Lesson Plan

Name of faculty : Er. Puneet Chawla

Discipline : Electrical Engineering

Semester : 7th

Subject : Electrical Machine Design (ET-401E)

Lesson plan duration : 15 weeks

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Week** | **Theory** | | **Actual Lesson Plans Covered** | | |
| **Lecture**  **Day** | **Topic (Including assignment / Test)** | **Dates** | **HOD Sign.** | **Director-Principal** |
| **Unit-I** | | | | | |
| 1st | 1. | General Features and limitation of electrical machines design |  |  |  |
| 2. | General Features and limitation of electrical machines design |  |  |  |
| 3. | Classifications of Material (Conducting) |  |  |  |
| 4. | Classifications of materials (Magnetic) |  |  |  |
| 2nd | 5. | Classifications of Materials (Insulating) |  |  |  |
| 6. | Classifications of Materials (Insulating) |  |  |  |
| 7. | Classifications of Materials (Insulating) and Assignment-I |  |  |  |
| 8. | Heat Dissipation |  |  |  |
| 3rd | 9. | Heat Dissipation |  |  |  |
| 10. | Temperature Rise |  |  |  |
| 11. | Heating & Cooling Cycle |  |  |  |
| 12. | Heating & Cooling Cycle |  |  |  |
| 4th | 13. | Types of Enclosures |  |  |  |
| 14. | Cooling media used |  |  |  |
| 15. | Cooling media used |  |  |  |
| 16. | Types of Cooling system used in machines |  |  |  |
| 5th | 17. | Effect of size and ventilation |  |  |  |
| 18. | Rating of Machines |  |  |  |
| 19. | Types of Enclosures and Assignment-II |  |  |  |
| 20. | **DC Machines**- Introduction |  |  |  |
| 6th | 21. | Introduction |  |  |  |
| 22. | Output Equation |  |  |  |
| 23. | Choice of Specific loadings |  |  |  |
| 24. | Choice of poles and speed. |  |  |  |
| 7th | 25. | Design of Conductors |  |  |  |
| 26. | Design of windings |  |  |  |
| 27. | Design of Slots field poles |  |  |  |
| 28. | Design of field coils |  |  |  |
| 8th | 29. | Design of Commutator and machine design |  |  |  |
| **Minor Test-I** | | | | |
| **UNIT-II** | | | | |
| 30. | **Transformers**- Introduction |  |  |  |
| 31. | Introduction and standard specifications |  |  |  |
| 32. | Output equations |  |  |  |
| 9th | 33. | Design of Core |  |  |  |
| 34. | Design of Coil and winding, |  |  |  |
| 35. | Design of tanks and cooling tubes |  |  |  |
| 36. | Calculation of circuit parameters, magnetizing current |  |  |  |
| 10th | 37. | Losses and efficiency, temperature rise calculations and regulation Assignment-III |  |  |  |
| 38. | **Synchronous Machines**- Introduction |  |  |  |
| 39. | Specifications, ratings and dimensions, Specific loadings, main dimensions, |  |  |  |
| 40. | low speed machines, cooling, armature conductors, turbo-generators |  |  |  |
|  | **UNIT-III** | | | | |
| 11th | 41. | **Three-phase Induction motor**: Standard specifications, output equation, specific loadings, main dimensions, |  |  |  |
| 42. | Design of conductor size and turns, no. of slots, slot design |  |  |  |
| 43. | Design of stator core, design of rotor core, |  |  |  |
| 44. | Performance calculations |  |  |  |
| 12th | 45. | **Single Phase Induction Motor**: Output equation, specific loadings, main dimensions |  |  |  |
| 46. | Design of main and starting windings, capacitor design, |  |  |  |
| 47. | Equivalent Circuit parameter calculations |  |  |  |
| 48. | Torque and efficiency calculations |  |  |  |
|  | **UNIT-IV** | | | | |
| 13th | 49. | **Computer Aided Design**: Computerization of design procedures |  |  |  |
| 50. | Development of computer programs and performance predictions. |  |  |  |
| 51. | Optimization techniques and their applications |  |  |  |
| 52. | Flow chart design of machines |  |  |  |
| 14th | **Minor Test-II** | | | | |
| 15th | 53 | Flow chart design of machines |  |  |  |
|  | 54. | Numerical problems of Machine design concepts |  |  |  |
|  | 55. | Old question paper-Discussions |  |  |  |
|  | 56. | Old question paper-Discussions |  |  |  |