## Faculty of Computers and Information Technology

### Computer Organization & Assembly Language

**Information :**

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| **Course Code :** | CSC 223 | **Level** : | Undergraduate | **Course Hours :** | 3.00- Hours |

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| **Department :** | Department of Computer Science |

**Instructor Information :**

| Title | Name | Office hours |
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| Associate Professor | Khaled Ahmed Mohamed Elshafey | |
| Teaching Assistant | Basant Adel Enany Ali | |

**Area Of Study :**

The characteristics of a microprocessor, and its applications.
The relationship between hardware and software and how they work together to accomplish a task.
Identify the major component of a PC-based system, describe the steps involving in assembling, linking, and executing a program.
Write programs in assembly language to perform given tasks and run them

**Description :**

Computer basic units organization and design: memory, control, arithmetic and logic unit, input/output. Computer instructions and addressing modes, timing and control, execution cycle of instructions. Input, output and interrupt. Arithmetic processor algorithms. Hardwired versus microprogramming control organization. Assembly instructions and addressing: data transfer instructions, arithmetic instructions, logical instructions, conditional and unconditional branch instructions, loop instructions, procedures and procedure calls, macro instructions

**Course outcomes :**

**a.Knowledge and Understanding: :**

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| 1 - | Discuss issues about the microprocessor performanc |
| 2 - | List the main syntax of assembly language |
| 3 - | Outline fundamentals in computing, including hardware and operating systems |
| 4 - | Discuss issues of reliability |
| 5 - | Discuss some aspects of the subject, such as hardware systems design |
| 6 - | Identify and demonstrate usage of tools, practices and methodologies used in the specification, design, implementation and critical evaluation of computer software systems |
| 7 - | Outline current and underlying technologies that support computer processing and inter-computer communication |

**b.Intellectual Skills: :**

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| 1 - | Identify attributes and components |
| 2 - | Identify a range of solutions and critically evaluate and justify proposed design solutions |

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| 3 - | Generate an innovative design to solve a problem containing a range of commercial and industrial constraints | |
| 4 - | Create and/or justify designs to satisfy given requirements (synthesis, evaluation, application) | |

**c.Professional and Practical Skills: :**

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| 1 - | Write programs using the assembly language |
| 2 - | Program a microprocessor to perform given tasks |
| 3 - | Use the assembly language to control the different computer units |
| 4 - | Use the assembly language to write drivers for different computer accessories. |
| 5 - | Specify, design, and implement computer-based systems |
| 6 - | Identify any risks or safety aspects that may be involved in the operation of computing equipment within a given context |
| 7 - | Specify, investigate, analyze, design and develop computer-based systems using appropriate tools and techniques |
| 8 - | Operate computing equipment efficiently, taking into account its logical and physical properties |

**d.General and Transferable Skills: :**

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| 1 - | Work in stressful environment and within constraints |
| 2 - | Demonstrate efficient IT capabilities |
| 3 - | Manage tasks and resources |
| 4 - | Acquire entrepreneurial skills |
| 5 - | Communicate effectively |
| 6 - | Manage one's own learning and development, including time management and organizational skills |

**Course Topic And Contents :**

| Topic | No. of hours | Lecture | Tutorial / Practical |
|---|---|---|---|
| Basic Concepts | 3 | 2 | 2 |
| IA-32 Processor Architecture (Part 1) | 3 | 2 | 2 |
| IA-32 Processor Architecture (Part 2) | 3 | 2 | 2 |
| Assembly Language Fundamentals | 3 | 2 | 2 |
| Data Transfers, Addressing, and Arithmetic (Part 1) | 3 | 2 | 2 |
| Mid Term Exam 1 | 2 | 1 | 2 |
| Data Transfers, Addressing, and Arithmetic (Part 2) | 3 | 2 | 2 |
| Procedures | 3 | 2 | 2 |
| Conditional Processing | 3 | 2 | 2 |
| Integer Arithmetic (Part 1) | 3 | 2 | 2 |
| Integer Arithmetic (Part 2) | 3 | 2 | 2 |
| Mid Term Exam 2 | 2 | 1 | 2 |
| High-Level Language Interface (Part 1) | 3 | 2 | 2 |
| High-Level Language Interface (Part 2) | 3 | 2 | 2 |

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**Teaching And Learning Methodologies :**

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| Lectures |
| Practical training |
| Exercises |
| Open Discussion |
| E. Learning |
| Self Studies |
| Presentation |
| Projects |
| Web-Site searches |