

B.E Semester: VII
Automobile Engineering
Subject Name: Two and three wheeler technology (AE701)

Course Objective:

- To present a problem oriented in depth knowledge of two and three wheeler technology.
- To address the underlying concepts and methods behind two and three wheeler technology.

Teaching / Examination Scheme:

SUBJECT		Teaching Scheme				Total Credit	Evaluation Scheme					Total Marks
CODE	NAME	L	T	P	Total		THEORY		IE	CIA	PR. / VIVA	
		Hrs	Hrs	Hrs	Hrs		Hrs	Marks	Marks	Marks	Marks	
AE701	Two and three wheeler technology	3	0	2	5	4	3	70	30	20	30	150

Detailed Syllabus:

Topic no	Details
<u>1</u>	Introduction: Development history of two & three wheeler vehicles. Classification & layouts of two wheelers (motorcycles, scooters, mopeds) and Three wheelers vehicles (by applications – goods/passengers, carriage capacity). Study of technical specification of Two & Three wheelers.
<u>2</u>	Engine technology : Selection criteria and Design considerations for two wheeler & three wheeler engines Systems requirements for Engine lubrication, cooling & starting (Kick starter mechanism, Moped cranking mechanism & Button Start mechanism). Recent developments in engine (2 stroke/4 stroke engines, Fuel used – Gasoline, CNG, Diesel AND high powered engine), Electric Vehicles.
<u>3</u>	Transmission Systems: Clutch – special requirements, different types used in two & three wheelers. Need of primary reduction, selection of transmission - gear box, gear shift mechanism, Chain OR belt drive system for transmission of torque to drive wheels, automatic transmission (Continuously Variable Transmission - CVT, Epicyclic gear train), arrangement of final drive & differential for three wheeler.
<u>4</u>	Steering & Suspension : Steering system arrangement for two & three wheelers, steering column construction, steering geometry, Suspension requirements, design considerations, trailing & leading link, swinging arm, springs & shock absorbers.
<u>5</u>	Brake, Wheels & Tyres: Design consideration of brake, types of brakes – disc, drum and braking mechanism – mechanical, hydraulic & serv. Hand operated or Foot operated barks. Wheel types – spokes construction, alloy wheels, pressed wheel disc or split wheel disc. Types of tyres for two & three

	wheelers.
6	Frame & Body : Types of frame, construction, loads, design consideration, materials, Types of three wheeler bodies, layout, RTO regulations, aerodynamic, aesthetic & ergonomics considerations for body work, side car.
7	Electrical Systems & Instruments: Battery specifications, Charging system, Lighting (front & rear), Ignition key switch, Horn, Side Signaling, Instruments & Indicators.
8	Two & three wheeler Maintenance: Preventive & brake down maintenance, factors affecting fuel economy & emission.

Lesson Planning:

Sr. No.	Date/Week	Unit No.	% Weightage	Topic No
1	1 st , 2 ^{ed} , 3 ^{ed}	Unit 1	20 % .	1,2
2	4 th , 5 th , 6 th	Unit 2	20 %	3
3	7 th , 8 th , 9 th	Unit 3	20 %	4,8
4	10 th , 11 th , 12 th	Unit 4	20 %	5
5	13 th , 14 th , 15 th	Unit 5	20 %	6,7

Instructional Method & Pedagogy:

- At the start of course, the course delivery pattern, prerequisite of the subject will be discussed.
- Lecture may be conducted with the aid of multi-media projector, black board, OHP etc. & equal weightage should be given to all topics while teaching and conduction of all examinations.
- Attendance is compulsory in lectures and laboratory, which may carries five marks in overall evaluation.
- One/Two internal exams may be conducted and total/average/best of the same may be converted to equivalent of 30 marks as a part of internal theory evaluation.
- Assignment based on course content will be given to the student for each unit/topic and will be evaluated at regular interval. It may carry an importance of ten marks in the overall internal evaluation.
- Surprise tests/Quizzes/Seminar/Tutorial may be conducted and having share of five marks in the overall internal evaluation.
- The course includes a laboratory, where students have an opportunity to build an appreciation for the concept being taught in lectures.
- Experiments shall be performed in the laboratory related to course contents.
 - Draw and study about layout of two and three wheeler vehicles.
 - Study of technical specification of two and three wheelers.
 - Two wheeler chain test
 - Two wheeler Brake and Clutch adjustment as per specification.
 - Dismantling and assembling of two wheeler gear box and finding gear ratios
 - Dismantling and assembling of three wheeler box and finding gear ratios
 - Three wheeler brake and clutch play adjustment
 - Dismantling and assembling of three wheeler steering system.

- Study of three wheeler chassis frame and power transmission system.
Practical / Oral: The candidate shall be examined on the basis of term-work.

Students Learning Outcomes

- The student can identify different areas of two and three wheeler technology.
- Can find the applications of all the areas in day to day life.

Recommended Study Materials

Text & Reference Books:

- Newton Steed, "The Motor Vehicle", McGraw Hill Book Co. Ltd., New Delhi
- Siegfried Herrmann, "The Motor Vehicle", Asia Publishing House, Bombay.
- "Two stroke Motor Cycles", Staff & Motor Cycles, London Iife Books.
- G.B.S. Narang, "Automobile Engineering", 5th Edition, Khanna Publishers, Delhi.
- Service Manuals of Manufacturers of Indian Two & Three wheelers.
- Irving. P. E., "Motor Cycle Engineering", Temple Press Book, London – 1992.
- "The Cycle Motor Manual", - Temple Press Limited, London – 1990.
- Raymond Broad Lambretta, "A Practical Guide to maintenance and repair", S.Chand & Co., New Delhi - 1987.

