Academic Year: 2022-2023	Semester: 6th
Course Name: JAVA for Mobile Applications	Course Code: 18AI63
Total Contact hours: 50	Credits: 04
SEE Marks: 60; CIE: 40	Total Marks: 100
Course Plan Author: Prof. Manzoor Ahmed	Date: 20-03-2023

Course Prerequisites: Basic knowledge of Java fundamentals.

Course Objectives:

1. To have an insight into enumerations and collection frameworks for storing and processing data.
2. To understand the architecture and components of android application.
3. To design interactive user interface.
4. To work with SQLite database.

Course Outcomes:

1. Interpret the need for advanced Java concepts like enumerations and collections in developing modular and efficient programs.
2. Understand various application components in android.
3. Design efficient user interface using different layouts.
4. Develop application with persistent data storage using SQLite.

CO Number	Course Outcome At the end of the course, student should be able to . . .	Blooms' Level
CO1	Interpret the need for advanced Java concepts like enumerations, collections and strings in developing modular and efficient programs.	L3
CO2	Understand various application components in android.	L2
CO3	Design efficient user interface using different layouts.	L3
CO4	Develop application with persistent data storage using SQLite.	L3

Program Outcomes and Program Specific Outcomes

PO, PSO	*1.Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals and an Engineering specialization to the solution of complex problems in Computer Science and Engineering.* *2.Problem Analysis: Identify, formulate, review research literature and analyze complex Computer Science Engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.* *3.Design / Development of Solutions: Design solutions for complex Computer Science 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 related to Computer Science Engineering.* *5.Modern Tool Usage: Ability to create, select, and apply appropriate techniques, resources and modern engineering and IT tools including prediction, modeling and analysis to complex Computer Science Engineering activities with an understanding of the limitations.* *6. The Engineer and Society: Apply reasoning informed by the contextual knowledge to 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 Teamwork: 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, as a member and leader in a team, to manage projects and in multidisciplinary environments.

12. Life-long Learning: Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PSO1: Graduates will have the ability to adapt, contribute and innovate ideas in the field of Artificial Intelligence and Machine Learning.

PSO2: To provide a concrete foundation and enrich their abilities to qualify for Employment, Higher studies and Research in various domains of Artificial Intelligence and Machine Learning such as Data Science, Computer Vision, Natural Language Processing with Ethical Values.

PSO3: Graduates will acquire the practical proficiency with niche technologies and open- source platforms and to become Entrepreneur in the domain Artificial Intelligence and Machine Learning.

CO – PO Mapping

Course Outcomes	Program Outcomes														
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	2	1		1				1			2		1	
CO2	2	1	2		2				2			2		1	1
CO3	2	1	2		2				2			2		1	1
CO4	2	2	2		2				2			2		1	1

Course Content (Syllabus)

JAVA FORMOBILE APPLICATIONS (Effective from the academic year 2018 -2019) SEMESTER – VI			
Course Code	**18AI63**	**CIE Marks**	40
Number of Contact Hours/Week	3:2:0	**SEE Marks**	60
Total Number of Contact Hours	50	**Exam Hours**	03 Hrs

Module-1

Enumerations, Autoboxing and Annotations(metadata): Enumerations, Enumeration fundamentals, the values () and valueOf() Methods, java enumerations are class types, enumerations Inherits Enum, example, type wrappers, Autoboxing, Autoboxing and Methods, Autoboxing/Unboxing occurs in Expressions, Autoboxing/Unboxing, Boolean and character values, Autoboxing/Unboxing helps prevent errors, A word of Warning. Annotations, Annotation basics, specifying retention policy, Obtaining Annotations at run time by use of reflection, Annotated element Interface, Using Default values, Marker Annotations, Single Member annotations, Built-In annotations.

RBT: L2, L3

Module-2

The collections and Framework: Collections Overview, Recent Changes to Collections, The Collection Interfaces, The Collection Classes, accessing a collection Via an Iterator, Storing User Defined Classes in Collections, The Random Access Interface, Working with Maps, Comparators, The Collection Algorithms, Why Generic Collections? The legacy Classes and Interfaces, Parting Thoughts on Collections

RBT: L1, L2

Module-3

String Handling: The String Constructors, String Length, Special String Operations, String Literals, String Concatenation, String Concatenation with Other Data Types, String Conversion and toString( ) Character Extraction, charAt( ), getChars( ), getBytes( ) toCharArray(), String Comparison, equals( ) and equalsIgnoreCase( ), regionMatches( ) startsWith( ) and endsWith( ), equals( ) Versus ==, compareTo( ) Searching Strings, Modifying a String, substring( ), concat( ), replace( ), trim( ), Data Conversion Using valueOf( ), Changing the Case of Characters Within a String, Additional String Methods, StringBuffer, StringBuffer Constructors, length( ) and capacity( ), ensureCapacity( ), setLength( ), charAt( ) and setCharAt( ), getChars( ),append( ), insert( ), reverse( ), delete() and deleteCharAt( ), replace( ), substring( ), Additional StringBuffer Methods, StringBuilder

Text Book 1: Ch 15

Module-4

Getting Started with Android Programming: What is Android? Features of Android, Android Architecture, obtaining the required tools, launching your first android application **Activities, Fragments and Intents:** Understanding activities, linking activities using intents, fragments.

Text Book 3: Ch 1, 3 RBT: L1, L2, L3

Module-5

Getting to know the Android User Interface: Views and ViewGroups, FrameLayout, LinearLayout, TableLayout, RelativeLayout, ScrollView **Designing User Interface with Views:** TextView view – Button, ImageButton, EditText, Checkbox, ToggleButton, RadioButton and RadioGroupViews. **Creating and using Databases:** Creating the DBAdapter Helper class, using the database programmatically.

Text Book 3: Ch 4.1, 5.1, 7.3 RBT: L1, L2, L3

Schedule of Instruction

Sl.no	Class no	Module	Topic	Reference (Book, Page no.)	Course Outcome	Delivery mode
1	2	**Module1:**	**MODULE-1** **Enumerations, Autoboxing and Annotations(metadata):** Enumerations, Enumeration fundamentals, the values () and valueOf() Methods	T1-255-259	CO1	PPTs Chalk & Talk
2	3		java enumerations are class types, enumerations Inherits Enum, example, type wrappers,	T1-259-266	CO1	PPTs Chalk & Talk
3	4		Autoboxing, Autoboxing and Methods, Autoboxing/Unboxing occurs in Expressions,	T1-266-269	CO1	PPTs Chalk & Talk
4	5		Autoboxing/Unboxing, Boolean and character values,	T1-270	CO1	PPTs Chalk & Talk
5	6		Autoboxing /Unboxing helps prevent errors, A word of Warning.	T1-271	CO1	PPTs Chalk & Talk
6	7		Annotations, Annotation basics, specifying retention policy,	T1-272-273	CO1	PPTs Chalk & Talk
7	8		Obtaining Annotations at run time by use of reflection, Annotated element Interface	T1-273-278	CO1	PPTs Chalk & Talk
8	9		Using Default values, Marker Annotations,	T1-279-281	CO1	PPTs Chalk & Talk
9	10		Single Member annotations, Built-In annotations	T1-281-284	CO1	PPTs Chalk & Talk
10	11		Revision of Module-1	-	CO1	Quiz
11	12	**Module2:**	**The collections and Framework:** Collections Overview, Recent Changes to Collections	T1-437-440	CO1	PPTs Chalk & Talk
12	13		The Collection Interfaces,	T1-440-447	CO1	PPTs Chalk & Talk
13	14		The Collection Classes	T1-448-458	CO1	PPTs Chalk & Talk
14	15		accessing a collection Via an Iterator, Storing User Defined Classes in Collections	T1-458-463	CO1	PPTs Chalk & Talk

15	16		The Random Access Interface, Working with Maps,	T1-463-472	CO1	PPTs Chalk & Talk
16	17		Comparators	T1-472-475	CO1	PPTs Chalk & Talk
17	18		The Collection Algorithms, Why Generic Collections?	T1-475-486	CO1	PPTs Chalk & Talk
18	19		The legacy Classes and Interfaces, Parting Thoughts on Collections	T1-487-502 T1-	CO1	PPTs Chalk & Talk
19	20				CO1	PPTs Chalk & Talk
20	21		Revision of Module-2	-	CO1	Quiz
21	22	**Module3:**	**String Handling**: The String Constructors, String Length,	T1-357-360	CO1	PPTs Chalk & Talk
22	23		Special String Operations, String Literals, String Concatenation, String Concatenation with Other Data Types	T1-360-362	CO1	PPTs Chalk & Talk
23	24		String Conversion and toString( ) Character Extraction, charAt( ), getChars(), getBytes( )	T1-362-364	CO1	PPTs Chalk & Talk
24	25		toCharArray(), String Comparison, equals( ) and equalsIgnoreCase( ), regionMatches( ) startsWith( ) and endsWith( ), equals() Versus ==, compareTo( )	T1-364-368	CO1	PPTs Chalk & Talk
25	26		Searching Strings, Modifying a String, substring( ), concat( ), replace( ), trim( ), Data Conversion Using valueOf( ),	T1-368-373	CO1	PPTs Chalk & Talk
26	27		Changing the Case of Characters Within a String, Additional String Methods	T1-373-375	CO1	PPTs Chalk & Talk
27	28		StringBuffer, StringBuffer Constructors, length( ) and capacity( ), ensureCapacity(),	T1-375-376	CO1	PPTs Chalk & Talk
28	29		setLength( ), charAt( ) and setCharAt( ), getChars( ),append( ), insert( ), reverse( ), delete() and deleteCharAt(),	T1-376-380	CO1	PPTs Chalk & Talk
29	30		replace( ), substring( ), Additional StringBuffer Methods, StringBuilder	T1-380-382	CO1	PPTs Chalk & Talk
30	31		Revision of Module-3	-	CO1	Quiz

31	32	**Module4:**	**Getting Started with Android Programming:** What is Android? Features of Android, Android Architecture,	T3-1-7	CO4	PPTs Chalk & Talk
32	33		obtaining the required tools, launching your first android application	T3-8-26	CO4	PPTs Chalk & Talk
33	34		**Activities**	T3-47-75	CO4	PPTs Chalk & Talk
34	35				CO4	
35	36		**Fragments**	T3-75-92	CO4	PPTs Chalk & Talk
36	37				CO4	
37	38				CO4	
38	39		**Intents:** Understanding activities	T3-92-98	CO4	PPTs Chalk & Talk
39	40		linking activities using intents, fragments		CO4	PPTs Chalk & Talk
40	41		Revision of Module-4	-	CO4	App Dev
41	42	**Module5:**	**Getting to know the Android User Interface:** Views and ViewGroups, FrameLayout,	T3-101-104	CO4	PPTs Chalk & Talk
42	43		LinearLayout, TableLayout, RelativeLayout, ScrollView	T3-104-123	CO4	PPTs Chalk & Talk
43	44		**Designing User Interface with Views:** TextView view – Button, ImageButton, EditText	T3-147-153	CO4	Chalk & Talk
44	45				CO4	PPTs Chalk & Talk
45	46		Checkbox, ToggleButton, RadioButton and RadioGroupViews	T3-153-158	CO4	PPTs Chalk & Talk
46	47				CO4	PPTs Chalk & Talk
47	48		**Creating and using Databases:** Creating the DBAdapter Helper class, using the database programmatically.	T3-254-266	CO5	PPTs Chalk & Talk
48	49				CO5	PPTs Chalk & Talk
49	50				CO5	PPTs Chalk & Talk
50	51		Revision of Module-5	-	CO5	App Dev

**L – Lecture, V- Videos or any other mode*

Textbooks	
T1	Herbert Schildt: JAVA the Complete Reference, 7th/9th Edition, Tata McGraw Hill, 2007.
T2	Jim Keogh: J2EE-TheCompleteReference, McGraw Hill, 2007.
T3	J. F. DiMarzio, Beginning Android Programming with Android Studio, 4thEdition, 2017.
Reference books	
R1	John Horton, Android Programming for Beginners, 1stEdition, 2015.
R2	Dawn Griffiths & David Griffiths, Head First Android Development, O‟Reilly, 1stEdition, 2015

Web links and Video Lectures (e-Resources):	
1	https://sites.google.com/view/manzoorahmed/home
2	https://infyspringboard.onwingspan.com/web/en/app/toc/lex_29959473947367270000_shared/overview
3	
4	

Assessment Schedule:

Sl.No.	Assessment type	Contents	CO	Duration In Hours	Marks	Date & Time
1	**CIE Test 1**	Module1 & Module 2	CO1, CO2	1.5	30	
2	**CIE Test 2**	Module 3 & Module 4	CO3, CO4	1.5	30	
3	**CIE Test 3**	Module 5 & Module 1	CO4, CO1	1.5	30	
4	**Assignment 1**	Online Course on Fundamentals of JAVA	CO1, CO2		10	
5	**Assignment 2**	Project-App development	CO3, CO4		10	
6	**Quiz**	Module 1 to 5	CO 1 to 4		10	
7	**Semester End Examination**	Modules 1 to 5	CO1 to CO4	3	100	

The Average of total marks of three tests, two assignments, seminar and quiz will be out of 40 marks and final exam will be for 100 marks scaled down to 60 marks.

CIE + SEE = 40 + 60 = 100 marks

Faculty Incharge DAC Chairman