

## Lecture Plan

Name of Institute : Ambala College of Engineering and Applied Research  
 Name of the Faculty member : Er.Hitesh Vohra (Assistant Professor)  
 Discipline : Mechanical Engineering  
 Semester : 6<sup>th</sup>  
 Subject : Internal Combustion Engines (MEP-302A)  
 Lesson Plan Duration : 15 weeks (from Jan 2026 to May 2026)  
 Work Load : L-3 T-1 P-2

| Week            | Theory      |   | Practical       |  |
|-----------------|-------------|---|-----------------|--|
|                 | Lecture day | Topic (including assignment/ test)  | Practical day   | Topic  |
| 1 <sup>st</sup> | 1           | Heat engines; Internal and external combustion engines  | 1st             | Introduction of Lab Equipment's and their application, Layout Studies.   |
|                 | 2           | Classification of I.C. Engines; Cycle of operations in four strokes and two-stroke IC engines; Wankle Engine      |                 |  |
|                 | 3           | Air standard cycles: Assumptions made in air standard cycles; Otto cycle  |                 |  |
|                 | 4           | Numerical Problem   |                 |  |
| 2 <sup>nd</sup> | 5           | Diesel cycle  | 2 <sup>nd</sup> | To make a trial on single cylinder 4-stroke Diesel Engine to calculate B. H. P., S.F.C. and to draw its characteristics curves |
|                 | 6           | Dual combustion cycle   |                 |  |
|                 | 7           | Diesel cycle Numerical Problem  |                 |  |
|                 | 8           | Dual combustion cycle Numerical Problem   |                 |  |
| 3 <sup>rd</sup> | 9           | Numerical Problem   |                 | VIVA-VOCE  |
|                 | 10          | Comparison of Otto, diesel and dual combustion cycles   |                 |  |
|                 | 11          | Sterling and Ericsson cycles;   |                 |  |
|                 | 12          | Air standard efficiency   |                 |  |
| 4 <sup>th</sup> | 13          | Specific work output. Specific weight; Work ratio; Mean effective pressure  | 3rd             | To make a trial on 4-stroke high-speed diesel engine and to draw its Heat Balance Sheet  |
|                 | 14          | Deviation of actual engine cycle from ideal cycle   |                 |  |
|                 | 15          | Mixture requirements for various operating conditions in S.I. Engines   |                 |  |
|                 | 16          | various operating conditions in S.I. Engines  |                 |  |
| 5 <sup>th</sup> | 17          | Elementary carburetor,  | 4th             | To calculate the isothermal efficiency and volumetric efficiency of a 2 stage reciprocating air compressor.                    |
|                 | 18          | Numerical Problem   |                 |  |
|                 | 19          | The complete carburetor   |                 |  |
|                 | 20          | Calculation of fuel air ratio   |                 |  |
| 6 <sup>th</sup> | 21          | Requirements of a diesel injection system   |                 | VIVA-VOCE  |
|                 | 22          | S.I. engines; Ignition limits; Stages of combustion in S. I. Engines; Ignition lag; Velocity of flame propagation |                 |  |
|                 | 23          | Requirements of a diesel injection system Type of injection system Petrol injection                               |                 |  |
|                 | 24          | Types of ignition systems, ignition timing; Spark plugs.  |                 |  |

|      |    |   |      |   |
|------|----|---|------|---|
| 7th  | 25 | Detonation; Effects of engine variables on detonation; Theories of detonation; Octane rating of fuels; Pre-ignition | 5th  | To Find out the Efficiency of an air blower   |
|      | 26 | S.I. engine combustion chambers.  |      |   |
|      | 27 | Stages of combustion in C.I. Engines Delay period;  |      |   |
|      | 28 | Variables affecting delay period  |      |   |
| 8th  | 29 | Functions of a lubricating system   | 6th  | To make Morse Test to calculate IHP of the multi cylinder petrol engine and to determine its mechanical efficiency. |
|      | 30 | Types of lubrication system; Mist,  |      |   |
|      | 31 | Wet sump systems  |      |   |
|      | 32 | dry sump systems  |      |   |
| 9th  | 33 | Properties of lubricating oil; SAE rating of lubricants   |      | VIVA-VOCE   |
|      | 34 | Engine performance and lubrication  |      |   |
|      | 35 | Necessity of engine cooling;  |      |   |
|      | 36 | Disadvantage of over cooling  |      |   |
| 10th | 37 | Performance parameters; BHP, IHP, Mechanical efficiency;  | 7th  | To study the following models:(a) gas turbine (b) Wankle engine   |
|      | 38 | Brake mean effective pressure and indicative mean effective pressure  |      |   |
|      | 39 | Torque, Volumetric efficiency;  |      |   |
|      | 40 | Specific fuel consumption (BSFC, ISFC);   |      |   |
| 11th | 41 | Thermal efficiency; Heat balance; Basic engine measurements   | 8th  | To study lubrication and cooling system employed in various I.c. engine   |
|      | 42 | Brake power, Indicated power and friction power   |      |   |
|      | 43 | Alternative fuels for I.C. Engines;   |      |   |
|      | 44 | The current scenario on the pollution front.  |      |   |
| 12th | 45 | Working of a single stage reciprocating air compressor  |      | VIVA-VOCE   |
|      | 46 | Calculation of work input; Volumetric efficiency; Isothermal efficiency   |      |   |
|      | 47 | Advantages of multi stage compression;  |      |   |
|      | 48 | Two stage compressor with inter-cooling;  |      |   |
| 13th | 49 | Perfect inter cooling; Optimum intercooler pressure   | 9th  | To study a carburetor.  |
|      | 50 | Rotary air compressors and their applications   |      |   |
|      | 51 | Isentropic efficiency.  |      |   |
|      | 52 | Numerical Problem   |      |   |
| 14th | 53 | Brayton cycle; Components of a gas turbine plant  | 10th | To study cooling tower  |
|      | 54 | Open and closed types of gas turbine plants   |      |   |
|      | 55 | Optimum pressure ratio;   |      |   |
|      | 56 | Improvements of the basic gas turbine cycle;  |      |   |
| 15th | 57 | Multi stagecompression with inter-cooling;  |      | VIVA-VOCE   |
|      | 58 | Multi stage expansion with reheating between stages;  |      |   |
|      | 59 | Exhaust gas heat exchanger,.  |      |   |
|      | 60 | Application of gas turbines   |      |   |

(Signature of the teacher concerned with date)