IAF – 120

Embedded Systems Design

(02 credits – 50 marks)

Course Outcomes:

On completion of the course, students should be able to-

1	State the concepts of interfacing 8051 microcontroller to real world elements
2	Recognize protocols for interfacing 8051 microcontroller to real world elements
3	Demonstrate interfacing concepts and protocols for 8051 microcontroller.
4	Develop programs for interfacing real world elements to 8051 microcontroller
5	Implement 8051 microcontroller for process automation applications

Course Contents:

Module- I: Introduction **(05 Hrs)**

Introduction, Microcontroller and embedded processors, Overview of 8051 family, 8051 Architecture, PSW registers, register bank and stacks, addressing modes, introduction to the use of assemblers and simulators.

Module- II: Arithmetic, Logic Instructions and Assembly language program **(08 Hrs)**

Jump, loop and call instructions, Addressing modes, arithmetic instructions, logical instructions, Assembly language programs, introduction to timers and counters.

Module- III: Real World Interfacing - I **(06 Hrs)**

Interfacing of - LCD, Keyboard, ADC (Parallel and Serial), DAC; Analog and Digital Sensor; Case Studies

Module- IV: Real world interfacing– II **(06 Hrs)**

Interfacing of - External Memory, RTC, Stepper Motor, DC motor, Speed control of motors; Case studies

Module- V:

Presentations, case studies, Assignments, Tutorials based on Module I to IV.

Ref. Books:

1. Muhammad Ali Mazidi, J. G. Mazidi and Rolin D. McKinlay – The 8051 Microcontroller and Embedded Systems - Pearson, 2nd edition 2013
2. 8051 Architecture, Programming and Interfacing- K.J. Ayala; Penram International
3. John B. Peat Man Design with Microcontroller, Pearson Edition Asia, 1998
4. Burns, Alan and Wellings, Andy, Real Time Systemand Programming Languages, 2nd edition 2013, Harlow: Addison- Wesley
5. Frank Wahid - Embedded Systems
6. Raj Kamal -Embedded Systems