UPES

Year: 2021
Semester: IV

1. **Name of the Faculty: Shiv Naresh Shivhare** **Course Code: CSEG2116**
2. **Course: Object Oriented Programming Lab** **L: 0**
3. **Program : B. Tech CS+AI&ML** **T: 0**
4. **Target : Level 2** **P: 1**

C: 1

COURSE PLAN

Target	50% (marks)
Level-1	40% (population)
Level-2	50% (population)
Level-3	60% (population)

1. Method of Evaluation

UG
Viva voce and Quiz (50%)
Continuous Assessment and Record (50%)

2. Passing Criteria

Scale	**UG**
Out of 10point scale	SGPA – "5.0" in each semester CGPA – "5.0" Min. Individual Course Grade – "C" Course Grade Point – "4.0"

*for UG, passing marks are 35/100 in a paper

3. Pedagogy

- Synchronous Mode using BB Collaborate aided with power point presentations and demonstration.
- Regular Communication for Tests/Quizzes/Vivas will be ensured by the faculty through email or Blackboard announcements/ email ids.
- In continuation to problem description, the solution to the given problem statement should be designed suitably using algorithm/flow-chart/pseudocode. After obtaining a successful design, the design is implemented using java language and tested with appropriate test cases (with an insight on Input/Output Data Constraints). Students are evaluated under two main categories (1) Performance (via efficient design and implementation) and record, and (2) Preparation of the student evaluated via viva-voce /quiz. The same is detailed in Section-E.

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GUIDELINES TO STUDY THE SUBJECT

Instructions to Students:

1. Go through the 'Syllabus' in the Black Board section of the web-site(https://learn.upes.ac.in) in order to find out the Reading List.
2. Get your schedule and try to pace your studies as close to the timeline as possible.
3. Get your on-line lecture notes (Content, videos) at Lecture Notes section. These are our lecture notes. Make sure you use them during this course.
4. check your blackboard regularly
5. go through study material
6. check mails and announcements on blackboard
7. keep updated with the posts, assignments and examinations which shall be conducted on the blackboard
8. Be regular, so that you do not suffer in any way
9. C**ell Phones and other Electronic Communication Devices:** Cell phones and other electronic communication devices (such as Blackberries/Laptops) are not permitted in classes during Tests or the Mid/Final Examination. Such devices MUST be turned off in the class room.
10. **E-Mail and online learning tool:** Each student in the class should have an e-mail id and a pass word to access the LMS system regularly. Regularly, important information – Date of conducting class tests, guest lectures, via online learning tool. The best way to arrange meetings with us or ask specific questions is by email and prior appointment. All the assignments/tests/quizzes and asynchronous lectures (Recorded Lectures or Voice over ppt) will be uploaded on online learning tool BlackBoard. Various research papers/reference material will be mailed/uploaded on online learning platform time to time.
11. **Attendance:** Students are required to have minimum attendance of 75% in each subject. Students with less than said percentage shall NOT be allowed to appear in the end semester examination.

This much should be enough to get you organized and on your way to having a great semester! If you need us for anything, send your feedback through e-mail sshivhare@ddn.upes.ac.in. Please use an appropriate subject line to indicate your message details.

There will no doubt be many more activities in the coming weeks. So, to keep up to date with all the latest developments, please keep visiting this website regularly.

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RELATED OUTCOMES

1. **The expected outcomes of the Program are:**

PO1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO2	**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.
PO3	**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.
PO4	**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.
PO5	**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.
PO6	**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.
PO7	**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.
PO8	**Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

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PO9	**Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO10	**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.
PO11	**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.
PO12	**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.

2. The expected outcomes of the Specific Program are: (upto3)

PSO1	Perform system and application programming using computer system concepts, concepts of Data Structures, algorithm development, problem solving and optimizing techniques
PSO2	Apply software development and project management methodologies using concepts of front-end and back-end development and emerging technologies and platforms.
PSO3	Ability to create & develop most efficient solutions by applying machine learning with analytical emphasis on industrial and research problems.

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3. **The expected outcomes of the Course are: (minimum 3 and maximum 6)**

CO 1	Demonstrate object-oriented concepts using Java Language.
CO 2	Implement programs in Java using packages, interfaces and exceptions
CO 3	Apply strings, threads and collections in Java.
CO 4	Develop server-side applications using JSP, servlet and JDBC

4. **Co-Relationship Matrix**

Indicate the relationships by1- Slight (low) 2- Moderate (Medium) 3-Substantial (high)

Program Outcomes / **Course Outcomes**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO 1	1	2	2		2								1	3	
CO 2	1	2	2	2	2								1	3	
CO 3	1	2	2	1	2								1	3	
CO 4	1	2	2		2								1	3	
Average	1	2	2	1.5	2								1	3	

1=weakly mapped 2= moderately mapped 3=strongly mapped

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OVERVIEW OF COURSE DELIVERY/BROAD PLAN OF COURSE COVERAGE

Course Activities:

Expt. No.	Big Ideas/ Topics	Modality
1	Introduction to Java Programming-Installation Process	Online
2,3	Basic Java Programming	Online
4	Inheritance	Online
5	Interfaces	Online
6	Packages	Online
7	Exceptions	Online
8	String Handling and Wrapper Class	Online
9	Threads and Collections	Online
10	JDBC	Online
11	Servlets	Online
12	JSP	Online

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Expt. No.	Big Ideas/ Topics	COs
1	Introduction to Java Programming-Installation Process	CO1
2,3	Basic Java Programming	CO1, CO2
4	Inheritance	CO2
5	Interfaces	CO2
6	Packages	CO2
7	Exceptions	CO3
8	String Handling and Wrapper Class	CO2
9	Threads and Collections	CO3
10	JDBC	CO4
11	Servlets	CO4
12	JSP	CO4

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DETAILED DELIVERY PLAN

EXPERIMENT – 1

TITLE: Introduction to Java Environment

1) Installation of JDK
2) Setting of path and classpath
3) Introduction to Eclipse

EXPERIMENT – 2,3

TITLE: Basic Java Programming

1) Write a program to find the largest of 3 numbers.
2) Write a program to add two number using command line arguments.
3) Write a program to print Fibonacci series using loop.
4) Write a program to implement a command line calculator.
5) Write a program using classes and object in java.
6) Write a program to accept 10 student's marks in an array, arrange it into ascending order, convert into the following grades and print marks and grades in the tabular form.

   Between 40 and 50: PASS

   Between 51 and 75: MERIT

   and above: DISTINCTION

7) Write a program to accept three digits (i.e. 0 - 9) and print all its possible combinations. (For example, if the three digits are 1, 2, 3 than all possible combinations are: 123, 132, 213, 231, 312, 321.)

8) Write a Java Program to accept 10 numbers in an array and compute the square of each number. Print the sum of these numbers.

9) Write a program to input a number of a month (1 - 12) and print its equivalent name of the month. (e.g., 1 to Jan, 2 to Feb. 12 to Dec.)

10) Write a program to find the sum of all integers greater than 40 and less than 250 that are divisible by 5.

EXPERIMENT – 4

TITLE Inheritance

1) Write a Java program to show that private member of a super class cannot be accessed from derived classes.

2) Write a program in Java to create a Player class. Inherit the classes Cricket _Player, Football _Player and Hockey_ Player from Player class.

3) Write a class Worker and derive classes DailyWorker and SalariedWorker from it. Every worker has a name and a salary rate. Write method ComPay (int hours) to compute the week pay of every worker. A Daily Worker is paid on the basis of the number of days he/she works. The Salaried Worker gets paid the wage for 40 hours a week no matter what the actual hours are. Test this program to calculate the pay of workers. You are expected to use the concept of polymorphism to write this program.

4) Consider the trunk calls of a telephone exchange. A trunk call can be ordinary, urgent or lightning. The charges depend on the duration and the type of the call. Write a program using the concept of polymorphism in Java to calculate the charges.

5) Design a class employee of an organization. An employee has a name, empid, and salary. Write the default constructor, a constructor with parameters (name, empid, and salary) and methods to return name and salary. Also write a method *increaseSalary* that raises the employee's salary by a certain user specified percentage. Derive a subclass Manager from employee. Add an instance variable named department to the manager class. Supply a test program that uses theses classes and methods.

EXPERIMENT – 5

TITLE: Interface

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1) Write a program to create interface named test. In this interface the member function is square. Implement this interface in arithmetic class. Create one new class called ToTestInt. In this class use the object of arithmetic class.
2) Write a program to create interface A, in this interface we have two method meth1 and meth2. Implements this interface in another class named MyClass.
3) Write a program in Java to show the usefulness of Interfaces as a place to keep constant value of the program
4) Write a program to create an Interface having two methods division and modules. Create a class, which overrides these methods.

EXPERIMENT – 6

TITLE: Package

1) Write a Java program to implement the concept of importing classes from user defined package and created packages.
2) Write a program to make a package Balance. This has an Account class with Display_Balance method. Import Balance package in another program to access Display_Balance method of Account class.

EXPERIMENT – 7

TITLE: Exceptions

1) Write a program in Java to display the names and roll numbers of students. Initialize respective array variables for 10 students. Handle ArrayIndexOutOfBoundsExeption, so that any such problem doesn't cause illegal termination of program.
2) Write a Java program to enable the user to handle any chance of divide by zero exception.
3) Create an exception class, which throws an exception if operand is nonnumeric in calculating modules. (Use command line arguments).
4) On a single track two vehicles are running. As vehicles are going in same direction there is no problem. If the vehicles are running in different direction there is a chance of collision. To avoid collisions, write a Java program using exception handling. You are free to make necessary assumptions.

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5) Write a java program to throw an exception for an employee detail.

- If an employee name is a number, a name exception must be thrown.
- If an employee age is greater than 50, an age exception must be thrown.
- Or else an object must be created for the entered employee details

EXPERIMENT – 8

TITLE: Strings Handling and Wrapper Class

1) Write a program for searching strings for the first occurrence of a character or substring and for the last occurrence of a character or substring.
2) Write a program that converts all characters of a string in capital letters. (Use StringBuffer to store a string). Don’t use inbuilt function.
3) Write a program in Java to read a statement from console, convert it into upper case and again print on console. (Don’t use inbuilt function)
4) Write a program in Java to create a String object. Initialize this object with your name. Find the length of your name using the appropriate String method. Find whether the character ‘a’ is in your name or not; if yes find the number of times ‘a’ appears in your name. Print locations of occurrences of ‘a’. Try the same for different String objects.

TITLE: Wrapper Classes

1) Write a Java code that converts int to Integer, converts Integer to String, converts String to int, converts int to String, converts String to Integer converts Integer to int.

2) Write a Java code that converts float to Float converts Float to String converts String to float converts float to String converts String to Float converts Float to float.

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		C: 1

EXPERIMENT – 9

TITLE: Threads and Collections

1) Write a program to implement the concept of threading by extending Thread Class and Runnable interface.
2) Write a program for generating 2 threads, one for printing even numbers and the other for printing odd numbers.
3) Write a program to launch 10 threads. Each thread increments a counter variable. Run the program with synchronization.
4) Write a Java program to create five threads with different priorities. Send two threads of the highest priority to sleep state. Check the aliveness of the threads and mark which thread is long lasting

TITLE: Collections

1) Write a program for the following:

   Read all elements from ArrayList by using Iterator.

   Create duplicate object of an ArrayList instance.

   Reverse ArrayList content.

2) Write a program for the following HashMap

   find whether specified key exists or not.

   find whether specified value exists or not

   get all keys from the given HashMap

get all key-value pair as Entry objects

3) Write a program for the following HashSet

copy another collection object to HashSet object.

delete all entries at one call from HashSet

search user defined objects from HashSet

EXPERIMENT – 10

TITLE: JDBC

1) Create a database table to store the records of employee in a company. Use getConnection function to connect the database. The statement object uses executeUpdate function to create a table.

2) Create a database of employee of company in mysql and then use java program to access the database for inserting information of employees in database. The SQL statement can be used to view the details of the data of employees in the database.

EXPERIMENT – 11

TITLE: Servlet

1) Servlet: **a)** ServletContext interface **b)** getParameterValues () of Servlet Request

2) Write a Servlet page to display current date of the server.

3) Write a Servlet page to which include the two other Servlet pages through of include directives feature provided in Servlet.

4) Write a Servlet page to create a simple calculator.

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EXPERIMENT – 12

Title: JSP

Project Specification: (Write the following classes in same project named as Proj_Lab9)

Objective: After these lab exercises students will be in position to clear the concept of JSP and how to write the server-side scripting language.

1) Write a JSP page to access the data of a student from the student table.

2) Write a JSP Login page to enter the username and password entered by user and display the welcome page on successful login otherwise display wrong authentication page.

J. SUGGESTED READINGS:

1. The Java Programming Language 3rd Edition, Ken Arnold, James Gosling, Pearson
2. A premier guide to SCJP 3rd Edition, Khalid Mughal, Pearson
3. Thinking in Java, 3rd Edition, Bruce Ackel, Pearson
4. Video resources http://www.youtube.com and blackboard.