1.	Course title	**Advanced Java Programming**
2.	Course number	1902214
3.	Credit hours	3
	Contact hours (theory, practical)	3
4.	Prerequisites/corequisites	Object Oriented Programming (1902110)
5.	Program title	Computer Information Systems
6.	Program code	2
7.	Awarding institution	The university of Jordan
8.	School	King Abdullah II School for Information Technology
9.	Department	Computer Information Systems
10.	Level of course	Undergraduate
11.	Year of study and semester (s)	2nd/3rd year, first and second semesters
12.	Final Qualification	Bachelor of Science in Computer Information Systems
13.	Other department (s) involved in teaching the course	None
14.	Language of Instruction	English
15.	Teaching methodology	☐ Blended ☒ **classroom lectures**
16.	Electronic platform(s)	☒ Moodle: elearning.ju.edu.jo
17.	Date of production/revision	13/10/2021 / revision 9/10/2022

18. Course Coordinator:

Dr. Esra Alzaghoul
Office No.: 006
Office hours: Sunday , Tuesday and Thursday: 12:30-1:30.
Phone number: 22614
Email: e.zaghoul@ju.edu.jo

19. Other instructors:

N/A

20. Course Description:

This course introduces advanced programming skills based on core concepts
of Object-Oriented Programming (OOP) and Design using Java language. It builds on the OOP course to finalize a Java full-stack application. This course starts with using some Java classes such as String, StringBuffer and StringBuilder, and StringtTokenizer for string-processing. It also focuses on I/O operations using files and streams, and JavaFX for developing rich client applications. In addition to, GUI components, event-handling, Generics, exception-handling, multithreading, and JavaFX Event-Handler using Inner Class, Anonymous Class, and Lambda Expression. Finally, it introduces databases connectivity using JDBC. The JDBC case study is based on MySQL Database and Eclipse IDE.

21. Course aims and outcomes:

Aims:

This course covers the advanced aspects of object-oriented programming (OOP) in Java. Through the widely used Java programming language, concentrating on aspects of Java that best demonstrate advanced object-oriented principles and good practice will give the student the required knowledge to use java as a programming language for many purposes.

The main objectives of the OOP course in Java are:

1. Understand and Apply different Java classes and methods used in text processing.
2. Understand, Describe and Use GUI and event handling.
3. Understand, Describe and Use exception handling.
4. Describe and Use Multithreading.
5. Describe and Use Java for Database connectivity.
6. Use Input/output streams and file processing.

Intended Learning Outcomes (ILOs): Upon successful completion of this course, students will be able to:

A- Knowledge and Understanding:
- A1) Understand the concept of classes: String, StringBuilder and StringTokenizer.
- A2) Understand the design principles of graphical user interface (GUI) and its components.
- A3) Understand event-driven objects and handling events.
- A4) Understand exceptions and exception handling.
- A5) Understand the notation of multithreading and the advantages of multithreaded applications.
- A6) Understand and manipulate files in Java and connectivity to databases.

B-Intellectual skills-with ability to
- B1) Distinguish between non-modifiable class String and modifiable class StringBuilder.
- B2) Design a graphical user interface (GUI).
- B3) Recognize and employ analytical skills to solve problems.
- B4) Create and read text files and connect to databases.

C- Practical Skills-With ability to
- C1) Analyze a problem and write Java code to solve it.
- C2) Evaluate different Java layout managers and propose a solution for designing a GUI.
- C3) Discuss Java multithreading concepts.

D- Transferable Skills-With ability to
- D1) Work individually to design a graphical user interface for some selected systems
- D2) Work effectively, to implement Java code that implements the GUI under study.
- D3) Present the final GUI project.

ABET Students Outcomes (SOs):

1. Analyze a complex computing problem and to apply principles of computing and other relevant disciplines to identify solutions.
2. Design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program's discipline.
3. Communicate effectively in a variety of professional contexts.
4. Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles.
5. Function effectively as a member or leader of a team engaged in activities appropriate to the program's discipline.
6. Support the delivery, use, and management of information systems within an information systems environment [IS]

Mapping ILOs to ABET SOs

ABET SOs
1
2
4

22. Topic Outline and Schedule:

23.

Topic	Topic	ILOs	Teaching Methods	Evaluation Methods	References
1	Welcome & orientation (review syllabus, objectives, textbook, assignments, online material, and teaching methodology) + Introduction to the course	-	Classroom	-	Course Syllabus and Announcements on elearning
	Review of OOP concepts	-	Classroom	-	Text Book & elearning material
	Class String	A1 B1 C1	Classroom	Lecture running codes and questions	Text Book - Chapter 14; & elearning material
2	String Methods	A1 B1 C1	Classroom and practical sessions	Lecture running codes and questions	Text Book - Chapter 14; & elearning material
	Class StringBuffer & StringBuilder	A1 B1 C1	Classroom and practical sessions	Lecture running codes and questions	Text Book - Chapter 14; & elearning material
	StringBuffer Methods				
	Class StringTokenizer	A1 A3 C1	Classroom	Lecture running codes and questions	Text Book - Chapter 14; & elearning material
3	**Exception Handling**	A4 B3 C1	Classroom and practical sessions	Lecture running codes, questions and assignment	Text Book - Chapter 11; & elearning material

Topic	Topic	ILOs	Teaching Methods	Evaluation Methods	References
4	**Multithreading** - Thread States: Life Cycle of a Thread - Thread Priorities and Thread Scheduling - Creating and Executing Threads	A1 C3	Classroom and practical sessions	Lecture running codes, questions and assignment	Text Book - Chapter 23; & elearning material
5	**Class File & File Stream** - Class File - Read from a file - Write to a file	A6 B4	Classroom and practical sessions	Lecture running codes and questions	Text Book - Chapter 15; & elearning material
6	**Graphical User Interface (GUI): JavaFX**	A2 A3 B2 C2 D1 D2	Classroom and practical sessions	Lecture running codes and questions	Text Book - Chapter 25 & 26; & elearning material
	Graphical User Interface (GUI) Part II: **Event Handling**		Classroom and practical sessions		Text Book - Chapter 26; & elearning material
7	**Database Connectivity**	A6 B4	Classroom and practical sessions	Lecture running codes and questions	Text Book - Chapter 24; & elearning material

24. Evaluation Methods and Course Requirements (Optional):

Opportunities to demonstrate achievement of the ILOs are provided through the following <u>assessment methods and requirements</u>:
Teaching/Learning and Assessment Methods:
T: Instructor Presentation, and hands-on activities.
L: Reading Book Chapters and lecture notes, Writing and Running Code, Discussion and observation
A: Class discussion, questions, quizzes and exams

25. Course Policies:

A- Attendance policies:

Class attendance is mandatory. University regulations will be applied. Regular attendance is essential for satisfactory completion of this course.

B- Absences from exams and handing in assignments on time:

Any student who misses any exam will receive a failing grade. Permission for makeup will be granted only if the student notifies the instructor in due time and presents evidence of an officially excused absence.

C- Health and safety procedures:

- All students **MUST** wear face **masks (**in case if they have any **symptoms)**, underline covering their mouth and nose, while present in lecture rooms or labs or any academic or administrative building at the university.

- Students must try to maintain a physical (**social**) **distance** at all times on campus (indoors or outdoors).

As applied in Faculty.

D- Honesty policy regarding cheating, plagiarism, misbehavior:

Assignments are individual or done in learning teams. While students are free to discuss their individual assignments with anybody, including fellow students, individual assignments are expected to show the expertise, creativity and critical faculty of the individual student. Virtually identical individual assignments (in the judgment of the instructor) are not acceptable. Plagiarism is unacceptable and will be punished with an **F** for the full course. References to all source materials are necessary.

E- Grading policy + Weighting (i.e. weight assigned to exams as well as other student work)

All of the following are important in the evaluation of a student's work.

- Written Reports:
    - o Organization, clarity and continuity.
    - o Quality, completeness and soundness of the analysis
    - o Quality of presentation.
- Oral Presentation:
    - Organization and continuity.
    - Selection and support of recommendations.
    - Time, style and clarity.
    - Professionalism.

    - Quizzes, practical assessments, and assignments: 20%

    -Midterm exam: 30%

    -Final exam : 50%
    Satisfactory completion of this subject requires a 50% pass at the end-of-semester

F- Available university services that support achievement in the course:

elearning.ju.edu.jo

G- Statement on Students with disabilities

Students with Disabilities: Students with disabilities who need special accommodations for this class are encouraged to meet with the instructor and/or their academic advisor as soon as possible. In order to receive accommodations for academic work in this course, students must inform the course instructor and/or their academic advisor, preferably in a written format, about their needs no later than the 4th week of classes.

26. Required equipment:

(1) Java SDK (JDK17):
https://www.oracle.com/java/technologies/downloads

(2) Eclipse IDE for Java Developers 2022:
https://www.eclipse.org/downloads/packages

(3) JavaFX 18.0.2 (https://gluonhq.com/products/javafx/)

27. References:

> **Textbook:**
> 1. Java How to Program, Deitel & Deitel, Pearson, 10th edition, 2015.
> 2. Java How to Program, Deitel & Deitel, Pearson, 11th edition, 2018 (For JavaFX).
> 3. Intro to Java Programming, Y. Daniel Liang, 10th Edition, 2015.
>
> **<u>Online Course Site</u>**
> Every student should visit the following site for course material, handouts and announcements.
> Site address: **elearning.ju.edu.jo**
> User name: Your university internet id
> Password: Your university internet password
> A- Recommended books, materials, and media:
>   Students are encouraged to make heavy use of the library, E-LIBRARY
>   http://ezlibrary.ju.edu.jo/login or from within the university using (http://e-library)

28. **Additional information:**

> Please visit the course website available on **elearning.ju.edu.jo**

Date: **9/10/2022**

Name of Course Coordinator: **Esra Alzaghoul**---Signature: -----

Head of curriculum committee/Department: ----------------------- Signature: --------------------------------------

Head of Department: ------------------------- Signature: --------------------------------------

Head of curriculum committee/Faculty: ----------------------- Signature: --------------------------------------

Dean: --- Signature: --------------------------------------