



Department of Automobile Engineering		LP: <b>AE18021</b> Rev. No: <b>00</b> Date: <b>19.07.2021</b>
B.E/B.Tech/M.E/M.Tech	: <b>Automobile Engineering</b> Regulation: <b>2018</b>	
PG Specialisation	: <b>NA</b>	
Sub. Code / Sub. Name	: <b>AE18021 (E) TWO AND THREE WHEELER TECHNOLOGY</b>	
Unit	: <b>I</b>	

**Unit Syllabus:****THE POWER UNIT****09**

Two stroke and four stroke Spark Ignition & Compression Ignition engine - Construction, working, merits and demerits, Symmetrical and unsymmetrical valve and port timing diagrams, scavenging process, electric motor power train.

**Objective:** The aim of this course is to make the students to know and understand the constructional details of two and three wheelers

Session No *	Topics to be covered	Ref	Teaching Aids
1	Introduction to the subject and the course content	-	PPT & BB
2	Basic Engine nomenclature	1, Ch.2, Pg. 24 - 30	PPT & BB
3	Various components of I.C engine and its materials	1, Ch.2, Pg. 24 - 30	PPT & BB
4	Construction, working, merits and demerits of four stroke Spark Ignition engine and four stroke Compression Ignition engine	1, Ch.2, Pg. 30 - 38	PPT & BB
5	Construction, working, merits and demerits of two stroke Spark Ignition engine and two stroke Compression Ignition engine	1, Ch.2, Pg. 30 - 38	PPT & BB
6	Reed valves and rotor disc for two stroke engines	1, Ch.2, Pg. 30 - 38	PPT & BB
7	Valve timing and port timing diagram for four stroke Spark Ignition engine and two stroke Compression Ignition engine	1, Ch.2, Pg. 30 - 38	PPT & BB
8	Various types of scavenging process and various types of scavenging pumps	1, Ch.6, Pg. 119 - 127	PPT & BB
9	Construction and working of Electric motor power-train	1, Ch.17, Pg. 334 - 354	PPT & BB
<b>Content beyond syllabus covered (if any):</b>			

\* Session duration: 50 minutes



Sub. Code / Sub. Name: **AE18021 (E) TWO AND THREE WHEELER TECHNOLOGY**

Unit : **II**

**Unit Syllabus:**

**FUEL AND IGNITION SYSTEMS**

**09**

Fuel system – different circuits in two wheeler fuel systems, fuel injection system, Lubrication system, Ignition systems - Magneto coil and battery coil spark ignition system, electronic ignition System, Starting system - Kick starter system, Self starter system, liquid cooled engines, Oil cooled engines.

**Objective:** To impart the operating characteristics of two and three wheelers

Session No *	Topics to be covered	Ref	Teaching Aids
10	Fuel system – different circuits in two wheeler fuel systems	1, Ch.3, Pg. 61- 64	PPT & BB
11	Various components of fuel supply system for two wheelers	1, Ch.3, Pg. 66 - 70	PPT & BB
12	Fuel injection system	1, Ch.3, Pg. 66 - 70	PPT & BB
13	Lubrication system, Various types of lubrication systems	1, Ch.4, Pg. 83 - 94	PPT & BB
14	Ignition systems - Magneto coil and battery coil spark ignition system	1, Ch.14, Pg. 301 - 307	PPT & BB
15	Electronic ignition systems	1, Ch.14, Pg. 301 - 307	PPT & BB
16	Starting system - Kick starter system, Self starter system	1, Ch.8, Pg. 129 -143	PPT & BB
17	Liquid cooled engines	1, Ch.5, Pg. 95 - 103	PPT & BB
18	Oil cooled engines, overview about Unit II	1, Ch.5, Pg. 95 - 103	PPT & BB

**Content beyond syllabus covered (if any):** Flow of viscous fluid between two parallel plates, Problems on Boundary layer

\* Session duration: 50 mins



Sub. Code / Sub. Name: **AE18021 (E) TWO AND THREE WHEELER TECHNOLOGY**

Unit : **III**

**Unit Syllabus:**

**CHASSIS AND SUB-SYSTEMS**

**09**

Main frame for two and three wheelers - its types, Chassis components, different drive systems for two wheelers, single, multiple plates and centrifugal clutches, Gear box and its various gear controls in two wheelers, front and rear suspension systems, shock absorber, panel meters and controls on handle bar, Freewheeling devices.

**Objective:** To educate design aspects of two and three wheeler.

Session No *	Topics to be covered	Ref	Teaching Aids
19	Introduction to Chassis and Sub-systems of two and three wheelers	5, Ch.1, Pg. 32 - 36	PPT & BB
20	Main frame for two and three wheelers - its types, Chassis components	1, Ch.13, Pg. 262 - 286	PPT & BB
21	Different drive systems for two wheelers	1, Ch.9, Pg. 180 - 183	PPT & BB
22	Single, multiple plates and centrifugal clutches	1, Ch.9, Pg. 152 - 163	PPT & BB
23	Gear box and its various gear controls in two wheelers	1, Ch.9, Pg. 164 - 166	PPT & BB
24	Gear shifting mechanism for two wheelers	1, Ch.9, Pg. 167 - 175	PPT & BB
25	Types of suspension systems , front and rear suspension systems	1, Ch.10, Pg. 199 - 221	PPT & BB
26	Construction and working of shock absorber	1, Ch.10, Pg. 213	PPT & BB
27	Various Panel meters and controls on handle bars and freewheeling devices	1, Ch.14, Pg. 316 - 322	PPT & BB

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

\* Session duration: 50 mins



Sub. Code / Sub. Name: **AE18021 (E) TWO AND THREE WHEELER TECHNOLOGY**

Unit : **IV**

**Unit Syllabus:**

**BRAKES AND WHEELS**

**09**

Drum brakes and Disc brakes - construction, working and its types, front and rear brake links layouts, brake actuation mechanism, Combined Brake System in two wheelers, Antilock Brake System for two wheelers, Wheels, wheels types - spoke, cast, disc, its merits and demerits, tyre and tubes construction and its types, Steering geometry.

**Objective:** To impart knowledge on various components and systems in two and three wheelers.

Session No *	Topics to be covered	Ref	Teaching Aids
28	Introduction to Braking systems and Wheels	5, Ch.1, Pg. 35 - 36	PPT & BB
29	Construction and working of mechanical brake links for two wheelers and brake actuating mechanism	1, Ch.11, Pg. 226 - 241	PPT & BB
30	Construction and working of Drum brakes	1, Ch.11, Pg. 230 - 231	PPT & BB
31	Construction and working of disc brakes	1, Ch.11, Pg. 232 - 234	PPT & BB
32	Combined Brake System in two wheelers	5, Ch.15, Pg. 343 - 345	PPT & BB
33	Antilock Brake System for two wheelers	1, Ch.11, Pg. 226 - 241	PPT & BB
34	Construction, working, merits and demerits of various types of Wheels	1, Ch.12, Pg. 250 - 253	PPT & BB
35	Construction and working of various types of Tyres and Tubes	1, Ch.12, Pg. 254 - 260	PPT & BB
36	Steering geometry for two wheelers and review about Unit - IV	1, Ch.10, Pg. 186 -196	PPT & BB

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

\* Session duration: 50 mins



Sub. Code / Sub. Name: **AE18021 (E) TWO AND THREE WHEELER TECHNOLOGY**

Unit : **V**

**Unit Syllabus:**

**TWO & THREE WHEELERS – CASE STUDY**

**09**

Case study of Sports bike, Motor cycles, Scooters and Mopeds, Auto rickshaws, Pick up van, Delivery van and Trailer, Servicing and maintenance, recent developments, Indian Emission Regulation for Two and Three Wheelers.

**Objective:** To impart knowledge on vehicle servicing and maintenance.

Session No *	Topics to be covered	Ref	Teaching Aids
37	Case study of various Sports bike and motor cycles	1, Ch.16, Pg. 340 - 343	PPT & BB
38	Case study of various Scooters and mopeds	1, Ch.1, Pg. 1 - 23	PPT & BB
39	Classification and Layout of Auto rickshaws, Pick up van	1, Ch.18, Pg. 355 - 358	PPT & BB
40	Classification and Layout of Delivery van and Trailer	1, Ch.18, Pg. 360 - 361	PPT & BB
41	Servicing and maintenance	1, Ch.18, Pg. 361 - 365	PPT & BB
42	Suspension and Braking system of Three Wheelers	1, Ch.18, Pg. 367 - 372	PPT & BB
43	Recent developments in Three Wheelers	2, Ch.34, Pg. 268 - 273	PPT & BB
44	Indian Emission Regulation for Two and Three Wheelers	2, Ch.34, Pg. 268 - 27	PPT & BB
45	Review on Unit - V and on entire syllabus covered	-	PPT & BB

**Content beyond syllabus covered (if any):** Rules on Two and Three wheelers by Government of India in 2023 and 2025

\* Session duration: 50 mins



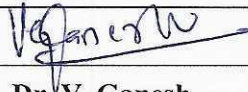
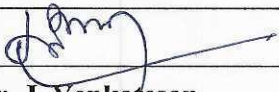


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**TEXTBOOKS:**

1. Dhruv U. Panchal, "Two and Three Wheeler Technology", PHI Learning Pvt. Ltd., 2015.
2. Irving, P.E., "Motor Cycle Engineering", Temple Press Book, London, 1992.

**REFERENCES:**

1. Elvis Payne, "The A-Z of Three-wheelers", Crecy Publishing, 2014.
2. Indian Emission Regulation Booklet by ARAI.
3. Joseph W. Connolly, "Understanding the Magic of the Bicycle: Basic Scientific Explanations of the Two-Wheeler's fascinating Behavior", Morgan & Claypool Publishers, 2016
4. Marshall Cavendish, "Encyclopedia of Motor Cycling", 20 volumes, New York and London, 1989.
5. Ramalingam K. K., "Two Wheelers", Scitech publications, Chennai, 2009.

	Prepared by	Approved by
Signature		
Name	<b>Dr. V. Ganesh</b>	<b>Dr. J. Venkatesan</b>
Designation	Associate Professor	Professor & Head
Date	19.07.2021	19.07.2021
Remarks* :	The same lesson plan shall be followed for the  AY 2022-23	
Remarks* :	The same lesson plan can be followed for the academic year 2023-24 	
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