

EMBEDDED NETWORKING

UNIT-I: Embedded Communication Protocols:

Embedded Networking: Introduction – Serial/Parallel Communication – Serial communication protocols -RS232 standard – RS485 – Synchronous Serial Protocols -Serial Peripheral Interface (SPI) – Inter Integrated Circuits (I2C) – PC Parallel port programming - ISA/PCI Bus protocols –Firewire.

UNIT-II: USB and CAN Bus:

USB bus-Introduction – Speed Identification on the bus – USB States – USB bus communication: Packets –Data flow types –Enumeration –Descriptors –PIC 18 Microcontroller USB Interface – C Programs –CAN Bus – Introduction - Frames –Bit stuffing –Types of errors – Nominal Bit Timing – PIC microcontroller CAN Interface –A simple application withCAN.

UNIT-III: Ethernet Basics:

Elements of a network – Inside Ethernet – Building a Network: Hardware options – Cables, Connections and network speed – Design choices: Selecting components –Ethernet Controllers – Using the internet in local and internet communications – Inside the Internet protocol.

UNIT-IV: Embedded Ethernet:

Exchanging messages using UDP and TCP – Serving web pages with Dynamic Data – Serving web pages that respond to user Input – Email for Embedded Systems – Using FTP – Keeping Devices and Network secure.

UNIT-V: Wireless Embedded Networking:

Wireless sensor networks – Introduction – Applications – Network Topology – Localization – Time Synchronization - Energy efficient MAC protocols –SMAC – Energy efficient and robust routing – Data Centric routing.

TEXT BOOKS:

1. Embedded Systems Design: A Unified Hardware/Software Introduction - Frank Vahid, Tony Givargis, John & Wiley Publications,2002
2. Parallel Port Complete: Programming, interfacing and using the PCs parallel printer port -Jan Axelson, Penram Publications,1996.

REFERENCE BOOKS:

1. Advanced PIC microcontroller projects in C: from USB to RTOS with the PIC18F series- Dogan Ibrahim, Elsevier2008.
2. Embedded Ethernet and Internet Complete - Jan Axelson, Penram publications,2003.
3. Networking Wireless Sensors – Bhaskar Krishnam achari, Cambridge press2005.