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| **JHARSUGUDA ENGINEERING SCHOOL,JHARSUGUDA TH.4 ELECTRICAL ENGG. MATERIAL BY** **SOURAV KUMAR MISHRA** **LESSON PLAN SESSION-2024-25** |
| **Sl.No.** | **Chapter** | **Hours** | **WEEK** | **Lecture No.** | **Topic to be covered** |
| 1 | Chapter-1 | 16 |  1 | **Conducting materials** |
| 1 | Introduction about conducting material |
| 1 |  Resistivity |
| 1 |  factors affecting resistivity |
| 1 | Classification of conducting materials into low resistivity materials |
| 2 | 1 | Classification of conducting materials into high resistivity materials |
| 1 |  Low Resistivity Materials and their Applications. (Copper, Silver, Gold, Aluminum, Steel) |
| 1 | Stranded conductors |
| 1 | Bundled conductors |
| 3 | 1 | Low resistivity copper alloys |
| 1 | High Resistivity Materials  |
| 1 | High Resistivity Materials Applications(Tungsten, Carbon) |
| 1 | High Resistivity Materials Applications( Platinum, Mercury) |
| 4 | 1 | Basic of superconductor |
| 1 | Superconductivity |
| 1 | Superconducting materials |
| 1 | Application of superconductor materials |
|   |
| 2 | Chapter-2 | 10 |   | **Semiconducting Materials** |
|  |
| 5 | 1 | Introduction about Semiconductors |
| 1 | Electron Energy and Energy Band Theory |
| 1 | Excitation of Atoms |
| 1 | Insulators, Semiconductors and Conductors |
| 6 | 1 | Semiconductor Materials |
| 1 | Covalent Bonds |
| 1 | Intrinsic and Extrinsic Semiconductors |
| 1 | N-Type Materials and P-Type Materials |
| 7 | 1 | Minority and Majority Carriers |
| 1 | Applications of Semiconductor materials |

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| 3 | Chapter-3 | 9 |  7 | **Insulating Materials** |
| 1 |  |
|  1 |  General properties of Insulating Materials |
| 8 | 1 | Electrical properties , Visual properties , Mechanical properties |
| 1 | Thermal properties , Chemical properties , Ageing |
| 1 |  Insulating Materials – Classification, properties, applications |
| 1 | Classification of insulating materials on the basis of chemical structure |
| 9 | 1 | Classification of insulating materials on the basis physical structure |
| 1 | Introduction of Insulating Gases  |
| 1 |  Commonly used insulating gases |
| 4 | Chapter-4 | 8 |   | **Dielectric Materials** |
| 9 | 1 |  |
|  | Introduction |
|  |  |
| 10 | 1 | Dielectric Constant of Permittivity |
| 1 | Polarization |
| 1 | Dielectric Loss |
| 1 | Electric Conductivity of Dielectrics  |
| 11 | 1 | Breakdown of conductivity |
| 1 | Properties of Dielectrics |
| 1 | Applications of Dielectrics. |
| 5 | Chapter-5 | 8 |  11 | **Magnetic Materials** |
|  1 | Introduction |
| 12 |  1 | Classification |
|  |  |
|  1 |  Diamagnetism |
| 1 | Para magnetism , Ferromagnetism |
| 1 | Magnetization Curve and Hysteresis |
| 13 | 1 | Eddy Currents , Curie Point |
| 1 |  Magneto-striction |
| 1 | Soft magnetic materials |
| 1 |  Hard magnetic materials |
|  6 | Chapter 6 |  8 |  |  |  **Materials for Special Purposes** |
| 14 | 1 | Introduction |
| 1 | Structural Materials |
| 1 | Protective Materials(leads) |
| 1 | Steel tapes, wires and strips |
|  15 | 1 | Thermocouple materials and Bimetals |
| 1 | Soldering Materials |
| 1 | Fuse and Fuse materials. |
| 1 | Dehydrating material. |