MICROPROCESSOR AND MICROCONTROLLER LABORATORY

The Microprocessor and Microcontroller Laboratory at Saveetha Engineering College provides practical exposure to processor architectures, programming, peripheral interfacing, and application development. The laboratory helps students connect theoretical knowledge with hardware implementation and develop skills in designing, testing, and troubleshooting electronic systems.

The laboratory introduces the architecture and programming of the 8-bit 8085 microprocessor, 16-bit 8086 microprocessor, and 8-bit 8051 microcontroller. Students execute assembly language programs involving arithmetic and logical operations, data transfer, sorting, code conversion, and memory manipulation. Interfacing experiments include traffic light controllers, stepper motors, ADCs, DACs, LCDs, keyboards, and sensors, providing an understanding of data acquisition, timing, display operations, and peripheral control.Development platforms, including PIC, MSP430, ARM, and STM32, extend learning to different processor families. STM32 boards support practical exercises in Embedded C, GPIO, interrupts, timers, PWM, ADC, and serial communication. FPGA, CPLD, and DSP platforms provide additional opportunities to explore programmable digital systems and signal-processing applications.

Facilities and Resources

Category	Available Facilities
Processor and controller trainers	8-bit microprocessor trainer kit; 8-bit microcontroller trainer kit
Interfacing kits	ADC and DAC kits; stepper motor kit; traffic light controller kit
Peripheral interfacing	LCDs, keyboards, and sensors
Microcontroller development boards	8051 development board; PIC development board; MSP430 16-bit development board; STM32 development boards
ARM development platforms	ARM7 LPC2148 RTOS-based development board; ARM9 STK9302 trainer-cum-development board; Stellaris LM3S1968 Evaluation Kit; Sitara AM335x Starter Kit
Programmable logic platforms	Xilinx FPGA Spartan Trainer, Model FPGA–A; Xilinx CPLD Trainer, Model CPLD–B
Digital signal processing platforms	TMS320C6713 DSP Starter Kit; TMS320C6745 floating- and fixed-point DSP trainer; DM6446 DSP+ARM DaVinci EVM bundle
Measurement equipment	100 MHz Digital Storage Oscilloscope
Software resources	Code Composer Studio IDE; LabVIEW

Through structured experiments and application-oriented mini-projects, the laboratory strengthens programming, hardware integration, debugging, and analytical skills. These facilities support students in developing practical solutions for monitoring, automation, communication, and control applications.