EE 517: PROGRAMMABLE & EMBEDDED SYSTEMS (3-0-0: 3)

PIC18F/ dsPIC33F Microcontroller

Architecture – memory organization – addressing modes – instruction set – PIC programming in Assembly & C –I/O port, Data Conversion, RAM & ROM Allocation, Timer programming, Communication programming , MPLAB.

Definition of Embedded System, Embedded Systems Vs General Computing Systems, Core of the Embedded System: General Purpose and Domain Specific Processors, ASICs, etc.

Embedded Firmware

Reset Circuit, Brown-out Protection Circuit, Oscillator Unit, Real Time Clock, Watchdog Timer, Embedded Firmware Design Approaches and Development Languages.

Embedded system implementation on FPGA Details study about FPGA, Filter implementation using FPGA, Object detection using FPGA.

Product specification and case studies – Serial/Parallel Communication, Hardware / Software partitioning – Detailed hardware and software design – Integration.

Text Books & References

1. Muhammad Ali Mazidi, Rolin D Mckinlay, Danny Causey, “PIC Microcontroller and Embedded Systems using Assembly and C for PIC18”, Pearson Education.
2. Myke Predko, “Programming and Customizing the 8051 Microcontroller”, Tata McGraw Hill.
3. Qing Li, “Real Time Concepts for Embedded Systems”, Elsevier.
4. Rajkama, “Embedded Systems- Architecture, Programming and Design”, TMH.