

## Government Polytechnic for Women, Faridabad

### Lesson Plan

**Name of Faculty** : Ms. Deepika (Theory / Practical)

**Discipline** : Mechanical Engineering

**Semester** : 4<sup>th</sup>

**Subject** : TD-II

**Lesson Plan Duration** : 15 weeks (from January 2020 to April 2020)

**Work Load (Lectures / Practical) per week (in hours):** Lectures-03, Practicals-02

| WEEK            | THEORY           |                                                                                                                                           | PRACTICAL       |                                                                                                      |
|-----------------|------------------|-------------------------------------------------------------------------------------------------------------------------------------------|-----------------|------------------------------------------------------------------------------------------------------|
|                 | Lecture Day      | Topic<br>(Including Assignment/Test)                                                                                                      | Practical Day   | Topic                                                                                                |
| 1 <sup>st</sup> | 1 <sup>st</sup>  | <b>1.I.C Engines</b> <ul style="list-style-type: none"> <li>Introduction</li> </ul> Working principle of two stroke and four stroke cycle | 1 <sup>st</sup> | 1.Study of a two stroke engine using cut section model, note the function and material of each other |
|                 | 2 <sup>nd</sup>  | SI Engines and CI Engines                                                                                                                 | 2 <sup>nd</sup> | do                                                                                                   |
|                 | 3 <sup>rd</sup>  | <ul style="list-style-type: none"> <li>Otto cycle</li> </ul>                                                                              |                 |                                                                                                      |
| 2 <sup>nd</sup> | 4 <sup>th</sup>  | <ul style="list-style-type: none"> <li>Diesel cycle and dual cycle</li> </ul>                                                             | 3 <sup>rd</sup> | do                                                                                                   |
|                 | 5 <sup>th</sup>  | Location and functions of various parts of IC engines and materials used for them                                                         | 4 <sup>th</sup> | do                                                                                                   |
|                 | 6 <sup>th</sup>  | Concept of IC engines: bore, stroke                                                                                                       |                 |                                                                                                      |
| 3 <sup>rd</sup> | 7 <sup>th</sup>  | Dead centre and crank throw                                                                                                               | 5 <sup>th</sup> | 2. Study of a four stroke engine using cut section model. Note the function of each part             |
|                 | 8 <sup>th</sup>  | Compression ratio, piston displacement and piston speed                                                                                   |                 |                                                                                                      |
|                 | 9 <sup>th</sup>  | <b>Test of chapter-1</b>                                                                                                                  | 6 <sup>th</sup> | do                                                                                                   |
| 4 <sup>th</sup> | 10 <sup>th</sup> | <b>2. Fuel supply in petrol engine</b><br>Concept of carburetion                                                                          | 7 <sup>th</sup> | do                                                                                                   |
|                 | 11 <sup>th</sup> | Air fuel ratio                                                                                                                            | 8 <sup>th</sup> | do                                                                                                   |
|                 | 12 <sup>th</sup> | <b>Assignment Topic:</b><br>Simple carburetor and its application                                                                         |                 |                                                                                                      |

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| 5 <sup>th</sup>  | 13 <sup>th</sup> | MPFI and common rail system                                                             | 9 <sup>th</sup> & 10 <sup>th</sup>  | <b>3.</b> Study of battery ignition system of a multi cylinder petrol engine stressing ignition timings, setting, fixing order and contact breaker, gap adjustment. |
|                  | 14 <sup>th</sup> | Supercharging and turbocharger                                                          |                                     |                                                                                                                                                                     |
|                  | 15 <sup>th</sup> | <b>Test of chapter-2</b>                                                                |                                     |                                                                                                                                                                     |
| 6 <sup>th</sup>  | 16 <sup>th</sup> | <b>3. Fuel system of diesel engine</b><br>Components of fuel system                     | 11 <sup>th</sup>                    | do                                                                                                                                                                  |
|                  | 17 <sup>th</sup> | Description and working of fuel feed pump                                               | 12 <sup>th</sup>                    | do                                                                                                                                                                  |
|                  | 18 <sup>th</sup> | Fuel injection pump                                                                     |                                     |                                                                                                                                                                     |
| 7 <sup>th</sup>  | 19 <sup>th</sup> | Injectors                                                                               | 13 <sup>th</sup> , 14 <sup>th</sup> | <b>4.</b> Study of cooling of IC Engine.                                                                                                                            |
|                  | 20 <sup>th</sup> | <b>Test of chapter-3</b>                                                                |                                     |                                                                                                                                                                     |
|                  | 21 <sup>st</sup> | <b>4. Ignition system of IC engines</b><br>Description of battery coil                  |                                     |                                                                                                                                                                     |
| 8 <sup>th</sup>  | 22 <sup>nd</sup> | <b>Assignment Topic:</b><br>Magnet ignition system                                      | 15 <sup>th</sup>                    | do                                                                                                                                                                  |
|                  | 23 <sup>rd</sup> | Electronic ignition system                                                              | 16 <sup>th</sup>                    | do                                                                                                                                                                  |
|                  | 24 <sup>th</sup> | Fault finding in ignition system and remedial action                                    |                                     |                                                                                                                                                                     |
| 9 <sup>th</sup>  | 25 <sup>th</sup> | <b>Test of chapter-4</b>                                                                | 17 <sup>th</sup>                    | <b>5.</b> Study of lubrication system of IC engine.                                                                                                                 |
|                  | 26 <sup>th</sup> | <b>5. Cooling and lubrication</b><br>Functions of cooling system in IC engine           | 18 <sup>th</sup>                    | do                                                                                                                                                                  |
|                  | 27 <sup>th</sup> | Air and water cooling system                                                            |                                     |                                                                                                                                                                     |
| 10 <sup>th</sup> | 28 <sup>th</sup> | Uses of thermostat, radiator and forced circulation in water cooling                    | 19 <sup>th</sup>                    | do                                                                                                                                                                  |
|                  | 29 <sup>th</sup> | Functions of lubrication                                                                | 20 <sup>th</sup>                    | do                                                                                                                                                                  |
|                  | 30 <sup>th</sup> | Types and properties of lubricant                                                       |                                     |                                                                                                                                                                     |
| 11 <sup>th</sup> | 31 <sup>st</sup> | Lubrication system of engine                                                            | 21 <sup>st</sup> , 22 <sup>nd</sup> | <b>6.</b> Determination of BHP by dynamometer.                                                                                                                      |
|                  | 32 <sup>nd</sup> | Cooling and lubrication <ul style="list-style-type: none"> <li>Fault finding</li> </ul> |                                     |                                                                                                                                                                     |
|                  | 33 <sup>rd</sup> | <ul style="list-style-type: none"> <li>Remedial action</li> </ul>                       |                                     |                                                                                                                                                                     |
| 12 <sup>th</sup> | 34 <sup>th</sup> | <b>Test of chapter-5</b>                                                                | 23 <sup>rd</sup>                    | do                                                                                                                                                                  |
|                  | 35 <sup>th</sup> | <b>6. Testing of IC engines</b><br>Engine power                                         | 24 <sup>th</sup>                    | <b>7.</b> Morse test on multi cylinder petrol engine.                                                                                                               |
|                  | 36 <sup>th</sup> | Indicated and brake power                                                               |                                     |                                                                                                                                                                     |

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| 13 <sup>th</sup> | 37 <sup>th</sup> | Efficiency <ul style="list-style-type: none"> <li>• Mechanical and thermal</li> <li>• Relative and volumetric</li> </ul>                             | 25 <sup>th</sup> , 26 <sup>th</sup> | do                                                         |
|                  | 38 <sup>th</sup> | Methods of finding indicated and brake power                                                                                                         |                                     |                                                            |
|                  | 39 <sup>th</sup> | <ul style="list-style-type: none"> <li>• Morse test for petrol engine</li> <li>• Heat balance sheet</li> </ul>                                       |                                     |                                                            |
| 14 <sup>th</sup> | 40 <sup>th</sup> | <b>Assignment Topic:</b> <ul style="list-style-type: none"> <li>• Concept of pollutants in SI and CI engines</li> <li>• Pollution control</li> </ul> | 27 <sup>th</sup> , 28 <sup>th</sup> | 8. Local visit to roadways or private automobile workshop. |
|                  | 41 <sup>st</sup> | Norms for two or four wheelers <ul style="list-style-type: none"> <li>• BIS-1, II, III and IV</li> </ul>                                             |                                     |                                                            |
|                  | 42 <sup>nd</sup> | Methods of reducing pollution in IC engines                                                                                                          |                                     |                                                            |
| 15 <sup>th</sup> | 43 <sup>rd</sup> | Alternative fuels <ul style="list-style-type: none"> <li>• CNG</li> </ul>                                                                            | 29 <sup>th</sup> , 30 <sup>th</sup> | do                                                         |
|                  | 44 <sup>th</sup> | <ul style="list-style-type: none"> <li>• LPG</li> </ul>                                                                                              |                                     |                                                            |
|                  | 45 <sup>th</sup> | <b>Test of chapter-6</b>                                                                                                                             |                                     |                                                            |