# Lesson Plan

Name of the Faculty : Sh. Lalit Prakash Discipline : Electrical Engineering

Semester : 5th Semester

**Subject : ELECTRICAL POWER –I**

Lesson Plan Duration : 13-14 Week

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| **We ek** | **Theory** | **Practical** |
| **Lectur****e Day** | **Topic (including assignment / test)** | **Practical Day** | **Top****ic** |
|  | 1,2 | Main resources of energy, Conventional and non-conventional | 1.To measure earth resistance with the help of earth resistance tester. |  |
|  | 3,4 | Different types of power stations, thermal, hydro, gas | 2. To study different types of line insulators, line support. |  |
|  | 5 | Diesel and nuclear power stations | 3.Visit a power generation plant to study its major parts, working and prepare detail report. |  |
|  | 6,7 | Flow diagrams and brief details of their operation, Comparison of the generating stations on the basis of running cost, site, starting, maintenance | 4. Visit a 400kV/220kV/132kV transmission line and make list of all components viz line supports, conductors, insulators and other accessories and prepare detail report. |  |
|  | 8,9 | Importance of non-conventional sources of energy in the present scenario, Brief details of solar energy, bio-energy, windenergy | 5.Visit to a 66kV/33kV/11kV/415V/230 V distribution line make list of all components viz line |  |
|  | 10 | Fixed and running cost, Load estimation, load curves, demand factor | 6.To determine experimentally flash over voltage of transformer oil and hence determine thedielectric strength |  |

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|  | 11 | Load factor, diversity factor, power factor and their effect on cost of generation, simple problems there on | 7.To measure the rating of capacitor bank installed in a sub-station for improvingpower factor |  |
|  | 12 | Base load and peak load power stations, inter-connection of power stations and its advantages, concept of regional and national grid | 8.Study of Indian Electricity rules as per BIS standard related to clearance of overheadtransmission anddistribution lines |  |
|  | 13 | Layout of transmission system, selection of voltage for H.T and L.T lines, advantages of high voltage for Transmission of power in both AC and DC | 9.Draw a layout diagram of 11kV/400V substation installed in the campus and make list of allaccessories |  |
|  | 14 | Comparison of different systems: AC versus DC for power transmission | 10.To find fault in underground cables by Murray Loop Test/ Varley Loop Test. |  |
|  | 15 | Conductor material and sizes from standard tables | 11.Study of data related to conductors of different sizes/types for overheadlines as per IS 398. |  |
|  | 16 | Types of supports, types of insulators | 12.Visit to a distribution substation to study layout of major components and types of Feeders, Distributors and Service Mains and prepare detailed report. |  |
|  | 17 | Types of conductors, Selection of insulators, conductors, earth wire andtheir accessories |  |  |
|  | 18,19, | Transposition of conductors and string efficiency of suspension type insulators, Bundle Conductors, Mechanical features ofline: Importance of sag, calculation of sag |  |  |
|  | 20 | Effects of wind and ice related problems;Indian electricity rules pertaining to clearance |  |  |

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|  | 21 | Electrical features of line: Calculation of resistance inductance and capacitance without derivation in a.c. transmission line,voltage regulation, and concept of corona. |  |  |
|  | 22 | Effects of corona and remedial measures,Transmission Losses, Lay out of HT and LT distribution system |  |  |
|  | 23 | Constructional feature of distribution lines and their erection, LT feeders and service mains; Simple problems on AC radial distribution system, determination of size ofconductor |  |  |
|  | 24 | Preparation of estimates of HT and LT lines(OH and Cables). |  |  |
|  | 25 | Constructional features of LT (400 V), HT (II kV) underground cables, advantages and disadvantages of underground system withrespect to overhead system |  |  |
|  | 26 | Calculation of losses in distribution system , Faults in underground cables-determine fault location by Murray Loop Test, Faults in underground cables-determine faultlocation by Murray Loop Test |  |  |
|  | 27 | Varley Loop Test |  |  |
|  | 28 | Varley Loop Test,Brief idea about substations; out door grid sub-station 220/132 KV, 66/33 KV out doorsubstation |  |  |
|  | 29 | Pole mounted substations and indoor substation, layout of 33/11 and kV/400V distribution substation and various auxiliaries and equipment associatedwith it |  |  |
|  | 30 | Concept of power factor Reasons and disadvantages of low power factor |  |  |
|  | 31 | Methods for improvement of power factorusing capacitor banks, VAR Static Compensator (SVC) |  |  |
|  | 32 | Revision of Topics already covered |  |  |