SRI VENKATESWARA COLLEGE OF ENGINEERING

COURSE DELIVERY PLAN - THEORY 

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

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

* Session duration: 50 minutes

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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

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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

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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

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

**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 | **Dr. V. Ganesh** | **Dr. J. Venkatesan** |
| Designation | Associate Professor | Professor & Head |
| Date | 19.07.2021 | 19.07.2021 |
| Remarks* : | The same lesson plan shall be followed for the A.Y 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