

**College of Information Technology**

**Department of Information Technology**

**COURSE SYLLABUS/ SPECIFICATION**

**Course Code & Title: ITCS 122– Introduction to Programming Techniques**

**Weight: (2-2-3)**

**Prerequisite: ITCS 101**

**NQF Level Allocated: 6**

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| **NQF Notional Hours / Credits:**  **120 notional hours/ 12 NQF credit** |

**Description:** This course introduces the fundamental concepts of computer programming. The covered topics are primitive data types and operators, input/output, control statements, methods and functions, arrays and strings, classes and objects, and an introduction to Java applications and object-oriented design techniques. Emphasis is placed on the development of problem-solving skills.

**Objectives:**

1. To understand the fundamentals of computer programming and programming languages.

2. To understand how to model and design a solution for a problem using algorithms and flowcharts.

3. To understand the programming language principles, operators, conditional and repetition statements, various built-in-functions such as mathematical, and string functions.

4. To create and implement user-defined data types such as arrays.

5. To gain facility in the writing, executing and debugging programs written in java language.

**Semester:**

**Instructor:**

**Office Telephone: Email (s):**

**Intended Learning Outcomes (ILOs):**

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| 1. **Knowledge and Understanding** | | | | | | | **NQF Descriptor/ Level** | | |
| **A1** | | **Concepts and Theories:** Demonstrate a detailed knowledge and understanding of the main theories, principles and concepts embedded in the process, properties and techniques, employed in computer programming in a Java environment. | | | | | Knowledge: theoretical understanding  [Level 6] | | |
| **A2** | | **Contemporary Trends, Problems and Research:** | | | | | N/A | | |
| **A3** | | **Professional Responsibility:** | | | | | N/A | | |
| 1. **Subject-specific Skills** | | | | | **NQF Descriptor/ Level** | | | |
| **B1** | | | **Problem Solving:** Solve simple problems using programs written in the computer programming language JAVA. | | Knowledge: Practical Application [Level 5]  Skills: Communication, ICT& Numeracy  [Level 5] | | | |
| **B2** | | | **Modeling and Design:** Formulate overall structure of the program & design the algorithms that meet specifications. | | Knowledge: Practical  Application [Level 5] | | | |
| **B3** | | | **Application of Methods and Tools:** Apply Java tools to build, develop, design, implement, test, debug and deploy java programs. | | Knowledge: Practical  Application [Level 5]  Skills: Communication, ICT & Numeracy  [Level 5] | | | |
| 1. **Critical-Thinking Skills** | | | | | | **NQF Descriptor/ Level** | | |
| **C1** | | | **Analytic skills:** Analyze problem specification and effectively use fundamental programming constructs to meet the specification. | | | Generic Problem Solving & Analytical skills  [Level 6] | | |
| **C2** | | | **Synthetic:** | | | N/A | | |
| **C3** | | | **Creative Thinking and innovation:** | | | N/A | | |
| 1. **General and Transferable Skills (other skills relevant to employability and personal development)** | | | | **NQF Descriptor/ Level** | | | |
| **D1** | **Communication:** | | | N/A | | | |
| **D2** | **Teamwork and Leadership:** | | | N/A | | | |
| **D3** | **Organizational and Developmental Skills:** Demonstrate ability to organize ideas and effectively allocate time in given assignment. | | | Competence: Autonomy, Responsibility and Context [Level 6] | | | |
| **D4** | **Ethics and Social Responsibility:** | | | N/A | | | |

**Course Structure (Outline)**

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| **Course Structure (Outline)** | | | | | | |
| **Week** | **Hours** | | **ILOs** | **Unit/Module or Topic Title** | **Teaching**  **Method** | **Assessment**  **Method** |
| **Lec.** | **Lab** |
| 1 | 2 | 2 | A1 | Introduction to Computers and Problem Solving. | Lecture |  |
| 2 | 2 | 2 | B2 | Problem Solving and Solution  Design. | Lecture/ In-  Class Supervised Work |  |
| 3 | 2 | 2 | A1, B3 | Introduction to Java environment. | Lecture/ Lab  Demonstration |  |
| 4 | 2 | 2 | A1, B3 | Arithmetic manipulation and  Operators.  Introduction to classes, Objects and Methods. | Lecture/ Lab  Demonstration  / In-Lab Supervised Work | In-Lab  Exercises |
| 5 | 2 | 2 | A1, B3 | Numbers and variables (local and global variables), Common Programming Errors. | Lecture/ Lab  Demonstration  / In-Lab Supervised Work | Lab Project 1 |
| 6 | 2 | 2 | A1, B1, B3, D3 | Assignment operators, Logical operators, java API Packages. | Lecture/ Lab  Demonstration  / In-Lab Supervised Work/ Project Supervision | In-Lab  Exercises |
| 7-8 | 4 | 4 | A1, B1, B2, B3, C1, D3 | Control statement: simple-if and nested-if. | Lecture / In-  Lab Supervised Work / Project Supervision | Lab Project 2 (Week8) |
| 9-10 | 4 | 4 | B1, B2, B3, C1 | Control statement: switch statement, Math class methods. | Lab  Demonstration  / In-Lab Supervised Work | Major Test  (Week10) |
| 11 | 2 | 2 | A1, B3 | Repetition (while-loop, do-while, for-loop). | Lecture/ Lab  Demonstration | In-Lab  Exercises |
| 12 | 2 | 2 | B1, B2, B3, C1 | Repetition (while-loop, do- while, for-loop). | In-Lab Supervised Work | Lab Test |
| 13 | 2 | 2 | A1, B1, B2, B3, C1, D3 | Repetition (while-loop, do- while, for-loop) & Array. | Lecture/  Project  Supervision | Lab Project 3 |
| 14 | 2 | 2 | A1, B3 | Arrays (1D Array). | Lab  Demonstration | In-Lab  Exercises |
| 15 | 2 | 2 | B1, B2, B3, C1, D3 | 2D Arrays. | In-Lab  Supervised Work/ Project Supervision | Lab Project 4 |
| 16 | 2 | - | A1, B1, B2, C1 | All Topics |  | Final Exam |

**Teaching Materials:**

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| **Textbook(s):** | Deitel T. R. Nieto. (2017) *Java How to Program*, 11th Edition, Prentice Hall. |
| **Handout(s):** | - Internal handouts (Hardcopies) prepared by course instructors.  - Available on Moodle i.e. <http://www.ahlia.edu.bh/moodle> |
| **Reference(s):** | 1. Liang Y. D. (2017) *Introduction to Java Programming, Brief Version*, 11th Edition, Pearson Education.  2. Savitch W. (2017) *Java: An Introduction to Problem Solving and Programming*, 8th Edition, Pearson Education.  3. Malik D. (2012) *Java* Programming*: From Problem Analysis to Program Design*, 5th edition, Cengage Learning. |

**Assessments:**

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| **Type of**  **Assessment** | **Description** | **ILOs** | **Weighting** |
| **Lab Test** | The knowledge of students will be evaluated throughout practical test, students should easily trace programs, configure the errors which may occur and rectify them by themselves. | B1, B3, C1, D3 | 30% |
| **Major Test** | The students will be assessed through theoretical test concentrating on three chapters to evaluate their acquaintance and understanding in the language of JAVA. | A1, B1, B2, C1 | 10% |
| **Lab Projects** | The students will be assessed on their practical application to create simple four projects which are covered through the chapters. Each project worth 20%, and average of best 3 projects will be taken. | B1, B2, B3, C1, D3 | 20% |
| **In-Lab Exercises** | The students will be evaluated through a  number of exercises focusing on certain chapters to assess their knowledge and understanding in the area of fundamental of computing programming JAVA. | B1, B3 | Formative |
| **Final Exam** | This is a theoretical exam which will assess the students’ overall knowledge and understanding of computational methods, logical operators, conditional statements, iteration statements and Arrays. | A1, B1, B2, C1 | 40% |
| **Overall** | | | **100%** |

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| **Admissions** | |
| **Minimum number of students** | **5** |
| **Maximum number of students** | **20** |

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| **Ahlia University values academic integrity. Therefore, all students must understand the meaning and consequences of cheating, plagiarism and other academic offences under the Code of Student Conduct and Disciplinary Procedures (see** [www.ahlia.edu.bh/integrity](http://www.ahlia.edu.bh/integrity) **for more information).** |