M.E Semester: 2 M.E Mechanical (Automobile Engineering)

Subject Name: Automobile chassis and body Engineering MEA203

H. **Course Objective**

- To present a problem oriented in depth knowledge of Automobile chassis and body engineering.
- To address the underlying concepts and methods behind Automobile chassis and body engineering.

I. **Teaching / Examination Scheme**

SUBJECT		Teaching Scheme				Total Credit	Evaluation Scheme					Total Marks
		L	T	P	Total		THEORY		IE	CIA	PR. / VIVO	
CODE	NAME	Hrs	Hrs	Hrs	Hrs		Hrs	Marks	Marks	Marks	Marks	
MEA203	Automobile chassis and body engineering	3	0	2	5	4	3	70	30	20	30	150

J. **Detailed Syllabus**

1. Vehicle Aerodynamics: Objects- vehicle drag and types, various types of forces and moments, effects of forces and moments, various body optimization techniques for minimum drag, principle of wind tunnel technology, flow visualization techniques, tests with scale models.
2. Car Body Details: Types of car bodies, visibility, regulations, driver's visibility, methods of improving visibility, safety design, constructional details of roof, under floor, bonnet, boot, wings etc, Classification of coach work.
3. Design of Vehicle Bodies: Vehicle body materials, Layout of the design, preliminary design, safety, Idealized structure- structural surface, shear panel method, symmetric and asymmetrical vertical loads in car, longitudinal loads.
4. Different loading situations- load distribution on vehicle structure, Calculation of loading cases, stress analysis of bus body structure under bending and torsion, stress analysis in integral bus body.

5. Design of chassis frame: Rules and regulations for body, recent safety measures, testing of body.

K. **Lesson Planning**

SR.NO	DATE/WEEK	UNIT NO	%WEITAGE	TOPIC NO
1	1^{ST} , 2^{ND} , 3^{RD}	1	20	1
2	4^{TH} ,5^{TH} , 6^{TH}	2	20	2
3	7^{TH} ,8^{TH} , 9^{TH}	3	20	3
4	10^{TH} ,11^{TH} , 12^{TH}	4	20	4
5	13^{TH} ,14^{TH} , 15^{TH}	5	20	5

L. **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 weight age 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.
  List of experiments:

  1. Experiments based on Vehicle body aerodynamics.
  2. Experiments based on Bodies optimize techniques.
  3. Experiments based on Car bodies details.
  4. Design of vehicle bodies.
  5. Experiments based on Load distribution on vehicle structure.
  6. Design of chassis frame.
  7. Experiments based on vehicle body materials.
  8. Experiments based on wind tunnel technology

9. Tutorials.

M. **Students Learning Outcomes**

- The student can identify different areas of Automobile chassis and body engineering.
- Can find the applications of all the areas in day to day life.

N. **Recommended Study Materials**

- **Text & Reference Books:**

1. Vehicle Body Engineering – Pawloski J., Business Books Ltd.
2. The Automotive Chassis : Engineering Principles – Reimpell J.
3. Vehicle Body Layout and Analysis – John Fenton, Mechanical Engg. Publications
4. Ltd. London
5. Body Construction and Design – Giles J. G., Illife Books, Butterworth and Co