Lesson Plan

Name of faculty : Sita Devi

Discipline : Electrical Engineering

Semester : 8th

Subject : HVDC

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 DC power transmission technology |  |
| 2 | Comparison of AC and DC system |  |
| 3 | Application of DC transmission |  |
| 4 | Description of DC transmission systems |  |
| 2nd | 5 | Planning for HVDC transmission |  |
| 6 | Modern trance in DC transmission |  |
| 7 | Advantage of HVDC over DC transmission |  |
| 8 | HVDC system |  |
| 3rd | 9 | Introduction to Cable |  |
| 10 | VSC based HVDC |  |
| 11 | Analysis of HVDC converter and HVDC system control |  |
| 12 | Pluse numbers and choice of converter configuration |  |
| 4th | 13 | Simplified analysis of graetz circuit |  |
| 14 | Converter bridge characteristics |  |
| 15 | Characteristics of twelve phase converter |  |
| 16 | Detailed analysis of converter |  |
| 5th | 17 | General principle of DC link control |  |
| 18 | Converter control characteristics |  |
| 19 | Firing angle control |  |
| 20 | Current angle control  |  |
| 6th | 21 | Excitation angle control |  |
| 22 | Generation of harmonics and filtering power control |  |
| 23 | Higher level controllers |  |
| 24 | Uses of higher level controllers |  |
| **7th** |  | **1st Sessionals** |  |
| 8th  | 25 | Discussion on 1st sessional |  |
| 26 | Advantages of DC system over Ac system |  |
| 27 | Analysis of HVDC system control |  |
| 28 | Choice of converter configuration |  |
| 9th | 29 | Introduction to DC breaker |  |
| 30 | Types of DC breaker |  |
| 31 | Purpose of MTDC system used |  |
| 32 | Difference between multiterminal and DC system |  |
| 10th | 33 | Introduction of multiterminal DC system |  |
| 34 | Advantage of MTDC system |  |
| 35 | Classification of MTDC system |  |
| 36 | Types of MTDC system |  |
| 11th | 37 | Control of MTDC system |  |
| 38 | Protection of MTDC system |  |
| 39 | Study of MTDC system |  |
| 40 | Power flow analysis in AC system |  |
| 12th | 41 | Power flow analysis in DC system |  |
| 42 | Per unit system for DC quantity |  |
| 43 | Modeling of DC link |  |
| 44 | Solution of DC load flow |  |
| 13th | 45 | Solution of AC-DC power flow |  |
| 46 | Unified method  |  |
| 47 | Sequential method for solution of AC -DC power flow |  |
| 48 | And its comparison |  |
| **14th** |  | **2nd Sessionals** |  |
| 15th | 49 | Substitution of power injection method |  |
|  | 50 | Numerical on per unit system |  |
|  | 51 | Numerical on per unit system |  |
|  | 52 | Discussion on 2nd sessional |  |