

AMEI-17 EMBEDDED SYSTEMS

UNIT-1 INTRODUCTION TO EMBEDDED SYSTEMS

- 1.1 Introduction to Embedded Systems,
- 1.2 Structural units in Embedded processor,
- 1.3 Selection of processor & memory devices, DMA
- 1.4 Memory management methods, Timer and Counting devices,
- 1.5 Watchdog Timer, Real Time Clock, in circuit emulator,
- 1.6 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),
- 2.4 Inter Integrated Circuits (I2C),
- 2.5 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,
- 3.4 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,
- 4.2 Interrupt routines in RTOS,
- 4.3 Multiprocessing and Multitasking,
- 4.4 Preemptive and non-preemptive scheduling,
- 4.5 Task communication shared memory, message passing,
- 4.6 Inter process Communication,
- 4.7 Synchronization between processes-semaphores,
- 4.8 Mailbox, pipes, priority inversion, priority inheritance.

UNIT-5 EMBEDDED SYSTEM APPLICATION AND DEVELOPMENT

- 5.1 Case Study of Washing Machine,
- 5.2 Automotive Application
- 5.3 Smart card System Application,
- 5.4 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