

B.E Semester: 7 Automobile Engineering
Subject Name: Two and Three Wheeler Technology (AE703-N-E)
[Dept. Elect.-3]

A. 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.

B. Teaching / Examination Scheme:

Teaching Scheme				Total Credit	Evaluation Scheme					
L	T	P	Total		Theory		Mid Sem Exam	CIA	Pract.	Total
Hrs	Hrs	Hrs	Hrs		Hrs	Marks	Marks	Marks	Marks	Marks
3	0	2	5	4	3	70	30	20	30	150

C. Detailed Syllabus:

Unit No.	Details
1	Frame & Body 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. 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.
2	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.
3	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.
4	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.
5	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	Electrical Systems & Maintenance Battery specifications, Charging system, Lighting (front & rear), Ignition key switch, Horn, Side Signaling, Instruments & Indicators. Preventive & brake down maintenance, factors affecting fuel economy & emission.

Total hours (Theory):48
Total hours (Practical):32
Total hours:80

D. Lesson Planning:

Sr. No.	Date/Week	Unit	Weight age	Topic No
1	1 st ,2 nd ,3 rd	Unit 1	15%	1
2	4 th .5 th ,6 th	Unit 2	20%	2
3	7 th , 8 th ,9 th	Unit 3	20%	3
4	10 th . 11 th . 12 th	Unit 4	20%	4
5	13 th , 14 th ,15 th ,16 th	Unit 5	25%	5,6

E. Instructional Method & Pedagogy

1	At the start of course, the course delivery pattern , prerequisite of the subject will be discussed
2	Lecture may be conducted with the aid of multi-media projector, black board, OHP etc. & equal Weight age should be given to all topics while teaching and conduction of all examinations.
3	Attendance is compulsory in lectures and laboratory, which may carries five marks in overall evaluation.
4	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.
5	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.
6	Surprise tests/Quizzes/Seminar/Tutorial may be conducted and having share of five marks in the overall internal evaluation.
7	The course includes a laboratory, where students have an opportunity to build an appreciation for the concept being taught in lectures. Suggested list of experiment is given below

F. List of Practical:

1	Draw and study about layout of two and three wheeler vehicles.
2	Study of technical specification of two and three wheelers.
3	Two wheeler chain test.
4	Two wheeler Brake and Clutch adjustment as per specification.
5	Dismantling and assembling of two wheeler gear box and finding gear ratios.
6	Dismantling and assembling of three wheeler box and finding gear ratios
7	Three wheeler brake and clutch play adjustment.
8	Dismantling and assembling of three wheeler steering system.

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

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

H. Text Books & Reference Books:

1	“Two and Three Wheeler Technology” by Dhruv U. Panchal, PHI
2	Newton Steed, “The Motor Vehicle”, McGraw Hill Book Co. Ltd., New Delhi
3	Siegfried Herrmann, “The Motor Vehicle”, Asia Publishing House, Bombay.
4	“Two stroke Motor Cycles”, Staff & Motor Cycles, London Iife Books.
5	G.B.S. Narang, “Automobile Engineering”, 5th Edition, Khanna Publishers, Delhi.
6	Service Manuals of Manufacturers of Indian Two & Three wheelers.
7	Irving. P. E., “Motor Cycle Engineering”, Temple Press Book, London – 1992.
8	“The Cycle Motor Manual”,- Temple Press Limited, London – 1990.
9	Raymond Broad Lambretta, “A Practical Guide to maintenance and repair”, S.Chand & Co., New Delhi - 1987.