



Th.4 Electrical Engineering Material

| | | | |
|---|------------|-----------------------------|-----------------|
| Name of the Course: Diploma in Electrical Engineering | | Semester: start = 14/9/2022 | |
| Faculty: Mr Ruhia Hansda | | | |
| Course code: | Th.4 | Semester: | 3 rd |
| Total Period: | 60 Periods | Examination: | 3 Hrs |
| Theory periods: | 4P / Week | Internal Assessment: | 20 |
| Tutorial: | - | End Semester Examination: | 80 |
| Maximum marks: | 100 | | |

VISION:

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

MISSION:

- To prepare diploma holders through "qualitative competency based education system" to compete 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 lifelong 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 Professional/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 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 |



GOVERNMENT POLYTECHNIC KORAPUT DEPARTMENT OF ELECTRICAL ENGINEERING

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 |
| 4 th | 1 st | Superconducting materials |
| | 2 nd | Superconducting material |
| | 3 rd | Application of superconductor materials |
| | 4 th | Application of superconductor materials |
| 5 th | 1 st | 2. 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. 13 Semi-Conductor Materials |
| | 4 th | Applications of Semiconductor materials, Rectifiers |
| 7 th | 1 st | Temperature-sensitive resistors or thermistors, Photoconductive cells |
| | 2 nd | Photovoltaic 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, geing |
| 8 th | 1 st | Insulating Materials – Classification, properties, applications |
| | 2 nd | Insulating Materials – Classification, properties, applications |
| | 3 rd | Insulating Materials – Classification, properties, applications |
| | 4 th | Insulating Materials – Classification, properties, applications |
| 9 th | 1 st | Insulating Materials – Classification, properties, applications |
| | 2 nd | Insulating Gases, Introduction. |
| | 3 rd | Commonly used insulating gases |
| | 4 th | 4. Dielectric Materials(8): 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:Introduction(08) Classification |



GOVERNMENT POLYTECHNIC KORAPUT
DEPARTMENT OF ELECTRICAL ENGINEERING

| | | |
|------------------|-----------------|---|
| 12 th | 1 st | Diamagnetism , Para magnetism, Ferromagnetism |
| | 2 nd | Magnetization Curve |
| | 3 rd | Hysteresis |
| | 4 th | Eddy Currents |
| 13 th | 1 st | Curie Point , Magneto-striction |
| | 2 nd | Soft and Hard magnetic Materials, Soft magnetic materials |
| | 3 rd | Hard magnetic materials |
| | 4 th | 6. Materials for Special Purposes:(9): Introduction 6.2 Structural Materials |
| 14 th | 1 st | Protective Materials 6.3.1 Lead |
| | 2 nd | Steel tapes, wires and strips |
| | 3 rd | Other Materials |
| | 4 th | Thermocouple materials |
| 15 th | 1 st | Birnetals |
| | 2 nd | Soldering Materials |
| | 3 rd | Fuse and Fuse materials |
| | 4 th | Dehydrating material. |

Signature of faculty concerned

12/9/22


H.O.D. Electrical