

| رمز المادة | نوع المادة | الساعات الأسبوعية | | | السنة الدراسية | اسم المادة |
|------------|------------|-------------------|---|---|----------------|-----------------------------------|
| | تخصصية | الوحدات | ع | ن | الثالثة | المسيطرات الرقمية والمعالج الدقيق |
| | | ٦ | ٢ | ٢ | ٣٠ أسبوع | |

أهداف المادة: ١. تدريب الطلبة على أسس عمل المسيطرات الدقيقة .
٢. بناء الدوائر المنطقية والتعرف على الحاسبات الدقيقة (أجزائها، برمجتها وتطبيقاتها).

| Week | Syllabus |
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| 1 st | Introduction to Microcomputers; Microprocessor vs. Microcontrollers. Introduction to Microprocessor-Based System Design. |
| 2 nd | Microprocessor Architecture: Programmers View. |
| 3 rd , 4 th | Introduction to Microprocessor Instruction Set and Programming. Addressing Modes. Different Instruction Types: Data Transfer, Arithmetic, Logical, Branch, etc. |
| 5 th , 6 th , 7 th | Microprocessor Interfacing. Input/output Instructions. Peripheral ICs: Block Diagram, Pin description, Modes of Operation and Interfacing. (For Example, In 80x86 Microprocessor System: 8255 PPI, 8253 PIT, 8259 PIC, 8251 USART and 8237 DMA Controller). |
| 8 th | Introduction to Single-Chip Microcomputer (Microcontroller). Overview and Applications. Types of Microcontrollers. |
| 9 th | Microcontroller Architecture. Architectural Block Diagram, Pin Diagram and Pin Functions, General-Purpose and Special-Function Registers, I/O Ports, Memory Organization. |
| 10 th | Introduction to Program Development Tools (IDE). Concept of IDE, Assembler, Compiler, Linker, Simulator, and Debugger. |
| 11 th | Introduction to Programming. Basic Programming Practices. |
| 12 th , 13 th | Microcontroller Interfacing. Concept of Sensor, Types of Sensors and Their Applications. A/D and D/A. I/O Instructions. |
| 14 th , 15 th | Advanced Programming Applications. |
| 16 th | Introduction to Programmable Controllers Definition, PLC History, Operation Principles, Ladder Diagrams, PLC Advantages. |
| 17 th | Processors and Power Supply Processors, Process Scan, System Power Supply, Error Checking, Programming Devices. |

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| 18th | Memory Systems and I/O Interaction Memory Overview, Structure, and Organization, Configuration, and I/O Interaction. |
| 19th | Discrete Input / Output System I/O Racks, PLC I/O Instructions, Discrete I/O Types. |
| 20th | Analog Input / Output System Analog I/O Instructions, I/O Data Representation and Handling |
| 21st | Special Function I/O Special Analog, Temperature, PID Interfaces, and Positioning Interfacing. |
| 22nd | PLC Programming Types of PLC Languages, Ladder Diagram Format |
| 23rd | Ladder Relay Programming. Timers and Counters. |
| 24th | Arithmetic and Data Manipulations Instructions Flow Control Instructions |
| 25th, 26th | System Programming and Implementation Control Strategy, Implementation Guidelines, I/O Control Programming |
| 27th, 28th 29th, 30th | PLC Industrial Applications Drilling Machine, Package Sorting, Injection Molding, Bottle Filling, X-Y Dispenser, etc. |