EMBEDDED DEVICE DRIVER DEV.

CODE: (EMBD-6M)

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
i.

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 THE DEVICE DRIVER

a. EVOLUTION OF LINUX
b. ROLE OF DEVICE DRIVER
c. INTRODUCTION TO DIFFERENT KERNEL MODULE – PEEK INSIDE THE KERNEL
d. TYPE OF DEVICES AND KERNEL MODULE
e. KERNEL MODULES DEVELOPMENT V/S APPLICATION DEVELOPMENT.
f. USER SPACE DRIVER V/S KERNEL SPACE DRIVER.
g. COMPILING AND LOADING MODULES
h. BACKWARD COMPATIBILITY AND VERSION DEPENDENCY.
i. COMPILING AND LOADING FOR MULTI-PROCESSOR SYSTEM

6. CHARACTER DRIVERS

a. CHARACTER DRIVER BASICS
b. MAJOR AND MINOR NUMBER ALLOCATION
c. FILE OPERATION FOR CHARACTER DEVICES
d. RACE CONDITION AND MODULE USAGE COUNT

e. ENHANCED CHARACTER DRIVER OPERATIONS
f. MEMORY MANAGEMENT
g. IO MEMORY AND IO PORTS
h. USING IO PORTS AND IO MEMORY
i. SAMPLE CHARACTER DRIVER FOR PARALLEL PORT.

7. INTERRUPT HANDLING

a. INSTALLING THE HANDLER
b. IMPLEMENTING THE HANDLER
c. TASKLETS AND BOTTOM HALVES
d. INTERRUPT SHARING.

8. SERIAL PORT DRIVERS

a. ARCHITECTURE
b. UART DRIVER DEVELOPMENT
c. TTY DRIVERS DEVELOPMENT

9. INPUT DRIVERS

a. INPUT EVENT DRIVER
b. INPUT DEVICE DRIVER
c. DEBUGGING AND LOGS MANAGEMENT

10. DEVICE DRIVERS IN USER SPACE

a. PROCESS SCHEDULING AND RESPONSE TIME
b. ACCESSING IO REGIONS
c. ACCESSING MEMORY REGIONS
d. USER MODE PARALLEL PORT AND SERIAL PORT DRIVERS
e. ADVANTAGES AND DISADVANTAGES OF USER SPACE DRIVERS

11. BLOCK DRIVERS

a. INTRODUCTION TO BLOCK DRIVERS
b. STORAGE TECHNOLOGIES
c. REGISTERING AND LOADING BLOCK DRIVERS
d. HANDLING REQUEST
e. LINUX BLOCK IO LAYER
f. BLOCK DRIVER AND DATA STRUCTURES
g. DEVICE EXAMPLE – SIMPLE STORAGE CONTROLLER
h. HOW MOUNTING AND UN-MOUNTING WORKS
i. THE IOCTLS() METHOD

12. MEMORY TECHNOLOGY DEVICES (MTD)

a. FLASH MEMORY
b. LINUX MTD SYSTEM
c. MAP DRIVERS
d. NOR CHIP DRIVER
e. NAND CHIP DRIVER
f. USER MODULES
g. MTD UTILITIES
h. CONFIGURATION OF MTD DEVICES