

**I Year I Semester**  
**Code: 17ES104**

**L P C**  
**4 0 3**

## **EMBEDDED-C**

### **UNIT-I: Programming Embedded Systems in C**

Introduction, What is an embedded system, Which processor should you use, Which programming language should you use, Which operating system should you use, How do you develop embedded software, Conclusions

### **Introducing the 8051 Microcontroller Family**

Introduction, what's in a name, The external interface of the Standard 8051, Reset requirements,  
Clock frequency and performance, Memory issues, I/O pins, Timers, Interrupts, Serial interface, Power consumption, Conclusions

### **UNIT-II: Reading Switches**

Introduction, Basic techniques for reading from port pins, Example: Reading and writing bytes, Example: Reading and writing bits (simple version), Example: Reading and writing bits (generic version), The need for pull-up resistors, Dealing with switch bounce, Example: Reading switch inputs (basic code), Example: Counting goats, Conclusions

### **UNIT-III: Adding Structure to the Code**

Introduction, Object-oriented programming with C, The Project Header (MAIN.H), The Port Header (PORT.H), Example: Restructuring the "Hello Embedded World" example, Example: Restructuring the goat-counting example, Further examples, Conclusions

### **UNIT-IV: Meeting Real-Time Constraints**

Introduction, Creating „hardware delays“ using Timer 0 and Timer 1, Example: Generating a precise 50ms delay, Example: Creating a portable hardware delay, Why not use Timer 2? .The need for "timeout" mechanisms, Creating loop timeouts, Example: Testing loop timeouts, Example: A more reliable switch interface, Creating hardware timeouts, Example: Testing a hardware timeout, Conclusions

UNIT-V:Case Study-Intruder Alarm System Introduction, The software architecture, Key software components used in this example, running the program, the software, Conclusions

### **TEXT BOOKS:**

1. Embedded C - Michael J. Pont, 2<sup>nd</sup> Ed., Pearson Education,2008.

### **REFERENCE BOOKS:**

1. PICMCU C-An introduction to programming, The Microchip PIC in CCS C - Nigel Gardner.