

## III B.Tech II Semester

## 15AEC32-MICROPROCESSORS &amp; MICROCONTROLLERS

(Common for EEE and ECE)

L T P C

3 1 0 3

**Course Objectives:** This subject deals about the basic 16-bit (8086) processor and an 8-bit (8051) controllers, their architecture, internal organization and their functions, interfacing an external device with the processors/ controllers.

**UNIT-I: Introduction**

Microprocessor based personal computer system, 8085 Micro Processors: Architecture, Register Organizing, Addressing modes, interrupts, Instruction set, Bus Timings, T state Calculations.

8086 Micro Processors: Programmer's model for 8086, memory organization of 8086, Addressing modes, Instruction set of 8086, Assembly language programming.

**UNIT- II: Interfacing with 8086 –Part 1**

Pin diagram detail of 8086, Minimum and Maximum mode of operations, Bus timing, Memory interface to 8086, DMA Controller: 8257 and 8237 their interfacing to 8086.

**UNIT-III: Interfacing with 8086 – Part 2**

Parallel and serial data transfer methods, I/O interface method, 8255 PPI chip, Interfacing with 7 segment LEDs, Interfacing with keyboards, Interfacing with ADCs, Interfacing with DACs, Interfacing with Stepper Motor.

**UNIT-IV: Interfacing with 8086 – Part 3**

Interrupts of 8086, Programming with DOS and BIOS function calls, 8259 interrupt controller and its interfacing with 8086, cascade mode of operation of 8259.

**UNIT-V: Introduction to Microcontrollers**

8051 Micro Controllers: Architecture, Registers Organization, Memory Organization, Pin Description, Connections, I/O Ports, Timers and their modes of operations, Serial Communication, Addressing Modes, Instruction Set, Assembly directives, Simple assembly software programs with 8051, Interfacing:LEDs, LCDs and switches.

**Course Outcomes:** Students can able to

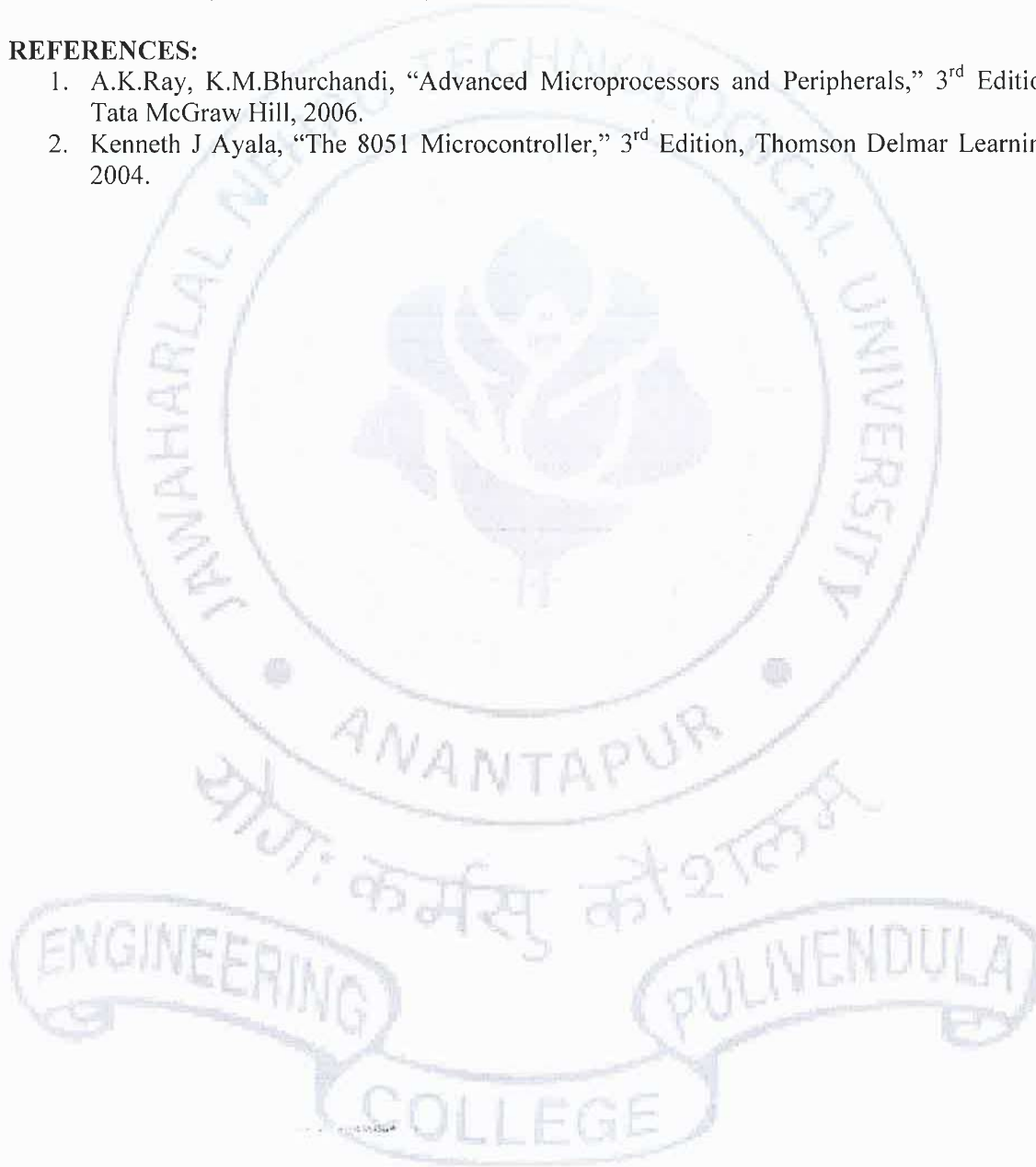
- Recall and apply a basic concept of digital fundamentals to Microprocessor based personal computer system.
- Understand architecture and working of basic microprocessor and Microcontrollers.
- Understand the detailed s/w & h/w structure of the Microprocessor.
- Illustrate how the different peripherals (8255, 8253 etc.) are interfaced with Microprocessor.
- Write Assembly level language programming for basic microprocessor and microcontrollers.
- Analyze the data transfer process through serial & parallel ports.

**TEXT BOOKS:**

1. Ramesh Gaonkar, "Microprocessor Architecture, Programming and Applications with the 8085," 6<sup>th</sup> Edition, Penram International Publishing, 2013
2. Douglas V Hall, S. S. SP Rao, "Microprocessors and Interfacing," 3<sup>rd</sup> Edition, Tata McGraw Hill, 2012.
3. M.A. Mazidi & J.C. Mazidi Microcontroller and Embedded systems using Assembly & C, 2<sup>nd</sup> Edition, Pearson Education, 2007.

**REFERENCES:**

1. A.K.Ray, K.M.Bhurchandi, "Advanced Microprocessors and Peripherals," 3<sup>rd</sup> Edition, Tata McGraw Hill, 2006.
2. Kenneth J Ayala, "The 8051 Microcontroller," 3<sup>rd</sup> Edition, Thomson Delmar Learning, 2004.



*[Handwritten signature]*