Faculty of Engineering & Technology
Diploma Engineering (DE)
(W. E. F.: 2023-24)

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Name of Faculty	:	Faculty of Engineering & Technology
Name of Program	:	Diploma Engineering
Course Code	:	1DAE01
Course Title	:	Basics of Automobile Engineering
Type of Course	:	Basic Engineering (BE)
Year of Introduction	:	2023-24

Prerequisite	:	Zeal to learn the subject
Course Objective	:	Due to the rapid growth of auto component manufacturers and automobile industries, there is a great demand for Automobile Engineers. Automotive sector offers wide range of job prospects to automobile engineering pass outs from manufacturing, marketing and service to survey and insurance. The automotive industry is addressing pressing environmental issues of carbon dioxide emissions, waste, and fossil fuel dependence. This course is prepared to familiarize students with vehicle, their work and responsibility in actual field as well as to prepare them for sustainable development. Overview of automotive waste management and energy saving/efficient methods are also incorporated in this course. The content of this course is purely practical base and designed in such a way that student be acquainted with latest trade practices in automobile sector and associated knowledge will also help the student to start workshop or work in authorized auto workshop.
Course Outcomes	:	At the end of this course, students will be able to:
	CO1	Identify various components of assemblies /systems, materials, fasteners etc., used in a vehicle with their broad specification.
	CO2	Demonstrate various types of roles and responsibilities which perform in different field of automotive sector
	CO3	Use common hand tools, testing equipment's and measuring instruments related to automobile workshop /garage.
	CO4	Prepare a study report after collection and analysis of field data.
	CO5	Perform task with due consideration to safety rules, energy saving and waste management methods in automotive industry.

Teaching and Examination Scheme

Teaching Scheme (Contact Hours)			Credits	Examination Marks				
				Theory Marks		Practical Marks		Total Marks
L	T	P	C	SEE	CIA	SEE	CIA	
3	0	2	4	70	30	30	20	150

Legends: ***L****-Lecture;* ***T****–Tutorial/Teacher Guided Theory Practice;* ***P****– Practical,* ***C*** *– Credit,* ***SEE*** *– Semester End Examination,* ***CIA*** *- Continuous Internal Assessment (It consists of Assignments/Seminars/Presentations/MCQ Tests, etc.))*

Course Content

Unit No.	Topics	Teaching Hours	Weightage	Mapping with COs
1	**Introduction to automobile.** Types of automobile in general, Various assemblies, subassemblies and components of an automobile with their main function, Types of materials, fasteners and hardware used in automotive vehicles.	12	25%	CO1 CO2
2	**Roles and responsibilities of automobile engineer.** Job/career opportunities available in auto and auto components sector, Types of job responsibilities and duties requirements in: Auto and Auto components manufacturing plant, Automobile garages, Auto insurance, Auto Finance, Auto Dealership and RTO office Skill requirements as owner of an auto garage / workshop.	10	25%	CO2 CO4
3	**Auto workshop tools, instruments and equipment** Types of hand tools and power tools used in auto garage/ workshop, Types of testing equipment are used in auto garage /workshop, Common measuring tools used in auto garage /workshop.	10	25%	CO3
4	**Sustainable management in Auto Industry** General safe practices concerning driving of vehicles, General energy saving method for driving of vehicles, Sustainability and waste management: Concept of waste management, Methods to handle automobile waste, Disposal of automobile waste Methods for data collection.	10	25%	CO4 CO5

Suggested Distribution of Theory Marks Using Bloom's Taxonomy						
Level	Remembrance	Understanding	Application	Analyse	Evaluate	Create
Weightage	**25**	**30**	**30**	**5**	**5**	**5**

NOTE: This specification table shall be treated as a general guideline for the students and the teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Suggested List of Experiments/Tutorials

Sr. No.	Name of Experiment/Tutorial	Teaching Hours
1	Identify various parts/ components of an automobile engine.	4
2	Identify various parts/ components of an automobile transmission system.	4
3	Identify various parts/ components of an automobile electrical system.	4
4	List various materials used in vehicle with giving (two to three) reasons for using them for particular application.(Make charts of component with material and picture)	4
5	Expert lecture from RTO-inspector/ vehicle surveyor /sales and marketing person of automobile industry to understand role of automobile engineer in field then prepare a note on it.	4
6	List work/ responsibilities of an automobile engineer as an engineer in private transport companies or as a garage owner.	4
7	Demonstrate features and use of various types of common hand & power tools used in automobile garage with safety measures.	4

Major Equipment/ Instruments and Software Required

Sr. No.	Name of Major Equipment/ Instruments and Software
1	Tool kits include Screwdrivers, Wrenches (spanners), Pullers, Surface tables, Hammers, Pliers, Bench vice
2	Hydraulic jack [Head Capacity (Ton)1 Lifting Capacity (min.) (Ton)3 Working Pressure (bar)700-750 Lifting Stroke (mm)117]
3	Vehicle lift [Type of mounting Surface mounted Lift Type2 Post Driver Type Electro-hydraulic Lifting capacity3.5 tonne Lifting height with load (Maximum)1800 millimeter]
4	Lubricating equipment's like oil pan to drain oil, grease gun, grease/lubricant oil pump
5	Piston ring compressor Capacity, mm53-175
6	Piston ring expander Size in mm80-120 Nominal capacity (mm)100-250
7	Measuring tools like Steel Rule, Dial Gauge, Calipers, Thickness gauge, Wire gauge, Micrometer, Vernier, Feeler Gauge
8	Battery load tester
9	Engine Compression Gauge
10	various types of testing instruments and equipment like battery load tester, engine compression gauge, battery hydrometer set, brake tester, Plasti gauge, engine vacuum test gauge, nozzle tester

Suggested Learning Websites

Sr. No.	Name of Website
1	https://www.howacarworks.com
2	https://jameshalderman.com
3	https://swayam.gov.in

Reference Books

Sr. No.	Name of Reference Books
1	Automobile Mechanics By William Crouse (Tata Mc-Graw Hill Publication ISBN-13:978-0-07-063435-0)
2	Automobile engineering By R B Gupta (Satya Prakashan, New Delhi ISBN: 9788176848589, 8176848581)
3	Automobile Engg Vol-3 By Anil Chhikara (Satya Prakasan ISBN: 81-7684-359-8)
4	Vehicle maintenance and garage practice By Jigar A Doshi Dhruv U Panchal Jayesh P Maniar (PHI Learning ASIN : B00LPGBTG2)
5	Sustainable Management of Automobile Waste in developing countries By Forbid George Teke (VDM Verlag ISBN-13 : 978-3639254969)
6	Automobile Engineering By Jain K K Asthana (McGraw Hill Education, New Delhi ISBN: 978-0-07-044529-1)
7	Automotive engine Theory and servicing By James D Haldernan (Pearson Education ISBN-13: 978-0134654003)