

# TKU212244

Microprocessor Systems

Sistem Mikroprosesor

## BASIC INFORMATION

<b>Course Credit</b>	3 / 150 minutes per Week
<b>Course Type</b>	Required
<b>Course Classification</b>	Engineering Topics
<b>Prerequisites</b>	Discrete Mathematics; Digital Systems Engineering; Fundamentals of Programming; Fundamentals of Programming Lab. Work

## STUDENT AND LEARNING OUTCOMES

### Covered Student Outcomes

Development of Engineering Solution (KP.2)          Modern Tools Utilization (SK.1)

### Learning Outcomes

- LO1** Students are able to explain the basic architecture of microprocessors.
- LO2** Students are able to explain the microarchitecture and how microprocessor works.
- LO3** Students are able to convert assembly language into machine language.
- LO4** Students are able to create programs in assembly language, compile them with assembler and run them on a microprocessor.

## COURSE DESCRIPTION

Describes the basic architecture of microprocessor, arithmetic logic unit (ALU), control unit (CU), register, memory, control path, data path, memory addressing modes, input-output (I/O), instruction-set, machine language, assembly, and assembler.

## TOPICS

### 1. Introduction, History & Development of Microprocessor

### 2. Architecture & Basic Components of Microprocessor

2.1 Microarchitecture & how the microprocessor works

2.2 Arithmetic Logic Unit

2.3 Control Unit

2.4 Register

2.5 Memory & memory addressing modes

2.6 Instruction-set

### **3. Introduction to ARM Architecture**

3.1 ARM Instruction Set

3.2 ARM Programming Model

### **4. Microcontroller**

4.1 Microprocessor vs Microcontroller

4.2 I/O

4.3 Timer and Counter

4.4 Interrupts

4.5 ADC

4.6 Serial Communication

### **5. Language**

5.1 Machine Language

5.2 Assembly and Assembler

5.3 C Language

### **6. Application of Microprocessor and Microcontroller**

6.1 Embedded System

6.2 Single Board Computer

## **REFERENCES**

[1] Steve Furber, “ARM System-on-Chip Architecture”, Pearson Education Limited, 2000.

- [2] William Hohl, Cristopher Hinds, “ARM Assembly Language, Fundamentals and Techniques”, CRC Press Taylor & Francis Group, 2nd edition, 2015.
- [3] Enoch O. Hwang, “Microprocessor Design Principles and Practices with VHDL”, Brooks/Cole, 2004.