

M.TECH FIRST SEMESTER EMBEDDED SYSTEMS

17EEPC1T5C

Lecture: 4 periods/week

Credits: 4

Internal Assessment: 40 marks

End Semester Assessment: 60 marks

Course Objective:

Study the internal structure and operation of ARM Processor, basic structure of Embedded Systems and real time applications.

Course Learning Outcomes: At the end of the course the student will be able to

1. Describe the embedded system, also recognize the classification of embedded systems.
2. Become aware of the architecture of the ARM Processor.
3. Write programming aspects of ARM processor.
4. Analyze various case studies of embedded systems.

UNIT I: INTRODUCTION TO EMBEDDED SYSTEMS

History of Embedded Systems, Major Application Areas of Embedded Systems, Purpose of Embedded Systems, Core of the Embedded System, Sensors and Actuators, serial port devices, parallel port devices, interrupt sources.

UNIT II: ARM PROCESSORS

History of ARM, ARM Architecture, Addressing modes, Instruction sets, ARM Thumb instruction sets.

UNIT III: EFFICIENT C PROGRAMMING

Overview of C Compilers and Optimization, Basic C data types, C Looping Structures, Register Allocation, Function Calls, Pointer Aliasing, Structure arrangement.

UNIT IV: CASE STUDIES

Microprocessor based Numerical Protective relays – Overcurrent Relay, Directional Relay
Microprocessor Implementation of Digital Distance Relaying Algorithms.

TEXT BOOKS:

1. Andrew N. Sloss, Dominic Symes and Chris Wright, ARM System Developer's Guide – Designing and Optimizing System Software, Elsevier
2. Shibu KV, Introduction to Embedded System, Tata Mc-Graw Hill Education Private Limited.

REFERENCE BOOKS:

1. Steve Furber, ARM System-on-chip Architecture, Pearson Education.
2. Raj Kamal, Embedded Systems Architecture, Programming and Design, Second Edition, McGrawHill Companies.
3. Badri Ram, D N Viswakarma, Power System Protection and Switch Gear, 2nd Edition, Tata Mc-Graw Hill Education Private Limited.