

1. Introduction 9

Challenges of Embedded Systems – fundamental components – examples of embedded systems – hardware fundamentals – gates – timing diagrams – memory – direct memory access – buses – interrupts – schematics – build process of embedded systems.

2. Memory Management and Interrupts 9

Memory access procedure – types of memory – memory management methods – Pointer related issues – polling versus interrupts – types of interrupts – interrupt latency – re-entrancy – interrupt priority – programmable interrupt controllers – interrupt service routines.

3. Real-time Operating Systems – RTOS 9

Desktop Operating Systems versus RTOS – need for Board Support Packages – task management – race conditions – priority inversion – scheduling – inter task communication – timers – semaphores – queues.

4. Embedded System Design and Implementation 9

Requirements of an embedded system – architecture styles and patterns – design practices – implementation aspects and choices.

5. Embedded Software Development tools 9

Host and target machines – cross compilers – linker and locators for embedded software – address resolution – locating program components – initialized data and constant strings – PROM programmers – ROM emulators – Flash memory.

TOTAL = 45

Text Books:

1. Sriram V. Iyer, Pankaj Gupta, “Embedded Real-time Systems Programming”, Tata McGraw Hill, 2004.
2. David E. Simon, ”An Embedded Software Primer”, Pearson Education, 1999.

References:

1. Embedded Systems – Raj Kamal.
2. Frank Vahid and Tony Givargis, “Embedded System Design – A unified Hardware/Software Introduction”, John Wiley & Sons, 2002.