

Year & Sem: E2S2	Course Code: EC2202	Course Name: Micro Processors and Micro Controllers	No. of Credits: 4	L 2	T&PS 2	P 0
Unit-I: Introduction to Microprocessors Introduction and evolution of microprocessors, Architecture of 8085 Processor, pin configuration of 8085, bus organization, and basic instruction sets. Architecture of 8086 microprocessor, special functions of general purpose registers, 8086 flag register and function of 8086 flags, pin diagram of 8086, minimum and maximum mode of 8086 configuration and timing diagrams. Unit-II: Instruction set and assembly language programming of 8086 Instruction formats. Addressing modes of 8086, Instruction sets of 8086- <i>Data transfer instructions, arithmetic instructions, logical instructions, flag manipulation instructions, control transfer instructions, shift / rotate, string instructions</i>, Assembly directives, Macros, Simple programs involving logical, branch and call instructions using assembler. Unit-III: Peripheral devices and interfacing with 8086 Memory interfacing to 8086 (static RAM and EPROM), Need for DMA, DMA data transfer method, interfacing with 8237/8257. 8255 PPI-various modes of operation and interfacing to 8086, interfacing keyboard and display controller- 8279, stepper motor and actuators. D/A and A/D converter interfacing, interrupt structure of 8086, Vector interrupt table. Interrupt service routines. 8259 PIC architecture and interfacing cascading of interrupt controller and its importance interfacing with key boards, LEDs, LCDs, ADCs, and DACs. Unit-IV: Introduction to Microcontrollers Overview of Intel 8051 microcontroller, architecture, memory organization, flags, stack, and special function registers, I/O, ports - connecting external memory, counters and timers, serial data I/O, Interrupts. Addressing modes of 8051, Microcontroller instructions - moving data, logical operations, arithmetic operations, jump and call instructions –subroutines - Interrupts and returns. Assembly Language Programming. Unit-V: Interfacing and Industrial applications of 8051 Programming Timer interrupts, programming external hardware interrupts, Programming the serial communication interrupts, Programming 8051 timers and counters. Applications of Microcontrollers, Interfacing 8051 to LED's, Push button, Relay's, interfacing seven segment display, ADC and DAC interfacing, Waveform generation, Stepper motor control Unit-VI: ARM Architecture and Development tools ARM Architecture, ARM Instruction sets, thumb instruction set, thumb instruction format. Introduction to micro controller development tools, Serial peripheral interface I2 C Bus, ADC, UART – Stepper Motor Control - DC Motor Control. References/Text Books: 1. Douglas V. Hall, "Microprocessors and Interfacing", Mc-Graw Hill, 2nd Edition. 2. Muhammad Ali Mazidi, Janice Gillispie Mazidi, Rolin D. McKinlay, "The 8051 Microcontroller and Embedded systems", PEARSON, 2nd Edition, 2006. 3. Rajkamal, "Microcontrollers – Architecture, Programming, Interfacing and system design",						

Pearson Education India, 2011.

4. Microprocessors & Controllers, N.Senthil Kumar, Oxford University press 2010.

5. Advanced microprocessor and Peripherals - A.K.Ray and K.M.Bhurchandi, Tata Mc Hill, 2000.

Lecture Plan: Unit-I & -II syllabus for MID-I, Unit-III & -IV syllabus for MID-II and Unit-V & -VI syllabus for MID-III examinations.

Video Lectures (Web Links):

1. [http://www.nptel.ac.in/courses/Webcourse-contents/IISc-](http://www.nptel.ac.in/courses/Webcourse-contents/IISc-BANG/Microprocessors%20and%20Microcontrollers/New_index1)

[BANG/Microprocessors%20and%20Microcontrollers/New_index1.](http://www.nptel.ac.in/courses/Webcourse-contents/IISc-BANG/Microprocessors%20and%20Microcontrollers/New_index1)

2. [http://nptel.ac.in/courses/Webcourse-contents/IIT-](http://nptel.ac.in/courses/Webcourse-contents/IIT-KANPUR/microcontrollers/micro/ui/Course_home1_1.htm)

[KANPUR/microcontrollers/micro/ui/Course_home1_1.htm](http://nptel.ac.in/courses/Webcourse-contents/IIT-KANPUR/microcontrollers/micro/ui/Course_home1_1.htm)

3. <https://www.edx.org/course/embedded-systems-shape-world-utaustinx-ut-6-03x#!>

4. <http://freevideolectures.com/Course/3018/Microprocessors-and-Microcontrollers>

Study Materials (Web Links):

1.

2.

Problems & Solutions (Web Links):

1.

2.

Assignments (Web Links):

1.

2.