



GUJARAT UNIVERSITY

BCA IV SYLLABUS

COURSE TITLE	CORE JAVA
COURSE CODE	CC-210
COURSE CREDIT	3
Session Per Week	4
Total Teaching Hours	40 HOURS

AIM

To develop the skill about the basic knowledge of java programming language with oop concepts and provide knowledge about platform independent concept.

To provide knowledge of interface exception handling, threading, package and applet details through java.

LEARNING OUTCOMES

On the completion of the course students will:

1. Understand the java programming and oop concepts.
2. Understand the concepts of Interface, exception handling, threading, and package.
3. Understand the basic concepts of applet.

DETAIL SYLLABUS

UNIT	TOPIC / SUB TOPIC	TEACHING HOURS
1	Java Introduction	10
	• Principles of Object oriented language • Java Essentials • Java Virtual Machine • Java Features • Program Structure • Java Improvements • Difference between Java and C++ • Installation of JDK 1.7 • Integrated Development Environment	3
	• Java Programming constructs - o Variables - o Primitive Data Types - o Identifier - o Literals - o Operators - o Expressions - o Precedence Rules and Associativity - o Primitive type conversion and casting - o Flow of Control	4

	• Classes and Objects - o Class, Objects, Class declaration in java, Creating Objects - o Methods, Constructors, Cleaning Up Unused Objects	3
2	Array, Inheritance and Interface	10
	- o Class Variable and Methods - Static Keyword - o this keyword • Arrays - o One dimensional, Two dimensional - o Using For..each with array - o Passing arrays to methods and returning arrays from method • command line arguments	4
	• Inheritance - o Deriving classes using extends keyword - o Overriding Method - o super keyword, final keyword - o Abstract class	4
	• Interface - o Variables in Interface - o Extending Interfaces - o Interface vs Abstract class	2
3	Package, String and Exception Handling	10
	• Packages - o Creating Packages - o Using Packages - o Access Protection • java .lang Package • java.lang.Objects class • java.wrapper classses • String class • String Buffer Class	5
	• Exception - o Introduction - o Exception Handling Techniques - o User Defined Exception	5
	Multithreading and Applet	10
	• Introduction • Multithreading in java • java.lang.Thread • Main Thread • Creation of new Threads • Thread State in java • Thread Priority • Multithreading using isAlive() and join()	5

- **Applet**
- Introduction
- Applet class
- Applet Structure
- Example Applet Program
- Applet Life Cycle
- Common methods used in displaying the output
- paint(), update() and repaint() methods
- More about applet tag
- Methods of Graphics class
 - o drawLine(), drawArc(), fillArc(), drawOval(), fillOval(), drawPolygon(), fillPolygon(), drawRect(), fillRect(), drawRoundRect(), fillRoundRect()

TEXT BOOK/S:

Programming in Java
Oxford Publication
By Sachin Malhotra and Saurabh Choudhary

REFERENCE BOOKS:

1. Programming in Java 2
Jaico publishing house
By Dr. K. Somasundaram
2. The Complete Reference Java2
TMH Publication
By Herbert Schildt

WEB RESOURCES:

1. docs.oracle.com/javase/6/tutorial/doc/girgm.html
2. docs.oracle.com/javase/6/tutorial/doc/bnagi.htm
3. www.javatpoint.com
4. www.tutorialspoint.com

REQUIRED SOFTWARE/S

1. Any editor of Windows or Linux/UNIX.
2. JVM version 1.8



GUJARAT UNIVERSITY

BCA IV SYLLABUS

COURSE TITLE		CORE JAVA PRACTICAL
COURSE CODE		CC-214
COURSE CREDIT		3
Session Per Week		3
Total Teaching Hours		40 HOURS
AIM		
To develop practical skill about the basic java programming language with OOP concepts. To provide development skill of interface, exception handling, threading and applet.		
LEARNING OUTCOMES		
On the completion of the course practically students will:		
1. Understand the java programming and Object Oriented Programing concepts.		
2. Understand the concepts of Interface, Exception handling, Threading, and Package.		
3. Understand the basic concepts of Applet.		
DETAIL SYLLABUS		
UNIT	TOPIC / SUB TOPIC	TEACHING HOURS
1	Java Introduction	10
1	Write a program to evaluate simple interest of a given principle, rate and time.	
2	A motor cycle dealer sells two-wheelers to his customer on loan, which is to be repaid in 5 years. The dealer charges simple interest for the whole term on the day of giving the loan itself. The total amount is then divided by 60(months) and is collected as equated monthly instalment (EMI). Write a program to calculate the EMI for a loan of Rs. X, where X is given from command line argument. Print the EMI value in rupees.	

3	A car accessories shop assigns code 1 to seat covers, 2 to steering wheel covers , 3 to car lighting and 4 for air purifiers. All other items have code 5 or more. While selling the goods, a sales tax of 2% to seat covers ,3% to steering wheel covers, 4% to car lighting, 2.5% to air purifiers and 1.2% for all other items is charged. A list containing the product code and price is given for making a bill. Write a java program using switch statements to prepare a bill.	
4	Write a java program to scan 3 integer values from the command line argument and display the maximum number using conditional operator.	
5	Write a program to calculate the hypotenuse of right angled triangle when other sides of the triangle are given. (Hypotenuse = square root (x*x + Y *Y))	
6	Write a program to calculate the area of square and rectangle by overloading the area method.	
7	Create a complex number class. The class should have a constructor and methods to add, subtract and multiply two complex numbers and to return the real and imaginary parts.	
8	A shop during festival season offers a discount 10% for purchase made up to Rs.1,000, 12% for purchase value of Rs.1,000 or more up to Rs 1,500 and 15% for purchase value of Rs.1,500 or more. Write a program to implement the above scheme for a given sales and print out the sales value, discount and net amount payable by a customer. Create necessary methods and constructors.	
9	A bank gives 6.5% per annum interest on deposits made in that bank. Write a program to calculate the total amount that a person will receive after the end of 5 years for a deposit of Rs.5000 for compound interest. Create necessary methods and constructors too.	
10	Write a java program to display powers of 2 i.e. 2,4,8,16 etc up to 1024 using bitwise operators.	
2	Array, Inheritance and Interface	10
1	Write a program to sort the elements of one dimensional array. Read value of array elements through command line argument.	
2	Write a program to create an array to store 5 integer values. Also initialize the array with 5 numbers and display the array Elements in reverse order.	
3	Write a program to find sum of two matrices of 3 x3.	
4	Write program to create an array of company name and another array of price quoted by the company. Fetch the company name who has quoted the lowest amount.	
5	Write an interface called numbers, with a method in Process(int x, int y). Write a class called Sum, in which the method Process finds the sum of two numbers and returns an int value. Write another class called Average, in which the Process method finds the average of the two numbers and returns an int.	

6	Create a class called NumberData that accept any array of the five numbers. Create a sub class called Numplay which provides methods for followings: 1. Display numbers entered. 2. Sum of the number. 3. Average of the numbers. 4. Maximum of the numbers. 5. Minimum of the numbers. Create a class that provides menu for above methods. Give choice from the command-line argument.	
7	Declare an abstract class Vehicle with an abstract method named numWheels().provide subclasses Car and Truck that each implements this method. Create instance of these subclasses and demonstrate the use of this method	
8	Write an interface called Exam with a method Pass(int mark) that returns a Boolean. Write another interface called Classify with a method Division(int average) which returns a string. Write a class called Result which implements both Exam and Classify. The pass method should return true if the marks is greater than or equal to 35 else false. The division method must return "First" when the parameter average is 60 or more, "second" when average is 50 or more but below 60, "no division" when average is less than 50.	
9	Create class calculation with an abstract method area(). Create Rectangle and Triangle subclasses of calculation and find area of rectangle and triangle.	
10	The abstract Vegetable class has four subclasses named cabbage, carrot and potato. Write an application that demonstrates how to establish this class hierarchy. Declare one instance variable of type string that indicates the color of a vegetable. Create and display instances of these object. Override the toString() method of object to return a string with the name of the vegetable and its color.	
3	Package, String and Exception Handling	10
1	Create a package P and within that package create class PackClass which have method called findmax() which find maximum value from three numbers. Now import the package within another class DemoClass and now display the maximum number.	
2	Write a program that creates three different classes in three different packages and access them from default package. All the three packages should be at the same level.	
3	Create package pack1 within this package create class A which contains one instance variable and one instance method. Create another package pack2 within this package create class B. where class B is calling the method and variable of class A	
4	Write a program that accepts a string from command line and perform following operations: 1. Display each character on separate line in reverse order. 2. Count total number of chracters and display each character's position too. 3. Identify that whether the string is palindrom or not. 4. Count total number of uppercase and lowercase characters in it.	

5	Write a Java program to input n integer numbers and display lowest and second lowest number. Also handle the different exceptions possible to be thrown during execution.	
6	Write a program that takes a string from the user and validate it. The string should be at least 5 characters and should contain at least one digit. Display an appropriate valid message.	
7	Write an application that accepts marks of three different subject from user. Marks should be between 0 to 100, if marks of any of the subject is not belong to this range, generate custom exception out of RangeException. If marks of each subjects are greater than or equal to 40 then display message "PASS" along with percentage, otherwise display message "FAIL". Also write exception handling code to catch all the possible runtime exceptions likely to be generated in the program.	
8	Write a program which takes the age of 5 persons from command line and find the average age of all persons. The program should handle exception if the argument is not correctly formatted and custom exception if the age is not between 1 to 100.	
9	Write an application that converts between meters and feet. Its first command-line argument is a number and second command line argument is either "centimeter" or "meter". If the argument equals "centimeter" displays a string reporting the equivalent number of meters. If this argument equals "meters", display a string reporting the equivalent number of centimeter. If unit is not given properly then generate custom exception UnitFormatException. If first argument is not proper format then generate numberFormatException. Generate other exception as per requirements. (1 meter=100 centimeter)	
10	Write a program that accepts 5 even numbers from command line , if any of the numbers is odd then throw custom exception OddException and count such invalid numbers.	
4	Multithreading and Applet	10
1	Write an application that starts two thread. First thread displays even numbers in the range specified from the command line and second thread displays odd numbers in the same range. Each thread waits for 300 milliseconds before displaying the next numbers. The application waits for both the thread to finish and then displays the message "Both threads completed".	
2	Write a program that create and starts five threads. Each thread is instantiated from the same class. It executes a loop with ten iterations. Each iteration displays the character 'x' and sleep for 500 milliseconds. The application waits for all threads to complete and then display a message 'hello'.	
3	Write a java program to create 2 threads each thread calculates the sum and average of 1 to 10 and 11 to 20 respectively. After all thread finish, main thread should print message " Task Completed". Write this program with use of runnable interface.	
4	Create two thread. One thread print 'fybca' 4 times and another thread print 'sybca' 6 times. Set priority for both thread and when thread finished print 'tybca' from main.	

5	Create an applet which draws a line, rectangle and filled circle in applet display area.
6	Write applets to draw the following shapes. a. cone b. cylinder c. cube
7	Write an applet that take 2 numbers as parameter and display their average and sum.
8	Write a Java applet that draws a circle centred in the centre of the applet. The radius of the circle should be passed as a parameter.
9	Write an applet that draw a circle divided in 6 equal parts.
10	Write an applet that draw a rectangle divided in 5 equal parts.

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1. Programming in Java 2
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2. The Complete Reference Java2
TMH Publication
By Herbert Schildt

WEB RESOURCES:

1. docs.oracle.com/javase/6/tutorial/doc/girgm.html
2. docs.oracle.com/javase/6/tutorial/doc/bnagi.htm
3. www.javatpoint.com
4. www.tutorialspoint.com

REQUIRED SOFTWARE/S

1. Any editor of Windows or Linux/UNIX.
2. JVM version 1.8