Name of Faculty		Sh. Pawan Kumar
Discipline		Electrical Engineering
Semester		3rd
Subject		Electrical and Electronics Engineering Materials
Lesson Plan Duration		From Sept 2023 to Jan2024
Work load (Theory + Practical) Per Week		(04+00)
Week	**Theory**	
	Lecture Day	**Topics**
1st	Day 1	**1Classification of materials**
	Day 2	Classification of Conducting ,semi conducting and insulating materials based onatomic structure
	Day 3	Classification based on energy bands
	Day 4	Revision and Class test of 1st unit
2nd	Day 1	**2 Conducting Materials** , Resistance and factors affecting itSuch as alloying and temperature
	Day 2	Classification of conducting material as low resistivity and high resistivitymaterials
	Day 3	low resistance materials Copper: General properties as conductor resistivity, temperature coefficient and density
	Day 4	Mechanical properties of hard-drawn and annealed copper corrosion, contactresistance
3rd	Day 1	Application of copper in the field of electrical engineering.
	Day 2	Aluminium: General properties as resistivity, temperature coefficient, density
	Day 3	Mechanical properties of hard and annealed aluminium, solder ability, contact resistance
	Day 4	Applications in the field of electrical engineering.
4th	Day 1	Steel: Mechanical properties of steel
	Day 2	Applications in the field of electrical engineering.
	Day 3	Introduction to bundle conductors and its applications
	Day 4	Low resistivity copper alloys Brass, Bronze and their applications
5th	Day 1	Applications of special metals e.g. Silver, Gold, Platinum etc
	Day 2	High resistivity materials and their applications manganin, constantan,
	Day 3	Nichrome, mercury, platinum, carbon and tungsten
	Day 4	Superconductors and their applications
6th	Day 1	Revision and problem related to 2nd unit
	Day 2	Class Test of 2nd unit
	Day	**3 Review of Semi-conducting Materials**, Semi-conductors and their properties

	3	
	Day 4	Materials used for electronic components like resistors, capacitors, diodes, transistors and inductors etc.
7th	Day1	Class Test of 3rd unit
	Day2	**4 Insulating materials; General Properties**
	Day3	Electrical Properties :Resistivity, surface resistance, dielectric loss, dielectric strength
	Day4	Physical Properties Hygroscopicity, tensile and compressive strength, abrasive resistance, brittleness
8th	Day1	Thermal Properties: Heat resistance, classification according to Permissible temperature rise
	Day2	Chemical Properties: Solubility, chemical resistance, weather ability
	Day3	Mechanical properties, mechanical structure, tensile structure
	Day4	Revision and problem related to 4thunit
9th	Day1	Class Test of 4th unit
	Day2	**5 Introduction to Insulating Materials and their applications**
	Day3	Plastics Definition and classification
	Day4	Thermosetting materials: Bakelite, amino resins, epoxy resins their important properties and applications
10th	Day1	Thermo-plastic materials: PVC, Polyethelene, silicones, their important properties and applications
	Day2	Natural insulating materials, properties and their applications
	Day3	Mica and Mica products, Asbestos and asbestos products, Ceramic materials
	Day4	Glass and glass products Cotton, silk, jute, paper, Rubber, Bitumen
11th	Day1	Mineral and insulating oil for transformer, insulating varnish for coating and impregnation
	Day2	Gaseous materials; Air, Hydrogen, Nitrogen, SFtheir properties and applications
	Day3	Revision and problem related to 5thunit
	Day4	Class Test of 5th unit
12th	Day1	**6 Magnetic Materials:** Introduction, Ferromagnetic materials, permeability
	Day2	B-H curve, magnetic saturation, hysteresis loop including coercive force and residual magnetism
	Day3	Concept of eddy current and hysteresis loss,
	Day4	Curie temperature, magnetostriction effect.
13th	Day1	Soft Magnetic Materials: Alloyed steels with silicon:
	Day2	High silicon alloy steel for transformers
	Day3	low silicon alloy steel for electric rotating machines
	Day4	Cold rolled grain oriented steels for transformer,
14th	Day1	Non-oriented steels for rotating machine, Nickel-iron alloys, Soft Ferrites
	Day2	Hard magnetic materials Tungsten steel,
	Day3	chrome steel , hard ferrites cobalt and Steel applications.
	Day4	Revision and problem related to 6thunit

	Day2	**7 Special Materials** Thermocouple, bimetals	
	Day3	leads soldering and fuses material and their applications	
	Day4	Revision and problem related to 7th unit	
16th	Day1	**8 Introduction of various engineering materials** necessary for fabrication of electrical machines such as motors,	
	15th	Day1	Class Test of 6th unit
	Day3	Revision/Review/Test of old HSBTE Papers	
	Day4	Revision/Review/Test of old HSBTE Papers	