

3/4 B.Tech - SECOND SEMESTER

IT6T5FE2**EMBEDDED SYSTEM DESIGN****Credits: 3****Lecture: 3 Periods/week****Internal assessment: 30 marks****Practice/Interaction: 1Period/week****Semester end examination: 70 marks****Objectives:**

- To provide the basic concepts of Embedded System.
- To introduce 8051 microcontroller programming concepts and System design for Hardware and software point of view.
- To introduce Real Time Operating System concepts for coding the embedded system software routines.
- To demonstrate tools and methodologies needed for embedded system design.

Outcomes:

Students will be able to

- Understand the basics of Embedded system.
- Understand the basic architecture of 8051 micro controller.
- Develop 8051 microcontroller programming.
- Understand the concepts of Real Time Operating Systems.
- Gain knowledge on various Embedded software development tools.

Prerequisite:

Microprocessors and Micro Controllers.

Syllabus:**UNIT -I**

Embedded Systems Basics: Introduction to Embedded systems, Examples of embedded systems, Typical Hardware, Gates, Timing Diagrams, Memory, Microprocessors, Buses, Direct Memory Access, Microprocessor Architecture, Interrupt Basics.

UNIT -II

The 8051 Architecture : Introduction, 8051 Micro controller Hardware, Input/output Pin Ports and Circuits, External Memory, Serial data Input/output, Interrupts.

UNIT- III

Basic Assembly Language Programming Concepts: The Assembly Language Programming Process, Programming Tools and Techniques, Programming with 8051.

Moving Data: Introduction, Addressing Modes, External Data Moves, Code Memory Read-Only Data Moves, Push and Pop Opcodes, Data Exchanges.

UNIT- IV

Introduction to Real – Time Operating Systems: Tasks and Task States, Tasks and Data, semaphores, and Shared Data, Message Queues, Mailboxes and Pipes, Timer Functions, Events, Memory Management, Interrupt Routines in an RTOS Environment.

UNIT- V

Embedded Software Development Tools: Host and Target machines, Linker/Locators for Embedded Software, Getting Embedded Software into the Target System, Debugging Techniques: Testing on Host Machine, Using Laboratory Tools, An Example System.

Text Books:

1. An Embedded Software Primer- David E. Simon, Pearson Education.
2. The 8051 Microcontroller- Third Edition, Kenneth J.Ayala, Thomson.

Reference Books:

1. 8051 Microcontrollers, Satish Shah, Oxford Higher Education.
2. Embedded Microcomputer Systems Real Time Interfacing, Jonathan W.Valvano, Cengage Learning.
3. Micro Controllers, Ajay V Deshmukhi, TMH.
4. Embedded System Design, Frank Vahid, Tony Givargis, John Wiley.
5. Microcontrollers, Raj kamal, Pearson Education.

e- Learning Resources:

1. <http://www.jntuk-coeerd.in/>
2. <http://elearning.vtu.ac.in/06ITBM52.html>
3. <http://nptel.ac.in/video.php?subjectId=108102045>
4. <https://docs.google.com/file/d/0B0DfyDcYZ0AbU3VkOVZoV21nNzg/edit>