NAWAB SHAH ALAM KHAN COLEEG OF ENGINEERING & TECHNOLOGY

DEPARTMENT OF INFORMATION TECHNOLOGY

(Name of the Subject/Lab Course): JAVA PROGRAMMING

(OUCODE:_____) **Programme: UG/PG**

Branch: **IT** **Version No:1**

Year: **II** **Document Number: NSAKCET/IT/**

Semester: **IV** **No. of Pages:_____**

Classification status (Unrestricted/Restricted) : Distribution List:

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3) Date:

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INSTITUTION VISION AND MISSION

1. Vision of the Institution:

To impart quality technical education with strong ethics, producing technically sound engineers capable of serving the society and the nation in a responsible manner.

2. Mission of the Institution:

- M1: To provide adequate knowledge encompassing sound technical concepts and soft skills thereby inculcating sound ethics.
- M2: To provide a conductive environment to nurture creativity in teaching- learning process.
- M3: To identify and provide opportunities for deserving students of all communities.
- M4: To strive and contribute to the needs of the society and the nation by applying advanced engineering and technical concepts.

DEPARTMENT VISION AND MISSION

1. Department Vision:

To produce quality IT professionals, with an ability to adapt to ever changing IT needs of local, national and international arena, through effective teaching & learning, interactions with alumni and industry.

2. Department Mission:

M1: To provide a holistic learning environment for students through ethical practices.

M2: To provide quality infrastructure through practical exposure to the latest technology requirements.

M3: To train the students in soft skills to excel in placements and competitive exams at higher level the industry ready.

M4: To have a healthy Industry - Institute interaction through faculty development programs, student internships, guest lectures and using latest teaching learning methodologies.

M5: To provide effective platform to meet the industrial requirement and provide research oriented environment for the faculty to meet the continuous societal needs.

Programme Outcomes:

1. **Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. **Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
6. **The engineer and society**: Apply reasoning informed by the contextual knowledgeto assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7. **Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. **Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11. **Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one‘s own work, asa member and leader in a team, to manage projects and in multidisciplinary environments.
12. **Lifelong learning**: Recognize the need for, and have the preparation and ability to engage in independent and lifelong learning in the broadest context of technological change.

Programme Specific Outcomes:

PSO1: The IT graduates will work as software engineers for providing solutions to real world problems using structured and object oriented programming languages and open source software.

PSO2: The IT graduates will work as System engineer, Software analyst and Tester for IT and ITes.

PROGRAM EDUCATIONAL OBJECTIVES STATEMENTS:

PEO NO.	PROGRAM EDUCATIONAL OBJECTIVES STATEMENTS
PEO1	GRADUATES WILL HAVE THE ABILITY TO ESTABLISH THEMSELVES AS PRACTICING PROFESSIONALS IN INFORMATION TECHNOLOGY OR RELATED FIELDS
PEO2	GRADUATES WILL APPLY THEIR **PROGRAMMING SKILLS** WITH TEAM SPIRIT TO ADDRESS EVER-CHANGING INDUSTRIAL REQUIREMENTS.
PEO3	GRADUATES WILL HAVE THE ABILITY TO ENGAGE IN LIFE-LONG LEARNING FOR EFFECTIVE ADAPTATION TO TECHNOLOGICAL DEVELOPMENTS

COURSE OBJECTIVES AND COURSE OUTCOMES

OBJECTIVES:

- To introduce the object oriented programming concepts.

From this course the student will able to

- To understand object oriented programming concepts, and apply them in solving problems
- To introduce the principles of inheritance and polymorphism; and demonstrate how they relate to the design of abstract classes.
- To introduce the implementation of packages and interfaces
- To Introduce the concepts of exception handling and multithreading.
- To introduce the design of graphical user interface using applets and swing controls

OUTCOMES:

At the end of the course the students are able to:

- CO1: solve real world problems using OOP techniques and understand the use of abstract classes.
- CO2: solve problems using java collection framework and I/O classes.
- CO3: develop multithreaded applications with synchronization and applets for web applications.
- CO4: design GUI based applications.

CO-PO MAPPING:

Co-Po,Pso	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12		Pso 1	Pso 2
CO1	3	3	2	2	2	1	1	1	1	2	1	2		3	3
CO2	3	2	2	1	1						1	2			2
CO3	2	2	2		1				2			2			2
CO4	3	2	1		2	1	1		1	1	1	3		3	3

Subject: Java Programming Department : IT

SYLLABUS

Unit-1

Object Oriented Programming:

Principles, Benefits of Object Oriented Programming.

Introduction to Java:

Java buzzwords, byte code, Java Programming Fundamentals: Applet and Application program using simple java program, data types, variables, arrays, operators, expressions, control statements, type conversion and casting, concepts of classes, objects, constructors, methods, access control, this keyword, garbage collection, overloading methods and constructors, introducing access control, static, final, nested and inner classes, exploring string class, using command-line arguments.

Inheritance:

Inheritance concept, types of inheritance, Member access rules, use of super and final. Polymorphism - dynamic binding, method overriding, abstract classes and methods..

Unit-2

Interfaces:

Defining an interface, implementing interfaces, extending interface.

Packages:

Defining, Creating and Accessing a Package, importing packages

Exception handling:

Benefits of exception handling, classification, checked exceptions and unchecked exceptions, usage of try, catch, throw, throws and finally, rethrowing exceptions, built in exceptions, creating own exception sub classes

Multithreading:

Java Thread Model, The Main Thread, creating a Thread, creating multiple threads, using is Alive() and join(), thread priorities, synchronization, inter thread communication, deadlock.

Unit-3

Collections:

Overview of Java Collection frame work, commonly used Collection classes – Array List, Linked List, Hash Set, Tree Set, Collection Interfaces – Collection, List, and Set. Accessing Collection via iterate, working with Map. Legacy classes and interfaces – Vector, Hashtable, Stack, Dictionary, and Enumeration interface.

Other Utility classes:

String Tokenizer, Date, Calendar, Gregorian Calendar, Scanner

Java Input/output: exploring java.io, Java I/O classes and interfaces, File, Stream classes, byte stream, character stream, serialization

Unit-4

GUI Programming with java:

The AWT class hierarchy, MVC architecture. Applet Revisited: Basics, architecture and skeleton, simple applet program.

Event Handling:

Delegation Event Model, Event Classes, Source of Events, Event Listener Interfaces. Handling mouse and keyboard events, Adapter classes.

Database Programming using JDBC:

Introduction to JDBC, JDBC Drivers & Architecture, CURD operation Using JDBC, Connecting to non-conventional Databases.

Unit-5

Exploring Swing:

JLabel, ImageIcon, JTextField, the Swing buttons, JTabbedpane, JScrollPane, JList, JComboBox.

Servlet:

Life cycle, using tomcat, simple servlet, servlet API, javax.servlet package, reading servlet parameters, javax.servlet.http package, handling HTTP requests and responses

Pre-requisites:

You can directly start learning Java without any prior knowledge of programming language

COURSE NAME	DESCRIPTION
C/C++	The syntax in Java is similar to the syntax of the C programming language, therefore, Knowing C language helps to get hold of Java quickly. Having introduced to object-oriented principles before starting Java, also helps in the understanding of the language so, having an idea on object-oriented languages such as C++ also helps. In short, if you know C or C++ it will be a little bit easier to cope with Java technology.

Class Timetable:

NAWAB SHAH ALAM KHAN COLLEGE OF ENGINEERING AND TECHNOLOGY

Approved by AICTE/ Affiliated to Osmania University

PROGRAMME: B.E IV SEMESTER TIMETABLE A.Y-2020-2021

BRANCH: IT LH: 16 W.E.F: 23-3-2021

Time /Date	09:30 AM-10:30 AM	10:31 AM-11:30 PM	11:31 PM-12:30 PM	12:30 PM-01:30 PM	01:30 PM-02:30 PM	02:31 PM-03:30 PM	3:31 PM-4:30PM
MON	OR	SS	COM	LUNCH BREAK	JAVA		LIBRARY
TUE	JAVA	DBS			COM	MP/ JAVA LAB	
WED	DBS	DBS/MP LAB			OR	SS	JAVA
THU	COM	JAVA / DBS LAB			DC		BFE
FRI	DC	SS	OR			BFE	
SAT	REMEDIAL/ TT/ VISITING HOURS				SPORTS		

S.NO	SUBJECT NAME	FACULTY NAME
1	OPERATION RESEARCH	MS AZEEZA SHAHEEN
2	BIOLOGY FOR ENGINEERS	MS NAZNEEN BEGUM/ MS SEEMA ASKARI
3	SIGNALS AND SYSTEMS	MS SHAREA TAKREEM
4	JAVA PROGRAMMING	MS TAHERA ABID
5	DATABASE SYSTEM	MR MD. AYAZ UDDIN
6	COMPUTER ORGANIZATION AND MICROPROCESSOR	MS SARAVANTHI
7	DATA COMMUNICATION	D. AKBAR HUSSAIN
8	MICROPROCESSOR LAB	MS SARAVANTHI
9	DATABASE SYSTEM LAB	MR MD. AYAZ UDDIN / SHAIK FATHIMA ZAHERA
10	JAVA PROGRAMMING LAB	MS TAHERA ABID / MS SABA MOHAMMADI

CLASS COORDINATOR
MS SUMERA JABEEN

HOD
DR G.S.S.RAO

PRINCIPAL
DR SYED ABDUL SATTAR

Individual Timetable:

Lecture schedule with methodology being used/adopted:

S. No.	No.Of Periods	Topic to be Covered	Regular/ Additional	Teaching aids used PPT/ OHP/ BB
		UNIT-1		
1	1	A Way of Viewing World Agents, Responsibility, Messages, Methods, History of Java	Regular	**MS** Teams WB/PPTS
2	2	Java Buzzwords, JRE, JVM, JDK, Object Oriented Thinking and Java Basics	Regular	**MS** Teams WB/PPTS
3	3	Need for OOP Paradigm, Summary of OOP Concepts- Over view of JAVA, Data Types, Variables	Regular	**MS** Teams WB/PPTS
4	4	Scope and Life Time of Variables, type conversion and casting	Regular	**MS** Teams WB/PPTS
5	5	Arrays, Operators, Expressions, Control Statements, Simple Java Program	Regular	**MS** Teams WB/PPTS
6	6	Concepts of Classes, Objects, Constructors, Methods, Access Control, This Keyword, Garbage Collection	Regular	**MS** Teams WB/PPTS
7	7	Overloading Methods and Constructors, Method Binding	Regular	**MS** Teams WB/PPTS
8	8	Inheritance, Overriding and Exceptions, super, final	Regular	**MS** Teams WB/PPTS
9	9	Parameter Passing, Recursion, Nested and Inner Classes, Exploring String Class.	Regular	**MS** Teams WB/PPTS
10	10	Polymorphism -ad hoc polymorphism, pure polymorphism	Regular	**MS** Teams WB/PPTS
11	11	method overriding, abstract classes, Object class	Regular	**MS** Teams WB/PPTS
		UNIT – II		
12	12	Packages Introduction, Package CLASSPATH	Regular	**MS** Teams WB/PPTS
13	13	Access Protection in packages, importing and creating packages	Regular	**MS** Teams WB/PPTS
14	14	Interface introduction – Defining an interface, implementing interfaces, Nested interfaces, applying interfaces.	Regular	**MS** Teams WB/PPTS
15	15	Variables in interfaces and extending interfaces. Multiple Inheritance with interface	Regular	**MS** Teams WB/PPTS
16	16	Stream based I/O (java.io) – The Stream classes-Byte streams and Character streams	Regular	**MS** Teams WB/PPTS
17	17	Reading console Input and Writing Console Output, File class, Reading and writing Files, Random access file operations	Regular	**MS** Teams WB/PPTS
18	18	The Console class, Serialization, Enumerations, auto boxing, annotations, generics	Regular	**MS** Teams WB/PPTS

19	19	Exception Handling: Introduction, Concepts of Exception Handling, Benefits of Exception Handling	Regular	**MS** Teams WB/PPTS
20	20	Termination or Resumptive Models, Exception Hierarchy, Usage of Try, Catch, Throw,	Regular	**MS** Teams WB/PPTS
21	21	Throws and Finally, Built in Exceptions, Creating Own Exception Sub Classes	Regular	**MS** Teams WB/PPTS
22	22	Differences between Multi-Threading and Multi-tasking, Thread Life Cycle, Creating Threads,	Regular	**MS** Teams WB/PPTS
23	23	Thread Priorities, Synchronizing Threads	Regular	**MS** Teams WB/PPTS
24	24	Inter-thread Communication, Thread Groups	Regular	**MS** Teams WB/PPTS
25	25	Daemon Threads. Enumerations	Regular	**MS** Teams WB/PPTS
		UNIT – III		
26	26	The Collections Framework (java.util)- Collections overview, Collection Interfaces,	Regular	**MS** Teams WB/PPTS
27	27	The Collection classes- Array List, Linked List	Regular	**MS** Teams WB/PPTS
28	28	Hash Set, Tree Set	Regular	**MS** Teams WB/PPTS
29	29	Priority Queue, Array Deque	Regular	**MS** Teams WB/PPTS
30	30	Accessing a Collection via an Iterator, Using an Iterator, The For -Each alternative, Map Interfaces and Classes	Regular	**MS** Teams WB/PPTS
31	31	Comparators	Regular	**MS** Teams WB/PPTS
32	32	Collection algorithms,	Regular	**MS** Teams WB/PPTS
33	33	Arrays, The Legacy Classes and Interfaces - Dictionary	Regular	**MS** Teams WB/PPTS
34	34	Hash table ,Properties, Stack, Vector More Utility classes	Regular	**MS** Teams WB/PPTS
35	35	String Tokenizer, Bit Set, Date, Calendar	Regular	**MS** Teams WB/PPTS
36	36	Random, Formatter, Scanner	Regular	**MS** Teams WB/PPTS
37	37	Java Input/Output: exploring java.io, Java I/O classes and interfaces	Regular	**MS** Teams WB/PPTS
38	38	File, Stream classes, byte stream, character stream	Regular	**MS** Teams WB/PPTS
39	39	serialization.	Regular	**MS** Teams WB/PPTS
		UNIT-IV		
40	40	GUI Programming with Swing – Introduction, limitations of AWT,	Regular	**MS** Teams WB/PPTS
41	41	MVC architecture, components, containers.	Regular	**MS** Teams WB/PPTS

42	42	Understanding Layout Managers, Flow Layout, Border Layout,	Regular	**MS** Teams WB/PPTS
43	43	Grid Layout, Card Layout, Grid Bag Layout.	Regular	**MS** Teams WB/PPTS
44	44	Event Handling: Events Introduction Event Sources, Event Classes, Event Listeners, Delegation Event Model,	Regular	**MS** Teams WB/PPTS
45	45	Database Programming using JDBC: Introduction to JDBC,	Regular	**MS** Teams WB/PPTS
46	46	, JDBC Drivers & Architecture, CURD operation Using JDBC	Regular	**MS** Teams WB/PPTS
47	47	Connecting to non-conventional Databases	Regular	**MS** Teams WB/PPTS
48	48	Handling Mouse and Keyboard Events, Adapter Classes. A Simple Swing Application,	Regular	**MS** Teams WB/PPTS
		UNIT-V		
49	49	Applets – Applets and HTML, Security Issues ,	Regular	**MS** Teams WB/PPTS
50	50	Differences between Applets and Applications, Creating Applets.	Regular	**MS** Teams WB/PPTS
51	51	Passing Parameters to Applets, Creating a Swing Applet, Painting in Swing	Regular	**MS** Teams WB/PPTS
52	52	Exploring Swing Controls - JLabel and Image Icon, JText Field	Regular	**MS** Teams WB/PPTS
53	53	The Swing Buttons - JButton, JToggle Button, JCheck Box, JRadio Button,	Regular	**MS** Teams WB/PPTS
54	54	JTabbed Pane, JScroll Pane, JList, JCombo Box, Swing Menus, Dialogs.	Regular	**MS** Teams WB/PPTS
55	55	Servlet: Life cycle, using tomcat, simple servlet,	Regular	**MS** Teams WB/PPTS
56	56	servlet API, javax.servlet package,	Regular	**MS** Teams WB/PPTS
57	57	reading servlet parameters, javax.servlet.http package	Regular	**MS** Teams WB/PPTS
58	58	handling HTTP requests and responses	Regular	**MS** Teams WB/PPTS

Lesson Plan& Schedule

Year & SEM: II year Sem-IV

Subject: JAVA PROGRAMMING

Faculty Name: Ms. TAHERA ABID

S. No.	Date	Topic to be Covered	Total No. of Periods
		UNIT-1	
1	8/4/21	A Way of Viewing World Agents, Responsibility, Messages, Methods, History of Java	1
2	8/4/21	Java Buzzwords, JRE, JVM, JDK, Object Oriented Thinking and Java Basics	1
3	9/4/21	Need for OOP Paradigm, Summary of OOP Concepts- Over view of JAVA, Data Types, Variables	1
4	15/4/21	Scope and Life Time of Variables, type conversion and casting	1
5	15/4/21	Arrays, Operators, Expressions, Control Statements, Simple Java Program	1
6	20/4/21	Concepts of Classes, Objects, Constructors, Methods, Access Control, This Keyword, Garbage Collection	1
7	22/4/21	Overloading Methods and Constructors, Method Binding	1
8	22/4/21	Inheritance, Overriding and Exceptions, super, final	1
9	23/4/21	Parameter Passing, Recursion, Nested and Inner Classes, Exploring String Class.	1
10	27/4/21	Polymorphism -ad hoc polymorphism, pure polymorphism	1
11	29/4/21	method overriding, abstract classes, Object class	1
		UNIT – II	
12	29/4/21	Packages Introduction, Package CLASSPATH	1
13	30/4/21	Access Protection in packages, importing and creating packages	1
14	1/6/21	Interface introduction – Defining an interface, implementing interfaces, Nested interfaces, applying interfaces.	1
15	1/6/21	Variables in interfaces and extending interfaces. Multiple Inheritance with interface	1
16	3/6/21	Stream based I/O (java.io) – The Stream classes-Byte streams and Character streams	1
17	3/6/21	Reading console Input and Writing Console Output, File class, Reading and writing Files, Random access file operations	1
18	4/6/21	The Console class, Serialization, Enumerations, auto boxing, annotations, generics	1
19	8/6/21	Exception Handling: Introduction, Concepts of Exception Handling, Benefits of Exception Handling	1

20	10/6/21	Termination or Resumptive Models, Exception Hierarchy, Usage of Try, Catch, Throw,	1
21	10/6/21	Throws and Finally, Built in Exceptions, Creating Own Exception Sub Classes	1
22	11/6/21	Differences between Multi-Threading and Multi-tasking, Thread Life Cycle, Creating Threads,	1
23	15/6/21	Thread Priorities, Synchronizing Threads	1
24	17/6/21	Inter-thread Communication, Thread Groups	1
25	17/6/21	Daemon Threads. Enumerations	1
		UNIT – III	
26	18/6/21	The Collections Framework (java.util)- Collections overview, Collection Interfaces,	1
27	22/6/21	The Collection classes- Array List, Linked List	1
28	24/6/21	Hash Set, Tree Set	1
29	24/6/21	Priority Queue, Array Deque	1
30	25/6/21	Accessing a Collection via an Iterator, Using an Iterator, The For -Each alternative, Map Interfaces and Classes	1
31	29/6/21	Comparators	1
32	1/7/21	Collection algorithms,	1
33	1/7/21	Arrays, The Legacy Classes and Interfaces - Dictionary	1
34	2/7/21	Hash table ,Properties, Stack, Vector More Utility classes	1
35	6/7/21	String Tokenizer, Bit Set, Date, Calendar	1
36	8/7/21	Random, Formatter, Scanner	1
37	8/7/21	Java Input/Output: exploring java.io, Java I/O classes and interfaces	1
38	9/7/21	File, Stream classes, byte stream, character stream	1
39	13/7/21	serialization.	1
		UNIT-IV	
40	15/7/21	GUI Programming with Swing – Introduction, limitations of AWT,	1
41	15/7/21	MVC architecture, components, containers.	1
42	16/7/21	Understanding Layout Managers, Flow Layout, Border Layout,	1
43	22/7/21	Grid Layout, Card Layout, Grid Bag Layout.	1

44	22/7/21	Event Handling: Events Introduction Event Sources, Event Classes, Event Listeners, Delegation Event Model,	1
45	23/7/21	Database Programming using JDBC: Introduction to JDBC,	1
46	27/7/21	, JDBC Drivers & Architecture, CURD operation Using JDBC	1
47	29/7/21	Connecting to non-conventional Databases	1
48	30/7/21	Handling Mouse and Keyboard Events, Adapter Classes. A Simple Swing Application,	1
		UNIT-V	
49	2/8/21	Applets – Applets and HTML, Security Issues ,	1
50	5/8/21	Differences between Applets and Applications, Creating Applets.	1
51	13/8/21	Passing Parameters to Applets, Creating a Swing Applet, Painting in Swing	1
52	17/8/21	Exploring Swing Controls - JLabel and Image Icon, JText Field	1
53	20/8/21	The Swing Buttons - JButton, JToggle Button, JCheck Box, JRadio Button,	1
54	24/8/21	JTabbed Pane, JScroll Pane, JList, JCombo Box, Swing Menus, Dialogs.	1
55	26/8/21	Servlet: Life cycle, using tomcat, simple servlet,	1
56	26/8/21	servlet API, javax.servlet package,	1
57	27/8/21	reading servlet parameters, javax.servlet.http package	1
58	31/8/21	handling HTTP requests and responses	1

Subject: Java Programming Branch: IT

ASSIGNMENT QUESTIONS

I SHORT ANSWER QUESTIONS:

Q1. List the byte stream classes? [L1, CO3]

Q2. What are the containers available in swing? [L1, CO4]

Q3. Compare applets with application program? [L4, CO4]

Q4. What is the use of string tokenizer class? [L1, CO3]

Q5. What is an adapter class? What is its significant? [L1, CO3]

Q6. What are the merits of swing components over AWT? [L1, CO4]

Q7. Explain the life cycle of an applet? [L2, CO3]

Q8. Explain the use of layout manager? [L2, CO3]

Q9. What is the need of JDBC type3, type 4 drivers? [L1, CO4]

Q10. What are the sources for item event? [L1, CO4]

Q11. Give the hierarchy for swing components? [L2, CO3]

Q12. List the different AWT controls? [L2, CO4]

Q13. Define serialization? [L2, CO3]

Q14. List the interfaces of java input stream? [L1, CO3]

Q15. Discuss about different menu events? [L2, CO4]

II LONG ANSWER QUESTIONS

Q1. Discuss the types of JDBC drivers with suitable diagrams. [L2, CO4]

Write a JDBC program to update the amount balance in an account after every withdrawal [L6, CO4]

Q2. What is the significance of layout manager? Discuss briefly various layout managers. Overview of JButton class? [L1, L2, CO3]

Q3. Explain the various event listener interfaces? Explain the file management using the file class? [L2, CO3]

Q4. Explain the various components in swing. What are the different types of event listener supported by java? [L2, CO3]

Q5. What is a file? What are the different types of file constructors? Explain file creation with an example? [L1, CO4]

Q6. Discuss in brief various java i/o classes? [L2, CO3]

References:

Suggested Readings:

1. Herbert Scheldt, “The Complete Reference Java, 7th Edition, Tata McGraw Hill, 2006.

2. James M Slack, Programming and Problem Solving with JAVA, Thomson Learning, 2002.

3. C Thomas Wu, An Introduction to Object Oriented Programming with Java 5th Edition, McGraw Hill Publishing, 2010.

4. H. M. Dietel and P. J. Dietel, Java How to Program, Sixth Edition, Pearson Education / PHI.

Links:

https://www.javatpoint.com/java-tutorial

https://www.w3schools.com/java/

https://www.geeksforgeeks.org/java/