

**COLLEGE OF INFORMATION TECHNOLOGY**

**DEPARTMENT OF INFORMATION TECHNOLOGY**

**COURSE SYLLABUS/SPECIFICATION**

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| **CODE & TITLE:** | **ITCS 122 – Introduction to Programming Techniques** | |
| **WEIGHT:** | **(2 - 2 - 3)** |  |
| **PREREQUISITE:** | **ITCS 101** |  |
| **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:** |  | **ACADEMIC YEAR:** |
| **INSTRUCTOR:** | | |
| **OFFICE TEL:** | | |
| **EMAIL:** | | |

**INTENDED LEARNING OUTCOMES (ILOS)**

Upon successful completion of the course, students should be able to:

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| **A. Knowledge and Understanding** | |
| **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. |
| **A2** | Contemporary Trends, Problems and Research: NA |
| **A3** | Professional Responsibility: NA |
| **B. Subject-Specific Skills** | |
| **B1** | Problem Solving: Solve simple problems using programs written in the computer  programming language JAVA. |
| **B2** | Modeling and Design: Formulate overall structure of the program and design the algorithms  that meet specifications. |
| **B3** | Application of Methods and Tools: Apply Java tools to build, develop, design, implement,  test, debug and deploy java programs. |
| **C. Thinking Skills** | |
| **C1** | Analytic: Analyze problem specification and effectively use fundamental programming  constructs to meet the specification. |
| **C2** | Synthetic: NA |
| **C3** | Creative: NA |
| **D. General and Transferable Skills (Other Skills Relevant to Employability and Personal**  **Development)** | |
| **D1** | Communication: NA |
| **D2** | Teamwork and Leadership: NA |
| **D3** | Organizational and Developmental Skills: Demonstrate ability to organize ideas and  effectively allocate time in given assignment. |
| **D4** | Ethical and Social Responsibility: NA |

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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 |

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| 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. (2015) *Java How to Program*, 10th Edition, Prentice Hall. |
| **HANDOUT(S):** | Internal handouts (Hardcopies) prepared by course instructors.  PowerPoint slides available on Moodle i.e. <http://www.ahlia.edu.bh/moodle> |
| **REFERENCE(S):**  **WEBSITE(S):** | 1. Malik D. (2012) *Java* Programming*: From Problem Analysis to Program Design*,  5th edition, Cengage Learning.  2. Liang Y. D. (2013) *Introduction to Java Programming, Brief Version*, 9th Edition, Pearson Education.  3. Savitch W. (2014) *Java: An Introduction to Problem Solving and Programming*,  7th Edition, Pearson Education.  [http://www.javatutorialhub.com](http://www.javatutorialhub.com/) [http://www.freejavaguide.com](http://www.freejavaguide.com/corejava.htm) |

**ASSESSMENT:**

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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 | B1, B3 | Formative |
| chapters to assess their knowledge and  understanding in the area of fundamental of computing programming JAVA. |
| 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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