Course Title: Microprocessors
Course Code: EEEG 314
Credit Hours: 3

Course Description:
This course acquaints the students with the operation, programming, interfacing and applications of microprocessors and microcontrollers.

Course Contents:

Unit 1: Introduction
Stored program computer (Von Neumann Architecture), Microcomputer, Bus system architecture, Reduced Instruction Set Computers (RISC), Complex Instruction Set Computers (CISC), Advanced RISC Machines (ARM), Register Transfer Language, Definition and applications of Microprocessors, History of microprocessors, Single core and Multi core processors,

Unit 2: 8 bit Microprocessor
Features of Intel 8085, internal functional diagram, Registers, Pin functions, instruction format, Addressing modes, Instruction types, Timing diagram, programs

Unit 3: 16 Bit Microprocessor
Features of Intel 8086, internal functional diagram, Registers, Pin functions, Addressing modes, Instruction types, Timing diagram, Assemblers and their use, programs, INT 21h functions, Support Chips: Intel 8288 bus controller, Intel 8284 clock generator, Latches 8282, Bus transceiver 8286

Unit 4: Interrupt Processing
Interrupt types and Interrupt processing sequence for Intel 8085 and Intel 8086; Introduction to Programmable Interrupt Controller- Intel 8259 and its programming sequence

Unit 5: Input and Output Interfaces
Serial and Parallel communication, Asynchronous and synchronous communication, Serial Communication Interface-RS232C, Universal Serial Bus (USB), Parallel Communication Interfaces-GPIB, Introduction to Programmable communication interface -Intel 8251A, Programmable Peripheral Interface-Intel 8255A: Internal functional diagram, operating modes and programming, Direct Memory Access (DMA) Operation, Introduction to DMA controller-Intel 8237/8257, Programmable Interval Timer-Intel 8253/8254: Internal functional diagram, operating modes and programming

Unit 6: System Design Using Intel 8086
Memory types and its interfacing requirements, Memory Mapping, Interfacing with RAM, ROM, Requirements for I/O interfacing, I/O mapped I/O and memory mapped I/O, Interfacing LEDs, switches, Seven segment displays and analog to Digital Converter, Case study of microprocessor based control system design with sensors and actuators

Unit 7: Introduction to Embedded System and Microcontroller

Embedded Systems and reprogrammable systems, Requirements of embedded system design, real world applications of embedded systems, Introduction to Microcontroller-Intel 8051: Architecture, Pin functions, instructions, programs and Embedded System designs with Intel 8051

References:

1. Gaonkar R., *Microprocessor Architecture, Programming, and application with 8085*, PHI
2. Liu Y. C. and Gibson G. A., *The 8086/8088 family architecture, programming and Design*, PHI
3. Hall, D. V., *Microprocessors and interfacing: programming and hardware*, TMH
4. Brey B. B., *The Intel Microprocessors 8086/8088, 80186, 80286, 80386 and 80486, Pentium, Pentium Pro-Pentium- (Architecture, Programming and Interfacing),* Pearson Education
5. Muhammad Ali Mazidi, Janice G. Mazidi, Rolin D. McKinlay, *The 8051 Microcontroller and Embedded Systems*, PHI

Evaluation:

In-Semester Evaluation: 50%
End-Semester Evaluation: 50%