

EMBEDDED SYSTEM CONCEPTS (EC505)

Objective of the Course : The embedded system concepts will give the basic knowledge of embedded design and system on chip, its interrupt handling and writing the device drivers for the system

UNIT - I

An Introduction to Embedded Systems: An Embedded system, processor in the system, other hardware units, software embedded into a system, Exemplary embedded systems, embedded system – on – chip (SOC) and in VLSI circuit. Processor and memory organization – Structural Units in a Processor, Processor selection for an embedded system, memory devices, memory selection for embedded systems, allocation of memory to program cache and memory management links, segments and blocks and memory map of a system, DMA, interfacing processors, memories and Input Output Devices.

UNIT - II

Devices and Buses for Device Networks: I/O devices, timer and counting devices, serial communication using the “P C” CAN, profibus, foundation field bus, and advanced I/O buses between the network multiple devices, host systems or computer parallel communication between the networked I/O multiple devices using the ISA, PCI, PCI-X and advanced buses.

UNIT - III

Device Drivers and Interrupts Servicing Mechanism: Device drivers, parallel port and serial port device drivers in a system, device drivers for internal programmable timing devices, interrupt servicing mechanism.

UNIT - IV

Programming Concepts and Embedded Programming in C, C++, VC++ and JAVA: Inter-process communication and synchronization of processes, task and threads, multiple processes in an application, problem of sharing data by multiple tasks and routines, inter-process communication.

UNIT - V

Hardware - Software Co-Design: Embedded system project management, embedded system design and co-design issues in system development process, design cycle in the development phase for an embedded system, use of target systems, use of software tools for development of an embedded system, use of scopes and logic analysis for system, hardware tests. Issues in Embedded system design.

Text books:

1. Arnold S Burger, Embedded system design, CMP
2. David Simon, An embedded software primer, PEA

Reference Books :

1. Butter worth Heinemann, Steve Heath; “Embedded systems design: Real world design”, Newton mass, USA 2002
2. Hayt; “Data communications”.