

EMBEDDED RTOS DEV.

CODE: (EMBD-4M)

1. EMBEDDED SYSTEM DEVELOPMENT

- a. HARVARD /SUPER HARVARD ARCH/ VON NEUMANN
- b. TYPES OF MICRO-CONTROLLERS
- c. RISC VS CISC
- d. MEMORY HIERARCHY
- e. 8 BIT MICROCONTROLLERS

2. INTEL 8051

- a. ARCHITECTURE
- b. INSTRUCTION SET, PIN DIAGRAM
- c. MEMORY (RAM, ROM), STACK
- d. SFR'S, FLAGS, ADDRESSING MODES
- e. TIMERS, CLOCKS
- f. INTERRUPTS, ISR
- g. INTERFACING WITH KEYBOARD, STEPPER MOTOR, ADC/DAC,LCD
- h. 7-SEGMENT DISPLAY, RTC, RELAYS, SERIAL COMMUNICATION

3. KEIL (DEVELOPMENT TOOL)

- a. DISCUSSION ON DIFFERENT MEMORY MODULES
- b. POINTERS & EXTENSIONS IN C51, ABSOLUTE VARIABLE DECLARATIONS
- c. STORAGE CLASSES & ITS IMPORTANCE IN EMBEDDED SYSTEMS
- d. FUNCTIONS AND EXTENSIONS IN C51, DISCUSSION ON
- e. RE-ENTRANCY, INTERRUPTS & IMPORTANCE OF GLOBAL VARIABLES
- f. USAGE OF BIT WISE OPERATORS IN EMBEDDED SYSTEMS

4. EMBEDDED C

- a. INTRODUCTION TO EMBEDDED C
- b. COMPILATION PROCESS, DESIGN APPROACH
- c. DATA TYPES, VARIABLES, LOOPS, NESTED LOOPS
- d. FUNCTIONS, ARRAYS
- e. STRUCTURE, UNIONS, TYPEDEF, ENUMS
- f. POINTERS, STRING OPERATION
- g. WORKING ON BITS MANIPULATIONS
- h. ADVANCED USE OF THE PREPROCESSOR
- i. DATA STRUCTURE

 LINKED LIST

5. INTRODUCTION TO RTOS

- a. RTOS BASICS
- b. RTOS VS. GENERAL PURPOSE OPERATING SYSTEM
- c. TYPES OF KERNELS
- d. TYPE OF RTOS
 - i. HARD RTOS
 - ii. SOFT RTOS

6. TORNADO IDE-2.0

- a. ARCHITECTURE
- b. WIND SHELL
- c. TARGET SERVER
- d. VX-SIM
- e. WIND-DEBUG

7. VXWORKS5.4 ARCHITECTURE

8. TASK MANAGEMENT IN VXWORKS

9. CPU SCHEDULING

- a. ROUND ROBIN
- b. RR WITH KERNEL TIME SLICE
- c. PRIORITY BASED PRE-EMPTIVE

10. PRIORITY INVERSION

11. DELETION SAFETY

12. WATCHDOG TIMERS

13. MULTI TASKING

14. INTER TASK COMMUNICATION ON VXWORKS

- a. SEMAPHORE
- b. SHARED MEMORY
- c. MESSAGE QUEUES

15. SOCKET PROGRAMMING

16. TARGET DEVICE BRINGING-UP ACTIVITY

- a. PREPARING TARGET DEVICE
- b. BOOTING UP TARGET DEVICE
- c. ATTACHING TARGET DEVICE

17. PORTING APPLICATION ON TARGET DEVICE

18. REMOTE DEBUGGING

19. KERNEL CUSTOMIZATION AND PORTING

20. INTRODUCTION TO BSP DEVELOPMENT

21. INTRODUCTION TO NANO KERNEL