Course Outline: Introduction to Microprocessors, memory and I/O interfacing, interrupt structure, serial I/O and DMA operations. Development of Microprocessor based digital systems, testing techniques, use of modern development tools for debugging hardware and software.


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Prerequisite by Topics: Knowledge of digital logic and computer organization. Knowledge of Assembly Language Programming

Course Outcomes: Graduates of this course will be able to design, develop, assemble and test microprocessor-based digital systems to solve an engineering problem. To conduct experiments, as well as to analyze and interpret data. To use modern computer engineering tools including logic analyzer and in-circuit emulator for the software/hardware integration and testing of a digital system.

Topics: Microprocessor Architecture and Programming
Microprocessor Development System
Memory Interfacing
Design of I/O interfaces
Testing and Diagnostic Schemes
Program Controlled I/Os
Design of various display system interfaces
Design of switches and various key-board interfaces
Interrupt structure and interrupt driven I/Os
Serial I/O
DMA Operation
System Buses

Computer Usage: In-Circuit Emulator

Lab Projects: Design Assembly language programs and run on the in-circuit emulator
Design and construct microprocessor based prototype system
Design of Diagnostic software
Design and test a ROM based monitor for the prototype system

Evaluation: Exam #1 15%
Exam #2 15%
Exam #3 20%
Home Work 10%
Lab 40%