



B.P. PODDAR INSTITUTE OF MANAGEMENT AND TECHNOLOGY

137, VIP Road, PoddarVihar, Kolkata: 7000052

Department of Electrical Engineering

Academic Year: 2025-26 (Even Semester)

LESSON PLAN

Program : Electrical Engineering Credit: 3 Contact: 3L
Course Name : Power System II
Course Code : PC EE 601
Course Coordinator: Chandrani Das

Lectures Number	Topics to be covered	Text Books / Reference	Teaching Pedagogies	Date of Execution	Remarks
L1	Per unit system, its advantages, change of base	T3, R1, W1	1. Lecture 2. Power Point Presentation		
L2	Equivalent per unit impedance of transformer, -phase per unit quantities, problems	T3, R1, W1	1. Lecture 2. Power Point Presentation		
L3	Single line diagram, Impedance diagram, method, problems	T3, R1, W1	1. Lecture 2. Power Point Presentation		
L4	Symmetrical fault, SCC, method, RL circuit transient	T3, R1, R3, W1	1. Lecture 2. Power Point Presentation		
L5	Short circuit armature current of a synchronous generator, problems	T3, R1, R3, W1	1. Lecture 2. Quiz 3. Power Point Presentation		
L6	Current limiting reactors = its types with advantages and disadvantages	T3, R1, R3	1. Lecture 2. Power Point Presentation		
L7	Short circuit MVA in a tie-bus system, problems	T3, R1, R3	1. Lecture 2. Quiz 3. Power Point Presentation		
L8	Method of symmetrical components, Fortescue's theorem, transformation between phase and symmetrical components	T3, R1, R3, W1	1. Lecture 2. Power Point Presentation		
L9	. Nature of zero sequence currents in star and delta connected windings	T3, R1, R3, W1	1. Lecture 2. Power Point Presentation		
L10	Problems on method of symmetrical components	T3, R1, R3	1. Lecture 2. Power Point Presentation		
L11	Power in terms of symmetrical components, sequence impedance	T3, R1, R3	1. Lecture 2. Power Point Presentation		

L12	Zero sequence network of different types of 3-phases transformer, sequence networks of synchronous machines, transmission lines.	T3, R1, R3	1. Lecture 2. Quiz 3. Power Point Presentation		
L13	Problems on sequence networks	T3, R1, R3	1. Lecture 2. Power Point Presentation		
L14	Different types of unsymmetrical faults, SLG fault, Problem	T3, R1, R3, W1	1. Lecture 2. Power Point Presentation		
L15	LL fault, DLG fault, Problem	T3, R1, R3, W1	1. Lecture 2. Power Point Presentation		
L16	Different types of buses, what is load flow, Formation of Bus admittance matrix, Problems	T1, T3, R3, W3	1. Lecture 2. Power Point Presentation		
L17	Static load flow equation, Gauss-Seidel load flow method	T1, T3, R3, W3	1. Lecture 2. Power Point Presentation		
L18	Newton-Raphson load flow method	T1, T3, R3 W3	1. Lecture 2. Power Point Presentation		
L19	Losses in transmission lines, DC load flow method	T1, T3, R1	1. Lecture 2. Power Point Presentation		
L20	Problems on load flow study	T1, T3, R1	1. Lecture 2. Power Point Presentation		
L21	Different types of electrical substations, substation equipments	T3, T4, W3	1. Lecture 2. Power Point Presentation		
L22	Different types of bus-bar arrangements, layout of a distribution substation	T4, R3	1. Lecture 2. Power Point Presentation		
L23	Methods of neutral grounding, Earthing – system and equipment	T4, R3	1. Lecture 2. Power Point Presentation		
L24	Feeder & distributors, types of distribution systems	T4, R3	1. Lecture 2. Power Point Presentation		
L25	DC distributors – single end and both end feeding, problems	T4, R3	1. Lecture 2. Power Point Presentation		
L26	DC distributors – ring distributor, distributor fed at the centre, Problems	T4, R3	1. Lecture 2. Power Point Presentation		
L27	Steady state and transient stability	T3, W2	1. Lecture 2. Power Point Presentation		
L28	Equal area criteria	T3, W2	1. Lecture 2. Power Point Presentation		

L29	Swing equation, multi-machine stability concept, problems	T3, W2	1. Lecture 2. Power Point Presentation		
L30	Protective relays, zone of protection, relay types, Classification of electromagnetic relays	T2, T4, R2, W4	1. Lecture 2. Power Point Presentation		
L31	Different types of over current relays, relay characteristics	T2, T4, R2, W4	1. Lecture 2. Power Point Presentation		
L32	Differential relay, problems	T2, T4, R2, W4	1. Lecture 2. Power Point Presentation		
L33	Distance protection – different types	T2, T4, R2, W4	1. Lecture 2. Power Point Presentation		
L34	Relay protection scheme for transformers	T2, T4, R2, W4	1. Lecture 2. Power Point Presentation		
L35	Relay protection scheme for feeders and generators	T2, T4, R2, W4	1. Lecture 2. Power Point Presentation		
L36	Relay protection scheme for motors	T2, T4, R2, W4	1. Lecture 2. Power Point Presentation		
L37	Circuit breakers and its types	T2, T4, R2, W4	1. Lecture 2. Power Point Presentation		
L38	Vacuum and air blast circuit breakers	T2, T4, R2, W4	1. Lecture 2. Power Point Presentation		
L39	Oil and SF6 circuit breaker, problems	T2, T4, R2, W4	1. Lecture 2. Power Point Presentation		

Text Books:

- T1.** Modern Power System Analysis, D.P. Kothari & I.J. Nagrath, McGraw Hill
T2. Switchgear and Protection – Sunil S. Rao, Khanna Publications
T3. Electrical Power Systems, Ashfaq Hussain, CBS Publishers & Distributors
T4. Principles of Power System, V. K. Mehta & Rohit Mehta, S. Chand Publication

Reference Books:

- R1.** A text book on Power System Engineering, Soni, Gupta, Bhatnagar & Chakrabarti, Dhanpat Rai
R2. Electrical Power, Dr. S.L. Uppal, Khanna Publications
R3. Electrical Power Systems, C. L. Wadha, New Age Publisher

Web References:

- W1.** https://onlinecourses.nptel.ac.in/e-learning/preview/noc22_ee120 - Per unit system & fault analysis
- W2.** nptel.ac.in/courses/108106026 – Power System Stability
- W3.** https://archive.nptel.ac.in/content/storage2/courses/108104051/ui/Course_home-4.htm – Load Flow Study
- W4.** nptel.ac.in/courses/108105167 – Power System Protection