# GIET POLYTECHNIC, JAGATPUR, CUTTACK LESSON PLAN

| Discipline | Semester:- | Name of the Teaching Faculty:- |
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| **Electrical Engg.** | **4th** | **SUDIPTAKUMARDAS** |

| Subject:- Energy Conversion-i | No of Days/per Week Class Allotted :- 4 | Semester From:-16TH January,2024 To:-24th April, 2024 |
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| | | No of Weeks:-15 |

| Week | Class Day | Theory/Practical Topics |
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| 1st | 1st | 1.1 D.C Generator,Explain principle of operation |
| | 2nd | 1.2 Explain Constructional feature |
| | 3rd | 1.3 Armature winding,back pitch,Front pitch, Resultant pitch and commutator-pitch |
| | 4th | 1.4.1Simple Lap winding(problems on winding diagram) |
| 2nd | 1st | 1.4.2 Simple wave winding(problems on winding diagram) |
| | 2nd | 1.5.1 Explain Different types of D.C.machines Shunt,Series and Compound machine with prob solving methods. |
| | 3rd | 1.5.2Explain Different types of D.C.machines Shunt,Series and Compound machine With problem solving methods. |
| | 4th | 1.6.Derive EMF equation of DC generators.(Solve problems) |
| 3rd | 1st | 1.7.Explain Armature reaction in D.C. machine & commutation. |
| | 2nd | 1.8.Explain Methods of improving commutation (Resistance and emf commutation) |
| | 3rd | 1.9.Explain role of inter poles and compensating winding.(solve problems) |
| | 4th | 1.10.Characteristics of D.C .Generators with problem solving methods1.11.State application of different types of D.C. Generators. |
| 4th | 1st | 1.12.Concep to critical resistance causes of failure of development of emf. |
| | 2nd | 1.13.Explain losses and efficiency of D.C.machines,condition for maximum Efficiency and numerical problems. |
| | 3rd | 1.14.Explain parallel operation of D.C.Generators. |
| | 4th | Tutorial |
| | 5th | 2.1Explain basic working principle of DC motor |
| 5th | 1st | 2.2State Significance of back emf in D.C. Motor. |
| | 2nd | 2.3 Derive voltage equation of Motor |
| | 3rd | 2.4 Derive torque (Equation of Armature Torque and shaft Torque) (solve problems) |
| | 4th | Tutorial |
| | 5th | 2.5.1Explain performance characteristics of shunt, series and compound motors and Their application.(Solve problems) |
| 6th | 1st | 2.5.2 Explain performance characteristics of shunt, series and compound motors and their application. (Solve problems) |
| | 2nd | 2.6.1Explain methods of starting shunt, series and compound motors |
| | 3rd | 2.6.1 Explain methods of starting shunt, series and compound motors, (solve problems) |
| | 4th | 2.7 Explain speed control of D.C shunt motors by 2.7.1 Flux control method |
| 7th | 1st | 2.7.2Armature voltage (rheostatic) Control method. |
| | 2nd | 2.7.3Solve problems |
| | 3rd | Tutorial |
| | 4th | 2.8 Explain speed control of series motors by Flux control method and series parallel method. |
| | 5st | 2.9Explaindeterminationofefficiency of D.C. Machine by break test method. |
| 8th | 1st | 2.10 Explain determination of efficiency of D.C. Machine by Swinburne's Test method. |
| | 2nd | 2.11.1Explain Losses & efficiency and condition for maximum power and solve Numerical problems. |
| | 3rd | 2.11.2Explain Losses & efficiency and condition for maximum power and solve numerical problems. |
| | 4th | 3.1Explain working principle of transformer. |
| 9th | 1st | 3.2ExplainsTransformerConstruction–Arrangement of core & winding in different types of transformer–Brief ideas about transformer accessories such as conservator, tank,breather explosio vent etc. |
| | 2nd | 3.3Explain types of cooling methods |
| | 3rd | 3.4State the procedures for Care and maintenance |
| | 4th | 3.5 Derive EMF equation |
| 10th | 1st | 3.6Ideal transformer voltage transformation ratio |
| | 2nd | 3.7Explain Transformer on no load and on load phasor diagrams. 3.8Explain Equivalent Resistance. Reactance and Impedance. |
| | 3rd | 3.9 Explain phasor diagram of transformer with winding Resistance and Magnetic leakage. Phaso diagram on load using unf. leading nf and lagging nf |

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| | | 1st | 3.11 Calculate Approximate & exact voltage drop of a Transformer. |
| | | 2nd | 3.12 Calculate Regulation of various loads and power factor. |
| 11th | | 3rd | 3.13 Explain Different types of losses in a Transformer.(solve problems) |
| | | 4th | 3.14 Explain Open circuit test |
| | | 1st | 3.15 Explain Shortcircuittest |
| 12th | | 2nd | 3.16 Explain Efficiency, efficiency at different loads and power factors, condition for maximum efficiency (solve problems) |
| | | 3rd | 3.17 Explain All Day Efficiency(solve problems) |
| | | 4th | 3.18 Explain determination of load corresponding to Maximum efficiency. |
| | | 1st | 3.19 Explain parallel operation of single phase transformer. |
| 13th | | 2nd | Tutorial |
| | | 3rd | 4.1 Explain constructional features o f Auto transformer |
| | | 4th | 4.2 Explain Working principle of single phase Auto Transformer. |
| | | 5st | 4.3 State Comparison of Autotransformer with an two winding transformer (saving of Copper) |
| | | 1st | 4.4 State Uses of Auto transformer. |
| | | 2nd | 4.5 Explain Tap changer with transformer(on load and off load condition) |
| 14th | | 3rd | THREE PHASETRANSFORMER<br>5.1 State and show Type of connection – Star-Star, Star-Delta, Delta-Star and Delta – Delta. |
| | | 4th | 5.1.2 State and show Type of connection – Star-Star, Star-Delta, Delta-Star and Delta– Delta. |
| | | 1st | 5.2 Explain parallel operation and state conditions for Parallel operation. |
| | | 2nd | 5.3 Maintenance schedule of power transformer. |
| 15th | | 3rd | Tutorial |
| | | 4th | Tutorial |

**Signature of Teaching Faculty**

**Signature of Sr.Lecturer**

Head of Dept. (HOD)
Electrical & ETC
G.I.E.T (POLY),

**Signature of Principal**
08/1/24.