Lesson plan

Name of the faculty : Mr. Manoj Bansal

Discipline : Electrical & Electronics Engineering

Semester : 5th

Subject : Power System-1(Paper Code: PCC-EE-301-G)

Lesson Plan Duration : 15 weeks (From August, 2020 to November 2020)

Work Load (Lecture/ Practical) per week (in hours): Lecture-02, Practical-01

Week	**Theory**		**Practical**	
	Lecture day	**Topic(Including assignment/test)**	**Practical Day**	**Topic**
1st	1st	Introduction, Review of Three-phase systems	1st	To determine negative and zero sequence reactances of an alternator
	2nd	Analysis of simple three-phase circuits		
2nd	1st	Single-phase representation of balance three-phase network	2nd	To determine fault current for L-G, L-L, L-L-G and L-L-L faults at the terminals of an alternator at very low excitation
	2nd	Phase shift in star-delta transformation, sequence impedances		
3rd	1st	The one-line diagram and the impedance or reactance diagram	3rd	To study the IDMT over current relay and determine the time current characteristics
	2nd	Per unit (PU) system		
4th	1st	Complex power, The steady state model of synchronous machine	4th	To study percentage differential relay
	2nd	Transmission of electric power, Representation of loads		
5th	1st	Method of Symmetrical Components	5th	To study Impedance, MHO and Reactance type

	2nd	positive, negative and zero sequences		distance relays
6th	1st	Balanced and Unbalanced Faults	6th	To study ferranti effect and voltage distribution in H.V. long transmission line using transmission line model.
	2nd	Representation of generators		
7th	**Sessional -I Examination+Activity**			
8th	1st	Representation of lines and transformers in sequence networks	8th	To study operation of oil testing set
	2nd	Computation of Fault Currents		
9th	1st	Neutral Grounding	9th	To understand PV modules and their characteristics like open circuit voltage, short circuit current, Fill factor, Efficiency
	2nd	**Switchgear and protection:** Types of Circuit Breakers		
10th	1st	Attributes of Protection schemes	10th	To understand I-V and P-V characteristics of PV module with varying radiation and temperature level
	2nd	Back-up Protection		
11th	1st	Protection schemes Over-current	11th	To understand the I-V and P-V characteristics of series and parallel combination of PV modules.
	2nd	Protection schemes directional		
12th	1st	distance protection	12th	To understand wind energy generation concepts like tip speed, torque and power relationship, wind speed versus power generation
	2nd	differential protection and their application		

13th	1st	**Introduction to DC Transmission & Renewable Energy Systems**	13th	Simulation Based Experiments (using MATLAB or any other software) To obtain steady state, transient and sub-transient short circuit currents in an alternator
	2nd	DC Transmission Systems: Line-Commutated Converters (LCC)		
14th	1st	Voltage Source Converters (VSC). LCC and VSC based dc link	14th	To perform symmetrical fault analysis in a power system
	2nd	Real Power Flow control in a dc link. Comparison of ac and dc transmission.		
15th	1st	**Solar PV systems:** I-V and P-V characteristics of PV panels	15th	To perform unsymmetrical fault analysis in a power system
	2nd	power electronic interface of PV to the grid		
16th	1st	Wind Energy Systems: Power curve of wind turbine. Fixed and variable speed turbines		
	2nd	Permanent Magnetic Synchronous Generators and Induction Generators		
17th	**Sessional -II Examination+Activity**			

Faculty Signature