BCA (3rd semester)
Teaching Schedule

030010310: CC7 Java Programming

Objective: To design and develop Java programs using object oriented concepts namely classes and object, inheritance, polymorphism, interface, package & exception handling.

Course Outcomes: Upon completion of the subject, students shall be able to,

CO1: Describe and use of core Java concept.

CO2: Demonstrate the concept of control flow, exception and perform different operation on arrays and file.

CO3: Create classes, objects as per the need of problem definition.

CO4: Describe and implement the concept of inheritance and overriding functions.

CO5: Develop programs using interface and package.

Unit	Sub Unit	No. of Lecture(s)	Topics	Reference Chapter/Additional Reading	Teaching Methodology to be used	Evaluation Parameters
Unit 1 : Java Programming and Programming Elements					**[8 hours]**	
	1.1	1	History of Java	BR#2, Page No:34-36	Topic Slide	
	1.2	1	JVM and JRE	BR#2, Page No:35-41	Topic Slide	
	1.3	1	Java Program Structure	BR#2,Page No:42,45 , http://spoken-tutorial.org/watch/Java/User%2BInput/English/	Audio-Visual Tool , Demonstration	
	1.4		Simple I/O Operation			
	1.5	1	Character Set, Character Encoding	BR#3,Page No:57-61 BR#3,Page No:64	Topic Slide	
	1.6		Escape Sequence, Identifiers, Keywords, Data and Data Types			
	1.7		Declaration of Scalar Variables			
	1.8	1	Comments, Whitespaces , Tokens, Literals, Separators, Operators	BR#3,Page No:65-72	Topic Slide	
	1.9	1	Operators Categories and their Features	BR#4,Page No:75,77	Hands – On ,Presentation	

Ms. Jenisha Tailor

	1.10		Arithmetic, Relational, Equality, Logical, Conditional, Shift, Assignment	BR#4,Page No:81-92		
	1.11	1	Operator Precedence and Associativity	BR#4,Page No:93	Chalk - Talk	
	1.12		Expression and their Evaluation	BR#4,Page No:76,78	Demonstration	
	1.13	1	Type Conversion: Numeric Promotion, Explicit Type Conversion	BR#4,Page No:79-81,93	Topic Slide , Hands - On	
	1.14		String Concatenation	BR#4,Page No:93	Hands-On	
Unit 2 : Control Flow Statement and Arrays					**[10 hours]**	
	2.1	1	Conditional Statements: Selection, Iteration	BR#5,Page No:101-105, 107-110 , http://www.learnerstv.com/video/Free-video-Lecture-5525-Computer-Science.htm	Audio – Visual Tool , Hands – On	
	2.2	1	Usage of enum with Conditional Statements	BR#5,Page No:106	Topic Slide and Demonstration	Th-Quiz
	2.3		Unconditional Execution: break, continue, return	BR#5,Page No:118-120	Topic Slide	
	2.4	1	Block Statements, Declaration Statement, Empty Statement	BR#5,Page No:120-122	Chalk- Talk	
	2.5	1	Features of Array	BR#6,Page no:128, 148 http://spoken-tutorial.org/watch/Java/Array+Operations/English/	Audio- Visual Aids , Chalk - Talk	
	2.6		Array Classification	BR#6,Page No:128,129		
	2.7	1	Creation of Regular Arrays and Jagged Arrays	BR#6,Page No:129-134	Chalk-Talk	

2.8	1	Reading and Writing of Arrays	BR#6,Page No:134-136 , http://spoken-tutorial.org/watch/Java/Array%2BOperations/English/	Demonstration and Audio – Visual Aids	
2.9	1	Initialization of Arrays	BR#6,Page No:136-147	Chalk Talk	
2.10	1	Passing Array as Parameter	BR#6,Page No:149	Demonstration	
2.11	2	java.util package :ArrayList, LinkedList	BR#11,Page No:292,309,310	Topic Slide and Demonstration	
Unit 3 : Classes and Objects				**[6 hours]**	
3.1	2	Class, Objects, Constructors, Access Modifiers	BR#7,Page No:167-180	Chalk – Talk , RolePlay	Unit Test -1 (TH,PR)
3.2	1	Getter and Setter Methods, Instance Methods, Parameter Passing	BR#7,Page No:180-183	Chalk – Talk , Demonstration	
3.3	1	Invoking Methods	BR#7,Page No:184-188	Chalk - Talk	
3.4	1	Method Overloading	BR#7,Page No:188-190	Hands - On	
3.5	1	Features of Static Members, Static Fields and Methods	BR#7,Page No:194-197	Topic Slide	
Unit 4 : Inheritance				**[10 hours]**	
4.1	2	Inheritance: Derived Class Declaration, Types of Inheritance, Advantages of Inheritance, Implementation of Inheritance, Super Keyword	BR#8,Page No:206-210,217,229 , http://www.learnerstv.com/video/Free-video-Lecture-5543-Computer-Science.htm	Audio – Visual Aids , Wait Time method , Chalk - Talk	Open Book Th
4.2	2	Inheritance and Member Accessibility	BR#8,Page No:212	Demonstration	
4.3	1	Constructors in Derived Class	BR#8,Page No:214	Chalk – Talk	
4.4	1	Overriding	BR#8,Page No:214	Chalk - Talk , Demonstration	
4.5	2	Abstract Classes and Methods, Final Classes and Methods	BR#8,Page No:219-224	Open Book Study , Demonstration	

Ms. Jenisha Tailor

4.6	2	Dynamic Binding, Polymorphism	BR#8,Page No:225-228 , http://spoken-tutorial.org/watch/Java/Polymorphism/English/ , http://www.learnerstv.com/video/Free-video-Lecture-5549-Computer-Science.htm	Audio – Visual aids	
Unit 5 : Interface and Package				**[6 hours]**	
5.1	2	Interface: Declaration and Implementation	BR#9,Page No:236-240	Chalk- Talk , Demonstration	
5.2	1	Polymorphism in Interfaces	BR#9,Page No:241	Topic Slide	
5.3	2	Creating Packages	BR#9,Page No:253-254	Topic Slide	
5.4		Accessing Classes from Packages			
5.5	1	Accessing and Using Package	BR#9,Page No:254-257	Hands - On	Unit Test -2 (TH,PR)
Unit 6 : Exception Handling and Java Stream				**[8 hours]**	
6.1		Basic of Exception	BR#10,Page No:262-266 http://spoken-tutorial.org/watch/Java/Exception%2BHandling/English/	Audio – Visual aids , Demonstration	
6.2	1	Throw Statement, Try Statement			
6.3	2	Usage of ArithmeticException, ArrayIndexOutofBoundsException, ClassNotFoundException, NullPointerException, IOException	BR#10,Page No:269-271 http://spoken-tutorial.org/watch/Java/Custom%2BExceptions/English/	Chalk – Talk , Demonstration	Section Test (PR)
6.4	1	Java Streams	BR#12,Page No:318	Topic Slide	
6.5	1	Java Stream API : Reading and Writing Bytes and Characters	BR#12,Page No:319-322	Topic Slide	
6.6	2	File Management	BR#12,Page No:324	Demonstration	
6.7	1	File Processing: Binary Streams	BR#12,Page No:326-333	Hands-On	Internal(TH) and Semester End Exam

Ms. Jenisha Tailor

Text Book:
1. Buyya, R. - Object-oriented programming with Java: Essentials and Applications -McGraw Hill [BR]

Reference Books:
1. Herbert Schildt . - The Complete Reference - McGraw Hill [HS]
2. Malhotra, S. and Choudhary, S. - Programming in Java - Oxford Higher Education [MC]
3. Farell, J. - Java for Beginners - Cengage Learning [FJ]
4. Xavier, C. - Java Programming: A Practical Approach - McGraw Hill [XC]
5. Bhaskar, V - Object oriented Programming through Java – Scitech [BV]

Note: # denotes chapter number.

Course objectives and Course outcomes mapping:

To make student develop Java program: CO1, CO2
Usage of object oriented concept: CO3, CO4, and CO5

Course units and Course outcome mapping:

Unit No.	Unit	Course Outcome				
		CO1	CO2	CO3	CO4	CO5
1	Java Programming and Programming Elements	✓				
2	Control Flow Statement and Arrays		✓			
3	Classes and Objects		✓	✓		
4	Inheritance		✓	✓	✓	
5	Interface and Package		✓	✓		✓
6	Exception Handling and Java Stream		✓	✓		

Program Outcome: The student will have

PO1: Ability to understand the concepts of key areas in computer science.
PO2: Ability to design and develop system, component or process as well as test and maintain it so as to provide promising solutions to industry and society.
PO3: Effective communication and presentation skill.
PO4: Ability to understand professional and ethical responsibility.
PO5: Recognition of the need for life-long learning.

Programme outcomes and Course Outcomes mapping:

Programme Outcome	CO1	CO2	CO3	CO4	CO5
PO1	✓	✓	✓	✓	✓
PO2	✓	✓	✓	✓	✓
PO3		✓	✓	✓	✓

Ms. Jenisha Tailor

PO4	✓	✓	✓	✓	✓
PO5		✓	✓	✓	✓

Computing Environment:

- A student must have the following computing environment in laboratory and or on his/her laptop.
  - JRE 7.0 or above and JDK
  - Notepad for develop Java program.

Modes of Transaction (Delivery):

Unit No	Topic Detail	Teaching Approach	PO mapped
3	Class , Object , Constructor , Instance Method , Invoking method of class	RolePlay (Team of 8 students shall perform the situation based on calling of object and class and their methods.)	PO1 , PO2 , PO3 and PO5
4	Types of Inheritance	Wait Time : Course Teacher will ask scenario based question and will giving time for think , Meanwhile no students raise hand for answer. After waiting time over randomly any students will ask question.	PO1 , PO3 and PO5
4	Abstract class and Final class	Open Book Study: Students have to explain topic given by course teacher after reading from book. For topic 10 minutes will be given to prepare.	PO1, PO2 , PO3 , PO4 and PO5
3,4	Class , Inheritance , Interface	**Pair Programming:** Teams of 2 students will be formed in advanced. Practical problem will be given to all. From each team one students have to do coding for first 20 minutes and then other student from that have to complete that program and give output.	PO1 , PO2 , PO4 and PO5

Activities/Practicum:

The following activities shall be carried out by the students.

- Describe difference between procedural language and Object Oriented Language.
- Demonstrate usages of Set Collection.

The following activities shall be carried out by the teacher.

Learner	Activities to be done	PO mapped
For slow learners	Course teacher will identify the group of slow learners change the seating arrangement and make them seat with advance learners so that former can learn from later ones and arrange extra sessions for them on alternate Saturday. Tasks will be assigned to them and evaluated on very next laboratory session.	PO1, PO2, PO3 and PO5
For advanced learners	Course teacher will identify the group of advanced learners and assign them to find out difference between Java 7 and Java 8.	PO1, PO2, PO3 and PO5
For all	✓ Demonstration of methods of String, StringTokenizer class. ✓ Demo for creation of custom exception.	PO1, PO2, PO3 and PO5

Number of Practical Problems in Journal: 18
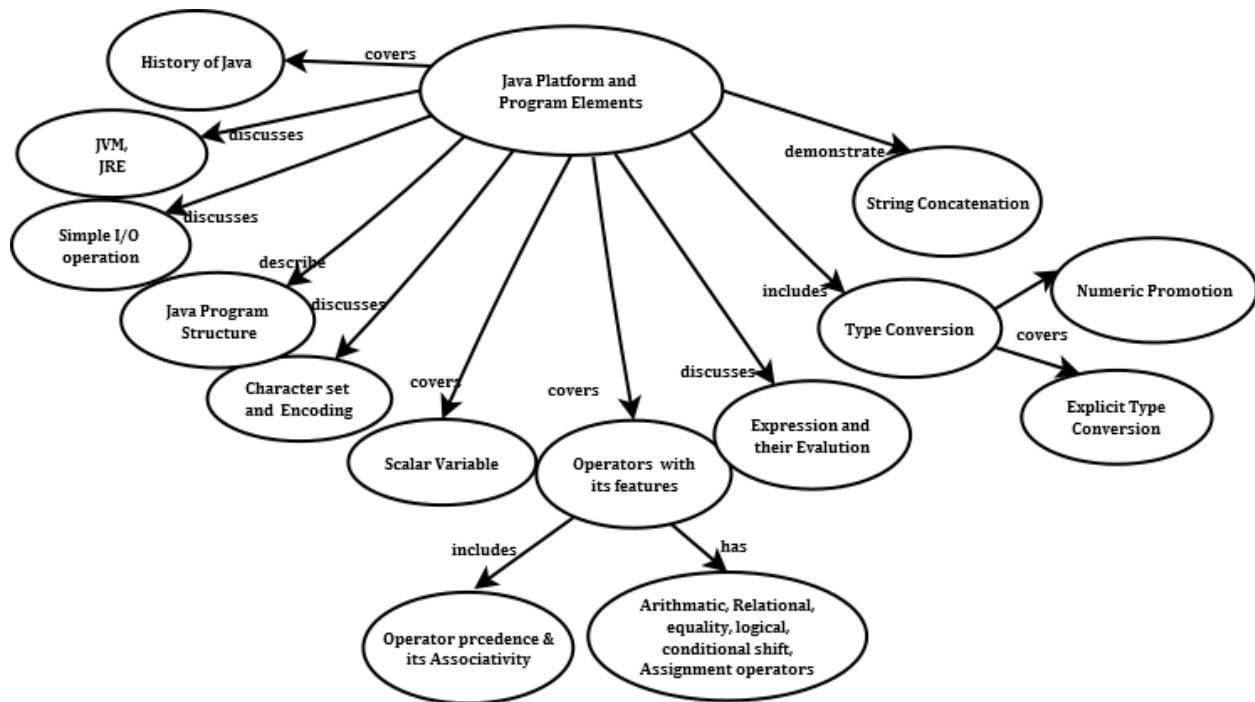**Total sets to be developed for each division: 2**

Unit Number	Number of Questions	Time required to implement and debug the question (in hours)	Minimum required of Journal Certification
Unit 1	3	6	2
Unit 2	3	10	3
Unit 3	3	6	3
Unit 4	3	12	3
Unit 5	3	8	2
Unit 6	3	6	2
TOTAL	18	48	16

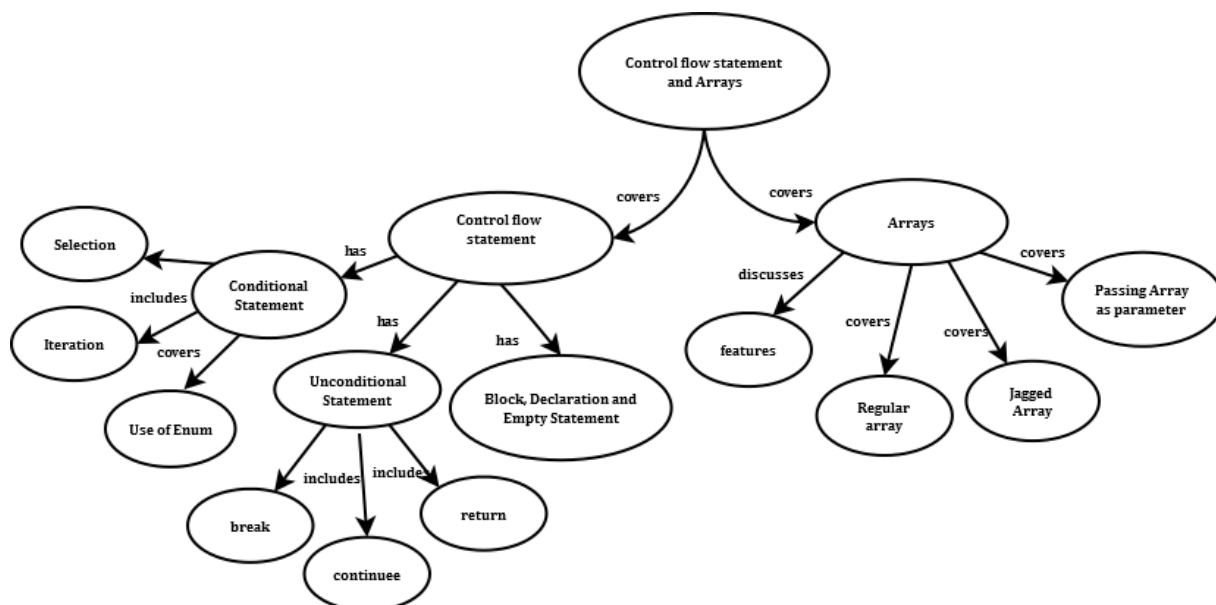## Concept map:

Course title: Java Programming
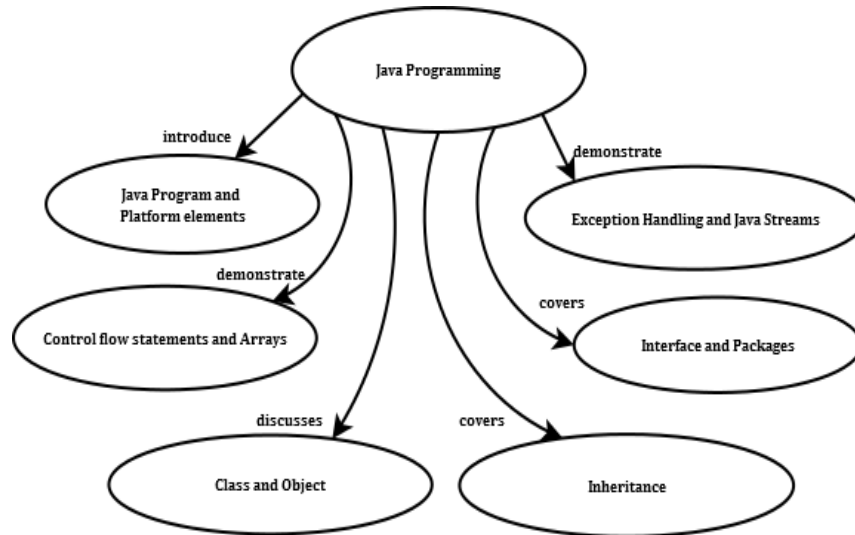
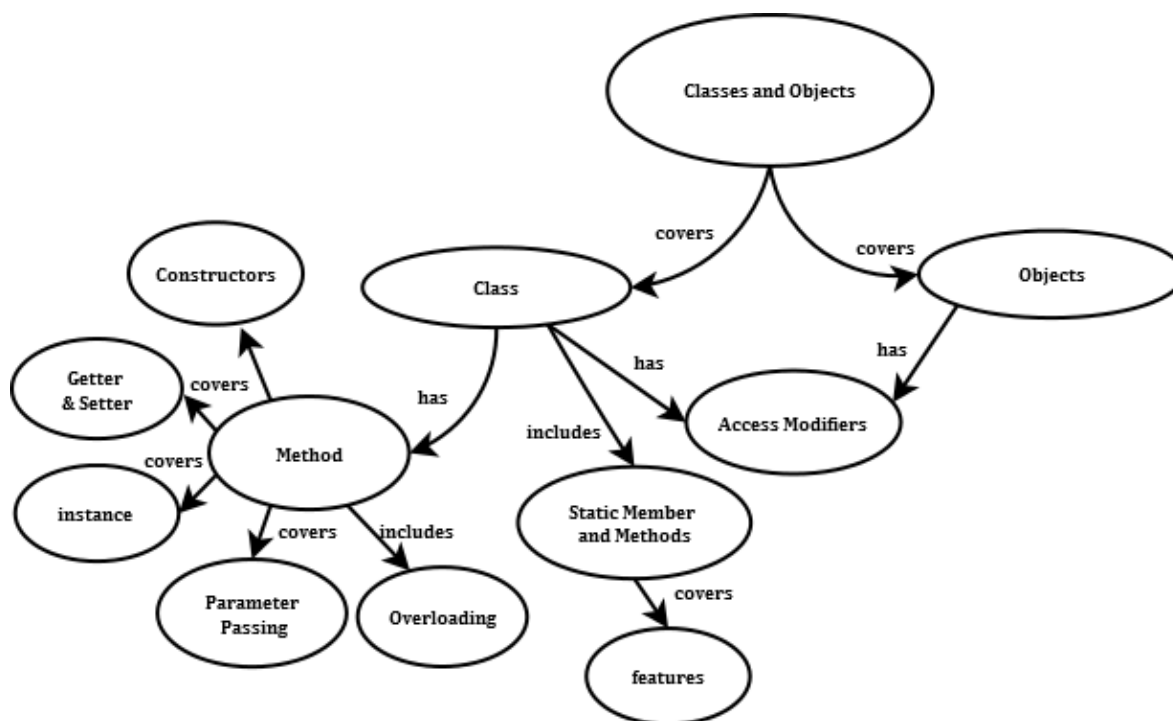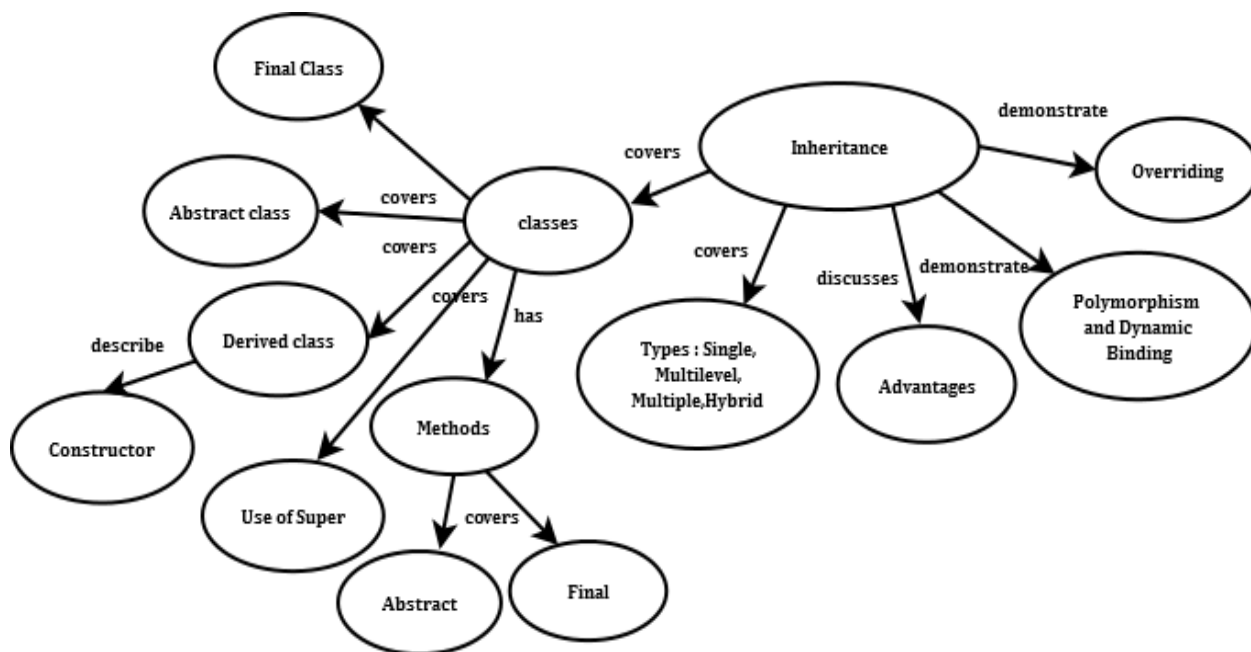## Unit 1: Java Platforms and Program Elements

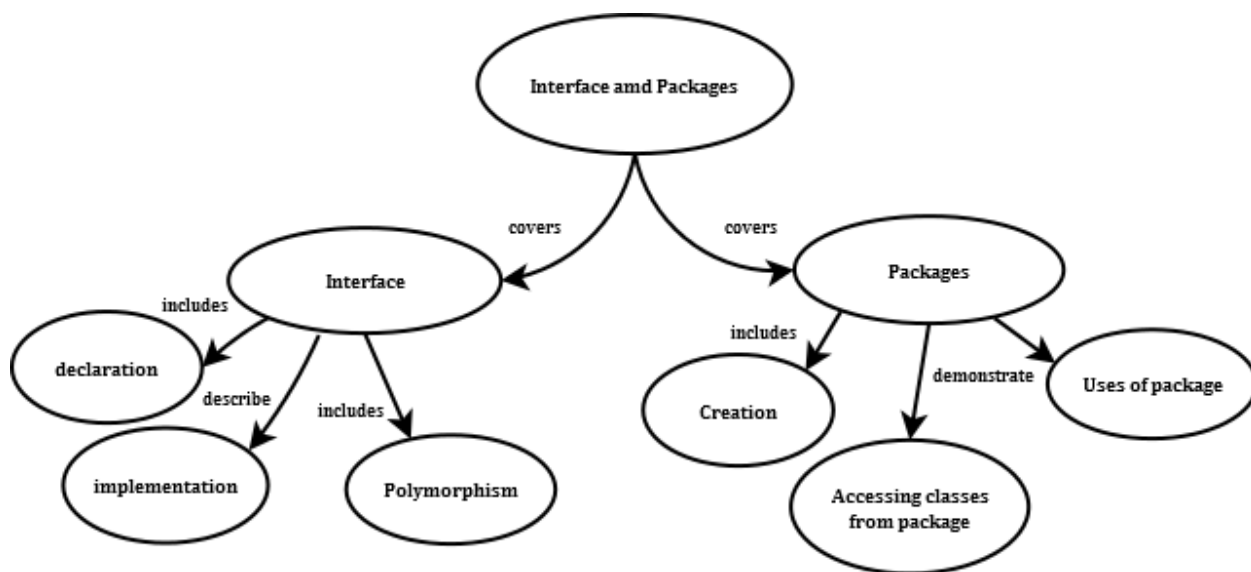## Unit 2: Control flow statement and Arrays

Unit 3: Classes and Objects

Unit 4: Inheritance

Unit 5: Interface and Packages

Unit 6: Exception Handling and Java Streams