

Detailed Teaching Plan

Lecture No.	Unit No.	Topic to be covered	Books & Page Nos.	Notes Page Nos.	Slide Nos.	A/V Resource
L-01	1	Unit-1 Representation of Power System Single line representation of a simple power system with standard symbols.	Ashfaq Hussain			
L-02	1	Single Phase representation of balanced three phase networks	"			
L-03	1	Per unit (PU system) : Introduction, representation, change of base and simple numerical.	Ashfaq Hussain	213		
L-04	1	Per unit (PU system) : Introduction, representation, change of base and simple numerical.				
L-05	1	Complex power flow, Concept of torque or Load angle (δ) and Power factor angle (θ)	Ashfaq Hussain	488		
L-06	1	Complex power flow, Concept of torque or Load angle (δ) and Power factor angle (θ)	Ashfaq H	489		
L-07	1	Simplified representation of Synchronous Machines				
L-08	1	Simplified representation of Synchronous Machines				
L-09	1	Power angle curve of a synchronous generator	Ashfaq Hussain			
L-10	1	Power angle curve of a synchronous generator				
L-11	2	Unit-2.0 Power System faults and Stability Symmetrical Faults: Definition of transients in a transmission lines, subtransient, transient and steady state period; reactance offered, LLL and LLLG faults	A. H			
L-12	2	Symmetrical Faults: Definition of transients in a transmission lines, Subtransient, transient and steady state period; reactance offered, LLL and LLLG faults	"			
L-13	2	Definition: Short Circuit Capacity (SCC) of a bus, Simple Numerical	"			
L-14	2	Unsymmetrical faults : LG, LL, LLLG faults and their effects	"			
L-15	2	Stability: Introduction, Steady state and transients stability, Stability limit	"			



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L-16	2	Stability: Introduction, Steady state and transients stability, Stability limit	Asghar Hussain			
L-17	2	Steady State stability: static and dynamic stability	"			
L-18	2	Steady State stability: static and dynamic stability	"			
L-19	2	Transient stability : swing curve, Introduction to equal area criteria of stability and its applications	Asghar Hussain			
L-20	2	Transient stability : swing curve, Introduction to equal area criteria of stability and its applications				
L-21	2	Methods of improving stability				
L-22	2	Methods of improving stability				
L-23	3	Unit-3.0 Active and Reactive power control Introduction to active and reactive power in power system and their sources. Requirement of reactive power in power system.				
L-24	3	Introduction to active and reactive power in power system and their sources. Requirement of reactive power in power system.				
L-25	3	Introduction to active and reactive power in power system and their sources. Requirement of reactive power in power system.				
L-26	3	Introduction to active and reactive power in power system and their sources. Requirement of reactive power in power system.				
L-27	3	Introduction to active and reactive power in power system and their sources. Requirement of reactive power in power system.				
L-28	3	Introduction to active and reactive power in power system and their sources. Requirement of reactive power in power system.				
L-29	3	Effect of DC excitation on lagging and leading operation of a synchronous machine, V curve of a synchronous machine.				

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L-30	3	Effect of DC excitation on lagging and leading operation of a synchronous machine, V curve of a synchronous machine.				
L-31	3	Effect of DC excitation on lagging and leading operation of a synchronous machine, V curve of a synchronous machine.				
L-32	3	Effect of DC excitation on lagging and leading operation of a synchronous machine, V curve of a synchronous machine.				
L-33	3	Effect of DC excitation on lagging and leading operation of a synchronous machine, V curve of a synchronous machine.				
L-34	3	Voltage control in power system: shunt reactor, synchronous phase modifier, shunt capacitors, series capacitors, static VAR system and related circuit diagram				
L-35	3	Voltage control in power system: shunt reactor, synchronous phase modifier, shunt capacitors, series capacitors, static VAR system and related circuit diagram				
L-36	3	Voltage control in power system: shunt reactor, synchronous phase modifier, shunt capacitors, series capacitors, static VAR system and related circuit diagram				
L-37	3	Voltage control in power system: shunt reactor, synchronous phase modifier, shunt capacitors, series capacitors, static VAR system and related circuit diagram				
L-38	3	Voltage control in power system: shunt reactor, synchronous phase modifier, shunt capacitors, series capacitors, static VAR system and related circuit diagram				

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Lecture No.	Unit No.	Topic to be covered	Books & Page Nos.	Notes Page Nos.	Slide Nos.	A/V Resource
L-39	4	Unit-4.0 Elements of Protection and Circuit Interrupting Devices Basic elements of a protective system				
L-40	4	Types, causes and effects of various Faults.				
L-41	4	Protection zones : Backup protection zones				
L-42	4	CT and PT: Specifications and Connection diagram (single phase and 3 phase)				
L-43	4	Current limiting reactors.				
L-44	4	Neutral Earthing				
L-45	4	Interrupting devices: Sequence of operation and interlocking				
L-46	4	Isolators and Fuses: types, features, testing and applications				
L-47	4	Construction, working and testing of circuit breakers: Air break, Air Blast, Sulphur Hexa Fluoride (SF6), vacuum and oil circuit breakers				
L-48	4	Construction, working and testing of circuit breakers: Air break				
L-49	4	Air Blast, Sulphur Hexa Fluoride (SF6), vacuum and oil circuit breakers				
L-50	4	Construction, working and testing of circuit breakers: Air break				
L-51	4	Air Blast, Sulphur Hexa Fluoride (SF6), vacuum and oil circuit breakers				
L-52	4	Auto-reclosure, Arc phenomena and extinction				
L-53	4	Resistance switching				
L-54	4	Working principle of arc quenching in HVDC circuit breaker				

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Lecture No.	Unit No.	Topic to be covered	Books & Page Nos.	Notes Page Nos.	Slide Nos.	AV Resource
L-55	5	Unit-5.0 Protective Relays and Circuit Breaker Protective relay: Principle of working, construction and operation of electromagnetic induction (shaded pole, watt-hour meter and induction cup), Settings				
L-56	5	Protective relay: Principle of working, construction and operation of electromagnetic induction (shaded pole, watt-hour meter and induction cup), Settings				
L-57	5	Protective relay: Principle of working, construction and operation of electromagnetic induction (shaded pole, watt-hour meter and induction cup), Settings				
L-58	5	Protective relay: Principle of working, construction and operation of electromagnetic induction (shaded pole, watt-hour meter and induction cup), Settings				
L-59	5	Relay Types: Thermal relay, Directional relay, Distance relay (impedance, reactance and mho), Negative phase sequence relay, Static relay, Microprocessor based relay: Principle and working				
L-60	5	Relay Types: Thermal relay, Directional relay, Distance relay (impedance, reactance and mho), Negative phase sequence relay, Static relay, Microprocessor based relay: Principle and working				
L-61	5	Relay Types: Thermal relay, Directional relay, Distance relay (impedance, reactance and mho), Negative phase sequence relay, Static relay, Microprocessor based relay: Principle and working				
L-62	5	Relay Types: Thermal relay, Directional relay, Distance relay (impedance, reactance and mho), Negative phase sequence relay, Static relay, Microprocessor based relay: Principle and working				
L-63	5	Relay Types: Thermal relay, Directional relay, Distance relay (impedance, reactance and mho), Negative phase sequence relay, Static relay, Microprocessor based relay: Principle and working				
L-64	5	Maintenance and testing of relays				
L-65	5	Maintenance and testing of relays				

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Lecture No.	Unit No.	Topic to be covered	Books & Page Nos.	Notes Page Nos.	Slide Nos.	A/V Resource
L-66	5	Various faults and abnormal operating conditions in Alternator and its protection schemes				
L-67	5	Various faults and abnormal operating conditions in Alternator and its protection schemes				
L-68	5	Differential Protection of Bus bars				
L-69	5	Differential Protection of Bus bars				
L-70	5	Differential Protection of Bus bars				

Signature of Lecturer

Signature of HOD

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