BC 307 EMBEDDED SYSTEMS

Course Description and Objectives :
The course emphasis on Comprehensive treatment of Embedded Hardware and Real Time Operating systems along with case studies in tune with the requirements of Industry. The example-driven approach will put students on a fast track to understanding embedded-system programming and applying what they learn to their projects.

Course Outcomes: After Completion of the subject student should able to
- Describe the differences between the general computing system and the embedded system, also recognize the classification of embedded systems..
- Become aware of the architecture of the processor and its programming aspects (assembly Level)
- Become aware of interrupts, hyper threading and software optimization.
- Design real time embedded systems using the concepts of RTOS.

UNIT-1

Introduction to Embedded Systems :
Applications of ES, Embedded Hardware Units and Devices, Embedded Software, Examples of Embedded Systems, Design Metrics in ES, Challenges in ES Design.

UNIT-2

Introduction to 8051 :
8051 Micro controller Hardware, Input/Output Ports and Circuits, External Memory, Counter and Timers, Serial data Input/Output, Interrupts.

UNIT-3

Data Transfer and Logical Instructions :
Arithmetic Operations, Decimal Arithmetic. Jump and Call Instructions, Further Details on Interrupts.

UNIT-4

Introduction to Real Time Operating Systems :
Tasks and Task States, Tasks and Data, Semaphores, and Shared Data; Message Queues, Mailboxes and Pipes, Timer Functions, Events, Memory Management, Interrupt Routines in an RTOS Environment.

UNIT-5

Principles Basic Design :
Using a Real-Time Operating System: Embedded Software Development Tools: Host and Target machines, Linker/Locators for Embedded Software, Getting Embedded Software into the Target System

TEXT BOOKS:
1. Raj Kamal, "Embedded Systems", 2nd ed., TMH, 2009. (Unit - I)
2. Kenneth J. Ayala, Thomson, "The 8051 Microcontroller", 3rd ed., 2008. (Unit - II, III)
3. David E. Simon, "An Embedded Software Primer", 1st ed., Pearson Education, 2008
   (Unit -IV, V)

REFERENCE BOOKS :
1. Wayne Wolf, "Computers as Components-principles of Embedded Computer system Design", 1st ed.,Elseveir, 2009.
2. Labrosse "Embedding system building blocks", 2nd ed., CMP Publishers, 2007.