

B.E Semester: 8 Automobile Engineering
Subject Name: Automobile System Design (AE802-N)

A. Course Objective:

- To present a problem oriented in depth knowledge of Automobile System Design.
- To address the underlying concepts and methods behind Automobile System Design.

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
4	0	2	6	5	3	70	30	20	30	150

C. Detailed Syllabus:

Unit No.	Details
1	Clutch Design: Design of single plate clutch, multi plate clutch, design of centrifugal clutch, cone clutch, energy dissipated, torque capacity of clutch,
2	Gearbox Design: Basic consideration in design, determination of speed range, concept of structure diagram, graphical representation of Ray and speed diagram, gearbox layout
3	Vehicle Frame And Suspension Design : Study of loads, moments and stresses on frame members, closed coil helical springs design, leaf spring design and torsion bar springs, standard size of springs.
4	Design Of Front Axle, Rear Axle And Final Drive: Design of propeller shaft, design of front axle, bearing load on front axle, design details of full floating, semi-floating and three quarter floating rear shafts and rear axle housings , design details of final drive gearing,.
5	Steering Systems Design: Steering linkages, fundamental equation for correct steering, steering mechanism (Davis steering and Ackermann steering mechanism), and turning circle radius.
6	Brake Components Design: Energy equation, design of internal expanding brake, design of disk brake, thermal consideration of brake.

Total hours (Theory):64

Total hours (Practical):32

Total hours:96

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 toequivalent 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 overallinternal evaluation.
7	The course includes a laboratory, where students have an opportunity to build an appreciation for theconcept being taught in lectures. Suggested list of experiment is given below

F. List of Practical:

1	Design of cone and semi centrifugal clutch.
2	Design of gear box
3	Design of leaf and coil spring.
4	Design of steering system.
5	Design of propeller shaft and front and rear axle
6	Design of internal expanding and disc brake.

G. Students Learning Outcomes:

1	The student can identify different areas of Vehicle Maintenance & Garage Practice.
2	Can find the applications of all the areas in day to day life.

H. Text Books & Reference Books:

1	Joseph E. Shigley & Larry D. Mitchell, "Mechanical Engineering Design", Fourth Edition, McGraw- Hill International Book Company.
2	"Mechanical system design" by Farazdak haideri.
3	Auto design" by R. B. Gupta.
4	Machine Design by R.S.Khurmi & J.K.Gupta, S.Chand & Co.
5	Design of machine Elements by Bhandari , Tata McGraw-Hill Publishing Company Ltd.
6	Machine Design by Sharma-Agarwal, S.K.Kataria & Sons.
7	Machine Design by Sadhusingh, Khanna Publishers.