**UIT2401 MICROPROCESSOR AND MICROCONTROLLER**

OBJECTIVES:

The objective of this course is to enable the students to

* Understand the architecture and operation of the 8086 microprocessor and ARM microcontroller.
* Learn the addressing mode and programming model of Intel X86 Processor, and ARM architecture.
* Acquire Assembly language programming skills.
* Explore to basic peripherals, its programming and interfacing techniques of microprocessor and controllers
* Develop applications using Intel X86 Processors and ARM Microcontrollers

**UNIT I INTEL X86 MICROPROCESSOR ARCHITECTURE 9**

Introduction to Microprocessor and Computer -Evolution of Microprocessor -Computer Data Formats, Internal Microprocessor Architecture -Programming Model Addressing Mode -Data Addressing Mode -Program Memory Addressing Modes -Stack Addressing Modes -Data Movement Instructions -Arithmetic and Logical Instruction -Program Control Instruction

**UNIT II THE 8086 PROCESSOR AND MEMORY INTERFACING 9**

**8086** Architecture -Signal descriptions of 8086, Physical memory organization, Bus Buffering and Latching -Bus Timing, Ready and Wait States -MinimumMode Versus Maximum Mode assembler directives, Memory Interfacing-Memory Devices, Address Decoding -X86 Memory Interfacing -8086 Assembly language programming -Interrupts and interrupt service routines

**UNIT IIII/O & BUS INTERFACING 9**

Programmable Peripheral Interface (8255), Programmable Interval Timer (8253), Programmable Interrupt Controller (8259) Programmable Communication Interface, us Interface-Peripheral Component Interconnect Bus (PCI) -The Universal Serial Bus (USB) -Accelerated Graphics Port (AGP) Controller Area Network Interface, Zigbee wireless Interface.

**UNIT IV ARM MICROPROCESSOR ARCHITECTURE 9**

ARM Design Philosophy, Overview of ARM architecture States [ARM, Thumb, Jazelle], ARM Processor Fundamentals -Registers, Current Program Status Register, Pipeline, Exception, Interrupt, Vector Tables, Core Extension, Arm Processor Families

**UNIT V ARM PROGRAMMING AND ARMCONTROLLER 9**

**ARM** Instruction-data processing instructions, branch instructions, load-store instructions, SWI instruction, Loading instructions, conditional Execution, Assembly Programming. Thumb Instruction-Thumb Registers, ARM Thumb interworking.ARM Microcontroller -Features of the LPC 214X -Programming LPC2148 Case Study: ARM Cortex M Microcontroller

TOTAL: 45 HOURS

**TEXTBOOKS:**

1.Brey, Barry B. The Intel microprocessors, Pearson Publication, 2008

2.Andrew N Sloss, Dominic Symes, Chris Wright, ARM System Developer’s Guide, 2012, Morgan Kaufmann Publishers.

**REFERENCES:**

1.A.K.Ray, K.M. Bhurchandi, Advanced Microprocessors and Peripherals, Architecture, Programming and Interfacing, Sixth Edition Reprint, Tata McGraw-Hill Publishing Company Limited, New Delhi, 2nd edition 2006.

2.Jochen Steve Furber, “ARM System-on-Chip Architecture”, Addison Wesley Trade Computer Publications, Second Edition, 2000.

3.DoughlasV.Hall, Microprocessors and Interfacing, Programming and Hardware, TMH, 2012.

4.Mathur A.P., Introduction to Microprocessors, Third Edition, Tata cGraw-Hill Publishing Company Limited, New Delhi, 1989.

**COURSE OUTCOMES:**

On successful completion of this course, the student will be able to

1.Explainthe addressing modes, assembly language programming of X86, and ARM.

2.Explainarchitecture of 8086.

3.Design and develop assembly language programs.

4.Interface different external memory and peripheral devices with microprocessors and micro controller

5.Analyze a problem and formulate appropriate computing solution for microprocessor-based application