GUJARAT TECHNOLOGICAL UNIVERSITY
COMPUTER ENGINEERING
B. E. SEMESTER: VII

Subject Name: **Embedded Technology (Department Elective -I)**
Subject Code: **170705**

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 Contents	Total Hrs
1.	**An overview of embedded systems:** Introduction to embedded systems, Categories and requirements of embedded systems, Challenges and issues related to embedded software development, Hardware/Software co-design, Introduction to IC technology, Introduction to design technology	07
2.	**Embedded Software development:** Concepts of concurrency, processes, threads, mutual exclusion and inter-process communication, Models and languages for embedded software, Synchronous approach to embedded system design, Scheduling paradigms, Scheduling algorithms, Introduction to RTOS, Basic design using RTOS	10
3.	**Embedded C Language:** Real time methods, Mixing C and Assembly, Standard I/O functions, Preprocessor directives, Study of C compilers and IDE, Programming the target device	09
4.	**Hardware for embedded systems:** Various interface standards, Various methods of interfacing, Parallel I/O interface, Blind counting synchronization and Gadfly Busy waiting, Parallel port interfacing with switches, keypads and display units, Memory and high speed interfacing, Interfacing of data acquisition systems, Interfacing of controllers, Serial communication interface, Implementation of above concepts using C language	10

5.	**Study of ATMEL RISC Processor:** Architecture, Memory, Reset and interrupt , functions, Parallel I/O ports, Timers/Counters, Serial communication, Analog interfaces, Implementation of above concepts using C language, Implementation of above concepts using C language	10
6.	**Case studies and Applications of embedded systems:** Applications to: Communication, Networking, Database, Process Control, Case Studies of: Digital Camera, Network Router, RTLinux	08

Text Books:

1. Raj Kamal, "Embedded Systems", TMH
2. David E. Simon, "An Embedded Software Primer ", Pearson Education
3. Muhammad Ali Mazidi and Janice Gillispie Mazidi, "The 8051Microcontroller and Embedded Systems", Pearson Education

Reference Books:

1. Frank Vahid, Tony Givargis, "Embedded System Design: A Unified Hardware/Software Introduction", John Wiley
2. Craig Hollabaugh, "Embedded Linux", Pearson Education
3. Daniel Lewis, "Fundamentals of Embedded Software", Pearson Education.
4. Barnett, Cox, O'Cull, "Embedded C Programming and the Atmel AVR ", Thomson Learning
5. Myke Predko, "Programming and Customizing the 8051 Microcontroller", TMH
6. Shibu, Introduction to Embedded Systems, McGrawHill.
7. Computers As Components, Wolf, Elsevier
8. Embedded System Design, Heath, Elsevier