

18EEP17	ADVANCED ELECTRIC DRIVES			L	T	P	C
				3	0	0	3
Course objectives:							
1.	To know about the overview of Electrical drives.						
2.	To know about the Vector control strategies for AC motor drives.						
3.	To understand the concepts of various DSP based control.						
UNIT I	POWER CONVERTERS FOR AC DRIVES			9	+	0	
PWM control of inverter, selected harmonic elimination, space vector modulation, current control of VSI, three level inverter, Different topologies, SVM for 3 level inverter, Diode rectifier with boost chopper, PWM converter as line side rectifier, current fed inverters with self-commutated devices. Control of CSI, H bridge as a 4-Q drive.							
UNIT II	INDUCTION MOTOR DRIVES			9	+	0	
Different transformations and reference frame theory, modeling of induction machines, voltage fed inverter control-v/f control, vector control, direct torque and flux control(DTC).							
UNIT III	SYNCHRONOUS MOTOR DRIVES			9	+	0	
Modeling of synchronous machines, open loop v/f control, vector control, direct torque control, CSI fed synchronous motor drives.							
UNIT IV	PERMANENT MAGNET MOTOR AND SWITCHED RELUCTANCE MOTOR DRIVES			9	+	0	
Modeling of synchronous machines, open loop v/f control, vector control, direct torque control, CSI fed synchronous motor drives. Various topologies for SRM drives, comparison, Closed loop speed and torque control of SRM.							
UNIT V	DSP BASED MOTION CONTROL			9	+	0	
Use of DSPs in motion control, various DSPs available, realization of some basic blocks in DSP for implementation of DSP based motion control.							
Total (45+0)= 45 Periods							
Course Outcomes:							
Upon completion of this course, the students will be able to:							
CO1	:	Explain DSP based motion control.					
CO2	:	Understand the basics of Permanent magnet motor and Switched reluctance motor drives.					
CO3	:	Learn the concepts of Synchronous motor drives.					
CO4	:	Gain knowledge of Induction motor drives.					
CO5	:	Apply Power converters for AC drives.					
Text Books:							
1.	B. K. Bose, "Modern Power Electronics and AC Drives", Pearson Education, Asia, 2003.						
2.	P. C. Krause, O. Wasynczuk and S. D. Sudhoff, "Analysis of Electric Machinery and Drive Systems", John Wiley & Sons, 2013.						
Reference Books:							
1.	H. A. Taliyat and S. G. Campbell, " DSP based Electromechanical Motion Control" , CRC press, 2013.						
2.	R. Krishnan, "Permanent Magnet Synchronous and Brushless DC motor Drives", CRC Press, 2010,1 st edition.						
E-References							
1	https://nptel.ac.in/courses/						

CO/PO Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	1	1	3	2	2	1	1	1			1	1
CO2	3	3	3	3	3	1	1	1			1	1
CO3	1	3	3	3	3	1	1	1				
CO4	1	3	3	3	3	1	1	1				1
CO5	3	3	3	3	3	1	1	1			1	1