**13EC4104-MICRO CONTROLLERS AND EMBEDDED SYSTEMS**

**(ECE)**

**Lectures/Week:4Hrs. Sessional Marks:40**

**Univ. Exam. Duration:3Hrs Univ Exam.Marks:60**

**UNIT-I**

8051 Microcontroller – Architecture, pin description, Register set, Instruction set. Interrupt structure, timer and serial port operations, Memory and I/O interfacing Simple Assembly language programs.

**UNIT-II**

 Introduction to PIC microcontrollers, Architecture and pipelining, program memory considerations, Addressing modes, CPU registers, Instruction set, simple operations.

**UNIT-III**

Introduction to embedded systems, classification, processors, hardware units, software embedded into systems, applications and products of embedded systems.

**UNIT-IV**

Embedded system design: Processor Selection, Hardware and Software Requirements, Hardware/Software Partitioning, co-design issues

Embedded Software Development Tools: Host and Target Machines, Linkers/Locators for embedded software

**UNIT-V**

Real Time Operating Systems: Architecture of kernel, tasks and task scheduler, Interrupt Service Routine, Semaphores, Mutex, Mail boxes, Message queues, event registers, pipes, signals, timers, memory management, priority inversion problem

**TEXT BOOKS**:

1. The 8051 MICRO-CONTROLLERS, Kenneth J Ayala, 3rd edition, Thomson Publications
2. Design with PIC Micro-controllers by John B Peatman, Pearson Educations.
3. Raj Kamal, Embedded Systems- Architecture , programming and design, 2nd Edition, TMH, 2008.
4. “Embedded systems” (Black Book) by KVKK Prasad

**REFERENCES**:

1. An embedded software primer, Simon D E, Pearson Education, 1999.
2. Specifications and Design of Embedded systems, David D Gajski, Frandk Vahid, S. Narayan, J Garg.