

18PEE11	ADVANCED MICROCONTROLLER BASED SYSTEM DESIGN	L	T	P	C
		3	0	0	3
Course Objectives:					
1.	To implement digital control for power electronic applications				
2.	To learn various DSP peripherals for proper implementations to power applications				
Unit I	INTRODUCTION TO DSPIC 30F DIGITAL SIGNAL CONTROLLER	9	+	0	
dsPIC 30F CPU Core – Programmers Model – CPU Registers – DSP Engine – Memory Organization – Data – Program – Flash and EEPROM Programming.					
Unit II	SYSTEM CONFIGURATION	9	+	0	
Oscillator Configuration – Power saving Modes - Various Resets – Device Configuration – Low Voltage Detect - I/O Ports					
Unit III	CONTROL PERIPHERALS	9	+	0	
Study, Configuration and control - Interrupt Structure – Timers – Capture and Compare – AD Converter– Introduction to IDE for dsPIC and Project development with simple C programming.					
Unit IV	MOTOR CONTROL PERIPHERALS	9	+	0	
Motor Control PWM – Different PWM modes – Dead Time – Output and Polarity Control – PWM Fault Pins – Quadrature Encoder Interface					
Unit V	APPLICATIONS	9	+	0	
Closed loop Control of Single and three Phase VSI, Sensored and Sensorless BLDC Motor Control – AC Induction Motor Control – Vector Control of AC Induction Motor - Servo Control of a DC-Brush Motor - Four Channel Digital Voltmeter with Display					
Total (L+T)= 45 Periods					
Course Outcomes:					
<i>Upon completion of this course, the students will be able to:</i>					
CO1	:	<i>Understand various DSP peripherals</i>			
CO2	:	<i>Understand the configurations of peripherals for appropriate power applications</i>			
CO3	:	<i>Write C coding for implementing controls using peripherals</i>			
CO4	:	<i>Implement interfacing techniques with DSC for control applications</i>			
CO5	:	<i>Understand and implement data acquisition and processing for control application and implement control techniques for power electronic applications</i>			
Reference Books:					
1.	dsPIC30FFamily Reference Manual, Datasheets.				
2.	Creed Huddleston, "Intelligent Sensor Design using Microchip dsPIC ", Newnes, 2007.				
3.	Zoran Milivojević, DjordjeŠaponjić, "Programming dsPIC (Digital SignalControllers) in C", MicroElectronika				

PO CO	CO Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	<i>Understand various DSP peripherals</i>	1	1	1	1	1		1	1	1	1	1
CO2	<i>Understand the configurations of peripherals for appropriate power applications</i>	1	1	1	1	1		1	1	1	1	1
CO3	<i>Write C coding for implementing controls using peripherals</i>	1	1	1	1	1		1	1	1	1	1
CO4	<i>Implement interfacing techniques with DSC for control applications</i>	1	1	1	1	1		1	1	1	1	1

CO5	<i>Understand and implement data acquisition and processing for control application and implement control techniques for power electronic applications</i>	1	1	1	1	1			1	1	1	1	1
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