

AL AZHAR COLLEGE OF ENGINEERING & TECHNOLOGY

B TECH AUTOMOBILE ENGINEERING

2019 Scheme Syllabus - Course Outcomes

S1 B.Tech (2019) Syllabus

COURSE NAME	COURSE CODE	COURSE OUTCOME CODE	COURSE OUTCOME STATEMENTS
LINEAR ALGEBRA AND CALCULUS	MAT 101	CO 1	Solve system of Linear equations, diagonalize the matrices and characterise quadratic forms
		CO 2	Compute the partial and total derivatives and maxima and minima of multivariable functions
		CO 3	Compute multiple integrals and apply them to find area and volume of geometrical shapes, mass and centre of gravities of plane laminas
		CO 4	Perform various tests to determine whether a given series is convergent absolutely convergent or conditionally convergent
		CO 5	Determin the Taylor and Fourier series expansion of functions and learn their application
ENGINEERING CHEMISTRY	CYT 100	CO 1	Apply the basic concepts of Electrochemistry and corrosion to explore its possible applications in various Engineering fields
		CO 2	Understand various spectroscopic techniques like UV-VISIBLE, IR and NMR and its applications.
		CO 3	Apply the knowledge of analytical method for characterizing a chemical mixture or a compound. Understand the basic concept of SEM for surface characterisation of Nano materials.
		CO 4	Learn about the basics of stereochemistry and its application. Apply the knowledge of conducting polymers and advanced polymers in engineering.
		CO 5	Study various types of water treatment methods to develop skills for water treatments.
ENGINEERING GRAPHICS	EST 110	CO 1	Draw the projection of points and lines located in different quadrants
		CO 2	Prepare multiview orthographic projections of objects by visualizing them in different positions
		CO 3	Draw sectional views and develop surfaces of a given object

		CO 4	Prepare pictorial drawings using the principles of isometric and perspective projections to visualize objects in three dimensions.
		CO 5	Convert 3D views to orthographic views
BASICS OF ELECTRICAL & ELECTRONICS ENGINEERING	EST 130	CO 1	Apply fundamental concepts and circuit laws to solve simple DC electric and magnetic circuits
		CO 2	Develop and solve models of magnetic circuits
		CO 3	Apply the fundamental laws of electrical engineering to solve simple ac circuits in steady state
		CO 4	Describe working of a voltage amplifier
		CO 5	Outline the principle of an electronic instrumentation system
		CO 6	Explain the principle of radio and cellular communication
LIFE SKILLS	HUN 101	CO 1	To enable students to define and identify different life skills required in personal and professional life
		CO 2	To facilitate the students to develop an awareness of the self and apply well-defined techniques to cope with emotions and stress.
		CO 3	To inculcate effective communication and demonstrate these through presentations.
		CO 4	To enable students to take part in group discussions
		CO 5	To equip the students to use appropriate thinking and problem solving techniques to solve new problems
		CO 6	To create awareness on basics of teamwork and leadership.
ENGINEERING CHEMISTRY LAB	CYL 120	CO 1	Understand and practice different techniques of quantitative chemical analysis to generate experimental skills and apply this to various analyzes
		CO 2	Develop skills to synthesise Organic polymers and acquire knowledge about their applications and properties
		CO 3	Develop the ability to understand and explain the use of modern spectroscopic techniques for
			analysing and interpreting the IR and NMR spectra of compounds
		CO 4	Acquire the ability to understand and use pH meter to measure the acidic and basic character of solutions used for various analysis

		CO 5	Learn to design and carry out scientific experiments as well as accurately record and analyze the results of experiments.
		CO 6	Function as a member of a team, communicate effectively and engage in further learning. Also understand how chemistry addresses social, economical and environmental problems and why it is an integral part of the curriculum
ELECTRICAL & ELECTRONICS WORKSHOP	ESL 130	CO 1	Demonstrate safety measures against electric shocks.
		CO 2	Identify the tools used for electrical wiring, electrical accessories, wires, cables, batteries and standard symbols
		CO 3	Develop the connection diagram, identify the suitable accessories and materials necessary for wiring simple lighting circuits for domestic buildings
		CO 4	Identify and test various electronic components
		CO 5	Draw circuit schematics with EDA tools
		CO 6	Assemble and test electronic circuits on boards
		CO 7	Work in a team with good interpersonal skill

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S2 B.Tech (2019) Syllabus

COURSE NAME	COURSE CODE	COURSE OUTCOME CODE	COURSE OUTCOME STATEMENTS
VECTOR CALCULUS, DIFFERENTIAL EQUATIONS AND TRANSFORMS	MAT 102	CO 1	Compute the derivatives and line integrals of vector functions and learn their applications
		CO 2	Evaluate surface and volume integrals and learn their inter relations and applications
		CO 3	Solve homogeneous and non homogeneous linear differential equations and their applications
		CO 4	Compute Laplace transforms and apply them to solve ODEs arising in Engineering
		CO 5	Determine Fourier Transform of functions and apply them to solve problems arising in Engineering
ENGINEERING PHYSICS B	PHT 110	CO 1	Compute the quantitative aspects of waves and oscillations in engineering systems.
		CO 2	Apply the interaction of light with matter through interference, diffraction and identify these phenomena in different natural optical processes and optical instruments.
		CO 3	Analyze the behaviour of matter in the atomic and subatomic level through the principles of quantum mechanics to perceive the microscopic processes in electronic devices.
		CO 4	Apply the knowledge of ultrasonics in non-destructive testing and use the principles of acoustics to explain the nature and characterization of acoustic design and to provide a safe and healthy environment
		CO 5	Apply the comprehended knowledge about laser and fibre optic communication systems in various engineering applications
ENGINEERING MECHANICS	EST 100	CO 1	Recall principles and theorems related to rigid body mechanics
		CO 2	Identify and describe the components of system of forces acting on the rigid body
		CO 3	Apply the conditions of equilibrium to various practical problems involving different force system.
		CO 4	Choose appropriate theorems, principles or

			formulae to solve problems of mechanics.
		CO 5	Solve problems involving rigid bodies, applying the properties of distributed areas and masses
BASICS OF CIVIL & MECHANICAL ENGINEERING	EST 120	CO 1	Recall the role of civil engineer in society and to relate the various disciplines of Civil Engineering.
		CO 2	Explain different types of buildings, building components, building materials and building construction
		CO 3	Describe the importance, objectives and principles of surveying.
		CO 4	Summarise the basic infrastructure services MEP, HVAC, elevators, escalators and ramps
		CO 5	Discuss the Materials, energy systems, water management and environment for green buildings.
		CO 6	Analyse thermodynamic cycles and calculate its efficiency
		CO 7	Illustrate the working and features of IC Engines
		CO 8	Explain the basic principles of Refrigeration and Air Conditioning
		CO 9	Describe the working of hydraulic machines
		CO 10	Explain the working of power transmission elements
		CO 11	Describe the basic manufacturing, metal joining and machining processes
PROFESSIONAL COMMUNICATION	HUN 102	CO 1	Develop vocabulary and language skills relevant to engineering as a profession.
		CO 2	Analyze, interpret and effectively summarize a variety of textual content
		CO 3	Create effective technical Presentation
		CO 4	Discuss a given technical or non-technical topic in a group and arrive at generalizations/consensus
		CO 5	Identify drawbacks in listening patterns and apply techniques for specific needs
		CO 6	Create professional and technical documents that are clear and adhering to all the necessary conventions
PROGRAMMING IN	EST 102	CO 1	Compare various hardware and software

C			components of a computer system.
		CO 2	Design algorithm/flowchart for a given computational problem.
		CO 3	Develop C programs with branching and looping statements, which uses Arithmetic, Logical, Relational or Bitwise operators.
		CO 4	Develop C programs with arrays, structure or union for storing and processing the data.
		CO 5	Implement multi-function C programs for a given computational problem.
		CO 6	Build C programs which use pointers for array processing and parameter passing.
		CO 7	Develop readable C programs with files for reading input and storing output.
ENGINEERING PHYSICS LAB	PHL 120	CO 1	Develop analytical/experimental skills and impart prerequisite hands on experience for engineering laboratories.
		CO 2	Understand the need for precise measurement practices for data recording
		CO 3	Understand the principle, concept, working and applications of relevant technologies and comparison of results with theoretical calculations
		CO 4	Analyze the techniques and skills associated with modern scientific tools such as lasers and fiber optics
		CO 5	Develop basic communication skills through working in groups in performing the laboratory experiments and by interpreting the results
CIVIL & MECHANICAL WORKSHOP	ESL 120	CO 1	Name different devices and tools used for civil engineering measurements
		CO 2	Explain the use of various tools and devices for various field measurements
		CO 3	Demonstrate the steps involved in basic civil engineering activities like plot measurement, setting out operation, evaluating the natural profile of land, plumbing and undertaking simple construction work.
		CO 4	Choose materials and methods required for basic civil engineering activities like field measurements, masonry work and plumbing.
		CO 5	Compare different techniques and devices used in civil engineering measurements

		CO 6	Identify Basic Mechanical workshop operations in accordance with the material and objects
		CO 7	Apply appropriate Tools and Instruments with respect to the mechanical workshop trades
		CO 8	Apply appropriate safety measures with respect to the mechanical workshop trades

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COURSE NAME	COURSE CODE	COURSE OUTCOME CODE	COURSE OUTCOME STATEMENTS
PARTIAL DIFFERENTIAL EQUATION AND COMPLEX ANALYSIS	MAT201	CO 1	Understand the concept and solutions of PDE
		CO 2	Analyse and solve 1 D wave equation and heat equation
		CO 3	Understand the complex function ,its continuity,differentiability with use of CR equation
		CO 4	Evaluate complex integrals using Cauchy's theorem and Cauchy's integral formula,understand series expansion of Analytic functions
		CO 5	Understand series expansion of Complex functions about a singularity and apply Residue theorem to compare several kinds of real integrals
MECHANICS OF SOLIDS	MET201	CO 1	Determine the stresses, strains and displacements of structures by tensorial and graphical (Mohr's circle) approaches
		CO 2	Analyse the strength of materials using stress-strain relationships for structural and thermal loading
		CO 3	Perform basic design of shafts subjected to torsional loading and analyse beams subjected to bending moments
		CO 4	Determine the deformation of structures subjected to various loading conditions using strain energy methods
		CO 5	Estimate the strength of thin cylinders, spherical vessels and columns, and appreciate the theories of failures and its relevance in mechanical design
AUTOMOTIVE CHASSIS	AUT201	CO 1	Explain different chassis layouts,components and frames, Wheels and Tyres
		CO 2	Describe, about various Front Axles, Steering Systems ,steering geometry
		CO 3	Describe, about Rear Axles,Final drive and differential

		CO 4	Describe construction and working of different types of brake systems
		CO 5	Describe construction and working of different types of suspension systems
ENGINEERING THERMODYNAMICS	AUT203	CO 1	Understand basic concepts and laws of thermodynamics
		CO 2	Conduct first law analysis of open and closed systems
		CO 3	Determine entropy and availability changes associated with different processes
		CO 4	Understand the application and limitations of different equations of state
		CO 5	Determine change in properties of pure substances during phase change processes
		CO 6	Evaluate properties of ideal gas mixtures
PROFESSIONAL ETHICS	HUT200	CO 1	Understand the core values that shape the ethical behaviour of a professional
		CO 2	Adopt a good character and follow an ethical life
		CO 3	Explain the role and responsibility in technological development by keeping personal ethics and legal ethics
		CO4	Solve moral and ethical problems through exploration and assessment by established experiments.
		CO5	Apply the knowledge of human values and social values to contemporary ethical values and global issues.
SUSTAINABLE ENGINEERING	MCN201	CO 1	Understand the relevance and the concept of sustainability and the global initiatives in this direction
		CO 2	Explain the different types of environmental pollution problems and their sustainable solutions
		CO 3	Discuss the environmental regulations and standards
		CO 4	Outline the concepts related to conventional and non-conventional energy

		CO 5	Demonstrate the broad perspective of sustainable practices by utilizing engineering knowledge and principles
AUTOMOBILE LAB 1	AUL201	CO 1	To study about hand tools, special purpose tools, and their uses.
		CO 2	To familiarize with various systems and components of an automobile.
		CO 3	To know about writing technical specifications and description of all types of chassis
		CO 4	To know about writing technical specifications and description of transmission components of automobiles
		CO 5	To know about writing technical specifications and description of body and interiors
MATERIALS TESTING LAB	MEL203	CO 1	To understand the basic concepts of analysis of circular shafts subjected to torsion.
		CO 2	To understand the behaviour of engineering component subjected to cyclic loading and failure concepts
		CO 3	Evaluate the strength of ductile and brittle materials subjected to compressive, Tensile shear and bending forces
		CO 4	Evaluate the microstructural morphology of ductile or brittle materials and its fracture modes (ductile /brittle fracture) during tension test
		CO 5	To specify suitable material for applications in the field of design and manufacturing.

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COURSE NAME	COURSE CODE	COURSE OUTCOME CODE	COURSE OUTCOME STATEMENTS
PROBABILITY, STATISTICS AND NUMERICAL METHODS	MAT202	CO 1	Understand the concept ,properties and important models of discrete random variables and ,using them,analyse suitable random phenomena
		CO 2	Understand the concept ,properties and important models of continuous random variables and ,using them,analyse suitable random phenomena
		CO 3	Perform statistical inferences concerning characteristics of a population based on attributes of samples drawn from the population
		CO 4	Compute roots of equations ,evaluate definite integrals and perform interpolation on given numerical data using standard numerical techniques
		CO 5	Apply standard numerical techniques for solving systems of equations, fitting curves on given numerical data and solving ordinary differential equations.
FLUID MECHANICS AND MACHINERY	AUT202	CO 1	Become conversant with the principles of hydrostatics.
		CO 2	Understand the concept of fluid statics
		CO 3	Calculate pressure variations in accelerating fluids using Euler's and Bernoulli's equations and become conversant with the concepts of flow measurements and flow through pipes
		CO 4	Calculate forces and work done by a jet on fixed or moving plate and curved plates and understand
		CO 5	Discuss the characteristics of centrifugal pump and reciprocating pumps
AUTO POWER PLANT	AUT204	CO 1	Understand constructional details and working of various internal combustion engine
		CO 2	Discuss the fuel system of IC engines

		CO 3	Explain CI Engine & SI Engine and Combustion process
		CO 4	Explain engine pollutants and its remedial
		CO 5	Understand and analyse the Cooling and lubrication system for internal combustion engine
AUTOMOTIVE TRANSMISSION	AUT206	CO 1	Explain the Constructional, design and working principles of different types of clutches, fluid couplings, torque convertors, different gear box etc
		CO 2	Determine the gear ratio, speed of vehicle and number of teeth on driving and driven gears
		CO 3	Explain the constructional and principle of operation of different types epicyclic gear box, Calculation of gear ratio for epicyclic gear box.
		CO 4	Explain the necessity, advantages, constructional and principle of operation of different types of automatic transmissions and hydraulic control.
		CO 5	Compare various types of Hydrostatic drives, explain the principle of operation, advantages and limitations of electric drive.
DESIGN AND ENGINEERING	EST200	CO 1	Explain the different concepts and principles involved in design engineering.
		CO 2	Apply design thinking while learning and practicing engineering.
		CO 3	Develop innovative, reliable, sustainable and economically viable designs incorporating knowledge in engineering.
CONSTITUTION OF INDIA	MCN202	CO 1	Explain the background of the present constitution of India and features.
		CO 2	Utilize the fundamental rights and duties.
		CO 3	Understand the working of the union executive, parliament and judiciary.
		CO 4	Understand the working of the state executive, legislature and judiciary.
		CO 5	Utilize the special provisions and statutory institutions.
		CO 6	Show national and patriotic spirit as responsible citizens of the country

FM & HM LAB	MEL202	CO 1	Determine the coefficient of discharge of flow measuring devices (notches, orifice meter and Venturi meter)
		CO 2	Calibrate flow measuring devices (notches, orifice meter and Venturi meter)
		CO 3	Evaluate the losses in pipes
		CO 4	Determine the metacentric height and stability of floating bodies
		CO 5	Determine the efficiency and plot the characteristic curves of different types of
			pumps and turbines
AUTOMOBILE LAB-2	AUL202	CO 1	To study about special purpose tools and their uses.
		CO 2	To study about special purpose machines used in automotive service centers
		CO 3	To familiarize with various systems and components of an automobile.
		CO4	To familiarize with power transmission and scheduled maintenance

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COURSE NAME	COURSE CODE	COURSE OUTCOME CODE	COURSE OUTCOME STATEMENTS
THEORY OF MACHINES	AUT301	CO 1	Understand the kinematics of planar mechanisms and describe the principles of different types of brakes and clutches.
		CO 2	Define cam terminologies and apply kinematic principles to sketch a cam profile for a specified follower motion
		CO 3	Illustrate different types of gears and solve terminologies of gears and velocity of gears in a gear train.
		CO 4	Understanding on the Turning Moment Diagrams and use of the Flywheels in various machines and Demonstrate the concepts of static and dynamic balancing to rotating and reciprocating machine parts and analyse them for required balance.
		CO 5	Build the basics of single degree and multi degree of freedom vibrations and their measurements.
MANUFACTURING PROCESS	AUT303	CO 1	Understand the basic concept of foundry and casting
		CO 2	Explain the different types of Metal joining process
		CO 3	Discuss the different metal forming process
		CO 4	Explain the non-conventional machining process
		CO 5	Explain the advanced manufacturing technology
HYBRID AND FUEL CELL VEHICLES	AUT303	CO 1	Understand the construction and working of various hybrid electric topologies
		CO 2	Discuss the construction and working of various electric motors.
		CO 3	Explain the various energy storage systems available.

		CO 4	Explain the procedure to match electric motor and ic engine.
		CO 5	Understand the construction and working of various types of fuel cells
MATERIAL SCIENCE AND METALLURGY	AUT307	CO 1	Understand the basic atomic bonds, crystal structures (BCC, FCC, and HCP), and their relationship with the properties.
		CO 2	Recognize the mechanism of solidification of metals and the defects arising from it.
		CO 3	Analyse the microstructure of metallic materials using phase diagrams and modify the microstructure and properties using different heat treatments.
		CO 4	Define and differentiate engineering materials based on structure and properties for engineering applications.
		CO 5	How to quantify mechanical integrity and failure in materials.
MANAGEMENT FOR ENGINEERS	HUT310	CO 1	Explain the characteristics of management in the contemporary context
		CO 2	Describe the functions of management
		CO 3	Demonstrate ability in decision making process and productivity analysis
		CO 4	Illustrate project management technique and develop a project schedule
		CO 5	Summarize the functional areas of management
DISASTER MANAGEMENT	MCN301	CO 1	Define and use various terminologies in use in disaster management parlance and organise each of these terms in relation to the disaster management cycle
		CO 2	Distinguish between different hazard types and vulnerability types and do vulnerability assessment
		CO 3	Identify the components and describe the process of risk assessment, and apply appropriate methodologies to assess risk

		CO 4	Explain the core elements and phases of Disaster Risk Management and develop possible measures to reduce disaster risks across sector and community
		CO 5	Identify factors that determine the nature of disaster response and discuss the various disaster response actions
		CO 6	Explain the various legislations and best practices for disaster management and risk reduction at national and international level
PRODUCTION ENGINEERING LAB	MUL331	CO 1	Identify the machining operation involved for a component
		CO 2	Illustrate the manufacturing sequence for developing a component
		CO 3	Apply and optimise different criteria for machining of a component
		CO 4	Develop and analyse a CNC programme using simulation software
		CO 5	Enhance research capabilities by carrying out different research oriented experiments
THERMAL ENGINEERING LAB-I	MEL333	CO 1	Measure thermo-physical properties of solid, liquid and gaseous fuels
		CO 2	Identify various systems and subsystems of Diesel and petrol engines
		CO 3	Analyse the performance characteristics of internal combustion engines
		CO 4	Investigate the emission characteristics of exhaust gases from IC Engines
		CO 5	Interpret the performance characteristics of air compressors / blowers

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COURSE NAME	COURSE CODE	COURSE OUTCOME CODE	COURSE OUTCOME STATEMENTS
HEAT & MASS TRANSFER	MET302	CO 1	Apply principles of heat and mass transfer to engineering problems
		CO 2	Analyse and obtain solutions to problems involving various modes of heat transfer
		CO 3	Design heat transfer systems such as heat exchangers, fins, radiation shields etc.
		CO 4	Define laminar and turbulent boundary layers and ability to formulate energy equation in flow systems.
AUTOMOTIVE ELECTRICAL AND ELECTRONICS	AUT304	CO 1	Understand constructional details and working of various batteries used in automotive vehicles
		CO 2	Discuss the construction and working of starter motor and alternator
		CO 3	Explain the construction and working of battery ignition system and also working of electronic fuel injection system
		CO 4	Explain the different types of components that make up the lighting systems
		CO 5	Understand the working of various sensors used in automobiles
AUTOMOTIVE COMPONENTS DESIGN	AUT306	CO 1	Understand the concepts of mechanics of solids and failure prevention of components.
		CO 2	Apply the basic design methods for couplings, shafts and bearings.
		CO 3	Apply the basic design methods for clutches, brakes and springs.
		CO 4	Apply the basic design methods for gears.
		CO 5	Apply the basic design methods for internal combustion engine parts.

TWO AND THREE WHEELED VEHICLE (PROGRAM ELECTIVE-1)	AUT312	CO 1	Understand the Two and Three wheeled vehicles frames & its components
		CO 2	Understand the fuel, lubrication and electrical systems used in two and three wheel vehicles
		CO 3	Acquire knowledge on transmission and steering system
		CO4	Illustrate the brakes and suspension system
		CO 5	Understand the criteria used for performance and maintenance
INDUSTRIAL ECONOMICS AND FOREIGN TRADE	HUT300	CO 1	Understand the problem of scarcity of resources and consumer behaviour, and to evaluate the impact of government policies on the general economic welfare.
		CO 2	Take appropriate decisions regarding volume of output and to evaluate the social cost of production.
		CO 3	Analyse the functional requirement of a firm under various competitive conditions.
		CO 4	Analyse the overall performance of the economy, and the regulation of economic fluctuations and its impact on various sections in the society.
		CO 5	Determine the impact of changes in global economic policies on the business opportunities of a firm.
COMPREHENSIVE COURSE WORK	AUT308	CO 1	Learn to prepare for a competitive examination
		CO 2	Comprehend the questions in Automobile Engineering field and answer them with confidence
		CO 3	Communicate effectively with faculty in scholarly environments
		CO 4	Analyse the comprehensive knowledge gained in basic courses in the field of Automobile Engineering
COMPUTER AIDED DESIGN & ANALYSIS LAB	MEL332	CO 1	Gain working knowledge in Computer Aided Design and modeling procedures.
		CO 2	Gain knowledge in creating solid machinery parts.
		CO 3	Gain knowledge in assembling machine elements.
		CO 4	Gain working knowledge in Finite Element Analysis.

		CO 5	Solve simple structural, heat, and fluid flow problems using standard software
AUTOMOBILE LAB-3	AUL334	CO 1	To study about hand tools, special purpose tools, and their uses.
		CO 2	To familiarize with various electrical systems and components of an automobile.
		CO 3	To know about technical specifications and description of electrical components.
		CO 4	To know about applications of electrical components of automobiles.
		CO5	To test various electrical components of automobiles.

B TECH MECHANICAL ENGINEERING
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S7 B.Tech (2019) Syllabus

COURSE NAME	COURSE CODE	COURSE OUTCOME CODE	COURSE OUTCOME STATEMENTS
ADVANCED IC ENGINE	AUT401	CO 1	Understand the modern SI and CI engine combustion technologies.
		CO 2	Familiarise and understand the basics of dual fuel engines and non-conventional engines
		CO 3	Get an overview about the concept and working of Lean-burn engines
		CO 4	Understand the working principle and operation of stratified charge engines
		CO 5	Get exposed to the basic principles, types and operation of LTC concepts and strategies
MARKETING MANAGEMENT(Pr ogramme Elective II)	AUT433	CO 1	Understand the basics of vibrations and undamped free vibrations
		CO 2	Identify the applications of the damped free vibrations
		CO 3	Identify and evaluate systems with single degrees of freedom.
		CO 4	Elaborate on systems with two degrees of freedom
		CO 5	Analyse and solve vibration with multiple degrees of freedom
RENEWABLE ENERGY ENGINEERING	MET445	CO 1	Explain renewable energy sources and evaluate the implication of renewable energy. To predict solar radiation at a location.

		CO 2	Explain solar energy collectors, storages, solar cell characteristics and applications.
		CO 3	Explain the different types of wind power machines and control strategies of wind turbines
		CO 4	Explain the ocean energy and conversion devices and different Geothermal sources.
		CO 5	Explain biomass energy conversion devices. Calculate the Net Present Value and payback period
INDUSTRIAL SAFETY ENGINEERING	MCN401	CO 1	Describe the theories of accident causation and preventive measures of industrial accidents
		CO 2	Explain about personal protective equipment, its selection, safety performance & indicators and importance of housekeeping.
		CO 3	Explain different issues in construction industries.
		CO 4	Describe various hazards associated with different machines and mechanical material handling.
		CO 5	Utilize different hazard identification tools in different industries with the knowledge of different types of chemical hazards.
AUTOMOBILE LAB-4	AUL411	CO 1	To study about hand tools, special purpose tools, and their uses.
		CO 2	To familiarize with various electronics systems and components of an automobile
		CO 3	To know about technical specifications and description of electronics components.
		CO 4	To know about applications of electronic components of automobiles.
		CO 5	To test various electronics components of automobiles.
SEMINAR	AUQ413	CO 1	Identify academic documents from the literature which are related to her/his areas of interest (Cognitive knowledge level: Apply).
		CO 2	Read and apprehend an academic document from the literature which is related to her/ his areas of interest (Cognitive knowledge level: Analyze).
		CO 3	Prepare a presentation about an academic document (Cognitive knowledge level: Create)

		CO 4	Give a presentation about an academic document (Cognitive knowledge level: Apply).
		CO 5	Prepare a technical report (Cognitive knowledge level: Create).
PROJECT PHASE I	AUD415	CO 1	Model and solve real world problems by applying knowledge across domains (Cognitive knowledge level: Apply).
		CO 2	Develop products, processes or technologies for sustainable and socially relevant applications (Cognitive knowledge level: Apply)
		CO 3	Function effectively as an individual and as a leader in diverse teams and to comprehend and execute designated tasks (Cognitive knowledge level: Apply).
		CO 4	Plan and execute tasks utilizing available resources within timelines, following ethical and professional norms (Cognitive knowledge level: Apply).
		CO 5	Identify technology/research gaps and propose innovative/creative solutions (Cognitive knowledge level: Analyze).
		CO 6	Organize and communicate technical and scientific findings effectively in written and oral forms (Cognitive knowledge level: Apply)

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2019 Scheme Syllabus - Course Outcomes
S8 B.Tech (2019) Syllabus

COURSE NAME	COURSE CODE	COURSE OUTCOME CODE	COURSE OUTCOME STATEMENTS
VEHICLE DYNAMICS	AUT402	CO 1	Acquires theoretical knowledge of vibrations and its effect and performance of automobiles
		CO 2	Acquires the knowledge of tire dynamics tire vibrations and under steer and over steer conditions
		CO 3	Acquires the knowledge of stability of a vehicle on slope, banked track and curved track
		CO 4	Acquires the knowledge of Principle of operation of brake ,efficiency of braking and stopping distance and types of suspension systems
		CO 5	Acquires the knowledge of various aerodynamic effect on a moving vehicle and aerodynamic aids
ADVANCED METAL JOINING TECHNIQUES (Programme Elective III)	AUT434	CO 1	Explain the physics, equipment, applications of EBW and LBW
		CO 2	Summarise the physics, equipment, applications of diffusion welding and adhesive bonding processes
		CO 3	Contrast the physics, equipment, applications of explosive welding with friction welding.
		CO 4	Outline the physics, equipment, applications of ultrasonic welding and brazing.
		CO 5	Illustrate the physics, equipment, applications of plasma arc welding and magnetically impelled arc butt welding.
		CO 6	Select an appropriate welding technique to resolve a metal joining problem.
OPERATIONS MANAGEMENT IN AUTO INDUSTRY (Programme Elective IV)	AUT416	CO 1	Understand the input–process–output framework, the extensions of it, and apply them to a wide range of operations
		CO 2	Understand various management skills needed for the effective operations management
		CO 3	Understand the roles and responsibilities of operations managers and the challenges they face
		CO 4	Understand various operations management

			responsibilities of automobile industries
		CO 5	Understand the content of an operations strategy and the decisions involved.
		CO 6	Understand the quality management to improve the productivity in automobile industries
VEHICLE BODY ENGINEERING AND SAFETY (Programme Elective V)	AUT428	CO 1	Fundamentals of vehicle body engineering and the terms used in bus body building
		CO 2	Introduction to materials used in vehicle body
		CO 3	Improve the knowledge about CFD technology and wind tunnel test
		CO 4	Introduction to load distribution and vehicle stability
		CO 5	Increase the knowledge about Safety equipment's
PROJECT PHASE II	AUD416	CO 1	Model and solve real world problems by applying knowledge across domains (Cognitive knowledge level: Apply).
		CO 2	Develop products, processes or technologies for sustainable and socially relevant applications (Cognitive knowledge level: Apply).
		CO 3	Function effectively as an individual and as a leader in diverse teams and to comprehend and execute designated tasks (Cognitive knowledge level: Apply).
		CO 4	Plan and execute tasks utilizing available resources within timelines, following ethical and professional norms (Cognitive knowledge level: Apply).
		CO 5	Identify technology/research gaps and propose innovative/creative solutions (Cognitive knowledge level: Analyze).
		CO 6	Organize and communicate technical and scientific findings effectively in written and oral forms (Cognitive knowledge level: Apply).