

GOVT. POLYTECHNIC MAYURBHANJ

LESSON PLAN

Discipline : MECHATRONICS ENGG.		Semester: 3RD		Name of the Teaching Faculty : Debasis Patra	
Subject : ECM TH3		No. of Days / per week class allotted : 03		Semester From date : 14.07.2025	To Date : 15.11.2025
MONTH	Week	Day	Unit	Topics	
JULY	3RD	1ST	UNIT-1	1. DC Circuits and DC Network Theorems	
				Concept of electrical quantities, Voltage, current & resistance, Statement and explanations	
		3RD		Power, energy, ohm's law, Resistances in series, Resistances in parallel	
		4TH		Series Parallel circuits, Simple problems	
	4TH	1ST		Kirchhoff's laws , Simple problems	
		3RD		Super position Statement and explanations, Simple problems	
		4TH		Thevenin's, Norton's Statement and explanations, Simple problems	
	5TH	1ST		Maximum power transfer theorems Statement and explanations, Simple problems	
		3RD	UNIT-2	2. AC Circuits	
		4TH		AC fundamentals, AC waveform, sinusoidal and non-sinusoidal	
AUGUST	2ND	1ST		period – frequency – cycle – amplitude – phase – peak value	
		3RD		average value – RMS value (effective value) – form factor – crest factor	
		4TH		AC Through pure resistor, inductor, Concept of impedance – vector diagram	
				AC Through pure Capacitor, Concept of impedance – vector diagram	
	3RD	1ST		Capacitors in series and parallel – energy stored in a capacitor– derivation	
		3RD		Simple problems.	
		4TH		Power in AC circuits – power factor	
	4TH	1ST		RL series and parallel circuits	
		3RD		RC series and parallel circuits	
		4TH		CLASS TEST	
	5TH	1ST		RLCseries and parallel circuits	
SEPTEMBER	1ST	1ST		Simple problems	
		3RD		Introduction of Harmonics - Effects of Harmonics	
		4TH	UNIT-3	3. Resonance and 3 phase AC circuits:	
				Resonance – condition for resonance, series and parallel resonance	
	2ND	1ST		resonance curve – effect of resistance on resonance curve	
		3RD		selectivity – Q factor and bandwidth – applications of resonance	
		4TH		simple problems in resonance	
				Concept of 3-Ph supply – line and phase voltage and current in star and delta connected circuits	
	3RD	4TH			

	4TH	1ST		Measurement of three phase power by two watt meter method
		3RD		simple problems
		4TH		INTERNAL EXAM-1
OCTOBER	2ND	1ST	UNIT-4	simple problems , advantages of three phase over single phase system
		3RD		4. D.C Machines and A.C Machines
		4TH		DC machines – Types – constructional details of DC machines
	3RD	1ST		DC generators - principle & types
		3RD		emf equation of DC generators
		4TH		Characteristics of shunt, series and compound generators
	4TH	1ST		DC motor – types, motor action & back emf
		4TH		Torque speed characteristics of DC motor
		4TH		Starting of motors using 3 and 4 point starters
	5TH	1ST		Speed control of DC motor-applications
		3RD		3phase alternator – construction and working & relation between speed and frequency
		4TH		INTERNAL EXAM-2
NOVEMBER	2ND	1ST		3 phase Induction motor – construction – types – principle of operation
				methods of starting of 3 phase induction motor & slip
				Single phase induction motor principle of operation & Applications
		4TH		Capacitor start - motors principle of operation & Applications
				Stepper motor principle of operation & Applications
	3RD	1ST	UNIT-5	5. Transformers
				Transformer – Ideal transformer – principle of working – constructional details
				emf equation – turns ratio
				core loss – copper loss – efficiency – regulation
		3RD		SC and OC tests
				simple problems.
				Transformer on No load – Transformer on load
4TH		condition for maximum efficiency – All-day efficiency		
		simple problems		
		Auto transformer – construction and working – applications		

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