Ministry of Higher Education

Al-Zahrawi University

Faculty of Science

Department of Artificial Intelligence Sciences

# MODULE DESCRIPTION FORM

# نموذج وصف المادة الدراسية

| Module Information<br>معلومات المادة الدراسية | | | | | |
|---|---|---|---|---|---|
| **Module Title** | **Programming Fundamentals (I)** | | | **Module Delivery** | |
| **Module Type** | **Core** | | | ☒ **Theory**<br>☐ **Lecture**<br>☒ **Lab**<br>☐ **Tutorial**<br>☐ **Practical**<br>☐ **Seminar** | |
| **Module Code** | ZU-SC-AI-1A-PF | | | | |
| **ECTS Credits** | **6** | | | | |
| **SWL (hr/sem)** | **175** | | | | |
| **Module Level** | | UG – Year 1 | **Semester of Delivery** | | First Semester |
| **Administering Department** | | Artificial Intelligence | **College** | College of Science | |
| **Module Leader** | م.م زاهر محمد رضا | | **e-mail** | Zaher.rida@alzahu.edu.iq | |
| **Module Leader's Acad. Title** | | Assistant teacher | **Module Leader's Qualification** | | PhD |
| **Module Tutor** | | | **e-mail** | | |
| **Peer Reviewer Name** | | | **e-mail** | | |
| **Scientific Committee Approval Date** | | | **Version Number** | 1.0 | |

| Relation with other Modules<br>العلاقة مع المواد الدراسية الأخرى | | | |
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| **Prerequisite module** | None | **Semester** | |
| **Co-requisites module** | None | **Semester** | |

| Module Aims, Learning Outcomes and Indicative Contents<br>أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية | |
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| **Module Objectives**<br>أهداف المادة الدراسية | This module aims to:<br>1. Introduce students to the fundamental concepts of computer programming using Python.<br>2. Develop structured problem-solving skills through algorithmic thinking.<br>3. Enable students to design solutions using flowcharts and pseudocode before coding.<br>4. Provide a solid foundation in variables, data types, operators, and control structures.<br>5. Strengthen logical thinking and analytical reasoning required for advanced programming courses.<br>6. Prepare students for subsequent modules in data structures, algorithms, and artificial intelligence. |
| **Module Learning Outcomes**<br><br>مخرجات التعلم للمادة الدراسية | Upon successful completion of this module, students will be able to:<br>LO1: Explain fundamental programming concepts and the role of programming in computing systems.<br>LO2: Apply problem-solving techniques to design algorithms using flowcharts and pseudocode.<br>LO3: Use Python data types, variables, and operators correctly.<br>LO4: Implement input/output operations in Python programs.<br>LO5: Develop programs using conditional statements and loop structures.<br>LO6: Apply arrays, strings, and functions to solve structured programming problems.<br>LO7: Debug, test, and improve simple Python programs. |
| **Indicative Contents**<br>المحتويات الإرشادية | **Part A – Programming Foundations (12 hours)**<br>– **Introduction to programming concepts**<br>– **Problem-solving steps**<br>– **Algorithms and algorithm characteristics**<br>**Part B – Program Design Tools (6 hours)**<br>– **Flowcharts**<br>– **Pseudocode**<br>– **Translating algorithms into Python programs**<br>**Part C – Python Basics (18 hours)**<br>– **Data types and variables**<br>– **Input and output operations**<br>– **Operators and expressions**<br>**Part D – Control Structures (24 hours)**<br>– **Conditional statements**<br>– **Nested conditionals**<br>– **Loop structures**<br>– **Nested loops** |

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| | **Part E – Structured Data and Modular Programming (18 hours)**<br>– **Arrays**<br>– **Strings**<br>– **Functions** |

| **Learning and Teaching Strategies**<br>استراتيجيات التعلم والتعليم | |
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| **Strategies** | The module is delivered through a combination of theoretical lectures and practical lab sessions.<br>Teaching strategies emphasize:<br>– **Problem-based learning**<br>– **Step-by-step algorithm design before coding**<br>– **Live coding demonstrations**<br>– **Guided laboratory exercises**<br>– **Continuous formative feedback**<br>These strategies aim to enhance logical reasoning, programming confidence, and independent learning skills. |

| **Student Workload (SWL)**<br>الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا | | | |
|---|---|---|---|
| **Structured SWL (h/sem)**<br>الحمل الدراسي المنتظم للطالب خلال الفصل | 94 | **Structured SWL (h/w)**<br>الحمل الدراسي المنتظم للطالب أسبوعيا | 6 |
| **Unstructured SWL (h/sem)**<br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 81 | **Unstructured SWL (h/w)**<br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 5 |
| **Total SWL (h/sem)**<br>الحمل الدراسي الكلي للطالب خلال الفصل | **175** | | |

| **Module Evaluation**<br>تقييم المادة الدراسية | | | | | |
|---|---|---|---|---|---|
| | | **Time/Number** | **Weight (Marks)** | **Week Due** | **Relevant Learning Outcome** |
| **Formative assessment** | **Quizzes** | 2 | 5% (10) | 4 and 10 | LO1–LO3, LO7–LO9 |
| | **Assignments** | 2 | 5% (10) | 7 and 12 | LO1–LO6, LO7- LO10 |
| | **Lab.** | 5 | 2% (10) | Continuous | All |
| | **Report** | 1 | 10% (10) | 14 | LO11–LO13 |
| | **Midterm Exam** | 2 hrs | 10% (10) | 8 | LO1–LO7 |

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| **Summative assessment** | **Final Exam/ Lab** | 1 hr | 10% (10) | 16 | All |
| | **Final Exam** | 3 hrs | 40% (40) | 16 | All |
| **Total assessment** | | | 100% (100 Marks) | | |

| **Delivery Plan (Weekly Syllabus)**<br>المنهاج الاسبوعي النظري | |
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| | **Material Covered** |
| **Week 1** | Introduction to Programming with Python |
| **Week 2** | Problem Solving and Algorithms |
| **Week 3** | Flowcharts and Pseudocode |
| **Week 4** | Data Types and Variables |
| **Week 5** | Input / Output Operations |
| **Week 6** | Operators and Expressions |
| **Week 7** | **Mid-term Exam** |
| **Week 8** | Conditional Statements |
| **Week 9** | Nested Conditional Statements |
| **Week 10** | Loop Structures |
| **Week 11** | Nested Loops |
| **Week 12** | Arrays |
| **Week 13** | Functions |
| **Week 14** | Strings |
| **Week 15** | General Review and Problem Solving Practice |
| **Week 16** | **Preparatory week before the final Exam** |

| **Delivery Plan (Weekly Lab. Syllabus)**<br>المنهاج الاسبوعي للمختبر | |
|---|---|
| | **Material Covered** |
| **Week 1** | Introduction to Python Environment and IDE Setup |
| **Week 2** | Basic Output Programs: Printing Text and “Hello World” |
| **Week 3** | Simple Printing Programs and Output Formatting |
| **Week 4** | Python Variables and Data Types Exercises |
| **Week 5** | Input Programming Tasks |
| **Week 6** | Practice on Operators and Expressions |

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| **Week 7** | Midterm Practical Evaluation |
| **Week 8** | Programming with Conditional Statements |
| **Week 9** | Implementing Nested Conditional Structures |
| **Week 10** | Loop-Based Programming Exercises |
| **Week 11** | Nested Loop Applications and Pattern Problems |
| **Week 12** | Array Manipulation and Basic Applications |
| **Week 13** | Writing and Calling Functions |
| **Week 14** | String Processing and Manipulation |
| **Week 15** | Comprehensive Lab Review |
| **Week 16** | Final Practical Preparation / Assessment |

## Learning and Teaching Resources
مصادر التعلم والتدريس

| | Text | Available in the Library? |
|---|---|---|
| **Required Texts** | Liang, Y. Daniel. Introduction to programming using Python. USA, 2022. | Yes |
| **Recommended Texts** | 1- Matthes, Eric. Python crash course: A hands-on, project-based introduction to programming. no starch press, 2023.<br>2- Allen, Downey. Think Python: How to think like a computer scientist. Green Tea Press, 2015. | Yes<br>Yes |
| **Websites** | https://liveexample.pearsoncmg.com/liang/py/test.html | |

## Grading Scheme
مخطط الدرجات

| Group | Grade | التقدير | Marks % | Definition |
|---|---|---|---|---|
| **Success Group (50 - 100)** | **A -** Excellent | امتياز | 90 - 100 | Outstanding Performance |
| | **B -** Very Good | جيد جدا | 80 - 89 | Above average with some errors |
| | **C -** Good | جيد | 70 - 79 | Sound work with notable errors |
| | **D -** Satisfactory | متوسط | 60 - 69 | Fair but with major shortcomings |
| | **E -** Sufficient | مقبول | 50 - 59 | Work meets minimum criteria |
| **Fail Group (0 – 49)** | **FX –** Fail | راسب (قيد المعالجة) | (45-49) | More work required but credit awarded |
| | **F –** Fail | راسب | (0-44) | Considerable amount of work required |
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**Note:** Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.