**Lesson Plan**

Name of faculty : Mr. Surender

Discipline : Electrical Engineering

Semester : 6th

Subject : Power System Analysis & Protection

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Week | Theory | | **Date of Actual covered** | **Signatures** | | | | | |
| Lecture  Day | Topic (Including assignment / Test) | **Concerned teacher** | | | **HOD** | **DP** | |
| **Unit-I** | | | | | | | | | |
| 1st | 1 | **Introduction :** Per unit quantities characteristics |  | |  |  | | |  |
| 2 | Representation of components of a power system |
| 3 | Synchronous machines, transformers |
| 4 | Lines cables & loads. Single line diagram |
| 2nd | 5 | Impedance diagram, line reactance diagrams. |  | |  |  | | |  |
| 6 | **Protective Relaying, Operating principle** |
| 7 | Scheme of protection of generators, transformers |
| 8 | Transmission lines & bus-bars |
| 3rd | 9 | Carrier current protection, |  | |  |  | | |  |
| 10 | Functional characteristics of relays |
| 11 | Electromagnetic and static relays, over current, |
| 12 | Differential relay, impedance relay. |
| **Unit-II** | | | | | | | | | |
| 4th | 13 | **Neutral grounding :** Need for neutral grounding |  | |  |  | | |  |
| 14 | Various types of neutral grounding |
| 15 | **Circuit Interruption :** Circuit interruption, theory of arc formation |
| 16 | It’s excitation in AC & DCcircuits |
| 5th | 17 | Interruption of capacitive & inductive currents |  | |  |  | | |  |
| 18 | Rupturing capacity & rating of circuit breakers. |
| 19 | **Circuit Breakers :** Classification of CB |
| 20 | Circuit-breakers of low medium, |
| 6th | 21 | High & extrahigh voltages |  | |  |  | | |  |
| 22 | Multi break & resistance switching |
| 23 | Auto restoring of high capacity |
| 24 | HV circuit breakers. Re striking & recovery voltage |
| **7th** | **1st Minor Test** | | | | | | | | |
| **Unit-III** | | | | | | | | | |
| 8th | 25 | **Fault Analysis**:- Symmetrical faults |  | |  |  | | |  |
| 26 | Calculation of fault currents, |
| 27 | Use of current limiting reactors |
| 28 | Unsymmetrical faults: |
| 9th | 29 | Types of transformation in power system analysis |  | |  |  | | |  |
| 30 | Sequence network of power system |
| 31 | **Symmetrical components** transformation |
| 32 | Sequence impedance of power system elements, |
| 10th | 33 | Analysis of unsymmetrical fault |  | |  |  | | |  |
| 34 | Short faults sequence components filters |
| 35 | Problems on Network analysis |
| 36 | It’s application to interconnected system |
| **Unit-IV** | | | | | | | | | |
| 11th | 37 | **Transients in Power Systems:** |  | |  |  | | |  |
| 38 | Transient electric phenomenon |
| 39 | Lighting & switching surges |
| 40 | Concept of Travelling waves |
| 12th | 41 | Problems Analysis |  | |  |  | | |  |
| 42 | Reflection of waves with different line termination |
| 43 | Refraction of waves with different line termination |
| 44 | Protection against dangerous pressure rises. |
| 13th | 45 | **Stability of power System** |  | |  |  | | |  |
| 46 | Concepts of stability |
| 47 | Power angle characteristics of Synchronous |
| 48 | Steady state & transient stability |
| **14th** | **2nd Minor test** | | | | | | | | |
| 15th | 49 | Swing equation |  | |  |  | | |  |
|  | 50 | Assignment |
|  | 51 | Numerical Problems |
|  | 52 | Revision and Overview |