# 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** | **CYS1103** | | | | |
| **ECTS Credits** | **7** | | | | |
| **SWL (hr/sem)** | **175** | | | | |
| **Module Level** | UG1 | | **Semester of Delivery** | 1 | |
| **Administering Department** | Cybersecurity | | **College** | College of Computer Science & Information Technology | |
| **Module Leader** | Ali Kareem Abdul Raheem | | **e-mail** | alialmujab@uowa.edu.iq | |
| **Module Leader's Acad. Title** | Lecturer | | **Module Leader's Qualification** | Ph.D. | |
| **Module Tutor** | Ali Kareem Abdul Raheem | | **e-mail** | alialmujab@uowa.edu.iq | |
| **Peer Reviewer Name** | Nabil Sadiq Abdul abbas | | **e-mail** | nabeel@uowa.edu.iq | |
| **Scientific Committee Approval Date** | 24/12/2025 | | **Version Number** | 1.0 | |

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

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**Department Head Approval** **Dean of the College Approval**

| Module Aims, Learning Outcomes and Indicative Contents<br>أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية | |
|---|---|
| **Module Aims**<br>أهداف المادة الدراسية | 1. Introduction to Programming: The module aims to introduce students to the fundamental concepts and principles of programming. It provides an overview of programming languages, their purpose, and their role in software development.<br>2. Basic Programming Constructs: The module aims to familiarize students with the basic programming constructs such as variables, data types, operators, and expressions. It focuses on teaching them how to use these constructs to write simple programs.<br>3. Control Structures: The module aims to introduce students to control structures such as loops and conditionals. It teaches them how to use these structures to control the flow of program execution and make decisions based on certain conditions.<br>4. Functions and Procedures: The module aims to teach students about functions and procedures, their purpose, and how to define and use them in programming. It focuses on modular programming and code reusability.<br>5. Input/Output Operations: The module aims to familiarize students with input/output operations in programming. It covers techniques for reading input from the user, displaying output, and interacting with files.<br>6. Problem-Solving Skills: The module aims to develop students' problem-solving skills by presenting them with programming challenges and exercises. It emphasizes the importance of breaking down problems into smaller steps, designing algorithms, and implementing solutions using programming constructs.<br>7. Debugging and Troubleshooting: The module aims to equip students with skills in identifying and resolving common programming errors. It teaches them techniques for debugging code, tracing program execution, and handling errors effectively. |
| **Module Learning Outcomes**<br>مخرجات التعلم للمادة الدراسية | 1. Understand the basic concepts of programming: Students should be able to explain the fundamental concepts of programming, including variables, data types, control structures, and functions.<br>2. Write and run simple programs: Students should be able to write simple programs using a programming language, demonstrating an understanding of basic syntax and semantics. They should be able to compile or interpret their programs and execute them successfully.<br>3. Apply problem-solving techniques: Students should be able to analyze and break down simple problems into smaller, manageable tasks. They should demonstrate the ability to design algorithms and implement solutions using appropriate programming constructs.<br>4. Use programming constructs effectively: Students should be able to utilize programming constructs such as loops, conditionals, and functions to control program flow, make decisions, and perform repetitive tasks.<br>5. Debug and troubleshoot programs: Students should be able to identify and correct common errors in their programs. They should be able to use debugging techniques and employ strategies to troubleshoot their code |

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| | effectively.<br>6. Demonstrate basic data manipulation skills: Students should be able to work with basic data structures such as arrays, lists, or strings. They should demonstrate proficiency in manipulating and accessing data stored in these structures.<br>7. Apply input/output operations: Students should be able to incorporate input/output operations into their programs. They should demonstrate the ability to read input from users, display output, and interact with files as needed.<br>8. Understand basic software development principles: Students should have an awareness of software development principles such as code organization, code reusability, and modularity. They should be able to write clear, readable, and maintainable code following coding conventions and best practices.<br>9. Collaborate effectively in programming projects: Students should demonstrate the ability to work collaboratively in a programming project, effectively communicating with team members, sharing code, and using version control systems. |
| **Indicative Contents**<br>**المحتويات الإرشادية** | The indicative contents of a programming fundamentals include the following topics:<br>1. Introduction to Programming:<br>o Definition and importance of programming<br>o Overview of programming languages and their uses<br>o Introduction to a specific programming language (e.g., Python) and its features<br>2. Variables and Data Types:<br>o Introduction to variables and their purpose<br>o Basic data types (e.g., integers, floating-point numbers, strings, booleans)<br>o Variable declaration and assignment<br>3. Control Structures:<br>o Introduction to control structures (e.g., if statements, loops)<br>o Conditional statements (e.g., if-else, nested if statements)<br>o Looping structures (e.g., while loop, for loop)<br>4. Functions and Procedures:<br>o Definition and purpose of functions<br>o Function declaration and invocation<br>o Passing arguments to functions and returning values<br>o Introduction to predefined functions and libraries<br>5. Problem Solving and Algorithmic Thinking:<br>o Understanding and defining problems<br>o Breaking down problems into smaller tasks<br>o Developing algorithms and step-by-step solutions<br>o Translating algorithms into code |

| Learning and Teaching Strategies<br>استراتيجيات التعلم والتعليم | |
|---|---|
| **Strategies** | When teaching programming fundamentals to first-grade students in an Information Technology department, it is important to employ strategies that are suitable for their age and learning level. Here are some effective strategies:<br>1. Hands-on Activities: Use interactive and hands-on activities to engage students actively in the learning process. For example, provide puzzles, games, or physical objects that represent programming concepts like variables or loops. This approach helps make abstract concepts more tangible and enjoyable.<br>2. Visual Representations: Utilize visual aids such as diagrams, flowcharts, or illustrations to help students visualize programming concepts. Visual representations can assist in understanding the flow of program execution, the relationship between different programming constructs, and the logic behind algorithms.<br>3. Gamification: Integrate gamification elements into programming exercises and assignments. Create coding challenges, competitions, or educational games that motivate students to apply programming concepts creatively. This approach promotes active learning, problem-solving, and healthy competition among students.<br>4. Collaborative Learning: Encourage collaborative learning by facilitating group projects or pair programming activities. Collaborative learning fosters communication, teamwork, and the exchange of ideas among students. It also allows students to learn from each other and collectively solve programming problems.<br>5. Step-by-Step Approach: Break down programming concepts into small, manageable steps. Start with simple and concrete examples before moving on to more complex topics. Provide clear instructions and explanations, demonstrating each step in the process. This incremental approach helps students grasp concepts gradually and build their programming skills effectively.<br>6. Real-Life Examples: Connect programming concepts to real-life scenarios that students can relate to. Use examples from everyday situations, such as creating a program to calculate the total cost of items in a shopping cart or simulating a traffic light system. Relating programming to real-world applications makes it more relevant and engaging for students.<br>7. Interactive Online Resources: Utilize interactive online resources, educational programming games, or kid-friendly coding platforms specifically designed for young learners. These resources often provide interactive tutorials, visual programming environments, and immediate feedback, making the learning experience more interactive and enjoyable.<br>8. Individualized Support: Provide individualized support and feedback to students. Offer assistance to those who are struggling and provide additional challenges to those who grasp concepts quickly. Regularly |

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| | assess students' progress and address their specific learning needs to ensure that they are making steady progress.<br>9. Encourage Creativity: Foster creativity by encouraging students to think creatively and find innovative solutions to programming problems. Provide opportunities for them to apply programming concepts in creative projects, such as designing simple games or creating animations. This approach encourages critical thinking, problem-solving, and the exploration of their own ideas.<br>10. Reflective Practice: Incorporate reflection and self-assessment activities into the learning process. Encourage students to review their own code, identify areas for improvement, and reflect on their problem-solving approaches. This reflective practice helps students develop a deeper understanding of programming concepts and improves their ability to analyze and debug their code. |

## Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ 15 اسبوعا

| | | | |
|---|---|---|---|
| **Structured SWL (h/sem)**<br>الحمل الدراسي المنتظم للطالب خلال الفصل | 78 | **Structured SWL (h/w)**<br>الحمل الدراسي المنتظم للطالب أسبوعيا | 5 |
| **Unstructured SWL (h/sem)**<br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 97 | **Unstructured SWL (h/w)**<br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 7 |
| **Total SWL (h/sem)**<br>الحمل الدراسي الكلي للطالب خلال الفصل | 175 | | |

## Module Evaluation

التقييم التكويني للطالب

| | | Time/Number | Weight (Marks) | Week Due | Relevant Learning Outcome |
|---|---|---|---|---|---|
| Formative assessment | Quizzes | 5 | 8% (8) | 2, 4, 5, 7, 9 | 1, 2, 3, 4 |
| | Projects | 1 | 5% (5) | 10 | All |
| | Attendance and Lab execution | 10 | 15% (15) | 2, 3, 4, 5, 6, 7, 8, 9, 10, 11 | All |
| | H. W. | 5 | 7% (7) | 2, 4, 5, 7, 9 | 2, 3, 4, 5, 7 8, 9, 10, 11 |
| | Weekly Class Activity with Attendance | 5 | 5% (5) | 2, 3, 4, 5, 6, 7, 8, 9, 10, 11 | All |
| | Formative assessment | 40%(40) | | | |
| Summative assessment | Midterm Exam | 2hr | 10%(10) | 7 | All |
| | Final Exam | 3hr | 50% (50) | 16 | |
| Total assessment | | | 100% (100 Marks) | | |

| Delivery Plan (Weekly Syllabus) | |
|---|---|
| | **Material Covered** |
| **Week 1** | Introduction to Programing Fundamentals |
| **Week 2** | Learn how to change problem to algorithm |
| **Week 3** | Pseudo Code and Flowchart |
| **Week 4** | Variables, Assignment Statements, and Expressions |
| **Week 5** | Augmented Assignment Operators |
| **Week 6** | Encode characters using ASCII |
| **Week 7** | **MidTerm Exam** |
| **Week 8** | Case Study: Minimum Number of Coins |
| **Week 9** | Write Boolean expressions using comparison operators |
| **Week 10** | if Statements and Common Errors in Selection Statements |
| **Week 11** | Logical Operators and Generating Random Numbers |
| **Week 12** | Loops and Nested loop |
| **Week 13** | Keywords Break and Continue |
| **Week 14** | **Preparation for final exam** |

| Delivery Plan (Weekly Lab. Syllabus) | |
|---|---|
| | **Material Covered** |
| **Week 1** | Lab 1: Introduction to Programming Fundamentals |
| **Week 2** | Lab 2: Getting started with C++ |
| **Week 3** | Lab 3: Reading Input from the Console |
| **Week 4** | Lab 4: learn variables |
| **Week 5** | Lab 5: learn Assignment Statements, and Expressions |
| **Week 6** | Lab 6: Read strings from the keyboard and Encode characters using ASCII |
| **Week 7** | **MidTerm Exam** |
| **Week 8** | Lab 8: Write Boolean expressions using comparison operators |
| **Week 9** | Lab 9: implement if Statements |
| **Week 10** | Lab 10:learn how to read Common Errors in Selection Statements |
| **Week 11** | Lab 11: learn Logical Operators |
| **Week 12** | Lab 12: Generating Random Numbers |
| **Week 13** | Lab 13: while loop, for loop, and Nested loop |
| **Week 14** | **Preparation for final exam** |

## Learning and Teaching Resources
مصادر التعلم والتدريس

| | Text | Available in the Library? |
|---|---|---|
| **Required Texts** | C++:The Complete Reference, Fourth Edition<br>Herbert Schildt<br>McGraw-Hill/Osborne<br>New York Chicago San Francisco<br>Lisbon London Madrid Mexico City<br>Milan New Delhi San Juan<br>Seoul Singapore Sydney Toronto | No |
| **Recommended Texts** | OqeiliSalch, prof. Department of IT-AL-Balqa Applied University | No |
| **Websites** | https://www.w3schools.com/cpp/cpp_intro.asp | |

## 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 |
| | | | | |

**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.

# MODULE DESCRIPTION FORM

# نموذج وصف المادة الدراسية

| Module Information<br>معلومات المادة الدراسية | | | | | |
|---|---|---|---|---|---|
| **Module Title** | **Digital Logic** | | | **Module Delivery** | |
| **Module Type** | **Basic** | | | ☒ **Theory**<br>☐ **Lecture**<br>☐ **Lab**<br>☐ **Tutorial**<br>☒ **Practical**<br>☒ **Seminar** | |
| **Module Code** | **CSIT1104** | | | | |
| **ECTS Credits** | **6** | | | | |
| **SWL (hr/sem)** | **150** | | | | |
| **Module Level** | UGI | | **Semester of Delivery** | 1 | |
| **Administering Department** | Cybersecurity | | **College** | College of Computer Science & Information Technology | |
| **Module Leader** | Nabil Sadiq Abdul abbas | | **e-mail** | nabeel@uowa.edu.iq | |
| **Module Leader's Acad. Title** | Assist Lecturer | | **Module Leader's Qualification** | M.Sc | |
| **Module Tutor** | Nabil Sadiq Abdul abbas | | **e-mail** | nabeel@uowa.edu.iq | |
| **Peer Reviewer Name** | Dr. Ali Kareem | | **e-mail** | alialmujab@uowa.edu.iq | |
| **Scientific Committee Approval Date** | 24/12/2025 | | **Version Number** | V1 | |

| Relation with other Modules<br>العلاقة مع المواد الدراسية الأخرى | | | |
|---|---|---|---|
| **Prerequisite module** | Non | **Semester** | ... |
| **Co-requisites module** | Non | **Semester** | ... |

**Department Head Approval** **Dean of the College Approval**

| Module Aims, Learning Outcomes and Indicative Contents<br>أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية | |
|---|---|
| **Module Objectives**<br>أهداف المادة الدراسية | This course aims to give fundamentals of the number systems arithmetic and representation. The course focuses on binary numbers, because the machine language is represented as binary patterns. After understanding the machine signals (zero and one), the course deals with logical gates, Boolean algebra and logical expression, and digital system design. |
| **Module Learning Outcomes**<br><br>مخرجات التعلم للمادة الدراسية | 1. Knowing the numerical number systems used in logical circuits and performing arithmetic operations on them.<br>2. Knowledge of logical circuits and their design methods.<br>3. Simplify logic circuits by simplifying their equations.<br>4. Full knowledge of digital meters, dividers, and other electronic circuits.<br>5. Full knowledge of the use of signs and their representation in binary numbers.<br>6. Full knowledge of how to convert between number systems used in numerical operations.<br>7. How to integrate digital portals together and methods of calculating their outputs.<br>8. Design counters and dividers and link them together |
| **Indicative Contents**<br>المحتويات الإرشادية | Logic gates are based on Boolean algebra [50 hrs]. At any given moment, every terminal is in one of the two binary conditions, false or true. False represents 0, and true represents 1. Depending on the type of logic gate being used and the combination of inputs, the binary output will differ [50 hrs]. Direct contact with students in theoretical or practical sessions for different subjects such as ( Standard Forms of Boolean Expressions, Boolean Expressions and Truth Tables, The Karnaugh Map, Karnaugh Map SOP Minimization, Karnaugh Map POS Minimization, Basic Combinational Logic Circuits) [70 hrs]. |

| Learning and Teaching Strategies<br>استراتيجيات التعلم والتعليم | |
|---|---|
| **Strategies** | various strategies can be employed to facilitate effective learning and engagement. Here are some learning and teaching strategies commonly used, Lectures: Delivering lectures to present theoretical concepts, principles, and foundational knowledge. Interactive Discussions: Encourage students to actively participate in discussions by asking questions, sharing their thoughts, and engaging in peer-to-peer learning. Discussions can focus on challenging concepts. Hands-on Lab Sessions: Conduct practical lab sessions where students can gain hands-on experience. Assessments and Feedback: Use a variety of assessment methods such as quizzes, assignments, projects, and exams to evaluate students' understanding |

| Student Workload (SWL)<br>الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا | | | |
|---|---|---|---|
| **Structured SWL (h/sem)**<br>الحمل الدراسي المنتظم للطالب خلال الفصل | 78 | **Structured SWL (h/w)**<br>الحمل الدراسي المنتظم للطالب أسبوعيا | 5 |
| **Unstructured SWL (h/sem)**<br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 72 | **Unstructured SWL (h/w)**<br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 4 |
| **Total SWL (h/sem)**<br>الحمل الدراسي الكلي للطالب خلال الفصل | 150 | | |

| Module Evaluation<br>تقييم المادة الدراسية | | | | | |
|---|---|---|---|---|---|
| | | **Time/Number** | **Weight (Marks)** | **Week Due** | **Relevant Learning Outcome** |
| **Formative assessment** | **Quizzes** | 5 | 10% (10) | 7,12 | 1 to 5 |
| | **Assignments** | 2 | 5% (5) | 11 | 3,6 |
| | **Lab.** | 10 | 15% (15) | 1-10 | All |
| | **Projects / Pr.** | 1 | 5% (5) | 14 | All |
| | **Seminar** | 2 | 5% (5) | 15 | 2,3 |
| **Summative assessment** | **Midterm Exam** | 2hr | 10% (10) | 7 | |
| | **Final Exam** | 3hr | 50% (50) | 17 | All |
| **Total assessment** | | | 100% (100 Marks) | | |

| Delivery Plan (Weekly Syllabus)<br>المنهاج الاسبوعي النظري | |
|---|---|
| | **Material Covered** |
| **Week 1** | Number Systems, Binary Numbers, Decimal-to-Binary Conversion |
| **Week 2** | Binary Arithmetic, Complements of Binary Numbers |
| **Week 3** | Signed Numbers, Arithmetic Operations with Signed Numbers |
| **Week 4** | Hexadecimal Numbers, Binary Coded Decimal (BCD) 100, Digital Codes |
| **Week 5** | Logic Gates |
| **Week 6** | Fixed-Function Logic Gates |
| **Week 7** | Boolean Operations and Expressions, Laws and Rules of Boolean Algebra |
| **Week 8** | **Midterm Exam** |
| **Week 9** | Standard Forms of Boolean Expressions |

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| **Week 10** | Boolean Expressions and Truth Tables |
| **Week 11** | The Karnaugh Map |
| **Week 12** | Karnaugh Map SOP Minimization |
| **Week 13** | Karnaugh Map POS Minimization |
| **Week 14** | Basic Combinational Logic Circuits |
| **Week 15** | Implementing Combinational Logic |
| **Week 16** | **Final Exam** |

| **Delivery Plan (Weekly Lab. Syllabus)**<br>المنهاج الاسبوعي للمختبر | |
|---|---|
| | **Material Covered** |
| **Week 1** | Number Systems |
| **Week 2** | Logic Gates |
| **Week 3** | And , OR gates |
| **Week 4** | Arithmetic operation gate |
| **Week 5** | Addition, subtraction operations |
| **Week 6** | multiplication and division process |
| **Week 7** | XOR, XNOR gates |
| **Week 8** | Design for logic circuits |
| **Week 9** | convert from logic circuits to truth table |
| **Week 10** | Timing diagram |
| **Week 11** | The Karnaugh Map |
| **Week 12** | Karnaugh Map SOP Minimization |
| **Week 13** | Karnaugh Map POS Minimization |
| **Week 14** | Basic Combinational Logic Circuits |
| **Week 15** | Implementing Combinational Logic |

| **Learning and Teaching Resources**<br>مصادر التعلم والتدريس | | |
|---|---|---|
| | **Text** | **Available in the Library?** |
| **Required Texts** | Thomas L. Floyed, "Digital Fundamentals" | |
| **Recommended Texts** | Digital Fundamentals 11th Edition, 2015 | |
| **Websites** | http://www.sasurieengg.com/e-course-material/I-year-E-course-material-II-sem/7.CS6201%20-DPSD.pdf<br>https://www.scribd.com/doc/219587519/Digital-Principles-and-System-Dsign<br>https://www.vidyarthiplus.com/vp/thread-17782.html#.WFrbbFN96po | |

| Grading Scheme<br>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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# نموذج وصف المادة الدراسية

| Module Information<br>معلومات المادة الدراسية | | | | | |
|---|---|---|---|---|---|
| **Module Title** | **Computer Organization** | | | **Module Delivery** | |
| **Module Type** | **Core** | | | ☒ **Theory**<br>☒ **Lecture**<br>☒ **Lab**<br>☐ **Tutorial**<br>☒ **Practical**<br>☐ **Seminar** | |
| **Module Code** | **Cys1105** | | | | |
| **ECTS Credits** | 5 | | | | |
| **SWL (hr/sem)** | **125** | | | | |
| **Module Level** | 1 | | **Semester of Delivery** | 1 | |
| **Administering Department** | Cybersecurity | | **College** | College of Computer Science & Information Technology | |
| **Module Leader** | Maky H.Abdulraheem | | **e-mail** | maky.h@uowa.edu.iq | |
| **Module Leader's Acad. Title** | Lecturer | | **Module Leader's Qualification** | Dr. | |
| **Module Tutor** | Maky H.Abdulraheem | | **e-mail** | maky.h@uowa.edu.iq | |
| **Peer Reviewer Name** | Dr. Ali Kareem | | **e-mail** | alialmujab@uowa.edu.iq | |
| **Scientific Committee Approval Date** | 24/12/2025 | | **Version Number** | 1.0 | |

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

**Department Head Approval** **Dean of the College Approval**

| Module Aims, Learning Outcomes and Indicative Contents<br>أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية | |
|---|---|
| **Module Aims**<br>أهداف المادة الدراسية | 1. Equip students with a fundamental understanding of different computer types, including their structure and hardware components.<br>2. Foster an understanding of the functionality and operation of various input/output devices.<br>3. Provide in-depth knowledge about computer memory structures, including ROM, RAM, virtual memory, and cache memory.<br>4. Facilitate understanding of various storage options, their properties, and disk partitioning techniques.<br>5. Impart a comprehensive understanding of operating systems, their types, functionalities, and history. |
| **Module Learning Outcomes**<br><br>مخرجات التعلم للمادة الدراسية | 1. Identify and distinguish between different types of computers and their associated hardware components.<br>2. Understand and describe the functionality of various input/output devices.<br>3. Demonstrate knowledge about different memory types, their functions, and hierarchy.<br>4. Understand and explain various data storage options, including HDDs, SSDs, and the concept of disk partitioning.<br>5. Analyze and compare various operating systems, describing their functions, types, and historical developments. |
| **Indicative Contents**<br>المحتويات الإرشادية | 1. Introduction to Computers: Definitions and types of computers, including supercomputers, server computers, workstation computers, personal computers, and microcontrollers.<br>2. Computer Hardware: Detailed analysis of hardware components such as input/output units, memory units, CPUs, motherboards, expansion cards, and power supply units.<br>3. Input Devices: In-depth study of devices like keyboards, mice, scanners, bar-code and QR code scanners, and speech recognition technology.<br>4. Output Devices: Exploration of devices such as speakers, printers (laser and inkjet), and monitors, including resolution, color depth, and refresh rates.<br>5. Memory: Examination of ROM, RAM, virtual memory, CPU cache, and the hierarchy of memory.<br>6. Storage: Detailed look at HDDs, SSDs, disk partitioning techniques, file systems, and related tasks.<br>7. Operating Systems: Study of the functions and types of operating systems, with examples and history of UNIX, MacOS, Linux, and Microsoft Windows. |

| Learning and Teaching Strategies<br>استراتيجيات التعلم والتعليم | |
|---|---|
| **Strategies** | 1. Lectures: Core concepts and principles will be taught through lectures, providing students with a foundational understanding of the subject matter.<br>2.Hands-On Labs: Practical skills will be developed through lab sessions, where students can apply theoretical knowledge in a practical context.<br>3.Group Projects: Students will work on group projects to foster teamwork and collaboration skills. This also allows for the application of knowledge in a practical, real-world context.<br>4.Independent Study: Students will be encouraged to engage in independent study to deepen their understanding of the topics covered. This could involve reading recommended texts, researching online resources, or practicing skills.<br>5.Discussions and Seminars: Regular discussions and seminars will be held to foster a deeper understanding of the material, encourage critical thinking, and facilitate the exchange of ideas.<br>6.Assessments: Regular assessments will be conducted to gauge students' understanding of the material, provide feedback, and track progress.<br>7. Guest Lectures: Guest lectures from industry professionals or academics could be arranged to provide different perspectives and insights into the subject matter.<br>8. Online Learning Resources: Students will be encouraged to utilize online resources, such as video tutorials, online courses, and forums, to supplement their learning. |

| Student Workload (SWL)<br>الحمل الدراسي للطالب محسوب لـ ١٥ أسبوعا | | | |
|---|---|---|---|
| **Structured SWL (h/sem)**<br>الحمل الدراسي المنتظم للطالب خلال الفصل | 63 | **Structured SWL (h/w)**<br>الحمل الدراسي المنتظم للطالب أسبوعيا | 4 |
| **Unstructured SWL (h/sem)**<br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 62 | **Unstructured SWL (h/w)**<br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 4 |
| **Total SWL (h/sem)**<br>الحمل الدراسي الكلي للطالب خلال الفصل | 125 | | |

| Module Evaluation<br>تقييم المادة الدراسية | | | | | |
|---|---|---|---|---|---|
| | | **Time/Number** | **Weight (Marks)** | **Week Due** | **Relevant Learning Outcome** |
| **Formative assessment** | **Quizzes** | 5 | 10% (10) | 7,12 | 1 to 3 |
| | **Assignments** | 2 | 5% (5) | 11 | 2,4 |
| | **Lab.** | 10 | 15% (15) | 1-10 | All |
| | **Projects / Pr.** | 1 | 5% (5) | 14 | All |
| | **Seminar** | 2 | 5% (5) | 15 | 2,3 |
| **Summative assessment** | **Midterm Exam** | 2hr | 10% (10) | 7 | |
| | **Final Exam** | 3hr | 50% (50) | 17 | All |
| **Total assessment** | | | 100% (100 Marks) | | |

| Delivery Plan (Weekly Syllabus)<br>المنهاج الاسبوعي النظري | |
|---|---|
| | **Material Covered** |
| **Week 1** | Introduction to Computers: What is a Computer, Types of Computers (Supercomputer, Server Computer, Workstation Computer, Personal Computer or PC, Microcontroller) |
| **Week 2** | Introduction to Computer Hardware (Input Unit and Output Unit (I/O), Memory Unit, CPU, Motherboard) |
| **Week 3** | More on Computer Hardware (Expansion Cards, Power Supply) |
| **Week 4** | Input Devices (Keyboard, Pointing Devices including Mouse, Trackball, Touchpad/Pointing Stick, Touch Screen, Stylus) |
| **Week 5** | More Input Devices (Scanners, Bar-code and QR Code Scanners, Microphone, Speech Recognition) |
| **Week 6** | Output Devices (Sound and Speakers, Printers including Laser and Inkjet) |
| **Week 7** | **Mid-term exam** |
| **Week 8** | More on Output Devices (Monitors, including an understanding of Resolution, Colour Depth, Refresh Rate, Difference between CRT, LCD, OLED) |
| **Week 9** | Memory (ROM, RAM, Virtual Memory, CPU Cache (Cache Memory), Memory Hierarchy) |
| **Week 10** | Storage (Hard Disk Drive (HDD), HDD Geometry, HDD Logical Blocks) |
| **Week 11** | More on Storage (Solid State Disk (SSD), SSD Controller, Disk Partitioning including MBR Partitioning and GPT, File Systems and Typical Tasks for File Systems) |
| **Week 12** | Introduction to Operating Systems, Functions of OS, OS Types (Batch, Single-Tasking and Multi-Tasking, Single- and Multi-User, Real Time OS, Distributed Operating System, Mobile OS) |
| **Week 13** | More on Operating Systems (OS Examples and History: UNIX and UNIX-like Operating Systems, BSD and its Descendants, MacOS, Linux Family) |
| **Week 14** | More on Operating Systems (Linux , Mac OS) |
| **Week 15** | **Preparatory week before the final Exam** |

| Delivery Plan (Weekly Lab. Syllabus)<br>المنهاج الاسبوعي للمختبر | |
|---|---|
| | **Material Covered** |
| **Week 1** | Introduction to computer architecture and organization. |
| **Week 2** | Understand BIOS' role in booting the laptop and finding out the laptop model number. |
| **Week 3** | Explore how to change the boot device. |
| **Week 4** | Explore the importance of having a healthy chair and desk to work on a laptop or a PC. |
| **Week 5** | Explore the importance of learning to type correctly. |

| | |
|---|---|
| **Week 6** | Introduction to computer components (CPU, Motherboard, RAM, HDD, Power supply, Case, Graphic card, Sound card, monitor, keyboard, mouse, speaker). |
| **Week 7** | Have practical experience with assembling and disassembling PC components. |
| **Week 8** | Explore Windows sandbox feature. |
| **Week 9** | Explore Oracle virtual box and Hyper-V. |
| **Week 10** | Download Windows ISO file and create a bootable flash disk using Rufus. |
| **Week 11** | Explore computer management and local users and groups. |
| **Week 12** | Explore Task scheduler, Event viewer, Services, Disk management, and Device manager. |
| **Week 13** | Learn about Windows users and groups and file permissions. |
| **Week 14** | Explore Task manager and startup programs. |
| **Week 15** | Explore disk encryption. |

## Learning and Teaching Resources
مصادر التعلم والتدريس

| | Text | Available in the Library? |
|---|---|---|
| **Required Texts** | Computer Organization and Architecture Designing for Performance, Eleventh Edition | No |
| **Recommended Texts** | "Computer Organization and Architecture" by William Stallings | No |
| **Websites** | https://www.tutorialspoint.com/basics_of_computer_science/index.htm | |

## 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 |
| | | | | |

**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.

# MODULE DESCRIPTION FORM

# نموذج وصف المادة الدراسية

| Module Information<br>معلومات المادة الدراسية | | | | | |
|---|---|---|---|---|---|
| **Module Title** | Calculus \| | | | **Module Delivery** | |
| **Module Type** | Basic | | | ☒ **Theory**<br>☐ **Lecture**<br>☐ **Lab**<br>☒ **Tutorial**<br>☐ **Practical**<br>☐ **Seminar** | |
| **Module Code** | CSIT1102 | | | | |
| **ECTS Credits** | 5 | | | | |
| **SWL (hr/sem)** | 125 | | | | |
| **Module Level** | UGI | | **Semester of Delivery** | 1 | |
| **Administering Department** | Cybersecurity | | **College** | College of Computer Science & Information Technology | |
| **Module Leader** | Elaf Ali Safooq | | **e-mail** | elaf.safooq@uowa.edu.iq | |
| **Module Leader's Acad. Title** | Assist Lecturer | | **Module Leader's Qualification** | M.Sc. in Mathematics | |
| **Module Tutor** | M.Sc Elaf Ali Safooq | | **e-mail** | elaf.safooq@uowa.edu.iq | |
| **Peer Reviewer Name** | Dr. Ali Kareem | | **e-mail** | alialmujab@uowa.edu.iq | |
| **Scientific Committee Approval Date** | 24/12/2025 | | **Version Number** | V1 | |

| Relation with other Modules<br>العلاقة مع المواد الدراسية الأخرى | | | |
|---|---|---|---|
| **Prerequisite module** | Non | **Semester** | ... |
| **Co-requisites module** | Non | **Semester** | ... |

**Department Head Approval** **Dean of the College Approval**

| Module Aims, Learning Outcomes and Indicative Contents<br>أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية | |
|---|---|
| **Module Objectives**<br>أهداف المادة الدراسية | 1. **Emphasize the importance of mathematics as a scientific foundation for the study of information security and cyber systems.**<br>2. **Prepare students for advanced cybersecurity courses such as cryptography, algorithms, and network security.**<br>3. **Enhance students' analytical and logical thinking skills for solving mathematical problems related to information technology.**<br>4. **Build a solid mathematical foundation for analyzing algorithms and understanding the behavior of functions related to time and memory performance.** |
| **Module Learning Outcomes**<br><br>مخرجات التعلم للمادة الدراسية | • Develop analytical and logical thinking skills for effective problem-solving.<br>• Organize mathematical solutions and present them in a systematic and scientific manner.<br>• Link mathematical concepts with practical applications in the fields of information technology and cybersecurity. |
| **Indicative Contents**<br>المحتويات الإرشادية | • Fundamentals of mathematics and their relation to cybersecurity<br>• Introduction to mathematical functions<br>• Derivatives and their applications<br>• Concept of differential equations<br>• Number systems<br>• Boolean algebra |

| Learning and Teaching Strategies<br>استراتيجيات التعلم والتعليم | |
|---|---|
| **Strategies** | The course adopts a range of **student-centered teaching strategies** that support both **theoretical and practical understanding**, including the following:<br>1. **Interactive lectures**, which actively engage students in understanding the course content through questions, discussions, and feedback.<br>2. **Problem-based learning**, implemented by presenting mathematical problems progressively from basic to advanced levels.<br>3. **Applied learning**, achieved by applying mathematical concepts to real-world problems. |

| | |
|---|---|
| | 4. **Integration of theory and practice**, by clarifying the relationship between mathematical principles and their practical applications.<br>An example of this approach is linking fundamental concepts with subsequent courses such as **cryptography and algorithms**. |

| Student Workload (SWL) | | | |
|---|---|---|---|
| **Structured SWL (h/sem)**<br>الحمل الدراسي المنتظم للطالب خلال الفصل | 48 | **Structured SWL (h/w)**<br>الحمل الدراسي المنتظم للطالب أسبوعيا | 3 |
| **Unstructured SWL (h/sem)**<br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 77 | **Unstructured SWL (h/w)**<br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 4 |
| **Total SWL (h/sem)**<br>الحمل الدراسي الكلي للطالب خلال الفصل | 125 | | |

## Module Evaluation
تقييم المادة الدراسية

| | | Time/Number | Weight (Marks) | Week Due | Relevant Learning Outcome |
|---|---|---|---|---|---|
| **Formative assessment** | **Quizzes** | 5 | 10% (10) | 3, 6,9,12 | All |
| | **Assignments** | 5 | 10% (10) | 2,5,7,10 | All |
| | **Onsite Assignments** | 2 | 10% (10) | 4,11 | 1,2 |
| | **Reports** | 2 | 10% (10) | 4,11 | 2,3 |
| **Summative assessment** | **Midterm Exam** | 2hr | 10% (10) | 7 | All |
| | **Final Exam** | 3hr | 50% (50) | 16 | All |
| **Total assessment** | | | 100% (100) | | |

## Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

| | Material Covered |
|---|---|
| **Week 1** | Introduction of cybersecurity and the relationship with calculus |
| **Week 2** | Introduction for Number theory (binary, octal, decimal, hexadecimal) |
| **Week 3** | Arithmetic operations of number theory( addition, subtraction, multiplication ,division) |
| **Week 4** | Boolean algebra( definition of Booleans, relationship with digital systems, gates) |
| **Week 5** | Boolean algebra (complementary, types of gates with truth tables) |
| **Week 6** | Derivative – Concept & Definition and Rules of Differentiation |
| **Week 7** | Application od Derivatives |

| | |
|---|---|
| **Week 8** | Integral- rules of integral |
| **Week 9** | Mid exam |
| **Week 10** | Differential equations and applications |
| **Week 11** | Basic Number Theory (Number theory is one of the most important fields of mathematics for cryptography, hashing, encryption, and digital security like cryptography, hashing, digital signature) |
| **Week 12** | Modular Arithmetic ( Addition, subtraction, multiplication) |
| **Week 13** | Primes &Greatest Common Divisor (GCD) |
| **Week 14** | Intro to Cryptographic Mathematics |
| **Week 15** | Fundamentals of Probability Basics |
| **Week 16** | Final exam |

## Learning and Teaching Resources
مصادر التعلم والتدريس

| | Text | Available in the Library? |
|---|---|---|
| **Required Texts** | Calculus: Early Transcendentals,Cengage Learning),Stewart<br>Anton, Bivens, Davis. *Calculus*, Wiley<br>CRYPTOGRAPHY AND NETWORK SECURITY by WILLIAM STALLINGS | No |
| **Recommended Texts** | Thomas, G. B. *Calculus*, Pearson Education<br>CRYPTOGRAPHY AND NETWORK SECURITY by William Stallings | No |
| **Websites** | https://www.khanacademy.org/math/calculus-1 | |

## 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 |
| | | | | |

**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.

# MODULE DESCRIPTION FORM

# نموذج وصف المادة الدراسية

| Module Information<br>معلومات المادة الدراسية | | | | | |
|---|---|---|---|---|---|
| **Module Title** | Arabic Language | | | **Module Delivery** | |
| **Module Type** | Support | | | ☒ **Theory**<br>☐ **Lecture**<br>☐ **Lab**<br>☒ **Tutorial**<br>☐ **Practical**<br>☐ **Seminar** | |
| **Module Code** | UOWA103 | | | | |
| **ECTS Credits** | 2 | | | | |
| **SWL (hr/sem)** | 50 | | | | |
| **Module Level** | UGI | | **Semester of Delivery** | 1 | |
| **Administering Department** | Cybersecurity | | **College** | College of Computer Science & Information Technology | |
| **Module Leader** | Hussein Abbas Abdul Hussein | | **e-mail** | hussein.ab@uowa.edu.iq | |
| **Module Leader's Acad. Title** | Assist Lecturer | | **Module Leader's Qualification** | M.S.c. | |
| **Module Tutor** | Hussein Abbas Abdul Hussein | | **e-mail** | hussein.ab@uowa.edu.iq | |
| **Peer Reviewer Name** | Ali Kareem Abdul Raheem | | **e-mail** | alialmujab@uowa.edu.iq | |
| **Scientific Committee Approval Date** | 24/12/2025 | | **Version Number** | V1 | |

| Relation with other Modules<br>العلاقة مع المواد الدراسية الأخرى | | | |
|---|---|---|---|
| **Prerequisite module** | Non | **Semester** | ... |
| **Co-requisites module** | Non | **Semester** | ... |

**Department Head Approval** **Dean of the College Approval**

| Module Aims, Learning Outcomes and Indicative Contents<br>أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية | |
|---|---|
| **Module Objectives**<br>أهداف المادة الدراسية | أهداف المادة الدراسية لدراسة مادة اللغة العربية تتعلق بتعريف الطلاب بأهم القواعد الأساسية للإملاء الصحيح وتجنب الوقوع في الخطأ في التعبير والتمكن منه بصورة تتناسب مع المستوى الثقافي للطالب، إليك بعض الأهداف الرئيسية للمادة:<br>1. معرفة تأصيل اللغة العربية وأساسها وتاريخها وعلومها<br>2. فهم القواعد الأساسية لعلم الإملاء التي يحتاجها الطالب في دراسته وعمله مستقبلًا.<br>3. التمكن من تطبيق هذه القواعد بسهولة ويسر دون الحاجة إلى حفظها عن ظهر قلب.<br>4. يميز الطالب الأخطاء الإملائية واللغوية البسيطة لتجنب الوقوع فيها.<br>5. القدرة على التعبير بشكل سليم دون الحاجة للاستعانة بغيره.<br>6. يعرف الطالب أهمية اللغة العربية في حياته والعمل زيادة ذخيرته اللغوية وتشخيص أهم الأخطاء والصعوبات التي يعاني منها ومعالجتها.<br>7. التمييز بين المعرب والمبني واستخراجهما من الجمل العربية |
| **Module Learning Outcomes**<br>مخرجات التعلم للمادة الدراسية | مخرجات التعلم لمادة اللغة العربية تهدف إلى تطوير مجموعة من المهارات والمعرفة لدى الطلاب. ادناه بعض مخرجات التعلم الرئيسية بعد انتهاء دراسة هذه المادة:<br>1. شرح القواعد الأساسية للكتابة في مادة اللغة العربية.<br>2. تطبيق المعارف اللغوية بمهارة ويسر.<br>3. تحليل التراكيب اللغوية والنصوص البسيطة التي يستعملها في حياته اليومية.<br>4. إظهار الثقة بالنفس والقدرة على التعبير بسهولة.<br>5. معالجة الأخطاء البسيطة لديه. |
| **Indicative Contents**<br>المحتويات الإرشادية | 1- نشر اللغة العربية بين أفراد المجتمع عموماً لفتح آفاق جديدة لتطوير المهارات اللغوية ودعمها.<br>2- التحدّيات المختلفة التي تواجه المجتمع على صعيد التربية والتعليم ولا سيّما في مجال تدريس اللغة العربية، ومحاولة التوصل إلى حلول ناجعة ومفيدة لتعزيز القدرات اللغوية.<br>3- الإفادة من وسائل الاتصال الحديثة كالإنترنت وغيرها في عملية التعلم. |

| Learning and Teaching Strategies<br>استراتيجيات التعلم والتعليم | |
|---|---|
| **Strategies** | يمكن استخدام العديد من الاستراتيجيات البسيطة التي تسهم في تطوير علمية التعلم بشكل فعال وتجعلها ماتعة ومفيدة ومنها:<br>1- استراتيجية خلية التعلم<br>2- استراتيجية السؤال المعكوس<br>3- استراتيجية أعواد المثلجات<br>4- استراتيجية المكعب.<br>5- استراتيجية الأداء التمثيلي<br>6- استراتيجية كرسي الخبير |

| Student Workload (SWL)<br>الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا | | | |
|---|---|---|---|
| **Structured SWL (h/sem)**<br>الحمل الدراسي المنتظم للطالب خلال الفصل | 33 | **Structured SWL (h/w)**<br>الحمل الدراسي المنتظم للطالب أسبوعيا | 2 |
| **Unstructured SWL (h/sem)**<br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 17 | **Unstructured SWL (h/w)**<br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 1 |
| **Total SWL (h/sem)**<br>الحمل الدراسي الكلي للطالب خلال الفصل | 50 | | |

## Module Evaluation
تقييم المادة الدراسية

| | | Time/Number | Weight (Marks) | Week Due | Relevant Learning Outcome |
|---|---|---|---|---|---|
| Formative assessment | Quizzes | 5 | 15% (15) | 5,7,9 | 2,3,4 |
| | Assignments | 2 | 10% (10) | 3 ,5 | 2 , 3 |
| | Onsite Assignments | 2 | 5% (5) | all | all |
| | Reports | 2 | 10% (10) | 6,7,8,9,10 | all |
| Summative assessment | Midterm Exam | 2hr | 10% (10) | 7 | |
| | Final Exam | 3hr | 50% (50) | 16 | all |
| Total assessment | | | 100% (100 Marks) | | |

## Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

| | Material Covered |
|---|---|
| Week 1 | علومها وأشهر وأصلها وتاريخها وفضلها العربية اللغة عن تعريفية مقدمة |
| Week 2 | مقدمة تعريفية بعلم الإملاء وواضعه ونشأته وتطوره |
| Week 3 | والقطع الوصل :الأولية الهمزة |
| Week 4 | الهمزة المتوسطة |
| Week 5 | الهمزة المتطرفة |
| Week 6 | الهمزة المتطرفة وتنوين الفتح |
| Week 7 | والمربوطة المبسوطة التاءان؛ |
| Week 8 | الضاد والظاء |
| Week 9 | امتحان نصف الفصل |
| Week 10 | الألف المقصورة |
| Week 11 | قصيدة المتنبي في مدح سيف الدولة الحمداني |
| Week 12 | العدد والمعدود1 |

| | |
|---|---|
| **Week 13** | العدد والمعدود 2 |
| **Week 14** | العدد والمعدود 3 |
| **Week 15** | المعرب والمبني |
| **Week 16** | التهيئة للامتحان النهائي |

## Learning and Teaching Resources
مصادر التعلم والتدريس

| | Text | Available in the Library? |
|---|---|---|
| **Required Texts** | الإملاء الفريد، نعوم جرجيس زرازير ، مكتبة اللغة العربية ، بغداد- العراق، ط6، 2017م.<br>الإملاء الواضح، عبد المجيد النعيمي، مكتبة دار المتنبي، بغداد- العراق، ط3، 1967م.<br>شرح ديوان المتنبي :عبد الرحمن البرقوقي، مؤسسة هنداوي، 2017م<br>جامع الدروس العربية :مصطفى الغلاييني، منشورات المكتبة العصرية صيدا -لبنان، 1993م | |
| **Recommended Texts** | | |
| **Websites** | مكتبة لسان العرب الإلكترونية<br>شبكة الألوكة<br>موقع فصيح<br>مكتبة نرجس الإلكترونية<br>المكتبة الوقفية الإلكترونية<br>مكتبة نور الإلكترونية | |

## 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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# MODULE DESCRIPTION FORM

# نموذج وصف المادة الدراسية

| Module Information<br>معلومات المادة الدراسية | | | | | |
|---|---|---|---|---|---|
| **Module Title** | **Data Security Principles** | | | **Module Delivery** | |
| **Module Type** | **Core** | | | ☒ **Theory**<br>☐ **Lecture**<br>☐ **Lab**<br>☒ **Tutorial**<br>☐ **Practical**<br>☒ **Seminar** | |
| **Module Code** | **Cys1101** | | | | |
| **ECTS Credits** | **5** | | | | |
| **SWL (hr/sem)** | **125** | | | | |
| **Module Level** | | UGI | **Semester of Delivery** | | 1 |
| **Administering Department** | | Cybersecurity | **College** | | College of Computer Science & Information Technology |
| **Module Leader** | Radwan Jawad Kazem | | **e-mail** | | Radhwanjawadkadhim@gmail.com |
| **Module Leader's Acad. Title** | | Lecturer | **Module Leader's Qualification** | | PhD |
| **Module Tutor** | Radwan Jawad Kazem | | **e-mail** | | Radhwanjawadkadhim@gmail.com |
| **Peer Reviewer Name** | | Dr. Ali Kareem | **e-mail** | | alialmujab@uowa.edu.iq |
| **Scientific Committee Approval Date** | | 24/12/2025 | **Version Number** | | V1 |

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

**Department Head Approval** **Dean of the College Approval**

| Module Aims, Learning Outcomes and Indicative Contents<br>أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية | |
|---|---|
| **Module Objectives**<br>أهداف المادة الدراسية | The objective of this module is to provide students with a solid understanding of fundamental concepts and practices in data security. Students will learn to identify security threats and vulnerabilities, apply cryptographic and authentication techniques, implement access controls, and ensure data integrity and privacy. The module also introduces digital forensics, database security, and relevant legal frameworks, enabling students to develop a holistic view of protecting information in modern computing environments. |
| **Module Learning Outcomes**<br><br>مخرجات التعلم للمادة الدراسية | 1. The student will learn the Basic cryptography concepts.<br>2. Knows what a digital investigation is, the sources of digital evidence, and the limitations of forensics.<br>3. An overview of the concepts of authentication, authorization, access control, and data integrity.<br>4. Finally, review some of the various techniques for data erasure. |
| **Indicative Contents**<br>المحتويات الإرشادية | 1. Introduction to Data Security Principles<br>• Fundamental security objectives: confidentiality, integrity, availability (CIA)<br>• Threats, vulnerabilities, and risk concepts<br>• Security controls and defense-in-depth<br>• Organizational and technical perspectives of data protection<br><br>2. Basic Cryptography Concepts<br>• Cryptographic primitives: encryption, hashing, digital signatures<br>• Symmetric vs. asymmetric cryptography<br>• Key generation, distribution, and management basics<br>• Use cases: data protection, integrity checks<br><br>3. Historical Ciphers<br>• Classical substitution and transposition ciphers<br>• Caesar, Vigenère, and One-Time Pad (concept)<br>• Cryptanalysis basics and evolution toward modern cryptography<br>• Lessons learned from historical weaknesses<br><br>4. Digital Forensics<br>• Purpose and scope of digital forensics<br>• Evidence acquisition and chain of custody<br>• Log analysis and incident investigation fundamentals<br><br>5. Data Integrity and Authentication<br>• Ensuring data accuracy, consistency, and trustworthiness<br>• Message Authentication Codes (MAC), hashing, checksums<br>• Digital certificates and authentication protocols |

| | |
|---|---|
| | 6. Password Storage Techniques and Data Integrity<br>• Secure password hashing: salts, key-stretching (PBKDF2, bcrypt, scrypt)<br>• Password policies and authentication risks<br>• Common attacks: brute force, dictionary, rainbow tables<br>• Maintaining integrity in authentication systems<br><br>7. Access Control<br>• Access control models: DAC, MAC, RBAC, ABAC<br>• Privilege escalation risks and mitigation<br>• Session management and authorization processes<br>• Identity and access management (IAM) fundamentals<br><br>8. Data Privacy<br>• Principles of data minimization, purpose limitation, and user consent<br>• Personally identifiable information (PII) and sensitive data classification<br>• Privacy-enhancing techniques (pseudonymization, anonymization)<br>• Data privacy risks and common mitigation approaches<br><br>9. Information Storage Security<br>• Secure storage methods: encryption at rest, disk/volume encryption<br>• Backup strategies, redundancy, and recovery<br>• Secure deletion, retention, and lifecycle management<br>• Physical storage security considerations<br><br>10. Database Security<br>• Threats to databases: SQL injection, privilege abuse, insider attacks<br>• Access control and role-based permissions in DB systems<br>• Encryption of data at rest and in transit<br>• Logging, auditing, and monitoring of database activity<br><br>11. Report Seminar<br>• Student-led research presentations on chosen security topics<br>• Development of report writing skills (formatting, referencing)<br>• Critical evaluation of sources and case studies<br>• Peer review and in-class discussion<br><br>12. Data Security Law<br>• Overview of national and international data protection regulations<br>• GDPR/ISO27001 principles and compliance obligations<br>• Legal aspects of data breaches and incident reporting<br>• Ethical considerations in handling personal and sensitive data |

| **Learning and Teaching Strategies**<br>استراتيجيات التعلم والتعليم | |
|---|---|
| **Strategies** | 1- Lectures<br>2- Problem based learning<br>3- Case studies<br>4- Feedback and Formative Assessment |

| Student Workload (SWL)<br>الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا | | | |
|---|---|---|---|
| **Structured SWL (h/sem)**<br>الحمل الدراسي المنتظم للطالب خلال الفصل | 48 | **Structured SWL (h/w)**<br>الحمل الدراسي المنتظم للطالب أسبوعيا | 3 |
| **Unstructured SWL (h/sem)**<br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 77 | **Unstructured SWL (h/w)**<br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 2 |
| **Total SWL (h/sem)**<br>الحمل الدراسي الكلي للطالب خلال الفصل | 125 | | |

| Module Evaluation<br>تقييم المادة الدراسية | | | | | |
|---|---|---|---|---|---|
| | | **Time/Number** | **Weight (Marks)** | **Week Due** | **Relevant Learning Outcome** |
| **Formative assessment** | **Quizzes/Attendance** | 5 | 10% (10) | All | 1,3 |
| | **Assignments** | 5 | 10% (10) | 4,8,12 | 3,4 |
| | **Onsite Assignments** | 2 | 10% (10) | 3,5,7,9,14 | 3 |
| | **Reports** | 2 | 10% (10) | 6,13 | all |
| **Summative assessment** | **Midterm Exam** | 2 | 10% (10) | 7 | 1,2 |
| | **Final Exam** | 3 | 50% (50) | 16 | all |
| **Total assessment** | | | 100% (100 Marks) | | |

| Delivery Plan (Weekly Syllabus)<br>المنهاج الاسبوعي النظري | |
|---|---|
| | **Material Covered** |
| **Week 1** | Overview about Data Security Principles |
| **Week 2** | Introduction to Data Security Principles |
| **Week 3** | Basic cryptography concepts |
| **Week 4** | Historical ciphers |
| **Week 5** | Digital Forensics |
| **Week 6** | Data Integrity and Authentication |
| **Week 7** | MidTerm Exam |
| **Week 8** | Password storage techniques and Data Integrity |
| **Week 9** | Access Control |
| **Week 10** | Data Privacy |
| **Week 11** | Information storage security |

| | |
|---|---|
| **Week 12** | Database security |
| **Week 13** | Report seminar |
| **Week 14** | Data security law |
| **Week 15** | Preparation for Final Exam |

## Learning and Teaching Resources
مصادر التعلم والتدريس

| | Text | Available in the Library? |
|---|---|---|
| **Required Texts** | Cryptography and Network Security, principles and practice, Global Edition – Eighth Edition, William Stallings, 2023 | No |
| **Recommended Texts** | https://cybersecurityguide.org/resources/reading-list/#book | No |
| **Websites** | https://www.coursera.org/professional-certificates/google-cybersecurity | |

## 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 |
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