



Ministry of Higher Education  
and Scientific Research – Iraq  
Al-Mustaqbal University College  
College of Sciences



## MODULE DESCRIPTOR FORM نموذج وصف المادة الدراسية

| Module Information<br>معلومات المادة الدراسية |                                |  |                            |
|---|--------------------------------|--|----------------------------|
| Module Title                                  | Microprocessors                | Module Delivery  |                            |
| Module Type                                   | CORE                           | Theory<br>Lecture<br>Lab<br>Tutorial<br>Practical<br>Seminar |                            |
| Module Code                                   | UOMU0304042                    |  |                            |
| ECTS Credits                                  | 4                              |  |                            |
| SWL (hr/sem)                                  | 125                            |  |                            |
| Module Level                                  | 2                              |  |                            |
| Administering Department                      | Artificial Intelligence        | College  | College of Sciences        |
| Module Leader                                 | Dr. Abdulkadhem A. Abdulkadhem | e-mail   | a.abdulkadhem@uomus.edu.iq |
| Module Leader's Acad. Title                   |                                | Module Leader's Qualification                                | Ph.D.                      |
| Module Tutor                                  | Dr. Abdulkadhem A. Abdulkadhem | e-mail   | a.abdulkadhem@uomus.edu.iq |
| Peer Reviewer Name                            |                                | e-mail   |                            |
| Review Committee Approval                     |                                | Version Number   |                            |

| Relation With Other Modules<br>العلاقة مع المواد الدراسية الأخرى   |         |          |   |
|--|---------|----------|---|
| Prerequisite module  | COLD123 | Semester | 2 |
| Co-requisites module   | COAR311 | Semester | 5 |
| Module Aims, Learning Outcomes and Indicative Contents<br>أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية |         |          |   |

|  |   |
|--|---|
| <p><b>Module Aims</b><br/>أهداف المادة الدراسية</p>                            | <ol style="list-style-type: none"> <li>1. Students acquire skills in dealing with the internal computer system infrastructure to provide a solid foundation in the basics of microprocessors and their applications</li> <li>2. Inform students about the historical development of processors</li> <li>3. Understand the microprocessor infrastructure</li> <li>4. Knowing the processor command sets</li> <li>5. Connecting input and output devices to the processor</li> <li>6. Show students the types of microprocessors</li> <li>7. Introduce students to the basics of assembly language</li> <li>8. Create new products using assembly language programming and solve real-time problems.</li> </ol> |
| <p><b>Module Learning Outcomes</b><br/>مخرجات التعلم للمادة الدراسية</p>       | <ol style="list-style-type: none"> <li>1. Learning how to implement instructions using Microprocessor registers.</li> <li>2. To provide a solid foundation on the fundamentals of microprocessors and applications.</li> </ol>  |
| <p><b>Indicative Contents</b><br/>المحتويات الإرشادية</p>                      | <p>Indicative content includes the following.</p> <ul style="list-style-type: none"> <li>➤ Introduction to Microprocessor and Microcomputer system. <ul style="list-style-type: none"> <li>• Microprocessor Architecture and Register Set.</li> <li>• System Buses</li> <li>• Memory types and physical addressing.</li> <li>• I/O devices</li> </ul> </li> <li>➤ Instruction Set and Format</li> <li>➤ Addressing Modes</li> <li>➤ Introduction to Assembly Programming Language. <ul style="list-style-type: none"> <li>• Arithmetic and logical Instructions (Shift and Rotate).</li> <li>• Program Control (interrupt and subroutine call).</li> </ul> </li> </ul>  |
| <p><b>Learning and Teaching Strategies</b><br/>استراتيجيات التعلم والتعليم</p> |   |
| <p><b>Strategies</b></p>   | <p>The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.</p>   |

| <p><b>Student Workload (SWL)</b><br/>الحمل الدراسي للطالب</p>                          |     |  |      |
|--|-----|--|------|
| <p><b>Structured SWL (h/sem)</b><br/>الحمل الدراسي المنتظم للطالب خلال الفصل</p>       | 78  | <p><b>Structured SWL (h/w)</b><br/>الحمل الدراسي المنتظم للطالب أسبوعياً</p>       | 5.2  |
| <p><b>Unstructured SWL (h/sem)</b><br/>الحمل الدراسي غير المنتظم للطالب خلال الفصل</p> | 47  | <p><b>Unstructured SWL (h/w)</b><br/>الحمل الدراسي غير المنتظم للطالب أسبوعياً</p> | 3.13 |
| <p><b>Total SWL (h/sem)</b><br/>الحمل الدراسي الكلي للطالب خلال الفصل</p>              | 125 |  |      |

## Module Evaluation

تقييم المادة الدراسية

|                      |                 | Time/Number | Weight (Marks)   | Week Due | Relevant Learning Outcome |
|----------------------|-----------------|-------------|------------------|----------|---------------------------|
| Formative assessment | Quizzes         | 1           | 10% (10)         | 5, 10    | LO #1 and 2               |
|                      | Assignments     | 1           | 5% (5)           | 2, 12    | LO #1 and 2               |
|                      | Projects / Lab. |             | 20%(20)          | 7        | LO #1 and 2               |
|                      | Report          | 1           | 5%(5)            | 13       | LO #1 and 2               |
| Summative assessment | Midterm Exam    | 2hr         | 20% (20)         | 7        | LO #1 and 2               |
|                      | Final Exam      | 3hr         | 40% (40)         | 16       | All                       |
| Total assessment     |                 |             | 100% (100 Marks) |          |                           |

## Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

|         | Material Covered                                       |
|---------|--|
| Week 1  | Introduction to microprocessor                         |
| Week 2  | Introduction to microcomputer system                   |
| Week 3  | Microprocessor Architecture                            |
| Week 4  | Register Set   |
| Week 5  | System Buses   |
| Week 6  | Memory types and physical addressing                   |
| Week 7  | I/O devices  |
| Week 8  | Instruction Set and Format                             |
| Week 9  | Addressing mode (real mode, protected mode)            |
| Week 10 | Introduction to Assembly Language Programming          |
| Week 11 | Arithmetic and logical Instructions (Shift and Rotate) |
| Week 12 | Applying Examples                                      |
| Week 13 | Program Control (interrupt and subroutine call)        |
| Week 14 | Applying Examples                                      |
| Week 15 | Implement Full Program                                 |
| Week 16 | Final Exam   |

## Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

|        | Material Covered                      |
|--------|---------------------------------------|
| Week 1 | Data transfer instruction Load & MOVE |

|                |   |
|----------------|---|
| <b>Week 2</b>  | Examples for Load & Move  |
| <b>Week 3</b>  | Arithmetic instruction ADD, SUB, MULT, DIV                              |
| <b>Week 4</b>  | Examples of arithmetic instruction , and addition XCHN, COMP, JMP, JNZ. |
| <b>Week 5</b>  | Logic instruction, shift , rotate, AND, OR, XOR NOR, NOT.               |
| <b>Week 6</b>  | Examples of logic instruction   |
| <b>Week 7</b>  | The addressing mode in 8 bit register                                   |
| <b>Week 8</b>  | Examples of direct register and Immediate register                      |
| <b>Week 9</b>  | The addressing mode in 16 bit register                                  |
| <b>Week 10</b> | Examples of direct, indirect, base, index, and base-index register      |
| <b>Week 11</b> | The addressing mode in 32 bit register                                  |
| <b>Week 12</b> | Examples of direct, indirect, base, index, and base-index register      |
| <b>Week 13</b> | Bit scan and bit test register  |
| <b>Week 14</b> | Examples  |
| <b>Week 15</b> | General examples  |

### Learning and Teaching Resources

مصادر التعلم والتدريس

|                          | Text  | Available in the Library? |
|--------------------------|---|---------------------------|
| <b>Required Texts</b>    | 1. Abel P., "IBM PC Assembly Language and Programming", 4th Edition, Prentice Hall, 1998.<br>2. M. M. Mano, "Computer system architecture" third edition, prentice Hall, 1993.<br>3. Walter A. Triebel, "The 80386, 80486, and Pentium® Processors Hardware, Software, and Interfacing", 1998.<br>4. Abel P., "IBM PC Assembly Language and Programming", 4th Edition, Prentice Hall, 1998. | Yes                       |
| <b>Recommended Texts</b> |   |                           |
| <b>Websites</b>          |   |                           |

### APPENDIX

#### GRADING SCHEME

مخطط الدرجات

| Group                           | Grade                   | التقدير | Marks (%) | Definition                       |
|---------------------------------|-------------------------|---------|-----------|----------------------------------|
| <b>Success Group (50 - 100)</b> | <b>A - Excellent</b>    | امتياز  | 90 - 100  | Outstanding Performance          |
|                                 | <b>B - Very Good</b>    | جيد جدا | 80 - 89   | Above average with some errors   |
|                                 | <b>C - Good</b>         | جيد     | 70 - 79   | Sound work with notable errors   |
|                                 | <b>D - Satisfactory</b> | متوسط   | 60 - 69   | Fair but with major shortcomings |

|                                |                  |             |         |                                       |
|--------------------------------|------------------|-------------|---------|---------------------------------------|
|                                | E - Sufficient   | مقبول       | 50 - 59 | Work meets minimum criteria           |
| <b>Fail Group<br/>(0 – 49)</b> | <b>FX – Fail</b> | مقبول بقرار | (45-49) | More work required but credit awarded |
|                                | <b>F – Fail</b>  | راسب        | (0-44)  | Considerable amount of work required  |
|                                |                  |             |         |                                       |