**TEMPLATE FOR COURSE SPECIFICATION**

|  |
| --- |
| HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW |

**COURSE SPECIFICATION**

|  |  |
| --- | --- |
| This Course Specification provides a concise summary of the main features of the course and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. It should be cross-referenced with the programme specification. | |
| Al-Maarif University College | **1. Teaching Institution** |
| Computer Engineering Techniques | **2. University Department/Centre** |
| Digital Controllers | **3. Course title/code** |
| Bachelor in Computer Engineering Techniques | **4. Programme(s) to which it Contributes** |
| Face-to-face and online presence | **5. Modes of Attendance offered** |
| Year | **6. Semester/Year** |
| 120 | **7. Number of hours tuition (total)** |
| 22.06.2021 | **8. Date of production/revision of this specification** |
| **9. Aims of the Course** | |
| * Introducing, educating and understanding students of the physical and software concepts related to PLCs, studying the concepts and principles of their work, passing through the characteristics and principles of the microcontroller, and identifying the work and programming of the PLC controller, with practical experiments. * Practical application of theoretical lectures on microcontroller and PLC * Understand the basics of the work of controllers in controlling any electrical or mechanical system | |

|  |
| --- |
| **10· Learning Outcomes, Teaching ,Learning and Assessment Method** |
| **A. Knowledge and Understanding**  A1. Ability to program micro and logic controllers  A2. The ability to design and formulate theoretical programs and convert them into practical programs and apply them  A3. Ability to work in applied fields |
| **B. Subject-specific skills**  B1. The ability to apply new skills in the use of programmed controllers  B2. Participation and practical training  B3. The practical orientation of the student to the practical side and taking advice from the professor of the subject or through social media |
| **Teaching and Learning Methods** |
| * The direct method is through lectures * Practical application in the laboratory * The subjective method by preparing research papers and discussing them collectively |
| **Assessment methods** |
| * Feedback from students * Daily and quarterly exams * Preparing scientific reports and assignments |
| **C. Thinking Skills**  C1. Improving and developing the student's focus on his scientific subject  C2. Refining the student's personality and training him to be an active member of society  C3. Presenting topics and situations outside university life, including information about work in the supervisors, to create attraction and enthusiasm for creativity in the aforementioned specialization. |
| **Teaching and Learning Methods** |
| * Knowledge of questions and inquiries distinctive depth and accuracy. * Simulate the student towards understanding the cause and cause. * Increase digital sense of expression. * Brainstorming. |
| **Assessment methods** |
| * Individualizing part of the exam questions that require depth of thinking, explanation and accuracy of observation. * Student participation in the classroom. * extra-curricular duties |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **11. Course Structure** | | | | | |
| **Assessment Method** | **Teaching Method** | **Unit/Module or Topic Title** | **ILOs** | **Hours** | **Week** |
|  |  | Introduction to Microcontroller, Types of Microcontroller, difference between MP and Microcontroller |  | 4 | 1 |
|  |  | Architecture of PIC Microcontroller |  | 4 | 2 |
|  |  |  | 4 | 3 |
|  |  |  | 4 | 4 |
|  |  | Programming the Microcontroller |  | 4 | 5 |
|  |  |  | 4 | 6 |
|  |  |  | 4 | 7 |
|  |  | A/D converter & Analog Module  On chip CCP (Capture, Compare & PWM)  Microcontroller Interrupts Programming  EEPROM Programming |  | 4 | 8 |
|  |  |  | 4 | 9 |
|  |  |  | 4 | 10 |
|  |  |  | 4 | 11 |
|  |  | Application projects of Microcontroller |  | 4 | 12 |
|  |  |  | 4 | 13 |
|  |  |  | 4 | 14 |
|  |  |  | 4 | 15 |
|  |  | **Principle of PLC** |  | 4 | 16 |
|  |  |  | 4 | 17 |
|  |  | **Input – Output modules of PLC** |  | 4 | 18 |
|  |  | **Numbers systems and codes**  **Fundamentals of logic in PLC**  **Basic of PLC programming**  **PLC- wiring diagram and ladders logic program and sensors**  **Timers Programming** |  | 4 | 19 |
|  |  |  | 4 | 20 |
|  |  |  | 4 | 21 |
|  |  |  | 4 | 22 |
|  |  |  | 4 | 23 |
|  |  |  | 4 | 24 |
|  |  | **Counters Programming** |  | 4 | 25 |
|  |  |  | 4 | 26 |
|  |  | **Math. Operations** |  | 4 | 27 |
|  |  |  | 4 | 28 |
|  |  | **Sensors and Actuators for Industrial Applications** |  | 4 | 29 |
|  |  | **PLC projects** |  | 4 | 30 |

|  |
| --- |
| **D. General and Transferable Skills (other skills relevant to employability and personal development)**  D1. Improve debating skills  D2. Raising research perceptions and transferring students from the stage of education to learning |

|  |  |
| --- | --- |
| **12. Infrastructure** | |
| * Advanced PIC Microcontroller Projects in C by Dogan Ibrahim. * Programmable Logic Controllers: Programming Methods and Applications by John R. Hackworth and Frederick D. Hackworth | Required reading:  · CORE TEXTS  · COURSE MATERIALS  · OTHER |
| * E-Learning / The official page of the College of Knowledge | Special requirements (include for example workshops, periodicals, IT software, websites) |
| * Guest Lectures * Internship | Community-based facilities  (include for example, guest  Lectures , internship , field studies) |

|  |  |
| --- | --- |
| 13. Admissions | |
| None | Pre-requisites |
| 8 | Minimum number of students |
| 100 | Maximum number of students |