

SNS COLLEGE OF TECHNOLOGY

(An Autonomous Institution) Coimbatore-35



DEPARTMENT OF BIOMEDICAL ENGINEERING

19BMB303 & Fundamentals of Microprocessors and Microcontrollers

Unit IV MICROCONTROLLER BASED SYSTEM DESIGN

III Year/ VI Sem

Dr. K. Manoharan, ASP / BME / SNSCT



MICROCONTROLLER BASED SYSTEM DESIGN



- Introduction
- Matrix display Interface
- 16x2 LCD Interface
- High power devices
- Optical motor shaft encoder
- Stepper Motor
- DC Motor speed Control using PWM
- RTC
- EEPROM interface using I2C protocol



Microcontroller-Based System Design

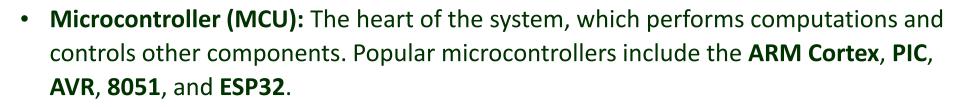


Introduction:

- Microcontroller-based systems are the foundation of many embedded systems and electronic devices. These systems are designed to perform specific tasks by interacting with sensors, actuators, or other components.
- The design of a microcontroller-based system typically involves several stages, from initial planning to implementation.



Microcontroller-Based System Design



- **Power Supply:** Provides the required voltage and current to the MCU and other components. Often includes voltage regulators to ensure stable operation.
- Input Devices: These could be sensors (temperature, pressure, humidity), keypads, switches, buttons, etc., used to collect data or provide control inputs.
- Output Devices: Devices such as LEDs, displays (LCD, OLED), motors, relays, or actuators that respond based on the system's logic.



Microcontroller-Based System Design



- Memory:
- **RAM**: Temporary data storage for running operations.
- **Flash/EEPROM**: Non-volatile memory for storing program code and configuration data.

• Clock System:

The clock controls the timing of operations. Typically involves an **oscillator** (crystal) to maintain system timing.