



STANLEY
COLLEGE OF ENGINEERING & TECHNOLOGY FOR WOMEN
(Approved by AICTE , New Delhi | Affiliated to Osmania University ,Hyderabad)
Address : Chapel Road, Abids ,Hyderabad

CS 404

PRINCIPLES AND APPLICATIONS OF EMBEDDED SYSTEMS

UNIT I

Embedded Computing: Introduction, Complex Systems and Microprocessor; Embedded System Design Process, Formalisms for System Design, Design Examples, The 8051 Architecture: Introduction, 8051 Micro Controller Hardware, Input/Output Ports and Circuits, External Memory, Counter and Timers, Serial data Input/Output, interrupts.

UNIT II

Basic Assembly Language Programming Concepts: Assembly Language Programming Process, Programming Tools and Techniques, Programming the 8051, Data Transfer and Logical Instructions.

Arithmetic Operations, Decimal Arithmetic, Jump and Call Instructions, Further Details on Interrupts.

UNIT III

Applications: Interfacing with Keyboards, Displays, D/A and NO Conversions, Multiple Interrupts, Serial Data Communication, Introduction to Real-Time Operating Systems: Tasks and Task States, Tasks and Data, Semaphores, Shared Data, Message Queues, Mailboxes and Pipes, Timer Functions, Events, Memory Management, Interrupt Routines in an RTOS Environment.

UNIT IV

Basic Design Using a Real-Time Operating System:

Principles, Semaphores and

Queues, Hard Real-Time Scheduling Considerations, Saving Memory and Power, An example RTOS like UC-OS(Open Source).

Embedded Software Development Tools:

Host and Target machines, Linker/Locators for Embedded Software, Getting Embedded Software into the Target System, Debugging Techniques: Testing on Host Machine, Using Laboratory Tools, An Example System.

UNIT V

Introduction to advanced architectures: ARM and SHARC, Processor and memory

organization and Instruction level parallelism, Net advanced embedded Systems, Design Examples-Elevator Controller.

Suggested Reading:

1. Computers and Components, Wayne Wolt Elsevier.
2. The 8051 Microcontroller; Third Edition, Kenneth J. Ayala, Thomson.
3. An Embedded Software Primer, David E. Simor, Pearson Education
4. Embedding System building blocks, Labrosse, via CMP Publishers.
5. Embedded Systems, Raj Kamal, Tata McGraw Hill.

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