

Course Syllabi: UEI609: Fundamentals of Microprocessors and Microcontrollers
(L:T:P::3:1:2)

1. **Course number and name:** UEI609: Fundamentals of Microprocessors and Microcontrollers
2. **Credits and contact hours:** 4.5 and 6
3. **Text book, title, author, and year**

Text Books / Reference Books

- *Hall, D.V., Microprocessor- Interfacing Programming and Hardware, Tata McGraw–Hill (1997).*
- *Ayala, K.J., The 8051 Microcontroller Architecture, Programming and applications, Penram International Publishing (India) Pvt. Ltd. (2007).*
- *Mazidi, M.A., The 8051 Microcontroller and Embedded System, Pearson Education (2008).*
- *Brey, B.B., The INTEL Microprocessors, Prentice–Hall of India Private Limited (2002).*
- *Liu, Y. C. and Gibson, G.A., Microcomputer Systems: The 8086/8088 Family– Architecture, Programming and Design, Prentice–Hall of India Private Limited (2007).*
- *Uffenbeck, J., The 8086/ 8088 Family, Prentice–Hall of India Private Limited (1994).*
- *Predko, M., Customizing The 8051 Microcontroller, Tata McGraw–Hill (2002).*

- a. Other supplemental materials
 - Nil

4. Specific course information

- a. Brief description of the content of the course (catalog description)

INTEL 8086 Microprocessor: Pin Functions, Architecture, Characteristics and Basic Features of Family, Segmented Memory, Addressing Modes, Instruction Set, Data Transfer Instructions, Arithmetic, Logical, Shift and Rotate Instructions, String Instructions, Flag Control Instructions, Transfer of Control Instructions, Processor Control Instructions, Programming Examples, Interrupt Structures, Multitasking and Multiprogramming, MIN/MAX Modes of 8086, Co-processors 8087 and 8089.

Introduction to 8051 Microcontroller: 8051 architecture and pin diagram, Registers, Timers, Counters, Flags, Special Function Registers, Addressing Modes, Data types, instructions and programming, Single–bit operations, Timer and Counter programming, Interrupts programming, Serial communication, Memory accessing and their simple programming applications.

Hardware interfacing: I/O Port programming, Bit manipulation, Interfacing to a LED, LCD, Keyboard, ADC, DAC, Stepper Motors and sensors.

Laboratory work: Introduction to INTEL kit, Programming examples of 8086, Interfacing using 8086 kits, ADC, DAC, 8253, Microprocessor based project, Programming and Application development around 8051, Interfacing to LED, LCD, Keyboard, ADC, DAC, Stepper Motors and sensors etc.

5. Specific goals for the course

After the completion of the course, the students will be able to:

- Demonstrate the concept of microprocessor and to be able to design a microprocessor based system to get desired results.

- Use 8086 microprocessor in advanced applications, which will give them a good platform to work further.
- Graduates will be able to update with current trends through self-study and show genuine need to learn on continuous basis.
- Students will be able to use hardware interfacing of 8051 to develop solutions of real world electrical problems.

6. Brief list of topics to be covered

- 8086 Microprocessor
- 8051 microcontroller
- Hardware interfacing