



**GOVERNMENT POLYTECHNIC KORAPUT
DEPARTMENT OF ELECTRICAL ENGINEERING**

TH.4 Electrical Engineering Material

Name of the Course Diploma in Electrical Engineering W.E.F: 01/08/2023			
Faculty: MR. Ruhia Hansda			
Course code:	Th.4	Semester:	3rd
Total Period:	60 Periods	Examination:	3 Hrs
Theory periods:	4 P / Week	Internal Assessment:	20
Tutorial:	-	End Semester Examination:	80
Maximum marks:	100		

VISION

To create competent and industry ready Electrical Diploma Engineers with professional and social values to meet future challenges

MISSION:-

- To prepare diploma holders through "qualitative competency based education" to competent with national requirement along with core values
- To produce dynamic electrical engineers to serve the society and industry.
- To develop leadership qualities, Communication skills, critical thinking and attitude for life-long learning.

PROGRAM EDUCATIONAL OBJECTIVES:-

PEO1	Apply technical knowledge and skills learned in the field of electrical engineering to excel in professional and / or higher education.
PEO2	To provide students an excellent academic environment and make them aware the needs of society and industry to become a successful profession/entrepreneur.
PEO3	To engage in lifelong learning, career enhancement to adopt emerging technologies

COURSE OUTCOMES:

CO1	Identify and study about different electrical materials.
CO2	Analyse the properties of the Conductors, Semiconductors and Insulating materials.
CO3	Understand the concept of dielectric and magnetic material and their properties.
CO4	Gain knowledge about the application of various electrical materials in different areas.

TOPIC WISE DISTRIBUTION OF PERIODS

Sl. No.	Topics	Periods
1.	Conducting Materials	16
2.	Semiconducting Materials	10
3.	Insulating Materials	09
4.	Dielectric Materials	08
5.	Magnetic Materials	08
6.	Material for Special Purposes	09
Total		60



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12th

LESSON PLAN

Week	Day	Theory topic
1 st	1 st	Conducting materials(16) Introduction, Resistivity, factors affecting resistivity
	2 nd	Classification of conducting materials into low-resistivity and high resistivity materials.
	3 rd	Low Resistivity Materials and their Applications. (Copper, Silver, Gold, Aluminum, Steel)
	4 th	Stranded conductors
2 nd	1 st	Bundled conductors
	2 nd	Bundled conductors
	3 rd	Low resistivity copper alloys
	4 th	Low resistivity copper alloys
3 rd	1 st	High Resistivity Materials and their Applications(Tungsten, Carbon, Platinum, Mercury)
	2 nd	High Resistivity Materials and their Applications(Tungsten, Carbon, Platinum, Mercury)
	3 rd	High Resistivity Materials and their Applications(Tungsten, Carbon, Platinum, Mercury)
	4 th	Superconductivity, Superconducting materials
4 th	1 st	Application of superconductor materials
	2 nd	Application of superconductor materials
	3 rd	Doubt Clear
	4 th	Revision, Class Test
5 th	1 st	Semiconducting Materials(10): Introduction, Semiconductors
	2 nd	Electron Energy and Energy Band Theory, Excitation of Atoms
	3 rd	Insulators, Semiconductors and Conductors
	4 th	Semiconductor Materials, Covalent Bonds
6 th	1 st	Intrinsic Semiconductors, Extrinsic Semiconductors
	2 nd	N-Type Materials, P-Type Materials
	3 rd	Minority and Majority Carriers
	4 th	Applications of Semiconductor materials, Rectifiers
7 th	1 st	Temperature-sensitive resistors or thermistors
	2 nd	Photoconductive cells, Varistors, Transistors, Hall effect generators & Solar power
	3 rd	3. Insulating Materials(9): Introduction, General properties of Insulating Materials
	4 th	Electrical properties, Visual properties, Mechanical properties, Thermal properties, Chemical properties, Ageing
8 th	1 st	Insulating Materials – Classification, properties, applications
	2 nd	Classification of insulating materials on the basis physical and chemical structure
	3 rd	Classification of insulating materials on the basis physical and chemical structure
	4 th	Classification of insulating materials on the basis physical and chemical structure
9 th	1 st	Classification of insulating materials on the basis physical and chemical structure
	2 nd	Insulating Gases
	3 rd	Commonly used insulating gases
	4 th	4. Dielectric Materials(08): Introduction
10 th	1 st	Dielectric Constant of Permittivity
	2 nd	Polarization
	3 rd	Dielectric Loss
	4 th	Electric Conductivity of Dielectrics and their Break Down
11 th	1 st	Electric Conductivity of Dielectrics and their Break Down
	2 nd	Properties of Dielectrics
	3 rd	Applications of Dielectrics.
	4 th	5. Magnetic Materials(08): Introduction, Classification, Diamagnetism



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12 th	1 st	Para magnetism, Ferromagnetism
	2 nd	Magnetization Curve
	3 rd	Hysteresis
	4 th	Eddy Currents
13 th	1 st	Curie Point,
	2 nd	Magneto-striction
	3 rd	Soft and Hard magnetic Materials
	4 th	6. Materials for Special Purposes: Introduction, Structural Materials
14 th	1 st	Protective Materials, Lead, Steel tapes, wires and strips
	2 nd	Thermocouple materials, Bimetals
	3 rd	Soldering Materials
	4 th	Fuse and Fuse materials.
15 th	1 st	Dehydrating material.
	2 nd	Revision
	3 rd	Practice Previous Question
	4 th	Practice Previous Question

Signature of faculty Concerned.

HOD Electrical