

Course Title: **Java Programming**

Course No. : ICT. Ed

Level: M.Ed.

Semester: First

Nature of course: Theoretical + Practical

Credit Hour: 3 hours

Teaching Hour: 75 hours(45+30)

1. **Course Description**

This course introduces computer programming using the JAVA programming language with object-oriented programming principles. Emphasis is placed on event-driven programming methods, including creating and manipulating objects, classes, and using object-oriented tools such as the class debugger.

2. **General Objective of the Course:**

- To understand and implement the essential object-oriented concepts and terminology in practices and build the deliverable java application.
- To learn the Java programming language fundamentals ,object oriented concept , multithreading, exception handling , packages and interfaces

3. **Course Outlines:**

Specific Objectives	Contents	Teaching Hours
<ul style="list-style-type: none">• understand the basic concept of java programming	1. Introduction to Java Language 1.1 History of Java 1.2 Java Platform 1.3 Java Virtual Machine (JVM) concept 1.4 Program Development in Java 1.5 Introduction to Java Technologies (J2SE, J2EE, J2ME)	3 hours
<ul style="list-style-type: none">• Explain the principles of the object oriented programming paradigm specifically including abstraction, encapsulation, inheritance and polymorphism	2 Object Oriented Concept in Java 2.1 Introduction and features Object-oriented Programmingt 2.2 Objects, Classes, Constructors , Methods 2.3 Garbage Collection and finalize() Method 2.4 Overloading Method and Overloading Constructors 2.5 Passing Object as a Parameters 2.6 Static Members (Static methods and Block) 2.7 Using the final keyword 2.8 Introduction to Nested and Inner Classes 2.9 Inheritance Basic and Reusability 2.10 Inheritance Types	5 hours

	<p>2.11 Polymorphism and Dynamic Method Dispatch</p> <p>2.12 Abstract Class and Methods</p>	
<ul style="list-style-type: none"> To understand how to create graphical interfaces 	<p>3 Packages and Interfaces</p> <p>3.1 Using the System packages and APIs</p> <p>3.2 Defining a new package</p> <p>3.3 Accessing a package</p> <p>3.4 Defining Interface</p> <p>3.5 Implementing and extending Interface</p> <p>3.6 Realization of multiple inheritance</p>	2 hours
<ul style="list-style-type: none"> To design and develop java error handling software 	<p>4 Exception Handling in Java and Multithreading</p> <p>4.1 Exceptions and Type of Exception</p> <p>4.2 Exception Handling Fundamental (try catch finally block)</p> <p>4.3 Use of throw, throws</p> <p>4.4 Chained Exceptions</p> <p>4.5 Introduction to multithreading</p> <p>4.6 Life Cycle of a Thread</p> <p>4.7 Creating threads in Java</p> <p>4.8 Thread Priorities</p> <p>4.9 Synchronization</p> <p>4.10 Interthread Communication</p>	3 hours
<ul style="list-style-type: none"> To learn the essentials of the Java class library and java APIs. To design and develop java applications and applets 	<p>5 Java GUI Applications and Applets Programming</p> <p>5.1 Introduction to Abstract Window Toolkit(AWT) and AWT Components</p> <p>5.2 Layout Managers and Layout Management</p> <p>5.3 Java Foundation Class (JFC) and Swing</p> <p>5.4 Swing Components and Containers Class hierarchy</p> <p>5.5 Event handling in java</p> <p>5.6 Model View Controller (MVC) Model</p> <p>5.7 Advanced Swing GUI Elements (JTable, JTree, JInternalFrame, JDesktopPane, JEditorialPane, JSplitPane etc)</p> <p>5.8 Introduction to Applet programming and Applet Class</p> <p>5.9 Introduction to Graphics and Java 2D APIs</p>	6 hours
<ul style="list-style-type: none"> To learn the 	<p>6 Java Input/Output System</p>	3 hours

essentials of the Java input and output system.	6.1 File and Directories 6.2 Byte Streams (FileInputStream and FileOutputStream) 6.3 Character Streams(FileReader and FileWriter) 6.4 Random Access File 6.5 Reading and writing with objects (ObjectStream)	
<ul style="list-style-type: none"> To learn how to write network applications in using java 	7 Java Network Programming 7.1 Introduction to Network Programming 7.2 TCP and UDP Protocols 7.3 IP Address, Port Number and Socket 7.4 Working with URL and URLConnection 7.5 Creating a client/server application using TCP Sockets 7.6 Creating a client/server application using UDP Datagram 7.7 Creating multithreaded server program	4 hours
<ul style="list-style-type: none"> To learn the essentials of the Java class library and java APIs. To understand the use of JDBC API to connect and access databases 	8 Java Database Programming 8.1 JDBC API and Versions 8.2 Driver Manager and JDBC Drivers 8.3 JDBC Driver Types 8.4 Introduction to ODBC 8.5 Connecting Database using JDBC ODBC Driver 8.6 ResultSet, ResultSetMetadata, RowSet, Scrollable and Updatable ResultSet, Transaction 8.7 Developing JDBC application	5 hours
<ul style="list-style-type: none"> To understand how to create graphical interfaces To design and develop java web application using java 	9 Web Programming Using Java Servlet 9.1 Introduction to CGI and Web and Application Servers 9.2 HTTP request-response model of Servlet 9.3 Servlet Life-cycle methods 9.4 Servlet APIs 9.5 Creating Java Servlet Program 9.6 Handling HTTP GET and POST Request 9.7 Accessing Database from Servlet program 9.8 Session Tracking and Cookies	4 hours
<ul style="list-style-type: none"> To learn the essentials of the Java class library and java APIs. To learn how to 	10 Distributed Application Development using Java 10.1 Distributed applications	5

<p>write network applications in using java</p>	<p>10.2 Introduction to Distributed Computing Technologies (DCOM, CORBA, RMI) 10.3 Object-based distributed system and Remote objects 10.4 RMI Architecture and Mechanism 10.5 Designing and developing Distributed Application using RMI 10.6 Security issues in the deployment of RMI Application 10.7 Introduction to CORBA</p>	
<ul style="list-style-type: none"> To understand how to frame work of Java application 	<p>11. Introduction to Java Beans and Development Framework</p> <p>11.1 Java Beans 11.2 Bean Development Kit (BDK) and Bean Builder 11.3 Software Components, Introspection and Discovery, Interface methods and Properties, Persistence, Event 11.4 Creating a New Bean 11.5 Introduction to Frameworks and the Application Development using Java-based Framework</p>	<p>3</p>

4. Instructional Techniques

The instructional techniques for this course are divided into two groups. First group consists of general instructional techniques applicable to most of the units. The second group consists of specific instructional techniques applicable to specific units.

4.1 General Techniques

- Providing the reading materials to the students to familiarize the units.
- Lecture, question-answer, discussion, brainstorming, practical, and buzz session.

4.2 Specific Instructional Techniques

Unit	Activity and instructional techniques	Teaching Hours (30)
I to XII	Lecture, Discussion, Practical	

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Note: *Specific Instructional Techniques may or may not require for each of the units mentioned in course outline.*

5. Evaluation

5.1 Internal Evaluation 30%

Internal evaluation will be conducted by course teacher based on following activities:

1) Attendance	4 points
2) Participation in learning activities	6 points
3) First assignment/midterm exam	10 points
4) Second assignment/assessment (1 or two)	10 points
<hr/> Total	<hr/> 30 points

Note: *First assignment/assessment might be mid-term exam + assigns or book review or article review or first term paper on specific issue/topic, mid-term exam or unit test and quiz etc according to nature of course. Second assignment/assessment might be project work, case study, seminar, survey/field study and individual/group report writing, term paper based on secondary data or review of literature and documents etc.*

First and second assignment/assessment may include one or two types of assessment. For instance, one home assignment/book/article review + mid-term exam or only mid-term exam. In the second assessment may include only one project work/term paper or two type of assignment according to nature of the course.

5.2 External Evaluation (Final Examination) 70%

Examination Division, office of the Dean, Faculty of Education will conduct final examination at the end of semester (proposed).

1) Objective type question (Multiple choice 11x11)	11 points
2) Short answer questions (5 questions x 7 points)	35 points
3) Long answer questions (2 questions x 12 points)	24 points
<hr/> Total	<hr/> 70 points

6. Recommended books and reading materials (including relevant published articles in national and international journals)

1. Java How to Program, Sixth Edition, A.M Deitel and P.J. Deitel , Pearson –Prentice Hall India
2. JAVA Programming with Advanced Features, First Edition 2013, Dilli Prasad Sharma, Buddha Publication, Kathmandu Nepal
3. The Complete Reference Java2 , Fifth Edition, Herbert Schildt, Tata McGraw-Hill New Delhi India
4. Core Java Volume-I Fundamentals, 8th Edition, Cay Horstman and Grazy Cornell, Prentice Hall.

5. Core Java Volume-II Advanced Features , 8th Edition, Cay Horstman and Grazy Cornell, Prentice Hall
6. Programming with Java – A Primer, Second Edition, E. Balagurusamy , Tata McGraw-Hill New DelhiIndia

Author (Year of publication). Title of books. Place and publisher. (..... chapter forunit).

Author (Year of publication). Title of article, Name of Journal. Vol. Number, Page number (For unit)

7. Reference materials

Note: Curriculum designers are requested to provide copies of books and reading materials referred in the courses.