HB
ORISSA

TRADE MARK

# LION™

# Teacher's Lesson Note

2023-24

Name - Gayatri Devi Sethi
Branch - Mechanical Engg.
Sem - 3rd Sem (2nd year)
Winter - (2023-24)
Sub - Engineering Material

Lion

# TEACHERS LESSON NOTE

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
| 3/8/23 | 1st Week | 1st | Engg. Material | Engg. Materials & their Properties | Material classification | Engg Material Introduction & Ferrous Alloys classification | | | Introduction of Engg Material & Overall Concept | | Chayaba 3/8/23 | 3/8/23 | |
| 4/8/23 | | 2nd | | | | Non ferrous Category & alloys with its material classification | | | Non ferrous & ferrous Material & its classification | | Chayaba 4/8/23 | 4/8/23 | |
| 11/8/23 | | 3rd | | | | • Properties of Material - Physical Properties | | | Physical & Mechanical Properties | | Chayaba 11/8/23 | 4/8/23 | |
| 14/8/23 | | 4th | | | | • Properties of Material - Chemical Properties | | | Chemical Properties | | Chayaba 14/8/23 | 4/8/23 | |

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| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
| 16/8/23 | 2nd Week 1st | | | | | Properties of Material - Mechanical Properties | | | Class Test | | Gayaba 16/8/23 | 16/8/23 | |
| 19/8/23 | 2nd | | | | | . Performance Requirement | | | Characteristics & Applications of ferrous Material | | Gayaba 18/8/23 | 18/8/23 | |
| 21/8/23 | 3rd | | | | | . Material Reliability & Safety | | | Define Steel, Castiron & Stainless Steel, Tool Steel | | Gayaba 21/8/23 | 21/8/23 | |
| | 4th | | | | Ferrous Materials & Alloys | . characteristics of ferrous Material | | | | | | | |

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| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
| | 3rd Week | 1st | Engg Materials | Ferrous Materials & Alloys | | Application of ferrous Materials | | | | | | | |
| | | 2nd | | | | • Classification of ferrous Materials | | | | | | | |
| | | 3rd | | | | • Composition of Ferrous Materials | | | | | | | |
| 29/9/23 | | 4th | | | | • Application of low, Medium & High Carbon Steel | | | Types of carbon steel with proper Explanations | | Ravi 22/8/23 | 28/9/23 | |

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| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
| 23/8/23 | 4th Week | 1st | | | Ferrous Materials & Alloys | Alloy Steel - low Alloy Steel | | | Properties of Stainless Steel with Proper Explanation | | 23/8/23 | | |
| | | 2nd | | | | High Alloy Steel | | | | | | | |
| | | 3rd | | | | Tool Steel | | | | | | | |
| | | 4th | | | | Stainless Steel | | | | | | | |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
| 25/8/23 | 6th Work | 1st | | | | Toolsteel - Effect of various alloying elements such as Cr, Mn, Ni, V, Mo. | | | Effect of alloying elements with proper Explanation | | Rayaba 25/8/23 | | |
| 31/8/23 | | 2nd | | | Iron-Carbon System | Concept of phase diagram & cooling curves. | | | Revision classes of chapter-2 | | Rayaba 31/8/23 | | |
| 1/9/23 | | 3rd | | | | Features of Iron carbon diagram | | | Revision classes of chapter-1 & chapter-2 | | Rayaba 1/9/23 | | |
| 7/9/23 | | 4th | | | | Iron-carbon diagram with salient micro constituents of Iron & Steel | | | Define phase Diagram & c'to diagram for one component | | Rayaba 7/9/23 | | |

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| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
| 12/9/23 | 6th Week 1st | | | | Crystal Imperfection | Crystal defines | | | Class Test | | Rayaba 12/9/23 | 12/9/23 | |
| 21/9/23 | 2nd | | | | | Classification of crystals | | | Cooling Curve of Iron with proper explanation | | Rayaba 21/9/23 | 21/9/23 | |
| 22/9/23 | 3rd | | | | | Ideal crystals | | | Iron - carbon phase Diagram Explanation | | Rayaba 22/9/23 | 22/09/23 | |
| 26/9/23 | 4th | | | | | Crystal Imperfections | | | Revision classes of Iron - carbon Diagram | | Rayaba 26/9/23 | 25/09/23 | |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
| 29/9/23 7th Week | 1st | | | | Crystal Imperfection | Classification of Imperfection. | | | Define Crystal & ob classificate, Ideal crystal & crystal Imperfectio | | Chayaba 29/9/23 | 29/9/23 | |
| 6/10/23 | 2nd | | | | | Point Defect, Cine Defect. | | | Revision clanes & classification of imperfection point defect & Cine defect | | Chayaba 6/10/23 | 6/10/23 | |
| 7/10/23 | 3rd | | | | | Surface Defect | | | Surface & volume defect | | Chayaba 9/10/23 | 9/10/23 | |
| 18/10/23 | 4th | | | | | Volume Defect | | | Type & cause of point defect, Vacancie, Interstial & Impurity | | Chayaba 18/10/23 | 18/10/23 | |

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| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
| 19/11/23 | 8th Week | 1st | | | | Types & causes of point defect Vacancies | | | Edge & Screw Dislocation & Effect of Imperfection | | Chayaba 19/11/23 | 19/11/23 | |
| 6/11/23 | | 2nd | | | | Interstitials & Impurities | | | Deformation by slip & twinning & Effect of Deformation of metal | | Chayaba 6/11/23 | 6/11/23 | |
| 6/11/23 | | 3rd | | | | Types & causes of Line defect, Edge dislocation | | | Revision classes | | Chayaba 6/11/23 | 6/11/23 | |
| 17/11/23 | | 4th | | | | Screw Dislocation | | | Heat Treatment Purpose & Definition | | Chayaba 15/11/23 | 16/11/23 | |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
| 17/11/23 | 4th Week 1st | | | | | Effect of Imperfection on Material Properties | | | Process of heat treatment Annealing, Normalising | | Chayalu 17/11/23 | | |
| 21/11/23 | 2nd | | | | | Deformation by slip & twinning | | | Surface hardening Carburizing & Nitriding | | Chayalu 21/11/23 | | |
| 24/11/23 | 3rd | | | | | Effect of deformation on materials Properties | | | Effect of heat treatment on properties of steel & Hardenability of steel | | Chayalu 24/11/23 | | |
| 28/11/23 | 4th | | | | | Revision classes | | | Revision class on Heat Treatment | | Chayalu 28/11/23 | | |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
| | 10th Week 1st | | Engg Material | | Heat Treatment | • Purpose of Heat Treatment | | | | | | | |
| | 2nd | | | | | • Process of Heat Treatment, Annealing, Normalizing. | | | | | | | |
| | 3rd | | | | | • Heat Treatment<br>→ Hardening<br>→ Tampering<br>→ Stress Relieving Measures | | | | | | | |
| | 4th | | | | | • Surface Hardening :-<br>1) Carburizing<br>2) Nitriding | | | | | | | |

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| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
| 30/11/23 | 1th Week | 1st | | | Heat Treatment | effect of heat treatment on properties of steel. | | | Non ferrous Alloys Introduction & details | | Rayaba 30/11/23 | 30/11/23 | |
| | | 2nd | | | | Hardenability of steel | | | | | | | |
| 01/12/23 | | 3rd | | | Non ferrous Alloys | Aluminium Alloys & Composition | | | Aluminium alloy. Copper alloys Predominating elements | | Rayaba 1/12/23 | 1/12/23 | |
| 7/12/23 | | 4th | | | | Aluminium Property & usage of Duralmon, γ-Alloy | | | low alloy material, High alloy materials | | Rayaba 7/12/23 | 7/12/23 | |

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|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 9/12/23 | 12th Week 1st | | | | | Copper Alloys: Composition, Property & Usage | |
| | | 2nd | | | | Predomenating Element of lead, Zinc & Nickel Alloys. | |
| | | 3rd | | | | Low Alloy Materials like P-91, P-22 for power plant & other | |
| | | 4th | | | | High Alloy Materials like Stainless steel grades of duplex Super duplex Materials | |

| Evaluative Questions | Expected learning outcome | Project work to be assigned | Signature of the Teacher | Signature of the Headmaster | Remarks |
|---|---|---|---|---|---|
| 9 | 10 | 11 | 12 | 13 | 14 |
| | Revision class on chapter – 6 | | 8/12/23 | 8/12/23 | |
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| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
| | 12th Week 1st | | | | Bearing Materials | Classification, Composition, Properties & Uses of Copper base, Tin, lead & Cd base. | | | | | | | |
| | 2nd | | | | Spring Materials | Classification, Composition, Properties & Uses of Iron-base & Copper base Material. | | | | | | | |
| | 3rd | | | | | Revision classes | | | | | | | |
| | 4th | | | | | Class Test | | | | | | | |

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| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
| | 1st Week 1st | | | | Polymers | Properties & Application of Thermosetting & Thermoplastic Polymers | | | | | | | |
| | | 2nd | | | | Revision classes | | | | | | | |
| | | 3rd | | | | Properties of Elastomer | | | | | | | |
| | | 4th | | | | Class Test | | | | | | | |

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| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
| | Week 15th 1st | | | | Composites & Ceramics | Classification, Composition of particulate based & fiber reinforced composites | | | | | | | |
| | 2nd | | | | | Properties & Uses of fiber Reinforced Composites | | | | | | | |
| | 3rd | | | | | Classification & Uses of ceramics | | | | | | | |
| | 4th | | | | | Revision classes | | | | | | | |