Prince Sultan University
College of Computer and Info Sciences / Department of Computer Science
Term 242
2nd Semester 2024-2025

Course Syllabus

Mission Statement of the Bachelor of Computer Science Program(s): Provide high quality, computer science education to prepare top graduates through an environment that promotes innovative thinking, ethical behavior, lifelong learning, research, and service to the community.

1. Course number and name: CS102: Computer Programming II
2. Credits and contact hours: 3 (3,1,0)
3. Instructor's or course coordinator's name: Ms. Layal Kazma
   Email: lkazma@psu.edu.sa
   Office Timings:
   Office Location: W337
3. Text book, title, author, and year
   a. Primary Text: Introduction to Java Programming and Data Structures, Comprehensive Version, Global Edition, 11/E, by Y. Daniel Liang, Publisher: Pearson
   b. Other References:
   Java How to Program, 9th Edition by Deitel and Deitel, Publisher: Prentice Hall; 9th edition Java: An Introduction to Problem Solving and Programming 6th edition, Walter Savitch, Pearson International
   c. Online Teaching Materials:
   1. https://media.pearsoncmg.com/ph/esm/ecs_liang_ijp_12/cw/#videonotes
   2. CS101/CS102 Review Material on Youtube: https://www.youtube.com/channel/UCaD4t3R16JRS93Z_4aJA5nQ/playlists
   d. Electronic Materials
   - https://www.udemy.com/course/oo-se-java/
   - Laboratory: Netbeans 8.2 IDE https://www.oracle.com/technetwork/java/javase/downloads/jdk-netbeans-jsp-3413139-esa.html

   e. Learning Management System: Moodle available at https://lms.psu.edu.sa
4. Specific course information
   a. Brief description of the content of the course (catalog description):
   The purpose of this course is to develop an intermediate understanding of object-oriented programming concepts. Some sophisticated uses of object-oriented concepts (inheritance, polymorphism, encapsulation, multiple inheritance of interfaces and Java Collection and Frameworks) and techniques for building systems of multiple interacting components.
   b. Prerequisites or co-requisites: CS101 Computer Programming I
   c. Indicate whether a required, elective, or selected elective (as per Table 5-1) course in the program: Required (R) as a Core course in BSCS and BSSE program.
5. Specific goals for the course
   a. Specific outcomes of instruction. The student will be able to:

CLO1: Demonstrate an understanding of processing data using files and 2D arrays.
CLO 2: Recognize object-oriented concepts using classes and class hierarchies to promote code reuse in software development.
CLO 3: Solve conventional software development problems using object-oriented concepts of inheritance, abstract classes, encapsulation, polymorphism, and interfaces.
CLO 4: Apply Java Collection Frameworks (list, arrays list, maps, sets) efficiently.
CLO 5: Develop and use generic classes to promote software reuse.
CLO 6: Develop recursive programs to solve iterative algorithms.
CLO 7: Evaluate teamwork through the use of effective group methods and techniques to design, develop, and showcase an object-oriented project.

6. Explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.

Course LOs #	Student Outcomes	
	Computer Science	Software Engineering
1	1	1
2	1	1
3	2	2
4	2	2
5	2	2
6	2	2
7	5	5

7. Brief list of topics to be covered

Week No.	Topics	CLO(s) Alignment	Assessments
1, 2	Review of CS101, Two-Dimensional Arrays	CLO 1	Lab Session
3, 4, 5	Class Design Class definition: fields and methods, Constructors (default, full-, no-argument and copy), Constructor overloading, Java keyword this, Setter and getter methods, Method overriding (toString() and equals()), Data encapsulation, hiding and privacy, Objects versus classes, Abstract	CLO 2	Quiz, Major-1, Lab Session, Final Exam

	classes, Access modifiers, Instance versus class members		
6, 7	Inheritance Object class, Java keyword extends, Single inheritance, Multiple inheritance, Java keyword super, Superclass versus subclass, Inheritance UML representation, Superclass references, Java keyword instanceof, protected access modifier, Class hierarchies, Type checking using instanceof and getClass() methods	CLO 13	Quiz, Major-1, Lab Session, Final Exam
8,9	Polymorphism and Interfaces Use of superclass references, Reference upcasting/downcasting, getClass() methods, Interface definition, Abstract methods, Single abstract method (SAM) interfaces	CLO 3	Quiz, Major-II, Lab Session, Final Exam
10,11,12	Java Collection Framework: Dynamic arrays, ArrayList class, Arrays class, Search and sort methods in Arrays class, LinkedList class, HasheSet class, HashMap class, PriorityQueue class,m Search and sort methods in Collections class, Uni-directional and bi-directional iterators	CLO 4	Major-II, Lab Session, Final Exam
13	Generic Class Generic types, Generic methods, Implementation of generic interfaces, Generic classes	CLO 5	Lab Session, Final Exam
14	Recursion Definition of recursive methods, Use of recursive methods, Base case and StackOverFlow exceptions	CLO 6	Lab Session, Final Exam
15,16	Course Review + Final Project presentations	CLO 7	Presentation, Lab Session, Final Exam

8. Weight of Assessments

- Weekly Lab Assignments **7%**
- Quizzes (**Computer Based)** **8%**
- Attendance **5%**
- 2 Major Exams (**Computer-based**) **30%**
- Project **10%**
- Final Exam (**Computer-based**) **40%**

Major Exam 1 will be on 17/2/2025 (12 to 1pm).
Major Exam 2 will be on 24/4/2025(12 to 1pm).

9. Additional Information

Plagiarism and Academic Dishonesty: "Plagiarism can be defined as unintentionally or deliberately using another person's writing or ideas as though they are one's own. Plagiarism includes, but is not limited to, copying another individual's work and taking credit for it, paraphrasing information from a source without proper documentation, and mixing one's own words with those of another author without attribution. In addition, buying a paper or project, or downloading a paper from the Internet, and submitting them as your own are also plagiarism. The penalty for academic dishonesty will bring course expulsion and failure, or even suspension" (Academic Integrity and Syllabus Acknowledgement Form).

Attendance Policies: The University attendance policy will be strictly followed. Students are expected to attend all class sessions and be in class on-time. Missing a class session is a student's responsibility. Missed classes will not be repeated. A total of 16 absences may lead to denial grade DN. It is the student's responsibility to periodically check course website/Moodle for course content, projects assignments, updates and notifications. The University attendance policy will be strictly followed.