


Lesson plan

Name of Faculty		Sh. Sandeep Kumar		
Discipline		Electrical Engineering		
Semester		6 th Sem		
Subject		Electrical Power-III		
Lesson Plan Duration		From 02 March 2022 to 16 June 2022		
Work load [Theory + Practical] Per Week		[04+02]		
Week	Day	Theory Topic/ Assignment/ Test	Practical Day	Practical
1 st	1	1.Introduction to Switchgear	Day1	Study of various types of fuses used in domestic and industrial installations
	2	Switchgear, Essential features of Switchgear		
	3	Switchgear elements and its operation		
	4	Bus-bar arrangements		
2 nd	1	Concept of short-circuit, short circuit current	Day1	To study the construction of IDMT over-current relay
	2	Switchgear elements		
	3	Essential features of Switchgear		
	4	Problem solution		
3 rd	1	2. Power System Faults	Day1	Revision/ file checking
	2	Types of faults: symmetrical faults		
	3	unsymmetrical faults		
	4	Unsymmetrical faults Analysis		
4 th	1	Analysis of L-to-L, L-to-G and L-L-to-G faults	Day1	To study and plot Time-Current characteristics at various multiples of plug setting current in IDMT over current relay
	2	L-to-G		
	3	G-to-L		
	4	L-L-to-G		
5 th	1	unsymmetrical faults	Day1	Revision/ file checking
	2	symmetrical faults		
	3	3. Fuses		
	4	Advantages and disadvantages of fuse		
6 th	1	Desirable characteristics of fuse element, fuse element materials	Day1	Study of Air Blast Circuit breaker
	2	Important terms related to fuse: current rating of fuse element,		
	3	fusing current fusing factor		
	4	cut-off current		
7 th	1	arcing time and breaking capacity	Day1	Revision/ file checking
	2	Types of fuse: LV fuse and HV fuse		
	3	LV fuse: semi-enclosed rewritable fuse		
	4	HRC fuse-their construction and working		
8 th	1	HV fuse: cartridge type	Day1	Study of MOCB & BOCB
	2	liquid type fuse		
	3	metal clad type-their construction & working		
	4	4. Circuit Breakers		
9 th	1	Difference between Switch	Day1	Revision/ file checking
	2	Isolator and Circuit Breakers		
	3	Function of Isolator and Circuit breaker		
	4	Difference between Fuse and Circuit Breaker		

10 th	1	Arc phenomenon in circuit breaker	Day1	Study of SF6 Circuit breaker
	2	principles and methods of arc Extinction		Revision/ file checking
	3	Terms related to circuit breaker		Quiz /viva-voice related to electrical machine
	4	arc voltage, re-striking voltage and recovery voltage		
11 th	1	Construction, working principles, types and applications of Air-Blast Circuit Breaker	Day1	Revision/ file checking
	2	Oil Circuit Breaker		
	3	Vacuum Circuit Breaker		
	4	SF6 Circuit Breaker		
12 th	1	Comparison between various types of Circuit Breakers in terms of their features and application areas.	Day1	Study of Vacuum Circuit Breaker
	2	Circuit breaker rating: breaking capacity, making capacity and short-time rating		
	3	5. Protective Relays		
	4	Introduction: fundamental requirement of relay, function of relay		
13 th	1	Electromagnetic attraction type relay	Day1	Revision/ file checking
	2	Electromagnetic induction type relays		
	3	Instantaneous relay, Inverse Time Relay, Definite Time lag relay		
	4	Relays Terminology: Pick-up Current, Current Setting, Plug Setting Multiplier (PSM), Time Setting Multiplier (TSM), Time/PSM Curve		
	1	Distance or Impedance Relay: definite-distance and time distance impedance relay	Day1	Routine Testing of Circuit breaker as per IS specifications
	2	Differential Relays: current differential and voltage balance differential relay		
	3	Brief idea of Static and Microprocessor based relays & their applications		
	4	6. Protection Schemes in Power System		
14 th	1	Differential Protection Scheme for Alternators	Day1	Quiz /viva-voice related to electrical machine
	2	Protection Schemes for Transformer, Buchholz relay		
	3	Merz-price voltage balance protection scheme for bus-bar and transmission line		
	4	Earth fault or Leakage Protection		
	1	7. Over-voltage Protection	Day1	Quiz /viva-voice related to electrical machine
	2	Introduction: voltage surge, causes of overvoltage		
	3	Lightening, lightening arresters such as rod gap, horn gap, multi-gap, expulsion type and valve type arrester, Brief idea about surge absorber		
	4	Transmission Line and substation protection against over-voltages		


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 (Dr. EE)
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