



## SRI VENKATESWARA COLLEGE OF ENGINEERING

## COURSE DELIVERY PLAN - THEORY

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Department of Automobile Engineering		
<b>B.E/B.Tech/M.E/M.Tech:</b> CHE, CSE, CVE ECE, EEE & INT	Regulation: 2018A	<b>LP: OE18106</b>
<b>PG Specialisation</b> : NA		<b>Rev. No: 00</b>
<b>Sub. Code / Sub. Name</b> : OE18106 / FUNDAMENTALS OF AUTOMOTIVE SAFETY AND MAINTENANCE		<b>Date: 27.12.2023</b>
<b>Unit</b> : I		

**Unit Syllabus: UNIT I - INTRODUCTION**

Legislative Safety Requirements, ISO26262 Safety Requirements, ASIL standards, active safety, classification of active safety, passive safety, driving safety, classification of passive safety, deformation behavior of vehicle body, speed and acceleration characteristics of passenger compartment on impact.

**Objective:** In the end, the students will gain knowledge on vehicle Legislative Safety Requirements standards followed worldwide.

Session No *	Topics to be covered	Ref	Teaching Aids
1	Introduction to Automotive Safety systems.	8, Ch. 2.6, Pg. 45-45	PPT, Online
2	Legislative Safety Requirements	<a href="https://morth.nic.in/">https://morth.nic.in/</a>	PPT, Online
3	ISO26262 Safety Requirements	<a href="https://en.wikipedia.org/">https://en.wikipedia.org/</a>	PPT, Online
4	ASIL standards	<a href="https://en.wikipedia.org/">https://en.wikipedia.org/</a>	PPT, Online
5	active safety, classification of active safety	8, Ch. 2.6, Pg. 45-45	PPT, Online
6	passive safety, driving safety,	8, Ch. 2.6, Pg. 46-46	PPT, Online
7	classification of passive safety	8, Ch. 2.6, Pg. 47-51	PPT, Online
8	deformation behavior of vehicle body	8, Ch. 3.4, Pg. 76-100	PPT, Online
9	speed and acceleration characteristics of passenger compartment on impact	8, Ch. 3.4, Pg. 102-108	PPT, Online
<b>Content beyond syllabus covered (if any):</b> <ul style="list-style-type: none"><li>Automotive Chassis Components</li></ul>			

\* Session duration: 50 minutes



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Unit : II

**Unit Syllabus: UNIT II - ACTIVE SAFETY SYSTEMS**

Active Safety Systems, antilock braking systems, electronic stability program, traction control systems, emergency warning braking, adaptive cruise control, sensoron brake control, brake by wire.

**Objective:** The students will be able to identify the various Active safety systems used in the vehicle.

Session No *	Topics to be covered	Ref	Teaching Aids
10	Introduction to Active Safety Systems	6, Pg. 4 - 5	PPT, Online
11	antilock braking systems	6, Pg. 28 - 36	PPT, Online
12	electronic stability program	6, Pg. 52 - 62	PPT, Online
13	traction control systems	6, Pg. 44 - 48	PPT, Online
14	emergency warning braking	1, Pg. 837 - 841	PPT, Online
15	Cruise control systems	5, Ch. 14, Pg. 332-340	PPT, Online
16	adaptive cruise control	1, Pg. 1214-1217	PPT, Online
17	sensoron brake control	1, Pg. 780 - 782	PPT, Online
18	Brake by wire	<a href="https://en.wikipedia.org/">https://en.wikipedia.org/</a>	PPT, Online
<b>Content beyond syllabus covered (if any):</b> <ul style="list-style-type: none"><li>• Lane Keep Assist Systems</li><li>• Lane Departure Warning Systems</li></ul>			

\* Session duration: 50 mins



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Unit : III

**Unit Syllabus: UNIT III - PASSIVE SAFETY SYSTEMS**

Passive safety system and components, sensors, controllers, actuators, seat belt, regulations for seat belt, automatic seat belt tightener system, collapsible steering column, tiltable steering wheel, air bags, electronic system for activating air bags, bumper design for safety.

**Objective:** The students will understand the basic working of various passive safety systems in the vehicle.

Session No *	Topics to be covered	Ref	Teaching Aids
19	Introduction to Passive safety system	6, Pg. 5 - 5	PPT, Online
20	Passive safety system and components	1, Pg. 928	PPT, Online
21	sensors, controllers, actuators, seat belt	1, Pg. 928 - 930	PPT, Online
22	regulations for seat belt	1, Pg. 928 - 930	PPT, Online
23	automatic seat belt tightener system	1, Pg. 928 - 930	PPT, Online
24	collapsible steering column	1, Pg. 5 - 5	PPT, Online
25	tiltable steering wheel	1, Pg. 5 - 5	PPT, Online
26	air bags, electronic system for activating air bags,	1, Pg. 931 - 934	PPT, Online
27	bumper design for safety	8, Pg. 76 - 100	PPT, Online

**Content beyond syllabus covered (if any):**

\* Session duration: 50 mins



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Unit : IV

**Unit Syllabus: UNIT IV - WORKSHOP AND ENGINE SUBSYSTEM MAINTENANCE**

Maintenance – need, importance, primary and secondary functions, policies, automotive service procedures – workshop operations, Personnel safety, basic tools, general engine service, clutch- general checks, adjustment and service, fault diagnosis, inspection.

**Objective:** In the end, the students will have good exposure in the basic workshop and engine maintenance.

Session No *	Topics to be covered	Ref	Teaching Aids
28	Maintenance – need, importance	2, Ch.2; Pg.27-27	PPT, Online
29	primary and secondary functions of maintenance	2, Ch.2; Pg.28-30	PPT, Online
30	Maintenance - policies	2, Ch.8, Pg. 274-274	PPT, Online
31	automotive service procedures	8, Ch. 1, Pg. 71-75	PPT, Online
32	workshop operations,	8, Ch. 1, Pg. 76-78	PPT, Online
33	Personnel safety , basic tools	8, Ch. 1, Pg. 18-33	PPT, Online
34	general engine service	2, Ch. 8, Pg. 304-308	PPT, Online
35	Clutch- general checks, adjustment and service	2, Ch. 8, Pg. 304-305	PPT, Online
36	Clutch - fault diagnosis	2, Ch. 8, Pg. 305-306	PPT, Online
37	Clutch - inspection	2, Ch. 8, Pg. 306-308	PPT, Online

**Content beyond syllabus covered (if any):**

\* Session duration: 50 mins



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**Unit : V**

**Unit Syllabus: UNIT V - AUTOMOTIVE BRAKE AND ELECTRICAL MAINTENANCE**

Maintenance and service of hydraulic brake, drum brake, disc brake, parking brake, bleeding of brakes, maintenance of batteries, starting system, charging system and body electrical, fault diagnosis using scan tools.

**Objective:** To know the various maintenance methods followed for electrical and braking system of a vehicle.

Session No *	Topics to be covered	Ref	Teaching Aids
38	Maintenance and service of hydraulic brake	2, Ch. 3, Pg. 35-44	PPT, Online
49	Maintenance and service of drum brake	2, Ch. 4, Pg. 63-104	PPT, Online
40	Maintenance and service of disc brake	2, Ch. 3, Pg. 47-54	PPT, Online
41	Maintenance and service of parking brake	2, Ch. 3, Pg. 446-450	PPT, Online
42	Bleeding of brakes	2, Ch. 3, Pg. 123-124	PPT, Online
43	Maintenance of batteries	2, Ch. 3, Pg. 125-129	PPT, Online
44	starting system, charging system and body electrical	2 Ch. 3, Pg. 108-111	PPT, Online
45	Fault diagnosis using scan tools.	1, Pg. 520 - 533	PPT, Online

**Content beyond syllabus covered (if any):**



\* Session duration: 50 mins



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**REFERENCES:**

1. Bosch, "Automotive Handbook", 8th Edition, SAE publication, 2018.
2. Bosch, "Automotive Handbook", 6th Edition, SAE publication, 2004
3. Ed May, "Automotive Mechanics Volume One and Two", Mc Graw Hill Publications, 2003
4. Bosch, "Safety, Comfort and Convenience Systems", John Wiley, 2011.
5. Ronald. K. Jurgen, "Automotive Electronics Handbook", McGraw-Hill Inc., 1999.
6. Robert Bosch, "Driving Stability Systems", The Bosch Yellow Jackets, Edition 2005.
7. Tom Denton, "Automotive Technology: Vehicle Maintenance and Repair", First Edition, Butterworth-Heinemann is an imprint of Elsevier, 2011.
8. Dieter Anselm, "The Passenger Car Body – Design, Deformation Characteristics, Accident Repair", SAE International publication, 2000
9. Tom Denton, "Advanced Automotive Fault Diagnostics", Fourth Edition, Routledge Publisher, 2016.

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Date	27.12.2023	27.12.2023
Remarks *:		
Remarks *:		

\* If the same lesson plan is followed in the subsequent semester/year it should be mentioned and signed by the Faculty and the HOD