GUJARAT TECHNOLOGICAL UNIVERSITY
POWER ELECTRONICS ENGINEERING
B. E. SEMESTER: VII

Subject Name: **Embedded Systems for Power Electronics (Department Elective-I)**
Subject Code: **172407**

Teaching Scheme				Evaluation Scheme			
Theory	Tutorial	Practical	Total	University Exam (E)		Mid Sem Exam (Theory) (M)	Practical (Internal)
				Theory	Practical		
4	0	2	6	70	30	30	20

Sr. No	Course Content	Total Hrs.
1.	**Introduction:** • Embedded Systems, Importance, Different micro-controllers used, Applications in Power Electronics.	4
2.	**Advanced Features of 8051:** • SPI, I^2C, Watch Dog Timer, Interfacing with RTC, Serial E^2PROM, E/A & SAR ADC, Concept of CAN Bus	10
3.	**Introduction to Advanced 8051 Architecture:** • Instruction Pipeline, 100 MHz 100 MIPS operation. • Generation of PWM through PCA. • MAC Unit, UART.	10
4.	**Programming CIP-51:** • Programming of General Purpose Input/Outputs • Programming of timers • Programming of PCA timer • Programming of on-chip ADC & DAC • Programming of UART	10

5.	**Embedded Software Architecture:** • Survey of software architecture • Round robin • Round robin with interrupts • Functional queue scheduling • Real time operating system	10
6.	**Real Time Operating System (RTOS):** • Introduction • Tasks & Task-States • Tasks & Data • Semaphores & Shared Data • Understanding importance and applications of RTOS in Power Electronics.	8

Text Books:

1. Embedded System Design using C8051, Han-Way Huang
2. An Embedded Software Primer, by David E. Simon

Reference Books:

1. Embedded C, Michael J Pont
2. 8051 Microcontroller and Embedded Systems, Mazidi & Mazidi
3. 8051/52 MCU Architecture, Assembly Language & H/W Interfacing, Creig Steiner
4. 8051 MCU An Application Based Introduction, Chris Braithwaite – Fred Cowan & Hassan Parchizadeh
5. PIC Microcontroller: An Introduction to Software & Hardware Interfacing, Han-Way Huang
6. Datasheet of P89V51xxx, P89C51xxx, C8051Fxxx (Si Labs CIP51 core), xC8xx series (Infineon)