Lesson Plan

Name of faculty : Er. Puneet Chawla

Discipline : Electrical Engineering

Semester : 7th

Subject : Electrical Machine Design (ET-401E)

Lesson plan duration : 15 weeks

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| **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 |  |  |  |