

**GOVT. POLYTECHNIC BOLANGIR**

**LESSON PLAN**

| Discipline : Automobile        | Semester: 3rd                             | Name of the Teaching Faculty : Faculty 5                                 |
|--------------------------------|---|--|
| Subject : ENGINEERING MATERIAL | No. of Days / per week class allotted : 4 | Semester From date : 15.09.2022 to Date :22.12.2022<br>No. of Weeks : 14 |
| Week                           | Class Day                                 | Topics   |
| 15.9 - 17.9                    | 1st                                       | Material classification  |
|                                | 2nd                                       | into ferrous and non ferrous category                                    |
|                                | 3rd                                       | alloys   |
|                                | 4th                                       | Types of alloys  |
| 19.9-24.9                      | 1st                                       | Properties of Materials  |
|                                | 2nd                                       | Physical , Chemical and Mechanical                                       |
|                                | 3rd                                       | Performance requirements   |
|                                | 4th                                       | Material reliability and safety  |
| 26.9-1.10                      | 1st                                       | Characteristics of ferrous materials                                     |
|                                | 2nd                                       | application of ferrous materials   |
|                                | 3rd                                       | Classification of low carbon steel                                       |
|                                | 4th                                       | composition of low carbon steel  |
| 10.10-15.10                    | 1st                                       | application of low carbon steel  |
|                                | 2nd                                       | Classification of Medium carbon steel                                    |
|                                | 3rd                                       | composition of Medium carbon steel                                       |
|                                | 4th                                       | application of Medium carbon steel                                       |
| 17.10-22.10                    | 1st                                       | Classification of High carbon steel                                      |
|                                | 2nd                                       | composition of High carbon steel   |
|                                | 3rd                                       | application of High carbon steel   |
|                                | 4th                                       | Alloy steel  |
| 24.10-29.10                    | 1st                                       | Low alloy steel  |
|                                | 2nd                                       | high alloy steel   |
|                                | 3rd                                       | tool steel   |
|                                | 4th                                       | stainless steel  |
| 31.10-5.11                     | 1st                                       | Tool steel:  |
|                                | 2nd                                       | Effect of various alloying elements such as Cr, Mn, Ni, V, Mo            |
|                                | 3rd                                       | Concept of phase diagram   |
|                                | 4th                                       | cooling curves   |
| 7.11-12.11                     | 1st                                       | Features of Iron-Carbon diagram  |
|                                | 2nd                                       | with salient micro-constituents of Iron and Steel                        |
|                                | 3rd                                       | Crystal defines  |
|                                | 4th                                       | classification of crystals   |
| 14.11-19.11                    | 1st                                       | crystal imperfections  |
|                                | 2nd                                       | Classification of imperfection   |
|                                | 3rd                                       | Point defects  |
|                                | 4th                                       | line defects   |
| 21.11-26.11                    | 1st                                       | volume defects   |
|                                | 2nd                                       | surface defects  |
|                                | 3rd                                       | Types and causes of point defects  |
|                                | 4th                                       | Vacancies  |
| 28.11-3.12                     | 1st                                       | Interstitials and impurities   |
|                                | 2nd                                       | Types and causes of line defects   |
|                                | 3rd                                       | Edge dislocation and   |

|             |     |   |
|-------------|-----|---|
|             | 4th | screw dislocation   |
|             |     |   |
| 5.12-10.12  | 1st | Effect of imperfection on material properties   |
|             | 2nd | Deformation by slip and twinning  |
|             | 3rd | Deformation by slip and twinning  |
|             | 4th | Effect of deformation on material properties  |
|             |     |   |
| 12.12-17.12 | 1st | Purpose of Heat treatment   |
|             | 2nd | Process of heat treatment: Annealing, normalizing, hardening, tempering, stress relieving measures  |
|             | 3rd | Surface hardening: Carburizing and Nitriding and Effect of heat treatment on properties of steel  |
|             | 4th | Hardenability of steel  |
|             |     |   |
| 19.12-22.12 | 1st | Aluminum alloys: Composition, property and usage of Duralmin, $\gamma$ - alloy.   |
|             | 2nd | Copper- Aluminum, Copper-Tin, Babbitt , Phosperous bronze, brass, Copper-Nickel   |
|             | 3rd | Predominating elements of lead alloys, Zinc alloys and Nickel alloys  |
|             | 4th | Low alloy materials like P-91, P-22 for power plants and other high temperature services. High alloy materials like stainless steel grades of duplex, super duplex materials etc. |



