Govt. Polytechnic Panchkula

Electrical Engineering Department

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

Name of Faculty	**Smt. Suchet Kumari**
Discipline	**Electrical Engineering**
Semester	**3rd (odd- semester)**
Subject	**Electrical and Electronics Engineering Materials**
Lesson Plan Duration	**From Sep 2020 to Dec 2020**
Work load (Theory + Practical) Per Week	**(04+00)**

Week	Day	Topics
1st	1	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
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	Aluminium: General properties as resistivity, temperature coefficient, density
	3	Mechanical properties of hard and annealed aluminium, 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
	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 manganin, constantan,
	3	Nichrome, mercury, platinum, carbon and tungsten
	4	Superconductors and their applications
6th	1	Revision
	2	Quiz
	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
	2	Class Test
	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	1	Revision
	2	Quiz
	3	Introduction to Insulating Materials and their applications
	4	Plastics Definition and classification
10th	1	Thermosetting materials: Bakelite, amino resins, epoxy resins their important properties and applications
	2	Thermo-plastic materials: PVC, Polyethelene, 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	Revision
12th	1	Class Test
	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.2nd Sessional test.
14th	1	Revision and problem related to 6thunit
	2	Quiz
	3	Special Materials Thermocouple, bimetals
	4	leads soldering and fuses material and their applications
15th	1	Revision
	2	Introduction of various engineering materials necessary for fabrication of electrical machines
	3	motors, generators, transformers etc.
	4	Revision