AME21 EMBEDDED SYSTEMS

UNIT-1 INTRODUCTION TO EMBEDDED SYSTEMS

1.1 Introduction to Embedded Systems, Structural units in Embedded processor,
1.2 Selection of processor & memory devices, DMA
1.3 Memory management methods, Timer and Counting devices,
1.4 Watchdog Timer, Real Time Clock, in circuit emulator, Target Hardware Debugging.

UNIT-2 EMBEDDED NETWORKING

2.1 Embedded Networking: Introduction, I/O Device Ports & Buses,
2.2 Serial Bus communication protocols RS232 standard, RS422, RS 485
2.3 CAN Bus, Serial Peripheral Interface (SPI), Inter Integrated Circuits (I2C),
2.4 Need for device drivers.

UNIT-3 EMBEDDED FIRMWARE DEVELOPMENT ENVIRONMENT

3.1 Embedded Product Development Life Cycle- objectives, different phases of EDLC,
3.2 Modelling of EDLC; issues in Hardware-software Co-design,
3.3 Data Flow Graph, state machine model, Sequential Program Model, concurrent Model, object oriented Model.

UNIT-4 RTOS BASED EMBEDDED SYSTEM DESIGN

4.1 Introduction to basic concepts of RTOS- Task, process & threads, interrupt routines in RTOS,
4.2 Multiprocessing and Multitasking, Preemptive and non-preemptive scheduling,
4.3 Task communication shared memory, message passing,
4.4 Inter process Communication, synchronization between processes-semaphores,
4.5 Mailbox, pipes, priority inversion, priority inheritance.

UNIT-5 EMBEDDED SYSTEM APPLICATION AND DEVELOPMENT

5.1 Case Study of Washing Machine- Automotive Application-
5.2 Smart card System Application-ATM machine –Digital camera

Reference Books:

1. Raj Kamal, 'Embedded System-Architecture, Programming, Design', Mc Graw Hill, 2013.
2. C.R.Sarma, "Embedded Systems Engineering", University Press (India) Pvt. Ltd, 2013.
3. Tammy Noergaard, "Embedded Systems Architecture", Elsevier, 2006