

GOVERNMENT POLYTECHNIC ASTHAWAN NALANDA

LESSON PLAN

BRANCH – ELECTRICAL ENGINEERING

SEMESTER- V

SUBJECT – A C MACHINE

SUBJECT CODE -1620502

UNITS	HOURS	PERIOD	TOPICS	METHODS
UNIT 1 Three phase induction motor	13	1	Construction of three phase induction motor	Video and advance lecture ,hands out
		2	Production of rotating magnetic field Principle of working / operation	PPT, Animation , advance teaching method
		2	Torque equation of three phase induction motor	Advanced lecture method and derivation method
		2	starting and running torque of squirrel cage and slip ring induction motor	Lecture,hands out Animation ,machine lab,Gd
		1	Condition for maximum and starting torque	Animation ,machine lab, hands out,Gd
		2	Numerical discussion on above topics	Board chalk , assignment
		1	Torque slip characteristics of 3 phase induction motor	Animation, lecture and hands out, practical in lab
		2	Effect of change in a)rotor circuit resistance on torque slip characteristics b) supply voltage on torque slip characteristics	Hands out , Animation/assimilation, practical in lab

	13	2	measurement of slip by a) Tachometer method b) Comparing rotor frequency and stator frequency	Videos , PPT , Hands out
		1	Speed control of three phase induction motor by a) Pole changing method b) Frequency control method	PPT , lecture, hands out
		2	Speed control of three phase induction motor by c) By stator voltage control d) Rotor resistance control	ppt, hands out Video
		1	Comparison between squirrel-cage and slip-ring induction motor Applications of three phase induction motor	Discussion, information search
		1	Power stages of three phase induction motor.	PPT, hands out,
		2	Numerical on above topics	Discussion, assignment, board chalk
		3	Double cage IM a) Construction b) Characteristic of outer, inner cage & combined characteristic c) Industrial Applications (Numerical on all above)	Videos, information search, lecture
		1	I M as generalised transformer and vector diagram of induction motor	Discussion, PPT, board chalk
	7	2	Equivalent circuit of 3-phase IM (No numerical)	PPT, hands out
		2	Starting of 3-phase IM (No numerical) a) Stator resistance starter b) Star-Delta starter	ppt, hands out Videos
		3	c) Auto transformer starter d) Rotor resistance starter	Videos, PPT, videos

UNIT II Three phase alternator	12	2	Three Phase Alternator Definition and construction of three phase Alternator a) Armature b) Rotor- smooth cylindrical & projecting type)	Ppt, videos, lecture
		2	Derivation of e.m.f. equation of Alternator which includes a) Chording factor b) Distribution factor	Board chalk , ppt, Assignment
		2	Factors affecting the terminal voltage of Alternator a) Armature resistive drop b) Leakage reactance drop	ppt, hands out
		3	c) Armature reaction at various power factors and concept of Synchronous impedance	Hands out,ppt, board chalk
		3	Regulation of three phase Alternator by a) Synchronous impedance method b) mmf method (Numerical on all above	Board chalk , ppt, Advance lecture
		2	Synchronous motor Principle of working/operation	Videos, ppt
UNIT III Synchronous motor	12	2	Synchronous Motor on load with constant excitation	Ppt, hands out
		2	Effect of excitation at constant load	Ppt, videos
		1	V curve & inverted V curve	Ppt , hands out
		2	Hunting & phase swinging and Applications	Videos, ppt
		1	Starting of Synchronous Motor	Ppt , lecture ,videos
		2	Comparison between IM & Synchronous Motor (Numerical on all above)	Ppt, discussion ,assignment

Unit-IV Single phase Motors	7	1	Types of Single phase IM	Ppt , videos
		2	Split phasing principle of starting a) Resistance start induction run b) Capacitor start induction run	lecture,ppt Assignment
		2	c) Capacitor start Capacitor run d) Double value Capacitor applications motor	Assignment, ppt, lecture
		1	Shaded pole IM	Ppt , lecture
		1	applications	Ppt, Lecture