## **LESSON PLAN**

## DEPARTMENT OF MECHATRONICS ENGINEERING, ITT, CHOUDWAR

SUBJECT: Vetronics Periods: 4 per week SEMESTER: 5th

NAME OF FACULTY: LEEZA MISHRA ACADEMIC YEAR.2021-2022

**Semester From date:** 15/09/2022 **To Date:** 22/12/2022 **No. of weeks:** 15

| Week            | Class Day                          | Theory / Practical Topics   |
|-----------------|------------------------------------|---|
| 1st             | 1 <sup>st</sup>                    | Discuss about automobile industry and advance Future Trends in                      |
|                 |                                    | Automobile Techniques.  |
|                 | 2 <sup>nd</sup>                    | Discuss about The engine and its components engine block, cylinder, crank           |
|                 |                                    | shaft, piston ,cam shaft, valves , intake system, ignition, exhaust                 |
|                 | 3 <sup>rd</sup>                    | Discuss about cooling system, Lubrication System- fuel feed system ignition         |
|                 |                                    | system-spark plug-high voltage circuit and distribution                             |
|                 | 4 <sup>th</sup>                    | Discuss about compression ignition system-steering system, Ackerman                 |
|                 |                                    | steering mechanism, suspension system, fuel injection and ignition system,          |
| 2 <sup>nd</sup> | 1 <sup>st</sup>                    | Discuss about fuel injection types throltle body versus port injection              |
|                 | 2 <sup>nd</sup>                    | Discuss about fuel injector different types High pressure diesel fuel injection     |
|                 | 3 <sup>rd</sup>                    | Discuss about introduction to Electronic ignition system                            |
|                 | 4 <sup>th</sup>                    | Discuss about Principle of lead acid cells, plates and their characteristics        |
| 3 <sup>rd</sup> | 1 <sup>st</sup>                    | Discuss about lead acid cells construction, electrolyte, effect of                  |
| 5               |                                    | temperature on electrolytes , specific gravity, capacity and efficiency             |
|                 | 2 <sup>nd</sup>                    | Discuss about methods of charging from D.C. mains, defects and remedies             |
|                 | 2                                  | of batteries  |
|                 | 3 <sup>rd</sup>                    |   |
|                 | 3                                  | Discuss about care of idle and new batteries, Recycling process recent              |
|                 | 4 <sup>th</sup>                    | developments  Discuss shout D.C. Conserters. Alternature and their characteristics. |
|                 | 4                                  | Discuss about D.C. Generators, Alternators and their characteristics                |
| 4 <sup>th</sup> | 1 <sup>st</sup>                    | Control, cutout   |
| 4               | 1                                  | Discuss about Electrical, Electro-mechanical and electronics regulators,            |
|                 | 2 <sup>nd</sup>                    | procedure for charging  |
|                 | 2                                  | Discuss about details of head light and side light, LED lighting system, head       |
|                 | 3 <sup>rd</sup>                    | light dazzling and preventive methods ,   |
|                 | _                                  | Discuss about static and Dynamic Bending lights                                     |
| ~th             | 4 <sup>th</sup>                    | Introduction to sensors ,transducers and its types                                  |
| 5 <sup>th</sup> | 1 <sup>st</sup>                    | Discuss about Air flow rate sensor, Engine crankshaft angular position              |
|                 | 2 <sup>nd</sup>                    | sensor  |
|                 | 2                                  | Discuss about engine speed sensor, Timing sensor, Throttle angle sensor,            |
|                 | 3 <sup>rd</sup>                    | Discuss about Pressure sensor, Temperature sensors, Pressure sensor-Flow            |
|                 | th                                 | sensor  |
|                 | 4 <sup>th</sup>                    | Discuss about Exhaust gas oxygen sensors, Knock sensor, Engine torque               |
| 6 <sup>th</sup> | 1 St                               | sensors,  |
| 6               | 1 <sup>st</sup>                    | Discuss about Automotive engine control actuators,                                  |
|                 | 2 <sup>nd</sup>                    | Discuss about Exhaust gas recirculation actuator                                    |
|                 | 3 <sup>rd</sup>                    | Discuss about Electronics engine management system                                  |
| <b>7</b> th     | 4 <sup>th</sup>                    | Discuss about Brake actuation warning system, flash system                          |
| $7^{\text{th}}$ | 1 <sup>st</sup><br>2 <sup>nd</sup> | Discuss about Oil pressure warning system   |
|                 | 3 <sup>rd</sup>                    | Discuss about engine over heat warning system                                       |
|                 | 3."                                | Discuss about air pressure warning system speed warning system                      |

|                  | 4 <sup>th</sup> | Discuss about door lock indicators, neutral gear indicator                |
|------------------|-----------------|---|
| 8 <sup>th</sup>  | 1 <sup>st</sup> | Discuss about horn design, permanent magnet horn, air & music horns       |
|                  | $2^{\text{nd}}$ | Discuss about wind shield wiper, Window washer                            |
|                  | 3 <sup>rd</sup> | Discuss about electronics instruments, dash board illumination and MIL    |
|                  | 4 <sup>th</sup> | Discuss about Engine control Objectives, Engine control functions         |
| 9 <sup>th</sup>  | 1 <sup>st</sup> | Discuss about fuel delivery systems,                                      |
|                  | $2^{\text{nd}}$ | Discuss about Electronics fuel Ignition Systems                           |
|                  | 3 <sup>rd</sup> | Discuss about Emission control  |
|                  | 4 <sup>th</sup> | Discuss about Automotive Transmission control system(ABS)                 |
| 10 <sup>th</sup> | 1 <sup>st</sup> | Discuss about Tire-slip control   |
|                  | $2^{\text{nd}}$ | Discuss about Active suspension, Traction Control                         |
|                  | 3 <sup>rd</sup> | Discuss about Electronics suspension system,                              |
|                  | 4 <sup>th</sup> | Discuss about Steering control  |
| 11 <sup>th</sup> | $1^{st}$        | Discuss about Stability control, Integrated engine control,               |
|                  | $2^{\text{nd}}$ | Discuss about locking ,Air bags and seat belt tensioners                  |
|                  | 3 <sup>rd</sup> | Discuss about Voice warning system, Travel information system, GPS.       |
|                  | $4^{\text{th}}$ | Discuss about Introduction to micro chip-micro controller-block diagram   |
|                  |                 | architecture  |
| 12 <sup>th</sup> | 1 <sup>st</sup> | Introduction to AVR family IC   |
|                  | 2 <sup>nd</sup> | Discuss about AVR family IC features block diagram                        |
|                  | 3 <sup>rd</sup> | Discuss about architecture, basic of embedded control and software.       |
|                  | 4 <sup>th</sup> | Discuss about Electrical and Hybrid vehicles and its pro and con          |
| 13 <sup>th</sup> | 1 <sup>st</sup> | Introduction to Electric vehicle development and system layout            |
|                  | $2^{\text{nd}}$ | Discuss about basic system components-Electric battery solar cells        |
|                  | 3 <sup>rd</sup> | Introduction to Rapid charging system                                     |
|                  | 4 <sup>th</sup> | Introduction to Motor drive system  |
| 14 <sup>th</sup> | $1^{st}$        | Introduction to fuel cell Electric vehicle                                |
|                  | $2^{\text{nd}}$ | Discuss about Hybrid vehicles and parallel Hybrid vehicles                |
|                  | 3 <sup>rd</sup> | Introduction to CNG Electric hybrid vehicle and discuss about it          |
|                  | 4 <sup>th</sup> | Discuss about Vehicle Intelligence  |
| 15 <sup>th</sup> | $1^{st}$        | Discuss about Introduction to Base structure-Vision based autonomous road |
|                  |                 | vehicles  |
|                  | $2^{\text{nd}}$ | Discuss about Architecture for vision system and its features and         |
|                  | ,               | applications  |
|                  | 3 <sup>rd</sup> | Discuss about image processing  |
|                  | 4 <sup>th</sup> | Discuss about Intelligent robot vehicles-obstacle detection, collision    |
|                  |                 | warning and avoidance system  |
|                  |                 |   |
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