Discipline: ELECTRICAL ENGINEERING	Semester: 3rd Sem.	Name of the Teaching Faculty: J BINOD KUMAR
Subject: ELECTRICAL ENGINEERING MATERIAL	No. of days/per week class allotted:4p/week	Semester From: 01/08/2023 TO: 30/11/2023 No. of weeks: 15 weeks
Week	**Class Day**	**Theory Topics**
1st	1st	**1. Conducting materials** Introduction,
	2nd	Resistivity
	3rd	Numerical on resistivity
	4th	factors affecting resistivity
2nd	1st	Classification of conducting materials into low-resistivity and high resistivity materials
	2nd	Properties of low resistive materials
	3rd	Properties of high resistive materials
	4th	Low Resistivity Materials and their Applications Copper, Silver
3rd	1st	Gold, aluminum, steel
	2nd	Stranded conductors and bundled conductors
	3rd	Low resistivity copper alloys
	4th	High Resistivity Materials and their Applications. Tungsten, Carbon
4th	1st	Platinum and mercury
	2nd	Superconductivity
	3rd	Superconducting materials
	4th	Application of superconductor materials
5th	1st	**2. Semiconducting Materials** Introduction, Semiconductors
	2nd	Electron Energy and Energy Band Theory, Excitation of Atoms
	3rd	Insulators, Semiconductors and Conductors
	4th	Semiconductor Materials Covalent Bonds
6th	1st	Intrinsic Semiconductors, Extrinsic Semiconductors
	2nd	N-Type Materials-Type Materials
	3rd	Minority and Majority Carriers Semi-Conductor Materials
	4th	Applications of Semiconductor materials, Rectifiers
7th	1st	Temperature-sensitive resisters or thermistors, Photoconductive cells
	2nd	Photovoltaic cells, Varisters, Transistors, Hall effect generators, Solar power
	3rd	**3. Insulating materials** Introduction, General properties of Insulating Materials (Electrical properties, Visual properties, Mechanical properties, Thermal properties Chemical properties, Ageing) Discussion of electrical properties
	4th	Visual properties, mechanical properties, thermal properties, chemical properties and ageing
8th	1st	Insulating Materials – Classification, properties, applications Fibrous materials, impregnated fibrous materials
	2nd	Nonresinous materials, insulating liquids
	3rd	Ceramics, mica and mica products
	4th	Asbestos and asbestos products, glass
9th	1st	Natural and synthetic rubbers, insulating resins and their products
	2nd	Laminates, adhesives, enamels and varnishes
	3rd	Insulating gases, commonly used insulating gases (air, nitrogen and hydrogen, sulphur hexafloride)
	4th	**4. Dielectric Materials** Introduction, Dielectric Constant of Permittivity
10th	1st	Polarization
	2nd	Dielectric Loss
	3rd	Electric Conductivity of Dielectrics and their Break Down Gaseous Dielectrics
	4th	Liquid dielectrics
11th	1st	Solid dielectrics
	2nd	Properties of Dielectrics
	3rd	Applications of Dielectrics.

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	4th	**5. Magnetic Materials** Introduction, Classification (Diamagnetism, Para magnetism, Ferromagnetism)
12th	1st	Magnetization Curve
	2nd	Hysteresis
	3rd	Eddy Currents
	4th	Curie Point, Magneto-striction
13th	1st	Soft magnetic materials, pure iron, iron silicon alloys
	2nd	Grain oriented sheet steel, magnetic anisotropy, annealing, nickel iron alloy
	3rd	Hard magnetic materials, carbon steel, tungsten steel, cobalt steel, ALNICO, hard ferrites
	4th	**6. Materials for Special Purposes** Introduction, Structural Materials,
14th	1st	Protective materials
	2nd	Lead
	3rd	Steel tapes wires and bitumens
	4th	Thermocouple materials
15th	1st	Bimetals
	2nd	Soldering Materials
	3rd	Fuse and Fuse materials
	4th	Dehydrating material.

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28/07/23
Signature of Teaching Faculty

24/07/23
Checked

Principal
Govt. Polytechnic
Malkangiri. (Odisha)