

Noorul Islam Centre for Higher Education

(Deemed to be University u/s 3 of the UGC Act 1956)

Kumaracoil, Thuckalay, Kanyakumari District - 629 180

Accredited by NAAC with 'A' Grade

AM22 B.E Automobile Engineering



Student Performance and Learning Outcomes

AM22 B.E Automobile Engineering

Programme Outcomes - PO	
PO-A	Apply knowledge of mathematics, science, and engineering to solve the problems related to automobile engineering.
PO-B	Identify, formulate and analyze the complex safety problems using the principles of mathematics, natural sciences, and engineering concepts.
PO-C	Design solutions for complex safety problems and design system components or processes to meet the desired needs in public health, road safety and environmental consideration.
PO-D	Design and conduct experiments, analyze and interpret data through appropriate methods in order to provide a valid conclusion.
PO-E	Gain and use knowledge on contemporary issues and apply appropriate techniques, skills and engineering tools necessary for implementation in real-time issues.
PO-F	Assess the societal needs in the field of occupational health and safety and to bring effective solutions through professional engineering practice.
PO-G	Understand the impact of professional engineering solutions in the context of social, cultural and environmental responsibilities and the need for sustained development.
PO-H	To provide excellent guidelines to exhibit ethical behaviour and to enrol as a professional in a competitive engineering society.
PO-I	Function effectively as an individual and as a member or leader in diverse teams and in multidisciplinary settings
PO-J	Communicate effectively to the engineering community and with the society through effective reports, documents, presentations, symbols, guidelines, and drawings.
PO-K	Demonstrate the knowledge and understanding of the safety engineering and management principles and apply these to manage and execute projects, audits in the multidisciplinary environment.
PO-I	Recognize the need for, and have the preparation ability to effectively engage in the fast-changing field of safety engineering and make students to be successful professionals, committed to lifelong learning.

PROGRAMME SPECIFIC OUTCOMES - PSO	
PSO-1	Demonstrate the ability of analyzing the common business problems to design and develop appropriate technical solutions in automobile sectors.
PSO-2	Ability to utilize available resources and reduce pollution.
PSO-3	Practice and promote ideas to cater social needs.

Sl.No	Subject code	SUBJECT NAME
SEMESTER II		
1.	EG2102	Technical English – II
2.	MA2102	Engineering Mathematics – II
3.	BS2103	Environmental Science
4.	ME2201	Engineering Graphics
5	ME2202	Manufacturing Processes – I
6	AM2201	Basic Automobile Engineering
7	AM2271	Basic Automobile Engineering Laboratory
8	ME2271	Geometric Modeling Laboratory - I
9	ME2272	Manufacturing processes Laboratory – I
SEMESTER IV		
10.	MA2204	Statistics And Numerical Methods
11.	AM2207	Fluid Mechanics and Machinery
12.	AM2208	Theory of Machines
13.	AM2209	Manufacturing of Automotive components
14.	AM2210	Automotive Electrical and Electronics system
15.	AM2211	Automotive Power Trains
16.	AM2275	Automotive Electrical and Electronics system Laboratory
17.	AM2276	Fluid Mechanics and Machinery Laboratory
18.	AM2277	Dynamics Laboratory
SEMESTER VI		
19.	IT1212	Cyber Security
20.	AM1214	Automotive Emission and Control
21.	AM1215	Automation and Pneumatic Control
22.	AM1216	Design of Vehicle components
23.	AM1217	Applied Finite Element Analysis
24.	EI12A5	Automotive Instrumentation And Control
25.	AM1278	Computer Aided Simulation, Analysis and Manufacturing Laboratory
26.	AM1279	Instrumentation and metrology Laboratory
SEMESTER VIII		
27.	AM 12B3	Two and three wheeled vehicle
28.	AM 12B3	Off road Vehicle
29.	AM22B6	Total Quality Management
30.	AM12P5	Project Work

COURSE OUTCOMES

EG2102 TECHNICAL ENGLISH - II

CO1	The Students will be able to improve their vocabulary and use articles and prepositions effectively in sentences.
CO2	The students will be able to understand grammatical items like phrases and verbs, derivatives, relative pronouns etc. and thereby enhance their linguistic competence.
CO3	The students will be able to acquire the essentials of writing skills relating to resume writing, E-mail writing and also the essential components of essay writing.
CO4	The students will be able to learn the basics of letter writing and the formalities involved in writing formal and business letters.
CO5	The students will be able to learn English Phonemes such as vowels, Diphthongs and consonants.

MA2102 ENGINEERING MATHEMATICS -II

CO1	Understand the linear differential equation with constant and variable coefficients. To solve the Cauchy's and Legendre equations and solve the differential equations by variation of parameters.
CO2	Know about functions of a complex variable, analytic functions, Cauchy's Riemann equations. To prove the properties of analytic functions. To find the analytic function and bilinear transformation.
CO3	Study about Cauchy's integral formula and Cauchy's integral theorem, Laurent's expansion. Know about singular point, Cauchy's integral theorem. To evaluate the integral by contour integration.
CO4	Know about gradient, divergence, curl, directional derivatives, irrotational and solenoidal vector field. To verify the vector integration by Green's theorem, Gauss divergence theorem and Stoke's theorem.
CO5	Obtain the Laplace transform of elementary functions. Transform of derivatives and integrals and periodic functions. To find the inverse Laplace transform using convolution theorem and solve the differential equations.

BS2103 ENVIRONMENTAL SCIENCE

CO1	Students are able to understand the different types of natural resources, its sources and importance.
CO2	Students are able to understand how interactions between organisms and their environments drive the dynamics of individuals, populations etc.
CO3	Students gain skills required to research and analyze environmental issues and learn how to overcome them.
CO4	Students are able to reflect critically about their roles and identities as citizens, consumers and environmental actors in a complex interconnected world.
CO5	Students can analyze the consequences of population growth and how it affects the environment.

ME2201 - Engineering Graphics	
CO1	Familiarize with the fundamental standards applied in engineering graphics and perform free hand sketching of basic construction and multiple view of objects
CO2	Project orthographic projection of points lines and plane surfaces
CO3	Understand and draw the projection of solid and its sections
CO4	The students will be able to explain various methods of modeling
CO5	The students will be able to explain the basic working principles of powder metallurgy.

ME2202–Manufacturing Process 1	
CO1	The students will be able to describe the principles of casting process
CO2	The students will be able to describe the principles of joining process
CO3	The students will be able to describe the principles of metal forming process.
CO4	The students will be able to explain various methods of plastic manufacturing.
CO5	The students will be able to explain the basic working principles of powder metallurgy.

AM 2201 BASIC AUTOMOBILE ENGINEERING	
CO1	Understand and examine fundamental concepts of automobiles
CO2	Ability to understand, analyze and design various power trains.
CO3	Ability to understand, analyze and design various suspension systems
CO4	Ability to study various types of braking systems
CO5	Knowledge and use of frame and body of vehicles

AM 2271 BASIC AUTOMOBILE ENGINEERING LABORATORY	
CO1	Student will be able to understand and analyze the working of vehicles.
CO2	Student will be able to construct and design basic petrol and diesel engines
CO3	Student will be able to analyze, build transmission systems
CO4	The students will be able to explain various methods of manufacturing.
CO5	The students will be able to explain the basic working principles of automobiles.

ME 2271 GEOMETRIC MODELING LABORATORY	
CO1	Student will be able to understand and analyze the working of CAD models
CO2	Student will be able to construct and design 2D drawings
CO3	Student will be able to draw mechanical components using Auto CAD
CO4	The students will be able to explain various methods of modeling.
CO5	The students will be able to explain the basic working principles of modeling.

ME 2272 MANUFACTURING PROCESS LABORATORY	
CO1	Student will be able to understand the preparation of mould
CO2	Student will be able to prepare split patterns.
CO3	Student will be able to different manufacturing process
CO4	The students will be able to explain various methods of manufacturing.
CO5	The students will be able to explain the basic working principles of manufacturing.

MA2204 STATISTICS AND NUMERICAL METHODS	
CO1	Recognize a Partial Differential Equation and formulate a Partial Differential Equation from a given solution, solve linear Partial Differential Equation of both first and second order with differential method.
CO2	Derive a Fourier series of a given periodic function by evaluating Fourier coefficient and expand Fourier cosine and Sine series for given function, also find the Fourier series for a given numerical methods.
CO3	Classify the second order Partial Differential Equation and solve a second order Partial Differential Equation in Wave, diffusion and Laplace with boundary and initial conditions using Fourier series.
CO4	Know fundamental mathematical properties of a Fourier transform, calculate the Fourier transform and its inverse transform of function, also know to apply Parseval's and convolution theorem.
CO5	Understand the characteristics and properties of Z-transform, compute Z-transform and inverse transform and apply Z-transform for solving difference equation.

AM 2207 FLUID MECHANICS AND MACHINERY	
CO1	Student will be able to remember the principles of fluid properties
CO2	Student will be able to know incompressible fluid flow.
CO3	Student will gain knowledge on fluid statics.
CO4	Student will understand the purpose hydraulic turbine.
CO5	Student will gain knowledge on different hydraulic pump.

AM2208 THEORY OF MACHINES	
CO1	Student will be able to remember the principles of vibration
CO2	Student will be able to know gear and gear train.
CO3	Student will gain knowledge on balancing of masses.
CO4	Student will understand the purpose of turning moment diagram
CO5	Student will gain knowledge on different Cams and governors.

AM 2209 MANUFACTURING OF AUTOMOTIVE COMPONENTS	
CO1	Acquire strong fundamental knowledge in the engine engineering concepts.
CO2	Understands the concepts of manufacturing clutch.
CO3	Analyze the design concepts of automotive body.
CO4	An ability to be familiar with types of heat treatments.
CO5	Evaluate the practices in modern manufacturing systems

AM2210 AUTOMOTIVE ELECTRICAL AND ELECTRONICS SYSTEMS	
CO1	Able to learn about automotive wiring
CO2	Able to understand the storage of automotive batteries.
CO3	Able to understand the concepts of charging and starting system operation.
CO4	Able to learn about the automotive electronics in context of industrial needs.
CO5	Able to get awareness of sensors and actuators.

AM 2274 AUTOMOTIVE ELECTRICAL AND ELECTRONICS SYSTEMS LABORATORY

CO1	Able to learn about automotive wiring
CO2	Able to understand the testing of automotive batteries.
CO3	Able to understand the concepts of charging.
CO4	Able to understand different wiring accessories
CO5	Understand the starting system operation

AM 2275 FLUID MECHANICS AND MACHINERY LABORATORY

CO1	Understanding the basics of Venturimeter.
CO2	Gaining knowledge regarding the orifice meter
CO3	Understanding the performance of pumps.
CO4	The students will be able to explain various methods of fluid mechanics.
CO5	The students will be able to explain the basic working principles of mechanics.

AM2276 DYNAMICS LABORATORY

CO1	Able to acquire knowledge about the reciprocating mass
CO2	Able to create a vibrating systems.
CO3	Able to get knowledge about various governors.
CO4	The students will be able to explain various methods of dynamics.
CO5	The students will be able to explain the basic working principles of damping system.

IT1212 CYBER SECURITY

CO1	Gives good idea to students and computer organization architecture, networking fundamentals.
CO2	Exposure to security issues of cyber crimes, breaches, data loss/theft as obtaining at the National level and at the International level.
CO3	Understand threats, variety and attack techniques, security requirements, e-commerce security, critical Information Infrastructure.
CO4	Understand cyber laws crime investigation procedure and cyber forensics.
CO5	Understand the cyber security problems, methods of implementation and about secure system.

EE12A5 AUTOMOTIVE INSTRUMENTATION AND CONTROL

CO1	Students should be able to understand the sensor
CO2	Students should be able to understand the warning system
CO3	Students should be able to model the neutral gear
CO4	Students should be able to model the vehicle
CO5	The students will be able to design a vehicle control system.

AM1214- AUTOMOTIVE EMISSION AND CONTROL	
CO1	Understand the basic knowledge of pollutions.
CO2	Have a fundamental knowledge of pollution formation.
CO3	Analyze the components and topologies pollution formation in engines.
CO4	Able to have a clear idea on emission control.
CO5	Gets familiar on emission measurement techniques.

AM1215- AUTOMATION AND PNEUMATIC CONTROLS	
CO1	Understand the basics of resistance to vehicles
CO2	Able to get knowledge about road load
CO3	Able to get knowledge about various vehicle handling.
CO4	Able to be familiar with stability of vehicles
CO5	Attain knowledge about suspension

AM 1216 DESIGN OF VEHICLE COMPONENTS	
CO1	Ability to understand and use the components of designing automobiles
CO2	Ability to use engine components
CO3	Knowledge to understand with different clutch and brake
CO4	Ability to understand and use the components of clutch and brake
CO5	Ability to use transmission system

AM1217-APPLIED FINITE ELEMENT ANALYSIS	
CO1	Students should able to understand the need of FEA
CO2	Students should able to understand basic FEA
CO3	Students should able to do different levels of FEA tools.
CO4	Students should able to do different levels of FEA simulation.
CO5	Students should able to plan the different FEA systems.

AM1278 COMPUTER AIDED SIMULATION ANALYSIS AND MANUFACTURING LABORATORY	
CO1	Learning of 3D part modelling
CO2	Understanding the concepts of Editing of patterns
CO3	Understanding the concepts of 3 D automotive components
CO4	The students will be able to explain various methods of manufacturing.
CO5	The students will be able to explain the basic working principles of manufacturing.

AM 1279 INSTRUMENTATION AND METROLOGY LABORATORY	
CO1	Students should able to understand the calibration of vernier
CO2	Students should able to measure the gear tooth dimensions
CO3	Students should able to measure the force
CO4	The students will be able to measure torque
CO5	The students will be able to measure the taper angle

AM 12B3 TWO AND THREE WHEELED VEHICLE	
CO1	Student should understand the fundamental concepts in the area of power unit.
CO2	Student should understand the fundamentals of chassis and power systems.
CO3	Students understand the key concepts of brake, wheels and tyres.
CO4	Student should understand the two wheelers
CO5	Student should understand three wheelers

AM 12B5 OFFROAD VEHICLES	
CO1	Student will be able to clearly understand the different classification of off road vehicles
CO2	Student will get knowledge of the earth moving machines
CO3	Student will be able to understand scrapper systems
CO4	The candidate will get knowledge of farm equipments
CO5	Student will be able to design and implement vehicle systems in future

AM12B6 TOTAL QUALITY MANAGEMENT	
CO1	Students should be able to understand the need of quality
CO2	Students should be able to understand basic quality of TQM.
CO3	Students should be able to do different levels of TQM tools.
CO4	Students should be able to do different levels of TQM tools II.
CO5	Students should be able to plan the different quality systems.

AM1220 ENTREPRENEURSHIP DEVELOPMENT	
CO1	Students should be able to understand the need of entrepreneurship
CO2	Students should be able to understand basic quality of motivation.
CO3	Students should be able to do different levels of business.
CO4	Students should be able to do different levels of financing.
CO5	Students should be able to plan the different support to entrepreneurship.

AM12P5 PROJECT WORK	
CO1	Demonstrate a sound technical knowledge of their selected project topic.
CO2	Undertake problem identification, formulation and solution.
CO3	Design engineering solutions to complex problems utilising a systems approach.
CO4	Conduct an engineering project
CO5	Demonstrate the knowledge, skills and attitudes of a professional engineer.