G B N Govt. PolytechnicNilokheri Electrical Engineering Department

Lesson plan (for odd-semester as per revised curriculum and study scheme)

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| Name of Faculty | | | | Sh. Mr. Parveen Kamboj |  |
| Discipline | | | | Electrical Engg. |  |
| Semester | | | | 3rd (odd- semester) |  |
| Subject | | | | Electrical and Electronics Engineering Materials |  |
| Lesson Plan Duration | | | | From15 September 2022 to16 Jan,2023 |  |
| Work load (Theory + Practical ) Per Week | | | | (04+00) |  |
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|  | worki ng  Week | Day | Topics | | |
|  | 1st | 1 | Introduction Of The Subject, COs,Its Need, Applications  Introduction to Classification of materials | | |
|  | 2 | Classification of Conducting ,semi conducting and insulating materials based on atomic structure | | |
|  | 3 | Classification based on energy bands | | |
|  | 4 | Revision and Class test of 1st unit | | |
|  | 2nd | 1 | Introduction to Conducting Materials Resistance and factors affecting it  Such as alloying and temperature | | |
|  | 2 | Classification of conducting material as low resistivity and high resistivity materials | | |
|  | 3 | low resistance materials Copper: General properties as conductor resistivity, temperature  coefficient and density | | |
|  | 4 | Mechanical properties of hard-drawn and annealed copper corrosion, contact resistance | | |
|  | 3rd | 1 | Application of copper in the field of electrical engineering. | | |
|  | 2 | Aluminum: General properties as resistivity, temperature coefficient, density | | |
|  | 3 | Mechanical properties of hard and annealed aluminum, solder ability, contact resistance | | |
|  | 4 | Applications in the field of electrical engineering. | | |
|  | 4th | 1 | Steel: Mechanical properties of steel | | |
|  | 2 | Applications in the field of electrical engineering. | | |
|  | 3 | Introduction to bundle conductors and its applications | | |

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|  |  | 4 | Low resistivity copper alloys Brass, Bronze and their applications |
|  | 5th | 1 | Applications of special metals e.g. Silver, Gold, Platinum etc |
|  | 2 | High resistivity materials and their applications constantan, |
|  | 3 | Nichrome, mercury, platinum, carbon and tungsten |
|  | 4 | Superconductors and their applications |
|  | 6th | 1 | Revision and problem related to 2nd unit |
|  | 2 | Class Test of 2nd unit |
|  | 3 | Review of Semi-conducting Materials, Semi-conductors and their properties |
|  | 4 | Materials used for electronic components like resistors, capacitors, diodes, transistors and  inductors etc |
|  | 7th | 1 | Revision and problem related to 3rd unit |
|  | 2 | sessional 1/Class Test of 3rd unit |
|  | 3 | Insulating materials; General Properties |
|  | 4 | Electrical Properties :Resistivity, surface resistance, dielectric loss, dielectric strength |
|  | 8th | 1 | Physical Properties Hygroscopicity, tensile and compressive strength, abrasive resistance,  brittleness |
|  | 2 | Thermal Properties: Heat resistance, classification according to permissible  temperature rise |
|  | 3 | Chemical Properties: Solubility, chemical resistance, weather ability |
|  | 4 | Mechanical properties, mechanical structure, tensile structure |
|  | 9th  10th | 1 | Revision and problem related to 4thunit |
|  | 2 | Class Test of 4th unit |
|  | 3 | Introduction to Insulating Materials and their applications |
|  | 4 | Plastics Definition and classification |
|  | 1 | Thermosetting materials: Bakelite, amino resins, epoxy resins their important properties and  applications |
|  | 2 | Thermo-plastic materials: PVC, Polyethylene, silicones, their important properties and  applications |
|  | 3 | Natural insulating materials, properties and their applications |
|  | 4 | Mica and Mica products, Asbestos and asbestos products, Ceramic materials |
|  | 11th | 1 | Glass and glass products Cotton, silk, jute, paper, Rubber, Bitumen |
|  | 2 | Mineral and insulating oil for transformer, insulating varnish for coating and impregnation |
|  | 3 | Gaseous materials; Air, Hydrogen, Nitrogen, SF their properties and applications |
|  | 4 | sessional 2/ Revision and problem related to 5thunit |
|  | 12th | 1 | Class Test of 5th unit |
|  | 2 | Magnetic Materials: Introduction, Ferromagnetic materials, permeability |
|  | 3 | B-H curve, magnetic saturation, hysteresis loop including coercive force and residual magnetism |
|  | 4 | Concept of eddy current and hysteresis loss, Curie temperature, magnetostriction effect. |
|  | 13th | 1 | Soft Magnetic Materials: Alloyed steels with silicon: High silicon alloy steel for transformers |
|  | 2 | low silicon alloy steel for electric rotating machines |
|  | 3 | Cold rolled grain oriented steels for transformer, Non-oriented steels for rotating machine,  Nickel-iron alloys, Soft Ferrites |
|  | 4 | Hard magnetic materials Tungsten steel, chrome steel , hard ferrites cobalt and  Steel applications. |
|  | 14th | 1 | Revision and problem related to 6thunit |
|  | 2 | Class Test of 6th unit |
|  | 3 | Special Materials Thermocouple, bimetals |
|  | 4 | leads soldering and fuses material and their applications |
|  |  | 1 | Revision and problem related to 7thunit |

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|  | 15th | 2 | Introduction of various engineering materials necessary for fabrication of electrical machines |
|  | 3 | such as motors, generators, transformers etc. |
|  | 4 | Revision and problem related to 8thunit |
|  | 16th | 1 | sessional 3/ Class Test of 8th unit |
|  | 2 | Viva-voice related to subject |
|  | 3 | Revision/Review/Test of old HSBTE Papers |
|  | 4 | Revision/Review/Test of old HSBTE Papers |