K L University
Department of Electronics & Computer Engineering
M.Tech (Embedded Systems)

Course No. : **15-EM5101**
Course Title : **Micro Controllers for Embedded System Design**
Course Structure : **3-0-2**
Credits : **4**
SYLLABUS:

UNIT – I: Introduction to Embedded Systems

Overview of Embedded Systems, Processor Embedded into a system, Embedded Hardware Units and Devices in system, Embedded Software, Complex System Design, Design Process in Embedded System, Formalization of System Design, Classification of Embedded Systems.

UNIT – II: Microcontrollers and Processor Architecture & Interfacing

8051 Architecture. Real world interfacing, Introduction to advanced architectures, processor & memory organization, Instruction-level parallelism, and performance metrics.

UNIT – III: PIC Microcontroller Hardware

Introduction, Architectural overview, Memory organization, interrupts and reset, I/O ports, Timers

Unit – IV: Device Drivers & Interrupt service Mechanism

Programmed-I/O Busy-wait approach without ISM,ISR concept, Interrupt sources, Interrupt service mechanism, Multiple Interrupts, context and the periods for context switching, Interrupt latency and deadline, Classification of processors ISM from context-saving angle, Direct Memory Access, Device driver programming

UNIT – V: Devices &Communication Buses for Devices Network

IO Types and examples, Serial communication Devices, Parallel Device ports, Networked Embedded systems, Serial Bus communication protocols

Text Books:

1. Embedded Systems - Architecture Programming and Design – Raj Kamal, 2nd ed., 2008, TMH.
2. Embedded C Programming and the Microchip PIC-Richard Barnett, O" Cull, Cox, 2009, Cengage Learning.

Reference Books:

1. Embedded Microcomputer Systems, Real Time Interfacing – Jonathan W. Valvano – Brookes Cole, 1999, Thomas Learning

Project Based Lab: The students will do five basic experiments to gain the knowledge and hands on experience with IDE's and Simulators of basic CISC and RISC microcontrollers and the Develop an application using this knowledge.