**Course description form**

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| 1. **Course Name** | | | | | | | | |
| Microcontroller | | | | | | | | |
| 1. **Course Code** | | | | | | | | |
| EP316 | | | | | | | | |
| 1. **Semester/Year** | | | | | | | | |
| 2n’d Semester/Third Year | | | | | | | | |
| 1. **The date this description was prepared** | | | | | | | | |
| 17 / 9 / 2023 | | | | | | | | |
| 1. **Available forms of attendance** | | | | | | | | |
| Face-to-Face theoretical lectures | | | | | | | | |
| 1. **Number of study hours (total) / number of units (total)** | | | | | | | | |
| 45/2 | | | | | | | | |
| 1. **Name of the course administrator** | | | | | | | | |
| Name: Lect. Hayder Salim Hameed Email:[haydersalim@uodiyala.edu.iq](mailto:haydersalim@uodiyala.edu.iq) | | | | | | | | |
| 1. **Course objectives** | | | | | | | | |
| During the semester, the student learns to understand the microcontroller, its components, programming languages, applications, the main differences between it and the microprocessor, and the most important applications for both types. In addition to learning about embedded systems and the revolution they have brought about in the field of current and future technology. | | | | **Objectives of the study subject** | | | | |
| 1. Solution of non-linear equations and root findings. | | | | | | | | |
| * The student is directed to think about modern technology * Urging the student to think about research in the field of embedded systems. * Urging the student to think about programming languages used in embedded systems platforms * Urging the student to think about contributing by conducting some experiments and programming them using Arduino * Through discussion, students participate in solving some practical problems. * Asking the student to visit the library and the international information network (the Internet) to obtain additional knowledge of the academic subjects. * Presenting a simple project or seminar to the student in front of his fellow students to enhance his self-confidence. | | | **The Strategy** | | | | | |
| 1. Numerical integration and differentiation. | | | | | | | | |
| Interpolation and solving differential equations. | **Learning method** | **Required learning outcomes** | | | | **Name of the unit or topic** | **Hours** | **Week** |
| Daily, oral, monthly, written examinations and reports | Whiteboard and Data show | Introducing the student to the components of a microcomputer | | | | Microcomputer Architecture, ***Microcomputer component:* Software**,Hardware | 2 | 1 |
| Daily, oral, monthly, written examinations and reports | Whiteboard and Data show | Introducing the student to the storage unit and its address. | | | | **Memory (Main Memory)**,Adresses | 2 | 2 |
| Daily, oral, monthly, written examinations and reports | Whiteboard and Data show | Introducing the student to the types of storage units. | | | | **Types of memory** | 2 | 3 |
| Daily, oral, monthly, written examinations and reports | Whiteboard and Data show | Introducing the student to precision therapy and how it works. | | | | **Microprocessor, How does a Microprocessor Work?** | 2 | 4 |
| Daily, oral, monthly, written examinations and reports | Whiteboard and Data show | Introducing the student to the classification of the microprocessor. | | | | Microprocessor − Classification | 2 | 5 |
| Daily, oral, monthly, written examinations and reports | Whiteboard and Data show | Introducing the student to the 8085 processor. | | | | 8085 Microprocessor | 2 | 6 |
| Daily, oral, monthly, written examinations and reports | Whiteboard and Data show | Introducing the student to the addressing modes, interrupts, and programming of the 8085. | | | | 8085 − Addressing Modes & Interrupts  8085 – Instruction Sets, | 2 | 7 |
| Daily, oral, monthly, written examinations and reports | Whiteboard and Data show | Introducing the student to control commands and logical and sub-operation commands. | | | | Control Instructions, Logical Instructions,  Branching Instructions, | 2 | 8 |
| Daily, oral, monthly, written examinations and reports | Whiteboard and Data show | Introducing the student to the commands of mathematical operations with examples | | | | Arithmetic Instructions,  Data Transfer Instructions,  8085 – Demo Programs | 2 | 9 |
| Daily, oral, monthly, written examinations and reports | Whiteboard and Data show | Introducing the student to the microcontroller and the difference between it and the microprocessor. | | | | Microcontrollers , Difference between Microprocessor and Microcontroller | 2 | 10 |
| Daily, oral, monthly, written examinations and reports | Whiteboard and Data show | Introducing the student to the 8051 microcontroller architecture. | | | | 8051 ─ Architecture | 2 | 11 |
| Daily, oral, monthly, written examinations and reports | Whiteboard and Data show | Introducing the student to the input and output ports of the 8051 controller. | | | | 8051 − Input Output Ports | 2 | 12 |
| Daily, oral, monthly, written examinations and reports | Whiteboard and Data show | Interrupts for the 8051 microcontroller | | | | 8051 − Interrupts | 2 | 13 |
| Daily, oral, monthly, written examinations and reports | Whiteboard and Data show | Introducing the student to an introduction to decryption and how to fully and partially encrypt. | | | | **Introduction to address decoding**,  Full address decoding,  **Partial address decoding** | 2 | 14 |
| Daily, oral, monthly, written examinations and reports | Whiteboard and Data show | Explain examples of implementing the encryption process | | | | **Implementing address decoders**,  Examples | 2 | 15 |
| 1. **Course Evaluation** | | | | | | | | |
| Distribution of the grade out of 100 according to the tasks assigned to the student, such as daily preparation, daily, oral, monthly, written exams, reports, etc. | | | | | | | | |
| 1. **Learning and teaching resources** | | | | | | | | |
| **1.Microcontroller & Embeddeed Systems**  **2.Microcontroller: Architecture, Programming & Applecations** | | | | | Required textbooks (methodology, if any) | | | |
| • Lectures presented by the subject teacher.  • Books available in the college library | | | | | Main references (sources) | | | |
| All reputable scientific magazines and periodicals related to embedded systems and Arduino. | | | | | Recommended supporting books and references (scientific journals, reports....) | | | |
| https://www.tutorialspoint.com | | | | | Electronic references, Internet sites | | | |