



Assignment 1: ESD Introduction

Comparison of
Microcontroller,
Microprocessor, and
Embedded System Design



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Similarities

Embedded System Design

Microcontroller

Microprocessor

Embedded Systems

Relates each other whereas its design depends on constraints such as size, power consumption, and cost.

Hardware and Software Integration

Involve the integration of hardware and software components and they are designated to meet the requirements of the application.

Real Time Operation

Operate in real-time or **near real-time** environments, where timely responses to external stimuli are crucial.



Week 1

Difference

- 1) Scope and Complexity
- 2) Integrated Components
- 3) Application Focus

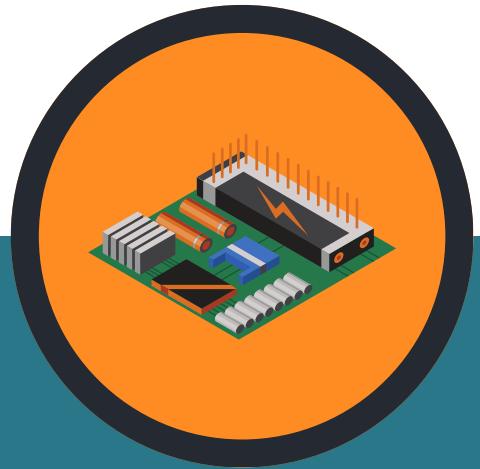


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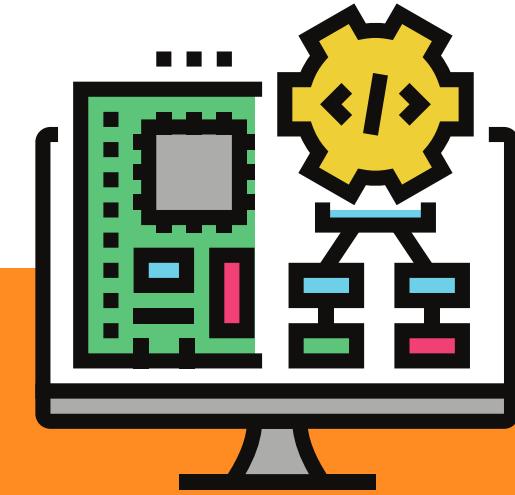


Scope and Complexity



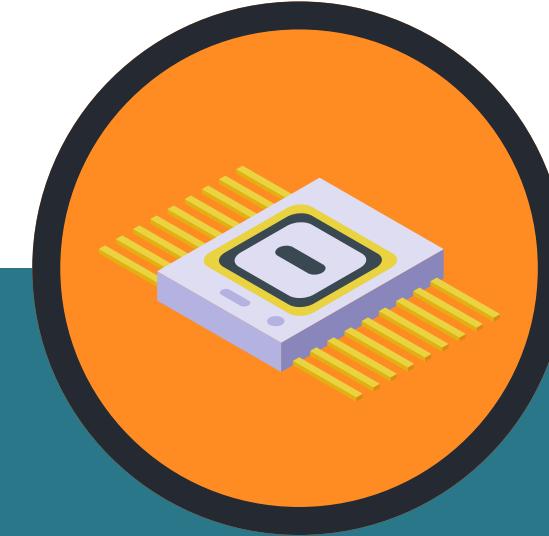
Microcontroller

- Designed for simpler embedded applications with limited processing requirements
- Containing a microprocessor core, memory, and peripherals on a single chip



Embedded System Design

- Advert to entire process of creating a specialized computing system
- Included in hardware and software design tailored to specific applications



Microprocessor

- Capable of executing instructions and processing data.
- More powerful and versatile
- Used in general-purpose computing devices

A professional man in a dark suit and tie is shown from the waist up, looking thoughtfully towards the right. He is positioned against a dark background that features a subtle, glowing network of interconnected nodes and lines, suggesting a digital or technological environment. The overall aesthetic is modern and professional.

Integrated Components

Microcontroller

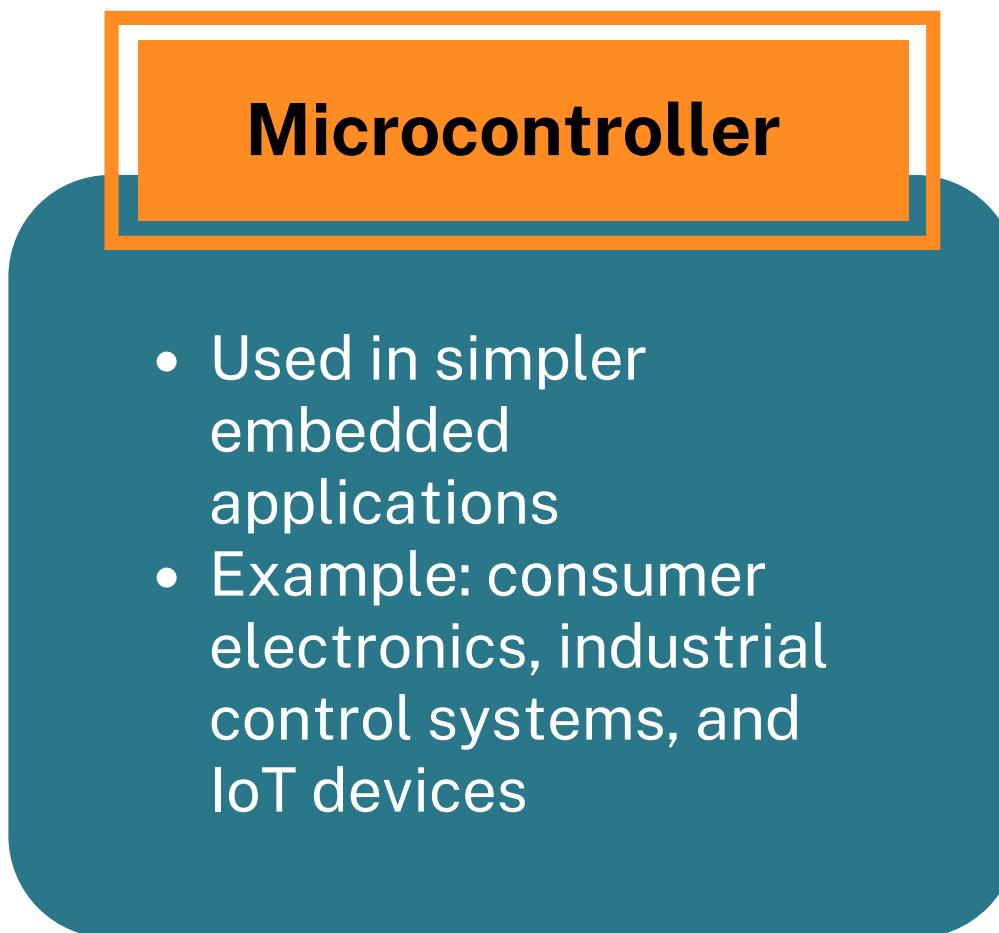
- Contains integrated memory, input/output (I/O) peripherals, and other components required for standalone operation.
- Simplifies the design of embedded systems and reduces the need for external components.

Microprocessor

- Lacks integrated memory and peripherals
- requiring additional external components such as memory, I/O interfaces, and support chips to form a complete computing system.

- Focuses on designing computing systems for specific applications
- Often with constraints such as size, power consumption, and cost

Embedded System Design



Application Focus

