

Embedded Distributed System

Session 1: Introduction of Embedded System

1. Princeton (Von Neumann) and Harvard Architecture.
2. CISC and RISC architecture, General-purpose processor, microcontroller.
3. Embedded processor, Digital Signal processor, Application specific processor.
4. Super scalar, VLIW, pipelined Architecture.
5. Definition of Embedded System, classification of embedded system, skills required for an Embedded System Designer.
6. Trends in embedded system various examples of an embedded system.
7. Challenges to design embedded system, embedded system development design methodology.

Session 2: Hardware Units of System

1. Hardware units required to design embedded system like power source.
2. Clock oscillator circuit, Real time clock and timer, reset circuit.
3. Watchdog timer, memories, interrupts.
4. DAC and ADC, LCD and LED display.
5. PWM, Keypad/keyboard, pulse dialer, modem and transceiver.

Session 3: Embedded Software

1. Embedded Software: Development tools for embedded software, Assemblers, Compilers, Editor, and Interpreter.
2. Cross Assembler, Simulator, Emulator, Locator, Linker, Profiler.
3. Coding strategies for obtaining optimized time and space requirements.
4. Debugging Embedded Software, Software in high level language.
5. Coding of software in machine language, Software for Device drivers and device management.

Session 4: Introduction to Real Time Operating System

1. Introduction to Real Time Operating System, comparison of RTOS with O.S.
2. Tasks and Task States, Task and Data.
3. Semaphores and Share data, Interrupt, Interrupt handler, Share data problem.
4. Messages, Queue, Mailboxes and pipe.
5. Introduction to U-COS II Real time operating system, main features of UCOS-II.

Session 5: Embedded Communication System

1. Embedded Communication System: Standard for Embedded Communication.
2. USART, SPI, I2C, CAN, USB, Firewire.
3. Ethernet, Wireless communication like IRDA.
4. Bluetooth, 802.11, PCI Bus, SoC, IP Core, Case Study of Digital camera.

Book References

1. Frank Vahid & Tony Givargis “Embedded System Design” John Wiley & Sons.
2. Dr. Rajkamal “Embedded System” TMH.
3. David E.Simon “An Embedded Software Primer”Addison Wesley Longman Publication.
4. Prasad..K.V.K.K.:“Embedded/Real Time System Concept & Design Black Book” Wiley Dreamtech Publication.