistry

5	Students will learn analytical techniques of various instruments
COs	**GE6252 Basic electrical and electronics engineering**
1	The student can apply the concepts to analyze and design AC and DC circuits
2	At end of the course, students understand about different machines.
3	Students will able to understand the applications are useful for home appliances and industrial purposes.
4	Students understand and design different types of electronic circuit and digital circuit.
5	Students understand how to communicate the information from one place to another.
COs	**GE6253 Engineering mechanics**
1	At end of the course students learn about statics of particles
2	At end of the course students learn about equilibrium of rigid bodies
3	Understand of properties of surface and solids
4	At end of the course students learn about dynamics of particles
5	Understand of friction and elements of rigid bodies
COs	**GE6261 Computer aided modeling and drafting laboratory**
1	The student will enable the student to design 2D and 3D models of an object.
2	The course helps the graduate to acquire knowledge about simple steel truss
3	The subject assists in constructing and designing buildings.
4	The programme gives an overall idea about sectional views attributed towards structure construction
5	The programme gives an overall idea about isometric projections attributed towards structure construction
COs	**GE6262 Physics and chemistry laboratory-II**
1	Analyze and determine many physical quantities
2	Determine various determinations and estimations of chemical contents in water
3	Obtain knowledge to solve engineering problems.
4	Be able to design and conduct experiments, as well as to analyze and interpret data.
5	Recognize the needs and challenges of our age and to assess the global and social impacts of engineering solutions.
Sem III	**Course Outcome**
COs	**MA6351 Transforms and Partial Differential Equation**
1	Students get familiar about the Fourier series to generate a sequence of waves
2	Students learn about the Fourier Transform to a sequence non parabolic waves to a general function
3	Construction of Partial differential equation and finding methods to solve it
4	Application of PDE in Mechanical Engineering
5	Z Transform for a 3D model and its solution
COs	**ME6301 Engineering Thermodynamics**
1	Apply the Thermodynamic Principles to Mechanical Engineering Application.
2	Apply mathematical fundamentals to study the properties of steam, gas and gas mixtures.
3	Thermodynamic laws and their applications.
4	Concept of entropy and availability.
5	Thermodynamic relations and its applications
COs	**CE6451 Fluid Mechanics and Machinery**
1	Apply mathematical knowledge to predict the properties and characteristics of a fluid.
2	Can critically analyse the performance of pumps and turbines.
3	Understand the mathematical techniques of practical flow problems.

4	Understand the energy exchange process in fluid machines.
5	Understand the boundary layer theory
COs	**AT6301 Automotive Engines**
1	Understand various components of the engine and its functions.
2	Gain knowledge on combustion in SI and CI Engine
3	Understand the lubrication and cooling system in IC Engines.
4	Understand the turbo, supercharging and scavenging system in IC Engines
5	Knowledge about the recent development in the area of engines.
COs	**AT6302 Mechanics of Machines**
1	Know the basics of mechanism and perform kinematic analysis.
2	Calculate the gas forces developed in an engine and use the excess energy for different applications.
3	Balance rotating and reciprocating masses in engines
4	Construct various cam profiles based on follower motion and perform kinematic analysis.
5	Deduce the number of teeth in gears and torque transmitted in epicyclic gear trains. Apply gyroscopic couple in different transportation vehicles.
COs	**ME6352 Manufacturing Technology**
1	The students learn about the different manufacturing process.
2	To use this in industry for component production
3	Recommend appropriate part manufacturing processes when provided a set of functional requirements and product development constraints.
4	Fabricate basic parts and assemblies using powered and non-powered machine shop equipments.
5	Gear manufacturing and Surface finishing processes.
COs	**AT6311 Automotive Components Laboratory**
1	Ability to dismantle and assemble the automobile components
2	Understand different types of frames used in various Automobiles
3	Understand the petrol engine fuel system
4	Understand the diesel engine fuel system
5	Ability to dismantle and assemble the driveline system
COs	**CE6461 Fluid Mechanics and Machinery Laboratory**
1	Ability to use the measurement equipments for flow measurement
2	Ability to do performance trust on different fluid machinery
3	Working of flow meters and different forms of energy of fluid flow.
4	Various losses in pipes
5	Performance of pumps and turbines.
COs	**ME6465 Manufacturing Technology Laboratory**
1	Various types of lathe operations
2	Ability to manufacture tools using cutter grinder
3	Ability to use different machine tools to manufacturing gears.
4	Ability to use different machine tools for finishing operations
5	Develop CNC part programming
Sem IV	**Course Outcome**
COs	**MA6452 Statistics and Numerical Methods**
1	The students to have a clear perception of the power of statistical techniques and ideas.
2	Ability to demonstrate the applications of these techniques to problems drawn from industry.

3	Ability to demonstrate the applications of these techniques to problems drawn from management.
4	Ability to demonstrate the applications of these techniques to problems drawn from other engineering fields.
5	The students to have a clear perception of the power of numerical techniques and ideas.
COs	**AT6401 Applied Thermodynamics and Heat Transfer**
1	A clear idea of application of thermodynamics and heat transfer.
2	Able to identify the applications of these techniques in their engineering fields.
3	Understand various gas power cycles
4	Integrate the basic concepts into various thermal applications like testing of engine performance, air compressor, refrigeration and air conditioning.
5	Enlighten the various mode of heat transfer and their engineering application
COs	**ME6403 Engineering Materials and Metallurgy**
1	Able to describe the structure and classify engineering materials.
2	Acquire knowledge through Phase diagram and control material properties by heat treatment.
3	Able to use different materials, their processing in application in mechanical engineering.
4	Select metallic and non-metallic materials for the various engineering applications.
5	Understand on elastic, plastic and fracture behaviour of engineering materials and its failure mechanism.
COs	**CE6306 Strength of Materials**
1	Able to apply mathematical knowledge to calculate the deformation behavior of simple structures.
2	Know the concepts of stress and strain
3	Analyze the beam of different cross sections for shear stress, bending stress.
4	Analyze the beam of different cross sections for slope and deflection.
5	Understand the concepts necessary to design the structural elements and pressure vessels.
COs	**EC6464 Electronics and Microprocessors**
1	Fundamental knowledge of electronic and its applications.
2	Ability to understand basic interfacing concepts
3	Understand the architecture of 8085 Microprocessor
4	Applications of microprocessor Temperature control
5	Simple programs using arithmetic and logical operations.
COs	**AT6402 Automotive Chassis**
1	Understand the basic knowledge about various vehicle frames, front axles and steering systems.
2	Understand the construction and working principle of final drives.
3	Gain knowledge about rear axle and suspension system.
4	Understand the conditions for true rolling motion of wheels during steering.
5	Gain knowledge about the constructional feature of wheels and tyres.
COs	**PR6412 Computer Aided Machine Drawing Laboratory**
1	Understand orthographic projections and drawing standards
2	Draw different automotive joints
3	Understand representations of the various mechanical components
4	Understand geometric, dimensioning and tolerances
5	Ability to develop engineering drawing for the industrial component using Indian

	Standard code of practice.
COs	**EC6466 Electronics and Microprocessors Laboratory**
1	Ability to perform speed characteristic of PN Junction Diode
2	Ability to perform speed characteristic of Uni Junction Transistor
3	Study of Logic Gates
4	Ability to perform speed characteristic of different microprocessor machine
5	Perform Stepper Motor Interfacing
COs	**CE6315 Strength of Materials Laboratory**
1	Understand the procedures for conducting various destructive testing methods like impact, compression test etc.
2	Learn how to measure hardness of materials and to interpret the same after heat treatment.
3	Determine the Young's modulus using deflection test on beams.
4	Determine the Young's modulus using tensile test on rods & springs.
5	Compare the fatigue behavior of a notched and un-notched specimen.
Sem V	**Course Outcome**
COs	**GE6351 Environmental Science and Engineering**
1	Public awareness of environmental is at infant stage.
2	Ignorance and incomplete knowledge has led to misconceptions.
3	About different types of pollution, effects and control measures of various types of pollution.
4	Social related issues such as Global warming, acid rain and ozone layer depletion.
5	Development and improvement in std. of living has led to serious environmental disasters.
COs	**ME6503 Design of Machine Elements**
1	Apply the successfully design various mechanical components
2	Understand the principles involved in evaluating the shape and dimensions of a component
3	Satisfy functional and strength requirements.
4	Learn to use standard practices and standard data
5	Learn to use catalogues and standard machine components
COs	**AT6501 Automotive Transmission**
1	Understand the fundamentals, principle of operation and performance of various clutches and gear boxes.
2	Gain the knowledge about various hydrodynamic drives.
3	Conceive various types of gear boxes used for Automotive transmission
4	Understand the principle of operation and performance of various hydrostatic drives.
5	Understand the principle of operation and performance of various electric drives.
COs	**AT6502 Automotive Electrical and Electronics System**
1	Understanding battery, Cranking motor construction and testing methods.
2	Understand the principle of alternator and to test the alternator
3	Understand the Electronic Controls in Gasoline Engine
4	Know the importance of Driver assistance, security and warning system
5	Understand the basics of Vehicle Motion Control and telematics system
COs	**AT6503 Vehicle Design Data Characteristics**
1	Understand the basic design principle of vehicle
2	Equip themselves familiar with functions of several variables pertaining to vehicular design.
3	Able to draw the performance curves pertain to engine.

4	Determination of Gear Ratios
5	Able to draw the performance curves pertain to chassis.
COs	**AT6504 Automotive Fuels and Lubricants**
1	Understand the importance of automotive fuels
2	Understand the manufacturing methods of automotive fuels and lubricants
3	Understand the testing methods of lubricants
4	Understand the testing methods of automotive fuels
5	Understand the combustion methodology of automotive fuels and lubricants.
COs	**GE6674 Communication Skills - Laboratory**
1	The students will have acquired speaking and writing skills
2	They will have developed their soft skills so that they can excel in their jobs
3	The training offered to them in group discussion and oral presenation will stand them in good stead when they appear for job interview
4	They will have acquired proficiency in the basics of english through their exposure to a variety of exercise in the language lab
5	They will have acquired ability to communicate the needs and requirement of the society
COs	**AT6511 Automotive Electrical and Electronics Laboratory**
1	Ability to rectify and faults in electrical systems.
2	Ability to rectify and faults in electronics systems.
3	Perform the battery, Cranking motor construction and testing methods.
4	Diagnosis of ignition system faults
5	Fault Diagnosis of various sensors
COs	**AT6512 Automotive Fuels and Lubricants Laboratory**
1	Test the lubricants and fuels used for IC engines
2	Conduct the test of fuels
3	Study of International and National standards for fuels and lubricants.
4	Study of Octane and Cetane Number of fuels.
5	Ability to characteristic and chase the fuels and Lubricantes for the automobiles.
Sem VI	**Course Outcome**
COs	**MG6851 Principles of Management**
1	Understanding of managerial functions
2	Learn the application of the principles in an organization
3	Study the functions and principles of management
4	Learn the application of the effective coomunication
5	Basic knowledge on international aspect of management
COs	**AT6601 Automotive Engine Components Design**
1	Design of cylinder head and valve actuating mechanism
2	Design of cylinder and piston
3	Design of connecting rod
4	Familiarize with design procedure of crank shaft
5	Design of flywheel
COs	**AT6602 Automotive Chassis Components Design**
1	Gain knowledge about various vehicular structures.
2	Identify, formulate and solve engineering problems related to automobile drive line components.
3	Learn about the performances of various axles and to design the same.
4	Learn and design various braking systems.

5	Learn and design the various suspension systems.
COs	**AT6603 Two and Three Wheelers**
1	Gain knowledge about the Engines employed for two and three wheelers.
2	Understand about the Chassis and its sub-systems.
3	Perceive about the functionality of Brakes and wheels.
4	Gain knowledge on specific Case studies of major Indian models.
5	Gather information about Servicing, maintenance and trouble shooting of two and three wheelers.
COs	**AT6604 Vehicle Dynamics**
1	Understand the concept of mechanical vibrating system
2	Understand fundamentals of vibration theory and familiar with basics of vibrations and their mathematic models.
3	Gain knowledge about the suspension and tire related vibrations
4	Equip themselves about the vibration control techniques.
5	Understand about the stability of vehicle
COs	**AT6002 Alternative Fuels and Energy System**
1	Gain knowledge about various alcohol and gaseous fuels and their use in SI and CI engines
2	Acquire knowledge about various vegetable oils (Bio Diesel) and their use in CI engines
3	Understand the various alternative fuels its properties and performance characteristics
4	Understand the various alternative fuels and its combustion characteristics
5	Understand the various alternative fuels its emission characteristics, engine modifications required
COs	**AT6611 Computer Aided Engine and Chassis Design Laboratory**
1	Ability to use the drafty for automobile engine components design
2	Ability to use the modeling software for automobile engine components design
3	Ability to use the drafty for automobile chassis components design
4	Ability to use the modeling software for automobile chassis components design
5	Famiarise the students to use modeling software to model engine components and chassis design
COs	**AT6612 Two and Three Wheelers Laboratory**
1	Perform testing using dynamometers.
2	Ability to assemble the engine components
3	conduct performance test on two and three wheelers.
4	Performance test on coil spring.
5	Performance test on shock absorber
Sem VII	**Course Outcome**
COs	**AT6701 Engine and Vehicle Management System**
1	Understand the role of various sensor
2	Construction and working principle and it influence in controlling pollution
3	Study of modern control strategies like Fuzzy logic and adaptive control
4	Understand the basics of Vehicle Motion Control and telematics system
5	Enhancing safety of the vehicle.
COs	**ME6603 Finite Element Analysis**
1	Apply finite element technique to Engineering problems
2	Improve their ability in solving differential equations for real world problems
3	Equip themselves familiar with multi-domain phenomenon like thermo-structural

	problems
4	Familiarize themselves with the applications of finite element method & FEA packages
5	Understand the concept of multibody dynamics
COs	**AT6702 Vehicle Maintenance**
1	Gain knowledge about vehicle operation and maintenance, service schedules etc.,
2	Gain skills in handling situations where the vehicle is likely to fail.
3	Understand maintenance procedures like repairing, overhauling etc.,
4	Understand the concept of fault diagnosis
5	Understand the various advances in fault diagnosis
COs	**AT6703 Automotive Pollution and Control**
1	Understand the current scenario of Automobile Emissions and standards.
2	Gain knowledge about the formation of Emissions from SI Engines.
3	Gain knowledge about the formation of Emissions from CI Engines.
4	Understand Emission and control Techniques in SI and CI Engines.
5	Understand measuring techniques of Emission and test procedure.
COs	**AT6007 New Generation and Hybrid Vehicles**
1	Familiar in the recent development pertain to energy system
2	Familiar in the recent development pertain to vehicle operation, newer vehicle
3	Understand the basics of Vehicle Motion Control and telematics system
4	Familiar in the recent development pertain to newer vehicle
5	Recent technologies in the area of suspension systems, brakes, aerodynamics
COs	**AT6011 Automotive Safety**
1	Understand the vehicle motion control and stabilization system
2	Know the importance of Driver assistance, security and warning system
3	Gain the knowledge of Safety and comfort system
4	Understand the various safety concepts used in passenger cars.
5	Understand the basics of vehicle collision and its effects.
COs	**AT6711 Engine Performance and Emission Testing Laboratory**
1	Obtain the knowledge of test engines
2	Conduct the performance and heat balance test on IC engines using various dynamometers.
3	Conduct exhausts gas analysis.
4	Ability to control the emission and use of different equipments to conduct performance test.
5	Understand the Valve timing and port timing diagram
COs	**AT6712 Vehicle Maintenance Laboratory**
1	Perform engine analysis using diagnostic systems.
2	Conduct wheel balancing and alignment.
3	Adjust timing and test a fuel injection pump.
4	Ability to identify the faults and knowledge on maintenance
5	Removal and fitting of tire and tube.
Sem VIII	**Course Outcome**
COs	**AT6801 Vehicle Body Engineering**
1	Understand the fundamentals of various automotive body construction details
2	Understand the concepts of aerodynamics in body engineering for better style and low drag.
3	Know about different aspects of car body and bus body, types, commercial vehicle.

4	Role of various aerodynamic forces and moments, measuring instruments
5	Know about the material used in body building, tools used, body repairs.
COs	**GE6757 Total Quality Management**
1	To understand the Total quality management concept, principles and the various tools available to achieve Total quality management.
2	To understand the statistical approach for quality control.
3	To create an awareness about the ISO and QS certification process
4	To learn about requirements for the industries
5	To understand an awarness of quality and testing of the products
COs	**AT6811 Project Work**
1	To develop the ability to solve a specific problem right from its identification
2	To literature review till the successful solution of the same
3	Preparing project reports and to face reviews and viva voce examination.
4	A position to take up any challenging practical problems
5	Find solution by formulating proper methodology

REGULATION-2008

Program Outcomes (PO's)

Automobile Engineering Graduates will be able to,

PO1	**Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO2	**Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO3	**Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO4	**Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO5	**Modern tool usage:**

	Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
PO6	**The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
PO7	**Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO8	**Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO9	**Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO10	**Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO11	**Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO12	**Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES (PSOs)

The student of Automobile Engineering will be able to,

PSO1	Apply mathematics, science, and computing techniques in a comprehensive method to solve automobile engineering problems in the areas of Vehicle design, Vehicle dynamics, automotive electronics and Power train problems.
PSO2	Use modern modeling and simulation techniques with acquired cross-discipline knowledge and industrial engineering concepts to develop strategies for solving automobile engineering problems in the current work environment.
PSO3	Assess society needs and develop constructive and creative solutions for complex automobile engineering problems under social and ethical constraints.

R 2008 Course Outcomes:

I SEM

Course Outcomes	
COs	HS2111 Technical English - 1
1	The course is designed in such a way that the students, after completing the course, will able to speak fluently.
2	Student will able to write fluently
3	They may also acquire the skills in reading and listening of Technical English
4	Students learnt about the logical evolution of thought and content.
5	Because of exposure to basics of English they may acquire skills in technical writing
COs	MA2111 Mathematics-1
1	Seeks to apply mathematical techniques to problems in a wide range of practical
2	Constructs arguments to prove and justify results
3	Manipulates algebraic expressions involving exponential functions

4	Manipulates algebraic expressions involving logarithmic functions
5	Uses techniques of integration to calculate areas and volumes
COs	PH2111 Engineering physics –I
1	Understand the use of divergence theorem to relate the electric flux density and charge density.
2	Calculate the electric field potential due to discrete, line, surface and volume charge distributions.
3	Calculate static capacitance of for simple conducting systems.
4	Understand the relationship between steady current elements and the magnetic field.
5	Understand the relationship between the electric field and the potential difference and the use of divergence theorem to relate the electric flux density and charge density.
COs	CY2111 Engineering chemistry –I
1	Students will gain an understanding of oxidation reactions as they relate to engineering applications, such as corrosion.
2	Students will gain an understanding of reduction reactions as they relate to engineering applications, such as corrosion.
3	Students will learn to balance chemical equations, using proper nomenclature.
4	Students will perform laboratory experiments related to solubility and pK.
5	Students will perform laboratory experiments in electrochemist
COs	GE2111 Engineering graphics
1	Students will able to Identify the different drafting tool machines and computer programs
2	Understand about usage of triangles, protractors, compasses.
3	Understand about usage of , French curves, parallel rulers, T-squares, erasers, erasing shields, templates.
4	Start-up AutoCAD program, create drawing file, recall drawing file.
5	Identify all the components of the computer equipment required to perform computer assisted drawing.
COs	GE2112 Fundamentals of Computing and Programming
1	Understand fundamentals of programming such as variables, conditional and iterative execution, methods, etc.
2	Be aware of the important topics of software development
3	Understand the principles of software development
4	Understand fundamentals of object-oriented programming in Java
5	Understand of defining classes, invoking methods, using class libraries, etc.
COs	GE2115 Computer practice laboratory
1	To enable the student to learn the major components of a computer system
2	To Know the correct the efficient ways of solving problems
3	To learn to use office automation tools
4	To learn to program in c
5	Understand about various variable of Programme in C
COs	GE2116 Engineering Practices Lab

1	Design different philosophies for steel structures and the basic steps in the design process
2	Develop problem solving skills, including the ability to convert an open-ended problem statement into a statement of work and/or a set of design specifications
3	Understand the plumbing and carpentry components of residential and industrial buildings
4	Students will able to learnt welding and basic machinary
5	Understand about various recent tools in mechanical engineering
COs	Physics and Chemistry Laboratory - I
1	Analyze and determine many physical quantities
2	Determine various determinations and estimations of chemical contents in water
3	Obtain knowledge to solve engineering problems.
4	Be able to design and conduct experiments, as well as to analyze and interpret data.
5	Recognize the needs and challenges of our age and to assess the global and social impacts of engineering solutions.
II SEM	
COs	HS2161 Technical English - II
1	Students develop listening skills for academic and professional purposes.
2	Students acquire the ability to speak effectively in English in real-life situations.
3	Inculcate reading habit and to develop effective reading skills.
4	Students improve their active and passive vocabulary
5	Students write letters and reports effectively in formal and business situations
COs	MA2161 Mathematics-II
1	Students will be able to learn ordinary differential equation
2	Students will be able to learn ordinary Vector calculus
3	Students will be able to learn ordinary analytic function
4	Students will be able to learn ordinary complex integration
5	Students will be able to learn ordinary laplace transform
COs	PH2161 Engineering physics –II
1	Understand the use of magnetic materials.
2	Understand the use of semiconducting materials.
3	Know about modern engineering materials
4	Understand dielectric materials.
5	Students will learnt about modern engineering tools
COs	CY2161 Engineering chemistry –II
1	Students will gain an understanding of oxidation reactions as they relate to engineering applications, such as corrosion.
2	Students will gain an understanding of reduction reactions as they relate to engineering applications, such as corrosion.
3	Students will learn to balance chemical equations, using proper nomenclature.
4	Students will perform laboratory experiments in electrochemistry

5	Students will learn analytical techniques of various instruments
COs	ME2151 Engineering mechanics
1	At end of the course students learn about statics of particles
2	At end of the course students learn about equlibrium of rigid bodies
3	Understand of properties of surface and solids
4	At end of the course students learn about dynamics of particles
5	Understand of friction and elements of rigid bodies
COs	GE2151 Basic electrical and electronics engineering
1	The student can apply the concepts to analyze and design AC and DC circuits
2	At end of the course, students understand about different machines.
3	Students will able to understand the applications are useful for home appliances and industrial purposes.
4	Students understand and design different types of electronic circuit and digital circuit.
5	Students understand how to communicate the information from one place to another.
COs	ME2155 Computer aided modeling and drafting laboratory
1	The student will enable the student to design 2D and 3D models of an object.
2	The course helps the graduate to acquire knowledge about simple steel truss
3	The subject assists in constructing and designing buildings.
4	The programme gives an overall idea about sectional views attributed towards structure construction
5	The programme gives an overall idea about isometric projections attributed towards structure construction
COs	GE2155 Computer practice laboratory-II
1	Student will be able to obtain programming skill in UNIX.
2	Student will be able to obtain programming skill in SHELL
3	Students will be learn about various variables on UNIX and SHELL
4	Student will be able to obtain basic knowledge in C programming on Unix
5	Student will be able to able to solve problems
COs	GS2165 Physics and chemistry laboratory-II
1	Analyze and determine many physical quantities
2	Determine various determinations and estimations of chemical contents in water
3	Obtain knowledge to solve engineering problems.
4	Be able to design and conduct experiments, as well as to analyze and interpret data.
5	Recognize the needs and challenges of our age and to assess the global and social impacts of engineering solutions.
III SEM	
COs	MA 2211 Transforms and Partial Differential Equation
1	Students get familiar about the Fourier series to generate a sequence of waves

2	Students learn about the Fourier Transform to a sequence non parabolic waves to a general function
3	Construction of Partial differential equation and finding methods to solve it
4	Application of PDE in Mechanical Engineering
5	Z Transform for a 3D model and its solution
COs	AT 2203 Engineering Thermodynamics
1	Students can Apply the Thermodynamic Principles to Mechanical Engineering Application.
2	Students can Apply mathematical fundamentals to study the properties of steam, gas and gas mixtures.
3	Students can apply Thermodynamic laws and their applications.
4	Students can perform thermal analysis on their behaviour & performance
5	Thermodynamic relations and its applications
COs	ME 2204 Fluid Mechanics and Machinery
1	Apply mathematical knowledge to predict the properties and characteristics of a fluid.
2	Can critically analyse the performance of pumps and turbines.
3	Understand the mathematical techniques of practical flow problems.
4	Understand the energy exchange process in fluid machines.
5	Understand the boundary layer theory
COs	AT 2201 Automotive Engines
1	Understand various components of the engine and its functions.
2	Gain knowledge on combustion in SI and CI Engine
3	Understand the lubrication and cooling system in IC Engines.
4	Understand the turbo, supercharging and scavenging system in IC Engines
5	Knowledge about the recent development in the area of engines.
COs	AE 2201 Mechanics of Machines
1	Know the basics of mechanism and perform kinematic analysis.
2	Calculate the gas forces developed in an engine and use the excess energy for different applications.
3	Balance rotating and reciprocating masses in engines
4	Construct various cam profiles based on follower motion and perform kinematic analysis.
5	Deduce the number of teeth in gears and torque transmitted in epicyclic gear trains.
COs	AE 2253 Production Technology
1	The students learn about the different casting process.
2	The students learn about the different welding process.
3	Recommend appropriate part manufacturing processes when provided a set of functional requirements and product development constraints.
4	Fabricate basic parts and assemblies using powered and non-powered machine shop equipments.
5	Gear manufacturing and Surface finishing processes.
COs	AT 2205 Automotive Components Laboratory

1	Ability to dismantle and assemble the automobile components
2	Understand different types of frames used in various Automobiles
3	Understand the petrol engine fuel system
4	Understand the diesel engine fuel system
5	Ability to dismantle and assemble the driveline system
Cos	AT 2207 Fluid Mechanics and Machinery Laboratory
1	Ability to use the measurement equipments for flow measurement
2	Ability to do performance trust on different fluid machinery
3	Working of flow meters and different forms of energy of fluid flow.
4	Ability to learn Various losses in pipes
5	Performance of pumps and turbines.
COs	AT 2206 Manufacturing Technology Laboratory
1	Various types of lathe operations
2	Ability to manufacture tools using cutter grinder
3	Ability to use different machine tools to manufacturing gears.
4	Ability to use different machine tools for finishing operations
5	Develop CNC part programming
IV SEM	
COs	MA 2266 Statistics and Numerical Methods
1	The students to have a clear perception of the power of statistical techniques and ideas.
2	Ability to demonstrate the applications of these techniques to problems drawn from industry.
3	Ability to demonstrate the applications of these techniques to problems drawn from management.
4	Ability to demonstrate the applications of these techniques to problems drawn from other engineering fields.
5	The students to have a clear perception of the power of numerical techniques and ideas.
COs	AT 2251 Applied Thermodynamics and Heat Transfer
1	A clear idea of application of thermodynamics and heat transfer.
2	Able to identify the applications of these techniques in their engineering fields.
3	Understand various gas power cycles
4	Integrate the basic concepts into various thermal applications like testing of engine performance, air compressor, refrigeration and air conditioning.
5	Enlighten the various mode of heat transfer and their engineering application
COs	ME 2253 Engineering Materials and Metallurgy
1	Able to describe the structure and classify engineering materials.
2	Acquire knowledge through Phase diagram and control material properties by heat treatment.
3	Able to use different materials, their processing in application in mechanical engineering.
4	Select metallic and non-metallic materials for the various engineering applications.

5	Understand on elastic, plastic and fracture behaviour of engineering materials and its failure mechanism.
COs	ME 2254 Strength of Materials
1	Able to apply mathematical knowledge to calculate the deformation behavior of simple structures.
2	Know the concepts of stress and strain
3	Analyze the beam of different cross sections for shear stress, bending stress.
4	Analyze the beam of different cross sections for slope and deflection. & understand about Struts columns.
5	Understand the concepts necessary to design the structural elements and pressure vessels.
COs	ME 2255 Electronics and Microprocessors
1	Fundamental knowledge of electronic and its applications.
2	Ability to understand basic interfacing concepts
3	Understand the architecture of 8085 Microprocessor
4	Applications of microprocessor Temperature control
5	Simple programs using arithmetic and logical operations.
COs	AT 2252 Automotive Chassis
1	Understand the basic knowledge about various vehicle frames, front axles and steering systems.
2	Understand the construction and working principle of final drives.
3	Gain knowledge about rear axle and suspension system.
4	Understand the conditions for true rolling motion of wheels during steering.
5	Gain knowledge about the constructional feature of wheels and tyres.
COs	AT 2255 Engine Performance and Emission Testing Laboratory
1	Obtain the knowledge of test engines
2	Conduct the performance and heat balance test on IC engines using various dynamometers.
3	Conduct exhausts gas analysis.
4	Ability to control the emission and use of different equipments to conduct performance test.
5	Understand the Valve timing and port timing diagram
COs	AT 2256 Computer Aided Machine Drawing Laboratory
1	Understand orthographic projections and drawing standards
2	Draw different automotive joints
3	Understand representations of the various mechanical components
4	Understand geometric, dimensioning and tolerances
5	Ability to develop engineering drawing for the industrial component using Indian Standard code of practice.
COs	AT 2257 Electronics and Microprocessors Laboratory
1	Ability to perform speed characteristic of PN Junction Diode
2	Ability to perform speed characteristic of Uni Junction Transistor
3	Study of Logic Gates

4	Ability to perform speed characteristic of different microprocessor machine
5	Perform Stepper Motor Interfacing
COs	ME 2256 Strength of Materials Laboratory
1	Understand the procedures for conducting various destructive testing methods like impact, compression test etc.
2	Learn how to measure hardness of materials and to interpret the same after heat treatment.
3	Determine the Young's modulus using deflection test on beams.
4	Determine the Young's modulus using tensile test on rods & springs.
5	Compare the fatigue behavior of a notched and un-notched specimen.
V SEM	
COs	GE2021 Environmental Science and Engineering
1	Public awareness of environmental is at infant stage.
2	Ignorance and incomplete knowledge has lead to misconceptions.
3	About different types of pollution, effects and control measures of various types of pollution.
4	Social related issues such as Global warming, acid rain and ozone layer depletion.
5	Development and improvement in std. of living has lead to serious environmental disasters.
COs	ME2303 Design of Machine Elements
1	Apply the successfully design various mechanical components
2	Understand the principles involved in evaluating the shape and dimensions of a component
3	Satisfy functional and strength requirements.
4	Learn to use standard practices and standard data
5	Learn to use catalogues and standard machine components
COs	AT2301 Automotive Transmission
1	Understand the fundamentals, principle of operation and performance of various clutches and gear boxes.
2	Gain the knowledge about various hydromatic drives.
3	Conceive various types of gear boxes used for Automotive transmission
4	Understand the principle of operation and performance of various hydrostatic drives.
5	Understand the principle of operation and performance of various electric drives.
COs	AT2302 Automotive Electrical and Electronics System
1	Understanding battery, Cranking motor construction and testing methods.
2	Understand the principle of alternator and to test the alternator
3	Understand the various ignition systems in IC Engine
4	Understand the various sensors used in automobiles.
5	Understand about the wiring & lighting systems for automobiles.

COs	AT2303 Vehicle Design Data Characteristics
1	Understand the basic design principle of vehicle
2	Equip themselves familiar with functions of several variables pertaining to vehicular design.
3	Able to draw the performance curves pertain to engine.
4	Determination of Gear Ratios
5	Able to draw the performance curves pertain to chassis.
COs	AT2305 Automotive Fuels and Lubricants
1	Understand the concepts of manufacturing fuels & lubricants
2	Learn about various fuels & lubricants for IC engines
3	Understand the testing methods of lubricants
4	Understand the testing methods of automotive fuels
5	Understand the combustion methodology of automotive fuels and lubricants.
COs	GE2321 Communication Skills - Laboratory
1	The students will have acquired speaking and writing skills
2	They will have developed their soft skills so that they can excel in their jobs
3	The training offered to them in group discussion and oral presenation will stand them in good stead when they appear for job interview
4	They will have acquired proficiency in the basics of english through their exposure to a variety of exercise in the language lab
5	They will have acquired ability to communicate the needs and requirement of the society
COs	AT2307 Automotive Electrical and Electronics Laboratory
1	Ability to rectify and faults in electrical systems.
2	Ability to rectify and faults in electronics systems.
3	Perform the battery, Cranking motor construction and testing methods.
4	Diagnosis of ignition system faults
5	Fault Diagnosis of various sensors
COs	AT2308 Automotive Fuels and Lubricants Laboratory
1	Test the lubricants and fuels used for IC engines
2	Conduct the test of fuels
3	Study of International and National standards for fuels and lubricants.
4	Study of Octane and Cetane Number of fuels.
5	Ability to characteristic and chase the fuels and Lubricantes for the automobiles.
VI SEM	
COs	MG2351 Principles of Management
1	Understanding of managerial functions
2	Learn the application of the principles in an organization
3	Study the functions and principles of management
4	Learn the application of the effective coomunication
5	Basic knowledge on international aspect of management
COs	AT2351 Automotive Engine Components Design
1	Design of cylinder head and valve actuating mechanism

2	Design of cylinder and piston
3	Design of connecting rod
4	Familiarize with design procedure of crank shaft
5	Design of flywheel
COs	AT2352 Automotive Chassis Components Design
1	Gain knowledge about various vehicular structures.
2	Identify, formulate and solve engineering problems related to automobile drive line components.
3	Learn about the performances of various axles and to design the same.
4	Learn and design various braking systems.
5	Learn and design the various suspension systems.
COs	AT2353 Two and Three Wheelers
1	Gain knowledge about the Engines employed for two and three wheelers.
2	Understand about the Chassis and its sub-systems.
3	Perceive about the functionality of Brakes and wheels.
4	Gain knowledge on specific Case studies of major Indian models.
5	Gather information about Servicing, maintenance and trouble shooting of two and three wheelers.
COs	ME2353 Finite Element Analysis
1	Apply finite element technique to Engineering problems
2	Improve their ability in solving differential equations for real world problems
3	Equip themselves familiar with multi-domain phenomenon like thermo-structural problems
4	Familiarize themselves with the applications of finite element method & FEA packages
5	Understand the concept of multibody dynamics
COs	AT2037 Metrology and Instrumentation
1	Understand the construction and operation of different linear measurement technology
2	Understand the construction and operation of different pressure measurement technology
3	Understand the construction and operation of different flow measurement technology
4	Understand the construction and operation of different temperature measurement technology
5	Understand the construction and operation of different force and torque measurement technology
COs	AT2354 Computer Aided Engine Design Laboratory
1	Ability to use the drafty for piston and connecting rod.
2	Ability to use the drafty for crankshaft and flywheel.
3	Ability to use the modeling for piston and connecting rod.
4	Ability to use the modeling for crankshaft and flywheel.
5	Famiarise the students to use modeling software to model engine components design
COs	AT2355 Computer Aided Chassis Design Laboratory
1	Ability to use the drafty for clutches and gearbox.

2	Ability to use the drafty for rear axle and final drive bearings.
3	Ability to use the modeling for clutches and gearbox.
4	Ability to use the modeling for rear axle and final drive bearings.
5	Famiarise the students to use modeling software to model chassis components design
COs	AT2356 Two and Three Wheelers Laboratory
1	Perform testing using dynamometers.
2	Ability to assemble the engine components
3	conduct performance test on two and three wheelers.
4	Performance test on coil spring.
5	Performance test on shock absorber
VII SEM	
COs	AT2401 Engine and Vehicle Management System
1	Understand the role of various sensor
2	Construction and working principle and it influence in controlling pollution
3	Study of modern control strategies like Fuzzy logic and adaptive control
4	Understand the basics of Vehicle Motion Control and telematics system
5	Enhancing safety of the vehicle.
COs	AT2402 Vehicle Dynamics
1	Understand the concept of mechanical vibrating system
2	Understand fundamentals of vibration theory and familiar with basics of vibrations and their mathematic models.
3	Gain knowledge about the suspension and tire related vibrations
4	Equip themselves about the vibration control techniques & stability of vehicle
5	Understand the application of numerical methods in automobiles
COs	AT2403 Vehicle Maintenance
1	Gain knowledge about vehicle operation and maintenance, service schedules etc.,
2	Gain skills in handling situations where the vehicle is likely to fail.
3	Understand maintenance procedures like repairing, overhauling etc.,
4	Understand the concept of fault diagnosis
5	Understand the various advances in fault diagnosis
COs	AT2404 Automotive Pollution and Control
1	Understand the current scenario of Automobile Emissions and standards.
2	Gain knowledge about the formation of Emissions from SI Engines.
3	Gain knowledge about the formation of Emissions from CI Engines.
4	Understand Emission and control Techniques in SI and CI Engines.
5	Understand measuring techniques of Emission and test procedure.

COs	AT2029 New Generation and Hybrid Vehicles
1	Familiar in the recent development pertain to energy system
2	Familiar in the recent development pertain to vehicle operation, newer vehicle
3	Understand the basics of Vehicle Motion Control and telematics system
4	Familiar in the recent development pertain to newer vehicle
5	Recent technologies in the area of suspension systems, brakes, aerodynamics
COs	AT2031 Project and Materials Management
1	Understand the concept of project management
2	To illustrate the various systems and procedures involved
3	Understand the concept of value analysis
4	Understand the Concept and importance of Material Management
5	Familiar in Planning commission and Public Investment Board.
COs	AT2405 Vehicle Maintenance and Re-conditioning Laboratory
1	Perform engine analysis using diagnostic systems.
2	Conduct wheel balancing and alignment.
3	Adjust timing and test a fuel injection pump.
4	Ability to identify the faults and knowledge on maintenance
5	Removal and fitting of tire and tube.
COs	ME2309 CAD and CAM Laboratory
1	To understand the concepts G and M codes and manual part programming.
2	To expose students to modern control systems (Fanuc, Siemens etc)
3	To know the application of various CNC machines
4	To expose students to modern CNC application machines EDM, EDM wire cut and Rapid Prototyping
5	To gain practical experience in handling 2D drafting and 3D modeling software systems.
VIII SEM	
COs	AT2451 Vehicle Body Engineering
1	Understand the fundamentals of various automotive body construction details
2	Understand the concepts of aerodynamics in body engineering for better style and low drag.
3	Know about different aspects of car body and bus body, types, commercial vehicle.
4	Role of various aerodynamic forces and moments, measuring instruments
5	Know about the material used in body building, tools used, body repairs.
COs	GE2022 Total Quality Management
1	To understand the Total quality management concept, principles and the various tools available to achieve Total quality management.
2	To understand the statistical approach for quality control.

3	To create an awareness about the ISO and QS certification process
4	To learn about requirements for the industries
5	To understand an awareness of quality and testing of the products
COs	AT2003 Automotive Safety
1	Understand the vehicle motion control and stabilization system
2	Know the importance of Driver assistance, security and warning system
3	Gain the knowledge of Safety and comfort system
4	Understand the various safety concepts used in passenger cars.
5	Understand the basics of vehicle collision and its effects.
COs	AT2453 Project Work
1	To develop the ability to solve a specific problem right from its identification
2	To literature review till the successful solution of the same
3	Preparing project reports and to face reviews and viva voce examination.
4	A position to take up any challenging practical problems
5	Find solution by formulating proper methodology