SATHYABAMA
INSTITUTE OF SCIENCE AND TECHNOLOGY
(DEEMED TO BE UNIVERSITY)
Accredited with "A" Grade by NAAC
Jeppiaar Nagar, Rajiv Gandhi Salai, Chennai - 600 119.
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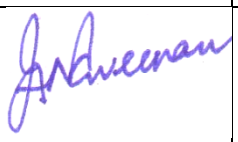
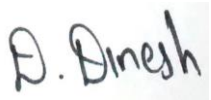
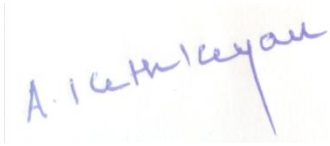
ISO 9001:2015

SCHOOL OF MECHANICAL ENGINEERING

DEPARTMENT OF AUTOMOBILE ENGINEERING

BOARD OF STUDIES MEETING HELD ON 21.12.2020

Memberspresent:

External Members	Signature	Internal Members	Signature
Dr.G.Sathiyaseelan General Manager-Ashok Leyland- External Member		Dr.S.Prakash Dean/School of Mechanical Engineering	
Mr.A.J.Naveenan Lawrence Chief training officer TVS Training and services Ltd Chennai		Dr.V.K.Bupesh Raja, Head/Automobile Engineering	
Er. Dinesh Deenadayalu (Alumni) Procurement Consultant Altron Deutschland S.A.S.& Co.KG, U.K		Dr.A.Karthikeyan Professor/ Automobile Engineering	

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Minutes of the Board of Studies meeting

Board of Studies meeting for the Department of Automobile Engineering held on 21st December 2020 through virtual mode (zoom) with the following agenda:

Inclusion of new contents in the course titled "Vehicle body Engineering" in B.E-Automobile Engineering Curriculum

Welcome Address

Dr.S.Prakash welcomed the members of BoS and placed the agenda for the deliberations of the members. The following decisions were made as per the items of the circulated agenda.

Agenda : Inclusion of new contents in the course titled "Vehicle Body Engineering" in B.E-Automobile Engineering Curriculum

The topics "Quality management system and Failure mode effect analysis" were included in the syllabus of the course "Vehicle body Engineering" as suggested by ISO Auditor.

BoS members accepted the changes and approved the syllabus.

The revised syllabus of the course is enclosed in Annexure-1

Vote of Thanks

Dr.V.K.Bupesh Raja thanked the expert members for accepting the invitation for attending the BoS meeting in a short notice. He thanked them for their valuable suggestions on the agenda items presented. He also thanked Dr.S.Prakash, Dean/Chair and Dr.A.Karthikeyan, Professor for their contribution towards the conduct of this BoS meeting.

Dean/CHAIR

ANNEXURE-1

SAUA1504	VEHICLE BODY ENGINEERING	L	T	P	Credits	TotalMarks
		3	0	0	3	100

COURSE OBJECTIVE

- To develop knowledge in design of vehicle body to give maximum comfort for the passengers
- To develop skills in the areas of car body design, bus body design, active and passive safety.
- To understand different types of bodies and ergonomics of the vehicle

UNIT1 CAR BODY DETAILS **9Hrs.**

Types of car bodies, visibility: regulations, driver's visibility, tests for visibility, methods of improving visibility and space incars safety: safety design, safety equipment for cars, car body construction - front assembly, roof assembly, under floor, bonnet; design criteria, prototype making, initial tests, crash tests on full scale model

UNIT2 VEHICLE AERODYNAMICS **9Hrs.**

Objectives, vehicle drag and its types; various types of forces and moments, effects of forces and moments, side wind effects on forces and moments, various body optimization techniques for minimum drag, wind tunnel testing: flow visualization techniques, scale model testing, component balance to measure forces and moments, aerodynamic study for heavy vehicles, effects of different cabin to trailer body, pressure distribution, effects of a cab to trailer body roof height.

UNIT3 BUSBODY AND COMMERCIAL VEHICLE DETAILS **9Hrs.**

Types: mini bus, single decker, double-decker, two level and articulated bus. Bus body layout; floor height, engine location, entrance and exit location, seating dimensions, constructional details: frame construction, double skin construction, types of metal sections used, regulations, conventional and integral type construction. commercial vehicle: types of body; flatplatform, drop side, fixed side, tipper body, tanker body, light commercial vehicle body types, dimensions of driver's seatrelationtocontrols,driverscabdesign.

UNIT4 INTERIOR ERGONOMICS **9Hrs.**

Introduction, seating dimensions, interior ergonomics, seat comfort, driver seat design, dash board instruments, electronicdisplays, commercial vehicle cabin ergonomics, mechanical package layout, goods vehicle layout. Vehicle stability: Introduction, longitudinal, lateral stability, vehicle on a curvilinear path, critical speed for toppling and skidding, effect of operating factors on lateral stability, steering geometry and stabilization of steerable wheels, mass distribution and engine location on stability.

UNIT5 BODY MATERIALS, TRIM AND MECHANISMS **9Hrs.**

Steel sheet, timber, plastic, glass, GRP, properties of materials; corrosion, anticorrosion methods, selection of paint and painting process, adhesives, insulation, body trim items, body mechanisms.

Max.45Hrs.

COURSE OUTCOMES

On completion of the course, student will be able to

CO1 -Discuss the different types of car body design and its safety features.

CO2 - Select suitable body optimization techniques to minimize drag and able to describe the wind tunnel testing procedure.

CO3 -Classify the various types of bus body construction and able to identify the Body layout.

CO4 -Describe the different types of commercial vehicles and its design.

CO5 -Explain the various types of materials and painting techniques used in

automobiles.
CO6 -Acquire knowledge about the corrosion coating methods

TEXT/REFERENCEBOOKS

1. PowloskiJ, “Vehicle Body Engineering”, Business BooksLtd.,London1989.
2. John Fenton, “Vehicle body layout and analysis”, Mechanical Engg. Publication ltd, London,1982.
3. KohliP.L, “Automotive Chassis & Body”, Papyrus Publishing House, New Delhi, 2010.
4. Wolf-Heinrich Hucho, “Aerodynamics of Road Vehicles” SAE International,USA,1998.
5. Robinson A., LiveseyW.A, “The Repair of Vehicle Bodies”, Butterworth-Heinemann Ltd,1989
6. John Fenton, “Vehicle Body Layout & Analysis”, Hutchinson, London,1998

END SEMESTER EXAMINATION QUESTION PAPER PATTERN

Max.Marks:100 **Exam Duration: 3Hrs.**

PARTA:10 Questions of 2 marks each–No choice **20Marks**

PARTB:2 Questions from each unit with internal choice, each carrying12 marks **80Marks**

SAUA1505	VEHICLE BODY ENGINEERING	L	T	P	Credits	TotalMarks
		3	0	0	3	100

COURSE OBJECTIVE

- To develop knowledge in design of vehicle body to give maximum comfort for the passengers
- To develop skills in the areas of car body design, bus body design, active and passive safety.
- To understand different types of bodies and ergonomics of the vehicle

UNIT1 CAR BODY DETAILS **9Hrs.**

Types of car bodies, visibility: regulations, driver's visibility, tests for visibility, methods of improving visibility and space in cars. safety: safety design, safety equipment for cars, car body construction - front assembly, roof assembly, under floor, bonnet; design criteria, prototype making, initial tests, crash tests on full scale model

UNIT2 VEHICLE AERODYNAMICS **9Hrs.**

Objectives, vehicle drag and its types; various types of forces and moments, effects of forces and moments, side wind effects on forces and moments, various body optimization techniques for minimum drag, wind tunnel testing: flow visualization techniques, scale model testing, component balance to measure forces and moments, aerodynamic study for heavy vehicles, effects of different cabin to trailer body, pressure distribution, effects of a cab to trailer body roof height.

UNIT3 BUS BODY AND COMMERCIAL VEHICLE DETAILS **9Hrs.**

Types: mini bus, single decker, double-decker, two level and articulated bus. Bus body layout; floor height, engine location, entrance and exit location, seating dimensions, constructional details: frame construction, double skin construction, types of metal sections used, regulations, conventional and integral type construction. commercial vehicle: types of body; flat platform, drop side, fixed side, tipper body, tanker body, light commercial vehicle body types, dimensions of driver's seat relation to controls, drivers cab design.

UNIT4 INTERIOR ERGONOMICS **9Hrs.**

Introduction, seating dimensions, interior ergonomics, seat comfort, driver seat design, dash board instruments, electronic displays, commercial vehicle cabin ergonomics, mechanical package layout, goods vehicle layout. Vehicle stability: Introduction, longitudinal, lateral stability, vehicle on a curvilinear path, critical speed for toppling and skidding, effect of operating factors on lateral stability, steering geometry and stabilization of steerable wheels, mass distribution and engine location on stability.

UNIT5 BODY MATERIALS, TRIM AND MECHANISMS **9Hrs.**

Steel sheet, timber, plastic, glass, GRP, properties of materials; corrosion, anti-corrosion methods, selection of paint and painting process, adhesives, insulation, body trim items, body mechanisms. IATF 16949:2016 - Quality management system for organizations in the automotive industry, Core tools including FMEA (Failure mode and effects analysis)

Max.45Hrs.

COURSE OUTCOMES

On completion of the course, student will be able to

CO1 -Discuss the different types of car body design and its safety features.

CO2 - Select suitable body optimization techniques to minimize drag and able

to describe the wind tunnel testing procedure.
CO3 -Classify the various types of bus body construction and able to identify the Body layout.
CO4 -Describe the different types of commercial vehicles and its design.
CO5 -Explain the various types of materials and painting techniques used in automobiles.
CO6 -Acquire knowledge about the corrosion coating methods

TEXT/REFERENCEBOOKS

1. PowloskiJ, "Vehicle Body Engineering", Business BooksLtd.,London1989.
2. John Fenton, "Vehicle body layout and analysis", Mechanical Engg. Publication ltd, London,1982.
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4. Wolf-Heinrich Hucho, "Aerodynamics of Road Vehicles" SAE International,USA,1998.
5. Robinson A., LiveseyW.A, "The Repair of Vehicle Bodies", Butterworth-Heinemann Ltd,1989
6. John Fenton, "Vehicle Body Layout & Analysis", Hutchinson, London,1998
7. AIAG & VDA FMEA Handbook, Edition 1, 2019

END SEMESTER EXAMINATION QUESTION PAPER PATTERN

Max.Marks:100 **Exam Duration: 3Hrs.**

PARTA:10 Questions of 2 marks each–No choice **20Marks**

PARTB:2 Questions from each unit with internal choice, each carrying12 marks **80Marks**