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III Year II Semester				
Code: 17EC633	**3**	**1**	**0**	**3**

EMBEDDED SYSTEMS
(Dept. Elective-II)

UNIT-I INTRODUCTION: Embedded system-Definition, history of embedded systems, classification of embedded systems, major application areas of embedded systems, purpose of embedded systems, the typical embedded system-core of the embedded system, General purpose and Domain specific Processors, RISC Vs CISC Processors, Harvard and Von- Neumann Processors, Big Endian Vs Little Endian Processors, Memory – ROM,RAM. Quality attributes of embedded systems, Application-specific and Domain-Specific examples of an embedded system.

UNIT-II EMBEDDED HARDWARE DESIGN: Sensors and Actuators, I/O types and examples- LED, 7 segment, optocoupler, stepper Motor, Relay, Piezo Buzzer, Push button switch, Keypad; Communication Interface- I2C, SPI, 1- wire Interface, Parallel Interface, External communication interfaces – RS232, RS485, Wireless- IrDA, Bluetooth, Wifi, Zigbee; Other System Components - Reset Circuit, Brownout Protection, Oscillator circuit, Real time clock, Watchdog timer.

UNIT-III EMBEDDED FIRMWARE DESIGN: Embedded Firmware design approaches, Embedded Firmware development languages, ISR concept, Interrupt sources, Interrupt servicing mechanism, Concepts of C versus Embedded C and Compiler versus Cross-compiler.

UNIT-IV REAL TIME OPERATING SYSTEM: Operating system basics, Types of operating systems, Tasks, Process and Threads, Multiprocessing and Multitasking, Task Scheduling, Threads, Processes and Scheduling, Task communication, Task synchronization, Device Drivers.

UNIT-V EMBEDDED SYSTEM DEVELOPMENT: The integrated development environment, Types of files generated on cross-compilation, Disassembler/Decompiler, Simulators, Emulators and Debugging, Target hardware debugging, Boundary Scan, Embedded Software development process and tools.

UNIT-VI EMBEDDED SYSTEM IMPLEMENTATION AND TESTING: The main software utility tool, CAD and the hardware, Translation tools-Pre-processors, Interpreters, Compilers and Linkers, Debugging tools, Quality assurance and testing of the design, Testing on host machine, Simulators, Laboratory Tools.

Text Books:

1. Embedded Systems Architecture-By Tammy Noergaard, Elsevier Publications,2013.
2. Embedded Systems-By Shibu. K.V-Tata McGraw Hill Education Private Limited,2013.

References:

1. Embedded System Design, Frank Vahid, Tony Givargis, John Wiley Publications, 2013.
2. Embedded Systems-Lyla B.Das-Pearson Publications,2013.