



**DEPARTMENT OF ELECTRICAL ENGINEERING**  
**Govt. Polytechnic, Balasore**

**LESSON PLAN FOR ACADEMIC SESSION - 2023-24**  
**ELECTRICAL ENGINEERING MATERIAL**

Course Code : Th.4	Semester : 3 <sup>rd</sup>
Total Periods : 60 Periods	Examination : 3 Hours
Theory Periods : 4 P/Week	Internal Assessment : 20 Marks
Tutorial : -Nil	End Semester Examination : 80 Marks
Maximum Marks : 100	
Semester From Date : 1 <sup>st</sup> August 2023	To Date :
Name of Teaching Faculty: Er. Anita Sial	

WEEK	PERIOD	TOPIC
1st	1 <sup>st</sup>	Introduction conducting materials.
	2 <sup>nd</sup>	Resistivity, factors affecting resistivity
	3 <sup>rd</sup>	Classification of conducting materials into low-resistivity and high resistivity materials
	4 <sup>th</sup>	Low Resistivity Materials and their Applications
2nd	1 <sup>st</sup>	Copper Silver
	2 <sup>nd</sup>	Gold Aluminum Steel
	3 <sup>rd</sup>	Stranded conductors
	4 <sup>th</sup>	Bundled conductors
3rd	1 <sup>st</sup>	Low resistivity copper alloys
	2 <sup>nd</sup>	High Resistivity Materials and their Applications
	3 <sup>rd</sup>	Tungsten Carbon
	4 <sup>th</sup>	Platinum Mercury

4th	1 <sup>st</sup>	Superconductivity
	2 <sup>nd</sup>	Superconducting materials
	3 <sup>rd</sup>	Application of superconductor materials
	4 <sup>th</sup>	Introduction Semiconductors
5th	1 <sup>st</sup>	Electron Energy and Energy Band Theory
	2 <sup>nd</sup>	Excitation of Atoms Insulators, Semiconductors and Conductors
	3 <sup>rd</sup>	Semiconductor Materials
	4 <sup>th</sup>	Covalent Bonds
6th	1 <sup>st</sup>	Intrinsic Semiconductors Extrinsic Semiconductors
	2 <sup>nd</sup>	N-Type Materials & P-Type Materials
	3 <sup>rd</sup>	Minority and Majority Carriers Semi-Conductor Materials
	4 <sup>th</sup>	Applications of Semiconductor materials Rectifiers Temperature-sensitive resistors or thermistors
7th	1 <sup>st</sup>	Photoconductive cells Photovoltaic cells Varistors
	2 <sup>nd</sup>	Transistors Hall effect generators Solar power
	3 <sup>rd</sup>	Introduction of Insulating Materials
	4 <sup>th</sup>	General properties of Insulating Materials Electrical properties
8th	1 <sup>st</sup>	Visual properties Mechanical properties
	2 <sup>nd</sup>	Thermal properties
	3 <sup>rd</sup>	Chemical properties Ageing
	4 <sup>th</sup>	Insulating Materials – Classification, properties, applications
9th	1 <sup>st</sup>	Introduction Classification of insulating materials on the basis physical and chemical structure
	2 <sup>nd</sup>	Insulating Gases
	3 <sup>rd</sup>	Introduction & Commonly used insulating gases
	4 <sup>th</sup>	Introduction of dielectric materials
10th	1 <sup>st</sup>	Dielectric Constant of Permittivity
	2 <sup>nd</sup>	Polarisation
	3 <sup>rd</sup>	Dielectric Loss

11th	4 <sup>th</sup>	Electric Conductivity of Dielectrics and their Break Down
	1 <sup>st</sup>	Properties of Dielectrics
	2 <sup>nd</sup>	Applications of Dielectrics
	3 <sup>rd</sup>	<b>Magnetic Materials:</b> Introduction
12th	4 <sup>th</sup>	Classification 1 Diamagnetism 2 Para magnetism 3 Ferromagnetism
	1 <sup>st</sup>	Magnetization Curve
	2 <sup>nd</sup>	Hysteresis
	3 <sup>rd</sup>	Eddy Currents
13th	4 <sup>th</sup>	Curie Point
	1 <sup>st</sup>	Magneto-striction
	2 <sup>nd</sup>	Soft and Hard magnetic Materials 1 Soft magnetic materials 2 Hard magnetic materials
	3 <sup>rd</sup>	<b>Materials for Special Purposes</b> Introduction
14th	4 <sup>th</sup>	Structural Materials
	1 <sup>st</sup>	Protective Materials Lead
	2 <sup>nd</sup>	Steel tapes, wires and strips
	3 <sup>rd</sup>	Thermocouple materials
15th	4 <sup>th</sup>	Bimetals
	1 <sup>st</sup>	Soldering Materials
	2 <sup>nd</sup>	Fuse and Fuse materials
	3 <sup>rd</sup>	Dehydrating material
15th	4 <sup>th</sup>	Tutorial

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