B.P. PODDAR INSTITUTE OF MANAGEMENT AND TECHNOLOGY
137, VIP Road, PoddarVihar, Kolkata: 7000052
Department of Electrical Engineering
Academic Year -2025-26(Odd Semester)
LESSON PLAN

Program : Electrical Engineering Credit: 3 Contact: 3L
Course Name : Power System I
Course Code : PC EE 502
Course Coordinator: Madhumita Kundu Mondal

Lectures Number	Topics to be covered	Text Books / Reference	Teaching Pedagogies
L1	General layout of a typical coal fired power station, their components and	T1, R3, T3, P1	1. Research Paper 2. Lecture 3. Quiz 4. Power Point Presentation
L2	Working principles of coal fired power station, Choice of site for coal fired power station,	T1, R3, T3, P2	1. Research Paper 2. Lecture 3. Quiz 4. Power Point Presentation
L3	Hydroelectric power station, their components	T1, T2, R3	1. Lecture 2. Quiz 3. Power Point Presentation
L4	Numerical Problems on Coal fired Power Plant.	T1, T2, R3	1. Lecture 2. Quiz 3. Power Point Presentation
L5	Working principles of Hydroelectric power station, their components. Choice of site for Hydroelectric power station	T1, T2, R3	1. Lecture 2. Quiz 3. Power Point Presentation
L6	Working principles of Nuclear power station, their components. Choice of site for it	T1, T2, R2	1. Lecture 2. Quiz 3. Power Point Presentation
L7	Numerical Problems on Hydroelectric power station and Nuclear power Station.	T1, T2, R2	1. Lecture 2. Quiz 3. Power Point Presentation
L8	Comparison of different methods of power generation. Introduction to Solar energy system	T1, T2, R3	1. Lecture 2. Quiz 3. Power Point Presentation
L9	. Introduction to Wind energy system	T1, T2, R3	1. Lecture 2. Quiz 3. Power Point Presentation

L10	Choice of frequency, Choice of voltage, Types of conductors, bundled conductors, skin effect	T1, R2, W3	1. Lecture 2. Quiz 3. Power Point Presentation
L11	Flux linkages due to single current carrying conductor	T3, R3	1. Lecture 2. Quiz 3. Power Point Presentation
L12	Flux linkages in parallel current carrying conductor, Inductance of a single phase two wire line,3-phase overhead line(symmetrical spacing)	T2, R3	1. Lecture 2. Quiz 3. Power Point Presentation
L13	Inductance of a 3-phase overhead line(unsymmetrical spacing),	T1, T3	1. Lecture 2. Online video lectures 3. Power Point Presentation
L14	Transposition of Transmission Line, Concept of GMD and GMR	T2, W3	1. Lecture 2. Online video lectures 3. Power Point Presentation
L15	Numerical problems on Inductance calculations and GMD & GMR	T4,R2	1. Lecture 2. Online video lectures 3. Power Point Presentation
L16	Inductance formulas in terms of GMD, Electric potential at a charged single conductor	T1, T2, R3	1. Lecture 2. Online video lectures 3. Power Point Presentation
L17	Electric Potential in a group of charged conductors, Capacitance of a single phase two wire line,3-phase overhead line (symmetrical spacing)	T1, T2, R3	1. Lecture 2. Online video lectures 3. Power Point Presentation
L18	Classification of overhead transmission lines, Performance of single phase and three phase short transmission lines.	T3, T4, W3, P3	1. Research Paper 2. Lecture 3. Online video lectures 4. Power Point Presentation
L19	Effect of load p.f on regulation and efficiency for short transmission lines, medium transmission lines- End condenser method	T1, T4, W2	1. Lecture 2. Online video lectures 3. Power Point Presentation
L20	Nominal T method & Nominal π method for medium transmission line	T1, T4, W2	1. Lecture 2. Online video lectures 3. Power Point Presentation
L21	Long Transmission lines, Analysis of long transmission line.	T1, W4	1. Lecture 2. Online video lectures 3. Power Point Presentation
L22	Generalised constants of a transmission lines and determination of it, Ferranti effect, surge impedance loading	T1, W4	1. Lecture 2. Online video lectures 3. Power Point Presentation

L23	Power equations and line compensation, power circle diagram, **Indian Electricity Rule-1956:** General Introduction	T4, R3	1. Lecture 2. Online video lectures 3. Power Point Presentation
L25	Type of insulators, Potential distribution over suspension insulator string	W2, T4	1. Lecture 2. Online video lectures 3. Power Point Presentation
L26	String efficiency, Arching shield & rings, Method of improving string efficiency	T2, W4	1. Lecture 2. Online video lectures 3. Power Point Presentation
L27	Line supports, towers, poles, introduction of sag in transmission line,	W2, T4	1. Lecture 2. Online video lectures 3. Power Point Presentation
L28	Introduction of Sag in overhead lines, causes of it, Tension and clearance calculation of sag in transmission line	T1, T4, W1	1. Lecture 2. Online video lectures 3. Power Point Presentation
L29	Effect of wind and ice loading on sag in transmission line, Introduction of dampers, effects of sag in transmission line,	R3, W1, P3	1. Research Paper 2. Lecture 3. Online video lectures 4. Power Point Presentation
L30	Corona, Critical disruptive voltage, Visual critical corona discharge Potential, Corona loss, factors affecting corona	T2, R1	1. Lecture 2. Online video lectures 3. Power Point Presentation
L31	Advantages and disadvantages of corona, Methods of reducing corona effect, Numerical problems	T3, R2	1. Lecture 2. Online video lectures 3. Power Point Presentation
L32	Types of cables, cable components, Capacitance of single core cable	T3, R3	1. Lecture 2. Online video lectures 3. Power Point Presentation
L33	Capacitance of 3 core cable, dielectric stress, optimum cable thickness	T3, W4	1. Lecture 2. Power Point Presentation
L34	Grading of cables, capacitance grading and inters heath grading, dielectric loss and loss angle.	R3, W4	1. Lecture 2. Power Point Presentation
L35	**Tariff:** Guiding principle of Tariff, different types of tariffs, Numerical problems	T1, T2, R3	1. Lecture 2. Power Point Presentation
L36	Numerical problems related to transmission lines	T1, T4, W1	1. Lecture 2. Power Point Presentation

Lectures Number	Topics to be covered	Text Books / Reference	Teaching Pedagogies
*L1	EHV Transmission – Brief description of the system with working & Constructional Details	T1, P3	1. Research Paper 2. Lecture

Text Books:

T1. Electrical Power System, Subir Roy, Prentice Hall
T2. Power System Engineering, Nagrath & Kothery, TMH
T3. Elements of power system analysis, C.L. Wodhwa, New Age International.
T4. Electrical Power System, Ashfaq Hussain, CBS Publishers & Distributors

Reference Books:

R1. Electric Power transmission & Distribution, S.Sivanagaraju, S.Satyanarayana,Pearson Education.
R2. A Text book on Power system Engineering, Soni, Gupta, Bhatnagar & Chakrabarti,Dhanpat Rai & Co.
R3. Electric Power distribution system Engineering, 2nd Edition, T. Gonen, CRC Press.

Web References:

W1. nptel.ac.in/courses/Webcourse-contents/IIT-KANPUR/power-system/.../1_7.htm
W2. www.engineeringenotes.com › Electrical Engineering › Cables › Single Core Cables
W3.nptel.ac.in/courses/Webcourse-contents/IIT-KANPUR/power-system/.../10_2.html
W4. nptel.ac.in/courses/Webcourse-contents/IIT-KANPUR/power-system/.../10_11.html
W5. www.powermin.nic.in/acts_notification/pdf/ier**1956**.pdf

Research Papers References:

P1. A Review Paper on Thermal Power Plant
https://ijarsct.co.in/Paper19882.pdf

P2. Life cycle assessment of co-firing biomass at coal-fired power plants with carbon capture and storage toward net-zero emissions.
https://doi.org/10.1016/j.ijggc.2026.104653

P3. High Impedance Fault Classification in UPFC Compensated Double Circuit Transmission Lines using Differential Power Protection Scheme
DOI:10.1109/ASPCON.2018.8748542