

**GOVERNMENT POLYTECHNIC JAJPUR**  
A/ P: Ragadi, Block: Korei, Dist.: Jajpur, Odisha- 755019

**DEPARTMENT OF PRECISION MANUFACTURING ENGINEERING**

**LESSON PLAN**

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| <b>Discipline: PME</b>                              | <b>Semester: 4th</b>                         | <b>Name of the Teaching faculty: Suprava Behera</b>  |
| <b>Subject-<br/>Manufacturing<br/>Technology-II</b> | <b>No of Days/Week<br/>class allotted: 3</b> | <b>Semester from Date: 22.12.2025 To Date: 18.04.2026</b><br><b>No of weeks: 15</b>  |
| <b>SL.NO</b>  | <b>Class/Day</b>                             | <b>TOPICS TO BE COVERED</b>  |
| 1   | 1st  | Introduction to Understand the Structure and Properties of various Materials and their importance in Modern Technology   |
|   | 2nd  | Classification of Engineering Materials  |
|   | 3rd  | Selectlon of material for a specific component   |
| 2   | 1st  | Definition of the mechanical properties of material such as tensile strength, compression strength, ductility malleability, hardness, brittleness, elasticity plasticity |
|   | 2nd  | Definition of the mechanical properties of material such as impact strength, fatigue, creep resistance   |
|   | 3rd  | Identification of the structure of materials - Unit cell, space lattice, BCC, FCC, & HCP structure, Atomic Packing factor  |
| 3   | 1st  | Transition from liquid to solid-crystallization  |
|   | 2nd  | Effect of grain size on Mechanical properties  |
|   | 3rd  | Deformation of metals  |
| 4   | 1st  | Elastic Deformation  |
|   | 2nd  | Plastic Deformation  |
|   | 3rd  | Mechanism of plastic deformation-slip mechanism & twinning mechanism   |
| 5   | 1st  | Comparison between Elastic deformation & plastic deformation   |
|   | 2nd  | Description of work hardening  |
|   | 3rd  | Description Re-Crystallization   |
| 6   | 1st  | Description of the various properties of Iron and Steel and change of properties Alloy steel on the addition of other elements   |
|   | 2nd  | Identificat: on the properties of pig iron   |
|   | 3rd  | Identification the properties of wrought iron  |
| 7   | 1st  | Comparison the various types of cast iron, such as white CI, molted CI gray CI and alloy CI  |
|   | 2nd  | Description the various steel making processes - Bessemer process  |
|   | 3rd  | Description the various steel making processes - LD process  |

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| 8  | 1st | Description the various steel making processes - Open hearth process  |
|    | 2nd | Description the various steel making processes - Electric Furnace-(arc & induction type)  |
|    | 3rd | Description the various steel making processes - Bessemer process, LD process, Open hearth process, Electric Furnace-(arc & induction type) |
| 9  | 1st | Identification of the properties of steel   |
|    | 2nd | Explanation of Iron-Iron Carbide Phase diagram  |
|    | 3rd | Alloy steel – Definition Effect of Alloying elements on steel   |
| 10 | 1st | Properties & use of alloy steel such as Nickel steel, stainless steel   |
|    | 2nd | Properties & use of alloy steel such as Spring steel, H.S.S, Tool steel   |
|    | 3rd | Designation of steel as per BIS standard.   |
| 11 | 1st | Analysis of material testing methods  |
|    | 2nd | Explanation of Destructive & non-Destructive testing methods  |
|    | 3rd | Description of Tensile strength test  |
| 12 | 1st | Description of Hardness test  |
|    | 2nd | Description of Impact strength test   |
|    | 3rd | Description of Fatigue Test   |
| 13 | 1st | Procedure of Creep Test with Creep curve  |
|    | 2nd | Description of non-destructive testing methods  |
|    | 3rd | Principle of X-ray Test   |
| 14 | 1st | Principle of r-ray Test   |
|    | 2nd | Principle of Magnetic particle Test   |
|    | 3rd | Principle of Ultrasonic test  |
| 15 | 1st | Principle of Crystallographic Test- X ray diffraction Techniques (powder method)  |
|    | 2nd | Principle of Scanning Electron Microscope (SEM)   |
|    | 3rd | Construction and application of Scanning Electron Microscope (SEM). Probable question discussion.   |

  
 20.12.25  
 Lect. (Mech)  
 FACULTY SIGNATURE