**COURSE FILE**

**AUTOMOBILE SYSTEM (2033401)**

DIPLOMA 4TH SEM.

PRO. MUKESH KUMAR

**DEPARTMENT OF AUTOMOBILE ENGINEERING**

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**GOVERNMENT POLYTECHNIC CHAPRA**

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**Time table**

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| --- | --- | --- | --- | --- | --- | --- | --- |
|  | 1st10:00-11:00 | 2nd1:00-12:00 | 3rd12:00-1:00 |  | 4th2:00-3:00 | 5th3:00-4:00 | 6th4:00-5:00 |
| MON |  |  |  | LUNCH |  |  |  |
| TUE |  |  |  |  |  |  |
| WED |  |  |  |  |  |  |
| THU |  |  |  |  |  |  |
| FRI |  |  |  |  |  |  |
| SAT |  |  |  |  |  |  |

Department of Automobile Engineering

**Vision**

To be a centre of excellence in the field of Mechanical Engineering offering value based world class education and research producing well qualified engineers, who can contribute favorably to the technological and socio-economic development of the nation.

**Mission**

1. To ensure sufficient modern technological exposure to the students in order to create skilled professionals.

2. To frequently update the labs keeping in view the requirement of the current industry scenario.

3. To extend counseling and career guidance facility to the students to help them to achieve their goal.

4. To encourage faculties and staffs to pursue higher education and to do the research work.

5. To encourage faculties and staffs to participate in various seminars, conferences and workshops to keep themselves updated of the state-of-the-art technology.

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Text/ Reference Books:

1. Motor Automotive Technology --Anthony Schwaller --Delmar Publisher Inc.

 2. Automotive Service --Tim Gills --Delmar Publisher Inc.

 3. Automobile Engineering Vol. II --Anil Chikara --Satya Prakashan New Delhi

 4. Automobile Mechanics --Crouse / Anglin. --TATA McGRAW – HILL

 5. Automobile Engineering --Vol.I Kirpal Singh --Standard Publication

 6. Automobile Engineering --R.B. Gupta --Satya Prakashan New Delhi

7. Automotive Mechanics --S. Srinivisan --TATA McGRAW – HILL

 8. ASHRAE HANDBOOK OF HVAC—ASHRAE

9. Automobile Air Conditioning --Boyce H. Dwiggins --THOMSON LEARNING

10. Automotive technology: A system Approach --Jack Erjavec

11. Automobile Electrical and Electronic systems --Tom Denton

Lecture plan

|  |  |  |
| --- | --- | --- |
| **Unit** | **Name of Topic** | **No. of Lecture** |
| **01** | Types of front axle – Dead axle, live axle,  | **Lec-1** |
| type of stub axle arrangements Elliot | **Lec-2** |
| , reverse Elliot, lamoine, reverse lamoine | **Lec-3** |
| Front wheel assembly. | **Lec-4** |
| Steering geometry – Caster, camber, king pin inclination,  | **Lec-5** |
| toe in– toe out, Correct Steering angle | **Lec-6** |
|  Under steering and over steering, Turning radius & its effect | **Lec-7** |
|  Construction, working & application of Steering gear box – rack and pinion type | **Lec-8** |
| , recirculating ball type, worm & roller type.  | **Lec-9** |
| Steering linkages & steering column.  | **Lec-10** |
| Ackerman Principle & linkage | **Lec-11** |
| . Power assisted steering & its types (Hydraulic & electrical) | **Lec-12** |
| **Class test-01** |  |

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| **Unit** | **Name of Topic** | **No. of Lecture** |
| **02** | Function and necessity | **Lec-13** |
|  Classification of brakes  | **Lec-14** |
|  braking systems.. | **Lec-15** |
| Principle, construction and working of –disc brakes,  | **Lec-16** |
| drum brake  | **Lec-17** |
| Construction and working of the following–Mechanical braking system | **Lec-18** |
|  Hydraulic Braking system | **Lec-19** |
| , Air braking system, Hydraulic operated air assisted braking system.  | **Lec-20** |
| Properties of brake fluids  | **Lec-21** |
| of brake fluids SPECIFICATION | **Lec-22** |
| Concept and working of antilock braking system.  | **Lec-23** |
|  Parking brake | **Lec-24** |
| **Class test-02** |  |

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| **Unit** | **Name of Topic** | **No. of Lecture** |
| **03** | Types of suspension systems – Rigid & independent suspension  | **Lec-25** |
|  Types of Independent suspension system-McPherson strut, wishbone type.  | **Lec-26** |
| Semi-elliptical Leaf spring,  | **Lec-27** |
| coil spring, torsion bar arrangement  | **Lec-28** |
|  Telescopic shock absorber, Gas filled shock absorber,  | **Lec-29** |
| hydraulic shock absorber  | **Lec-30** |
| Air Suspension System | **Lec-31** |
| Anti-roll bar, stabilizer bar | **Lec-32** |
| **Class test-03** |  |

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| **Unit** | **Name of Topic** | **No. of Lecture** |
| **04** | Effect of stream lining on vehicle performance | **Lec-33** |
| Materials used in body construction and  | **Lec-34** |
| types of bodies.  | **Lec-35** |
| Protective and anti-corrosive treatments, painting procedure.  | **Lec-36** |
|  Safety devices –air bags, exhaust brake,  | **Lec-37** |
| emergency brake, Central locking, collapsible steering. | **Lec-38** |
| **Class test-04** |  |

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| **Unit** | **Name of Topic** | **No. of Lecture** |
| **05** | Basic principle- vapour compression cycle,  | **Lec-39** |
| layout and operation of HVAC | **Lec-40** |
| Types of refrigerant used in car air conditioning  | **Lec-41** |
| Cae AC Properties.  | **Lec-42** |
| Human comfort conditions | **Lec-43** |
|  Temperature control system, humidity control | **Lec-44** |
| **Class test-05** |  |

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| **Unit** | **Name of Topic** | **No. of Lecture** |
| **06** | R.P Resistance faced by the vehicle-  | **Lec-45** |
| Air resistance, rolling Resistance, gradient resistance.  | **Lec-46** |
| Define traction, tractive efforts,  | **Lec-47** |
| draw bar pull, gradeability an Acceleration  | **Lec-48** |
| , pitching, Bouncing, Rolling, Sway and yaw | **Lec-49** |
| .Stability of vehicle on turn and slopes | **Lec-50** |
| **Class test-06** |  |

**Students list**

|  |  |
| --- | --- |
| **Roll Number** | **Name Of the Student** |
| 311131220001 | PANKAJ KUMAR |
| 311131220002 | TUSHAR |
| 311131220003 | DHIRAJ KUMAR |
| 311131220004 | SHASHIKANT KUMAR |
| 311131220005 | MANISH KUMAR CHAURASIYA |
| 311131220006 | DHRUV KUMAR |
| 311131220007 | ABHISHEK KUMAR SINGH |
| 311131220008 | ANKIT KUMAR |
| 311131220009 | RUPESH KUMAR TIWARI |
| 311131220010 | THAKUR ANISH ADARSH |
| 311131220011 | PAWAN KUMAR |
| 311131220012 | MUKESH KUMAR SAH |
| 311131220014 | ABHIJIEET KUMAR |
| 311131220015 | ARJUN KUMAR RAM |
| 311131220016 | VISHAL KUMAR |
| 311131220019 | SANTOSH KUMAR |
| 311131220020 | ANKESH KUMAR |
| 311131220021 | RAHUL RAY |
| 311131220022 | SONI KUMARI |
| 311131220023 | MUNNA KUMAR SHARMA |
| 311131220024 | ADITYA KUMAR |
| 311131220025 | AKSHAY KUMAR NIRALA |
| 311131220026 | AMIT KUMAR RAM |
| 311131220027 | SUMIT SAURABH |
| 311131220028 | ABHISHEK KUMAR RAM |
| 311131220029 | ANISH KUMAR |
| 311131220030 | MD ALHARISH |
| 311131220031 | SAURABH ANAND |
| 311131220032 | ADARSH BHARDWAJ |
| 311131220033 | VIVEK SAURAV |
| 311131220034 | DEEPAK KUMAR |
| 311131220035 | KAUSHAL KUMAR |
| 311131220036 | UTKARSH KUMAR |
| 311131220037 | AMAR KUMAR |
| 311131220038 | AYUSH RAJ |
| 311131220039 | AYUSH KUMAR |
| 311131220040 | AMAN KUMAR DEV |
| 311131220041 | KRISHNA PANDIT |
| 311131220042 | SHIVAM KUMAR |
| 311131220043 | RAVI KUMAR SAH |
| 311131220044 | SAURABH KUMAR |
| 311131220045 | VISHWAJEET KUMAR |
| 311131220046 | RAJEEV KUMAR CHAUHAN |
| 311131220047 | SHIPRA BHARTI |
| 311131220048 | ADITYA KUMAR |
| **401/A/21** | **SUBHAM KUMAR SINGH** |
| **402/A/21** | **ARUN KUMAR** |
| **403/A/21** | **AVINASH KUMAR** |
| **601/A/21** | **AMARJEET KUMAR** |
| **602/A/21** | **NIHAL KUMAR** |
| **603/A/21** | **SHAHNAWAZ ALAM** |
| **604/A/21** | **MUSKAAN KUMARI** |
| **605/A/21** | **ANUP KUMAR** |
| **606/A/21** | **AARIF PRAWEJ** |
| **607/A/21** | **BISHWASH SINGH** |
| **608/A/21** | **ABHISHEK KUMAR SINGH** |
| **609/A/21** | **SHIVAM KUMAR** |
| **610/A/21** | **ANURAG PRASAD** |
| **611/A/21** | **LALAN KUMAR YADAV** |