**Course Specification**

**(**IT 312 Microprocessors**)**

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| **University:** | Helwan University |
| **Faculty:** | Faculty of Computers & Information |
| **Department:** | Information Technology |

**1. Course Data**

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| **Code:** |  **IT 312**  |
| **Course title:** |  Microprocessors |
| **Level:** | 3 |
| **Specialization:** | Information Technology |
| **Credit hours:** | 3 hours |
| **Number of learning units (hours):**  | ( 3) theoretical (2 ) practical |

**2. Course Objective**

The aim of this course is to provide the fundamental knowledge and skill required in handling hardware and software interfaces for microprocessors. After completing this course, the students are expected to be able to translate and convert the learned knowledge into the design of a simple microprocessor-based device. In long run, the graduated students may use the gained knowledge and skill from this course in designing industrial products that require microprocessors.

**3. Intended Learning Outcomes:**

1. **Knowledge and Understanding**

A28. Describe the foundations of computer science: Hardware, Software and Networking.

1. **Intellectual Skills**

B22. Negotiate advanced technologies.

B23. Formulate and implement IT systems.

1. **Professional and Practical Skills**

C1. Choose IT solutions based on IT tools and techniques.

C28. Design of the hardware systems.

1. **General and Transferable Skills**

D14. Support Engineering skills.

**4. Course contents**

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| **Topic** |
| Buses and Interfaces:  Interconnecting system components, I/O addressing techniques |
| memory mapped I/O, interrupts    in I/O. Standard buses. Interfacing keyboard and printer. |
| Control Unit:  Construction of an instruction word, instruction and execution cycles; Organization of control registers |
| Arithmetic operations; Branch, skip or jump, and shift instructions; Register transfer. |
| Computer Architecture:  Word formats; number of addresses, instructions and data |
| Addressing techniques; Branch and jump instructions; Flags, condition codes and status registers; Interrupts; Pipelining, RISC and CISC architecture. |
| Applications: Data logging and instrumentation applications; On-line condition monitoring; |
| Process control systems; Mobile robots; Motor driven systems; Mechatronic-based systems. |

**5. Teaching and Learning Methods**

Lecture/Tutorial/Laboratory Mix

**6. Teaching and Learning Methods for students with limited capability**

* Using data show
* e-learning management tools

**7. Students Evaluation**

1. **Used Methods**
2. **Time**

Assessment 1

Assessment 2

Assessment 3

Assessment 4

1. **Grades Distribution**

Mid-Term Examination 20%

Final-term Examination 50%

Practical Examination 10%

Semester Work and Project 20%

Total 100%

**List of Books and References**

**a) Notes**

* Course Notes

**b) Mandatory Books**

**c) Suggested Books**

**d) Other publications**

 - Periodicals, Web Sites … etc

**Course Coordinator: Dr. Hossam**

**Chairman of the Department: Prof. Dr.**