Lesson Plan

Name of faculty : Er. Ruby Sathiala

Discipline : Electrical Engineering

Semester : 3rd

Subject : Electrical Machines-I (EE-205-L)

Lesson plan duration : 15 weeks

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| **Theory** |
| **Week** | **Lecture**  | **Topic (Including Assignment / Test) : Planned** | **Actually covered on (date)** |
| 1st | 1 | Introduction to subject |  |
| 2 | Magnetic circuits: Magneto motive force, magnetic field strength, permeability, reluctance, analogy between electric & Magnetic circuits |  |
| 3 | Series & parallel magnetic circuits |  |
| 4 | Permanent magnet & their applications |  |
| 2nd | 5 | Principles of Electro-Mechanical energy conversion: Basic principle |  |
| 6 | Energy, Force & Torque of singly excited system  |  |
| 7 | Energy, Force & Torque of mutiple excited system |  |
| 8 | Basic rotating machines |  |
| 3rd | 9 | EMF & MMF of distributed winding |  |
| 10 | Harmonics in MMF |  |
| 11 | Revolving field, Torque production  |  |
| 12 | Asynchronous & Synchronous torque, Winding factors  |  |
| 4th | 13 | Revision |  |
| 14 | Transformer: Principle, operation  |  |
| 15 | Construction of core, winding & tank |  |
| 16 | Testing of single phase transformer |  |
| 5th | 17 | Equivalent circuits |  |
| 18 | Phasor diagrams |  |
| 19 | Parameter determination  |  |
| 20 | P.U. representation of parameters |  |
| 6th | 21 | Regulation, Efficiency |  |
| 22 | Losses , separation of iron losses |  |
| 23 | Parallel operation  |  |
| 24 | Revision |  |
| **7th** |  | **1st Sessionals** |  |
| 8th  | 25 | Auto-transformer: Principle, construction |  |
| 26 | Comparison with two winding transformer  |  |
| 27 | Application, Introduction to tap-changing & phase-shifting transformers |  |
| 28 | Three-phases transformers: Construction  |  |
| 9th | 29 | Types of connection & their comparative features  |  |
| 30 | Zig-Zag connection, Phase conversion: Three to two phase |  |
| 31 | Three to six & twelve phase conversions  |  |
| 32 | Parallel opeation |  |
| 10th | 33 | Inrush current, Harmonics |  |
| 34 | Effect of construction on input current |  |
| 35 | Revision |  |
| 36 | DC machines: Elementary DC machines, Principle |  |
| 11th | 37 | Construction |  |
| 38 | Simplex lap & wave windings |  |
| 39 | DC generator: EMF equation |  |
| 40 | Armature reaction  |  |
| 12th | 41 | Compensating winding, Commutation  |  |
| 42 | Methods of excitation  |  |
| 43 | Load characteristics |  |
| 44 | Parallel operation  |  |
| 13th | 45 | DC motor: Torque & output power equations |  |
| 46 | Load characteristics  |  |
| 47 | Starting |  |
| 48 | Speed control |  |
| **14th** |  | **2nd Sessionals** |  |
| 15th | 49 | Braking |  |
|  | 50 | Testing  |  |
|  | 51 | Efficiency & applications  |  |
|  | 52 | Revision |  |