

**COLLEGE OF INFORMATION TECHNOLOGY**

**DEPARTMENT OF INFORMATION TECHNOLOGY**

**COURSE SYLLABUS/ SPECIFICATION**

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| --- | --- |
| **CODE& TITLE:** | **ITCS 221 – Object Oriented Programming II** |
| **WEIGHT:** | **(2 - 2 - 3)** |
| **PREREQUISITE:** | **ITCS 201** |
| **NQF Level Allocated:** | 6 |
| **NQF Notional Hours / Credits:** | **120 notional hours/ 12 NQF credit** |
| **DESCRIPTION:** This course is built on the information gained from the previous Java programming courses. It concentrates on modeling the GUI and advanced software programming issues such as: Java Applets, Multimedia (applets and applications) and Multithreading**.** | |
| **OBJECTIVES:**   1. To understand advanced concepts of Java Programming Language such as exception and error handling, Multithreading and applets. 2. To explain how to create and use generic methods and types effectively. 3. To teach students how to write multimedia and multithreaded applets and applications. 4. Write applications and applets, and develop a GUI interface. | |
| **Semester:**  **Instructor (s):**  **Office Telephone:**  **Email (s):** | |

**INTENDED LEARNING OUTCOMES (ILOS)**

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

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| **A. Knowledge and Understanding** | | | **NQF Descriptor/ Level** |
| **A1** | | Concepts and Theories: Demonstrate an understanding of advanced Java programming concepts, such as exception and error handling, generic methods and classes, Java applets, multimedia and multithreading. | Knowledge: theoretical understanding  [Level 7] |
| **A2** | | Contemporary Trends, Problems and Research: NA |  |
| **A3** | | Professional Responsibility: NA |  |
| **B. Subject-Specific Skills** | | | **NQF Descriptor/ Level** |
| **B1** | Problem Solving: Analyze and identify real world and computer application problems, and develop effective java applications and applets to solve these problems. | | Knowledge: Practical  Application  [Level 6]  Generic Problem Solving & Analytical skills [Level 6]  Skills: Communication, ICT  & Numeracy  [Level 6] |
| **B2** | Modeling and Design: Design computer programs that meet user specifications utilizing Java programming language. | | Knowledge: Practical  Application  [Level 6] |
| **B3** | Application of Methods and Tools: Apply Java programming language constructs and tools to write, run, trace, and debug object oriented programs. | | Knowledge: Practical  Application  [Level 6]  Skills: Communication, ICT  & Numeracy  [Level 6] |
| **C. Thinking Skills** | | | **NQF Descriptor/ Level** |
| **C1** | Analytic: Analyse user requirements and problems, and evaluate the effectiveness and performance of java programs needed to meet users’ expectations. | | Generic Problem Solving & Analytical skills [Level 6] |
| **C2** | Synthetic: Integrate Java application components into one java project to organize the data and make the program more flexible. | | Generic Problem Solving & Analytical skills [Level 6] |
| **C3** | Creative: Demonstrate creativity in solving new problems by developing Java programs and applets. | | Generic Problem Solving & Analytical skills [Level 6] |
| **D. General and Transferable Skills (Other Skills Relevant to Employability and Personal Development)**  **opment)** | | | **NQF Descriptor/ Level** |
| **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. | | Competence: Autonomy, Responsibility and Context [Level 6] |
| **D4** | Ethical and Social Responsibility: NA | |  |

**Week**

**Week**

**Lec. Lab**

**Course Structure (Outline)**

**ILOs Unit/Module or Topic Title**

**Teaching**

**Method**

**Assessment**

**Method**

1 2 2 A1 Introduction Lecture

2 2 2 A1, B1, B3

3-5 6 6 B1, B2, B3, C1

6 2 2 A1, B1, B2, B3, C1

B1, B2, B3,

**Exception Handling:**

Exceptions and Exception Types, Throwing Exceptions, Catching Ex- ceptions.

**Exception Handling:**

Creating user defined exception clas- ses. The finally Clause Cautions, chained exceptions, precondition and preconditions Assertions.

**Generics:**

Introduction and motivation for Ge- neric methods, and overloading gener- ic methods.

**Generics:**

Lecture/ Lab Demonstra- tion

Lecture/ In- Lab Super- vised Work

Lecture/ In- Lab Super- vised Work

Lecture/ In- Lab Super-

In-Lab

Exercises

In-Lab

Exercises

In-Lab

Exercises

Lab Project1/

7 2 2

8-9 4 4

10 2 2

11 2 2

12-13 4 4

14 2 2

C1, C2, C3, D3

A1, B1, B2, B3, C1, C2.

D3

B1, B2, B3, C1, C2

A1, B1, B2, B3

B1, B2, B3, C1, C2, C3

A1, B1, B2, B3, C1, C2, C3, D3

Generic classes, Generic and inher- itance.

**Introduction to Java Applets:**

Sample Applets, simple Java Applet, Applet life-Cycle methods, Security in Applets.

**Java Applets:**

Generic methods, Generic classes and

Java Applets.

**Multimedia:**

Introduction, manipulating images, loading and playing audio clips, Java media framework.

**Multimedia:**

Manipulating images, loading and playing audio clips, Java media framework.

**Multithreading and RMI:**

Introduction, life-Cycle of a thread, thread's properties and thread schedul- ing, thread synchronization, DeadLock, Socket Class.

vised Work/ Project Su- pervision Lecture/ Lab Demonstra- tion/ In-Lab Supervised Work

In-Lab Su- pervised Work

Lecture/ In- Lab Super- vised Work

Lecture/ In- Lab Super- vised Work

Lecture/ Lab Demonstra- tion/ In-Lab Supervised Work/ Project Supervision

In-Lab

Exercises

Lab Test1 (week 8)/ In- Lab Exercises

In-Lab

Exercises

In-Lab

Exercises

Lab Test2 (week13)/ In- Lab Exercises

Lab Project2/ In-Lab Exercises

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 15 | 2 | 2 | A1, B2, B3, C2 | Remote Method Invocation | Lecture/ Lab Demonstra- tion/ In-Lab Supervised Work | In-Lab Exercises |
| 16 | 2 | - | A1, B1, B2, C1, C2, C3 | **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):** | PowerPoint slides available on Moodle i.e. <http://www.ahlia.edu.bh/moodle> |
| **REFERENCE(S):** | 1. Gaddis T. and Muganda G. (2015) *Starting Out with Java, From Control Struc- tures through Data Structures*, 3rd Edition, Pearson Education.  2. Barnes D. J. and Kölling M. (2012) *Objects First with Java: A Practical Intro- duction Using BlueJ,* 5th Edition, Prentice Hall.  3. Savitch, W. (2017). Java: An Introduction to Problem Solving and Programming Plus MyProgramming Lab with Pearson eText-Access Card Package. Pearson. |

**ASSESSMENTS:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Type of**  **Assessment** | **Description** | **ILOs** | **Weighting** |
| Lab Tests | The student will be assessed through two practical  tests, which will take two hours each. In each test, the students will be asked to develop a JAVA pro- gram for solving a problem. | B1, B3, C1, C2, D3 | 40% |
| Lab Projects | Two lab projects to be given, each worth 10%. The  project could cover any topic in the course. | A1, B1, B2, B3,  C1, C2, C3, D3 | 20% |
| Final Exam | Final exam will be for two hours, including all  types of question: MCQs, short answers questions, true/false, problem solving, etc. | A1, B1, B2, C1, C2, C3 | 40% |
| In-Lab Exercis-  es | Exercises will help the students in understanding  and digesting all the course topics. | B1, B3, C1, C2 | Formative |
| **Overall** |  |  | **100%** |

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

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