MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

(A constituent unit of MAHE, Manipal)

COURSE PLAN

Department	:	Computer Applications
Course Name & code	:	Object Oriented Programming Lab & DSE 2161
Semester & branch	:	III Semester B.Tech & DSE
Name of the faculty	:	Dr. Ramakrishna M and Dr. Vidya Rao

No of contact hours/week:

L	T	P	C
0	0	3	1

ASSESSMENT PLAN

Course Outcomes (COs)

	At the end of this course, the student should be able to:	**No. of Contact Hours**	**Marks**
CO1:	Implement object-oriented programming concepts in Java	6	18
CO2:	Write, compile and debug programs written in Java	6	18
CO3:	Learn the usage of abstract classes and interfaces in a Java program	12	36
CO4:	Implement exception handling, multithreading, string programs, input/output streams in Java	6	18
CO5:	Develop simple GUI applications using Java swings	3	10
	Total	33	100

1. Continuous Evaluation	60%
Record: 4M, Execution: 6M and Viva: 10M Internal Marks: 3 * 20 = 60 Marks	
2. Lab Examination	40%
• End Semester Lab evaluation: 40 Marks, write Up: 15 Marks, execution: 25 Marks, • Total: 15+25 = 40 Marks Examination of 2 hours duration (Max. Marks: 40)	

Course Plan

L. No.	Topics	Course Outcome Addressed
L1	**Java Features & Simple Programs Using Control Structures and Data Types** 1. Create a class name "GreatestNumber" and define a method that displays the greatest among the three-given number. 2. Write a Java program to read an int number, double number and a char from keyboard and perform the following conversions: int to byte, char to int, double to byte, double to int. 3. A Taxi service offers a new service based on travel distance. Write a Java program to calculate the total distance travelled by considering following charges. First 5 KM = INR 10, Next 15 KM = INR 8, Next 25 KM = INR 5. **Practice Questions:** 1. Write a Java Program to check if the person is eligible for voting. Consider three test cases. 2. For a given rectangle find the area. [Hint: (length x breadth) and circumference (2(length + breadth)] 3. Add two numbers using bitwise operator and check is the output is a even or odd number. [Hint: use left shift and right shift bitwise operators] 4. By considering a string and a number, perform swap of string to int and int to string. [Hint: a = "hello", b = 123, ==> (swap to) a = 123, b = "hello"] 5. Display the corresponding day of the date, for example, if the day is 1 then they should display Monday. If the day is greater than 7, display invalid day. 6. Using Java control statements write a program to check if the given input number is a prime number of not?	CO1
L2	**Arrays, Exception handling** 1. Given the float array, return the sum of all elements in it. 2. Return the sum of the first, middle and last elements in the array if the length of the array is odd, if the length is even then the sum of the first and last element should be displayed. [Hint: import required java.util.Array package] 3. Demonstrate the 2x2 matrix multiplication using Arrays. **Practice Questions:**	CO2

	1. Consider an integer array with random values as 12, 67, 87,34, 90, 23, 67, 88 and output the sorted array. 2. Calculate the sum and average of array containing elements as 12, 67, 87,34, 90, 23, 67, 88.	
L3	**Classes & Methods, String Handling** 1. Create Book class with field name, id, price with a constructor and get methods for all fields. [hint: constructor will be Book(id, name, price), methods will be getID(), getName() and getPrice().] 2. Create a class as Student containing ID, Marks (array of 5). Now create methods for students to find the total and print the student score. Identify if the student is passed or failure with a minimum mark as 40M. 3. Write a menu driven program to do the following: -To compare two strings -To convert the uppercase character to lower and vice-versa -To display whether an entered string is a substring of the other or not -If the entered string is a substring of the other, replace it with "Hello"	CO3
L4	**Inheritance and Access Modification** 1. Create Area class with variable height. Create a triangle class that extends area class with variables base and method to calculate the area. Create a rectangle class that extends area class with variable width and method to calculate area. Now create a triangle and rectangle objects and print their areas. 2. Create two classes as Vehicle and Car where car is single inheritance subclass of vehicle. Now create an object for the car and print the details. Note that data member and methods can be defined in both classes. 3. In a single program demonstrate default, public, protected, and private access modifiers. **Practice Questions:** 1. Write a java program to store student record of college named "MIT". Class Student_Detail should contain name, id, college_name as its members.display_details() method should display the details of the students. 2. Demonstrate the usage of Protected access modifier in Java. 3. Demonstrate the default access modifier in Java. 4. Create a base class "Game" with method called "type" that prints "indoor & outdoor games". Create a subclass cricket with a method called "type" that prints "cricket is an outdoor game". Create one more subclass of "Game" called "chess" with a method "type" that prints "chess is an indoor game". Write a complete Java program for the above to understand the Dynamic method dispatch concept.	CO3
L5	**Classes-Access control, Static keyword, Nested & Inner class, Final, Wrapper class, Interface & Abstract Class** 1. Write a java program to store student record of college named "MIT". Class Student_Detail should contain name, id, college_name as its members.display_details() method should display the details of the students.	CO3

	2. Create an interface called "sports" with methods getNumberOfGoals and dispTeam. Create classes Hockey and football that uses the interface "sports". Write the appropriate code for the methods. **Practice Questions:** 1. Write a counter program to count the number of objects created. 2. Write a program to compute the area of a square and a triangle by using abstract class.	
L6	**File handling** 1. Write a program that handles NumberFormatException. [Hint: Invalid conversion of a string to a number] 2. Write a program that handles ArrayOverflowException. [Hint: Consider the array size] 3. Write a menu driven program to do the following: Write to a file, read from the file, copy bytes from one file to another file [Hint: Use read and write methods] 4. To read and write primitive data using random access file and append some information. [Hint: Use RandomAccessFile class]	CO4
L7	**Multithreaded Programming & Swings** 1. Write a menu driven program to create thread using runnable interface and inheriting thread class. [Hint: Make use of Extends and Implements keywords] 2. Write a program to create multiple threads. [Hint: Multiple instances of thread] 3. Write a java application using swings(hello world swing) to display "HELLO WORLD"	CO5

References:

1.	Patrick Naughton and Herbert Schildt,The Complete Reference -Java 2, 8th Edition, Tata McGrawHill, 2000
2.	E.Balaguruswamy, Programming with Java A Primer, 2nd Edition, Tata McGrawHill, 2000
3.	Aaron Walsh and John Fronckowiak, Java Programming Bible,1st Edition, IDG Books, India, 2000
4.	C Xavier Java Programming A Practical Approach – 1stEdition,TataMcGrawHill Publishing Co Ltd., 2011
5.	Dr. G.T.Thampi , Object Oriented Programming In Java , DreamTech, 2009

Submitted by: Dr. Ramakrishna M and Dr. Vidya Rao

(Signature of the faculty)

Date: 18-10-2021

Approved by: Dr. Karunakar A Kotegar

(Signature of HOD)

Date: 18-10-2021

FACULTY MEMBERS TEACHING THE COURSE (IF MULTIPLE SECTIONS EXIST):

FACULTY	SECTION	FACULTY	SECTION
Dr. Ramakrishna M	A		
Dr. Vidya Rao	B		

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