Course No: MCA-5EL5
Course Title : Design & Development of Embedded Systems

Unit I
Introduction to Embedded Systems(ES), their examples and applications.
Concept, Definition and Classification. Advanced hardware fundamentals.
Criteria for Processor and Memory Selection for ES.

Unit II
Interrupts- Basics, Shared-Data Issues, Latency. ES software architectures.
Round-Robin with interrupts; Function-Queue scheduling. Issues of context,
latency and deadline.

Unit III
Introduction to Real-Time Operating Systems(RTOS). Tasks, TaskStates,
Semaphores and Shared Data. Use of OS services e.g. Timer functions,
Message Queues, Events, Pipes and ISRs.

Unit IV
Discussion of basic design using RTOS and examples.Hard Real-Time
scheduling considerations.Memory and power conservation. Embedded Software
Development tools: Host/Target machines, Linker/Re-Locator, Debugging
Techniques.
Case study of Programming (at least one) industry-standard RTOS e.g. Micro-
C/OS , VxWorks, (Embedded) Linux. Detailed study of its services and use of its
API.

References Books:
David Simon, "An Embedded Software Primer", Pearson (Asia).
Raj Kamal, "Embedded Systems – Architecture, Programming & Design", TMH.
Qing Li, "Real-Time Concepts for Embedded Systems", CMP.
Arnold Berger, "Embedded Systems Design – An Introduction to Processes,
Tools & Techniques", CMP.