IV sem

COURSE STRUCTURE

Course Code	**CSE0PM20A**				
Course Category	**Program Major**				
Course Title	**Java Programming**				
Teaching Scheme	**Lectures**	**Tutorials**	**Laboratory / Practical**	**Project**	**Total**
Weekly load hours	**3**	**0**	**4**	**0**	**7**
Credits	**3**	**0**	**2**	**0**	**5**
Assessment Schema Code	**TL9**				

Prerequisites:

Course Objectives:

1. To learn how to implement object-oriented designs with Java.
2. To identify Java language components and how they work together in applications.
3. To design and program stand-alone Java applications.
4. To learn how to extend Java classes with inheritance and dynamic binding.

Course Outcomes:

After completion of this course students will be able to:

1. 1. Develop programs using Object Oriented methodology in Java and apply the concept of inheritance for code reusability.
2. Implement inheritance, Interface and packages
3. Develop programs using multithreading and exception handling
4. Use Java 8 features and Framework concepts for writing programs
5. Develop programs using JDBC

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Course Contents:

Unit 1: Basics of Java Programming

Java features & Java Programming Environment, java program structure, defining a class, creating an object, accessing class members, Java Tokens & data type, arrays & strings, typecasting. String & StringBuffer class, Vectors & wrapper class, types of constructors, constructor overloading, static members, Garbage Collection

Unit 2: Inheritance, Interface and Package

Inheritance-defining subclass, defining subclass constructor, multilevel inheritance & multiple inheritance, Interfaces definition & program, Final variables, methods & classes, finalize() method, abstract method & classes, Visibility controls, Package Define package, type of package naming & creating packages, accessing package, import statement, static import, adding class

Unit 3: Exception Handling and Multithreading

Errors & Exception Types of errors, exceptions, try & catch statement, nested try statement, throws & Finally statement, build-in exceptions, chained exceptions, creating own exception, subclassesCreating a Thread-by extending to thread class & by implementing runnable Interface. Life cycle of thread: Thread Methods: wait(), sleep(), notify(), resume(), suspend(), stop(). Thread exceptions, thread priority & methods, synchronization, inter-thread communication, deadlock.

Unit 4: Java 8 Features and Collection Framework

Java 8 Features: Lambda Expressions, Functional Interface-predicates, supplier, consumer, functions, Date/Time API(Suggested JODA)

Collection Framework: Introduction to Java Collection (List, Set, Map), Working with ArrayList, LinkedList, HashSet, HashMap, Iterators and foreach loop

Unit 5: Java Database Connectivity (JDBC)

Introduction to JDBC, JDBC Drivers Architecture: 2 Tier, 3 Tier, Multitier. Connection interface, Statement and PreparedStatement Interface, Result set interface-navigating Result set. CRUD operation Using JDBC: Create, Read, Update, Delete operation.

Laboratory Exercises / Practical:

1. Setup a Java Programming development environment by using.

Any IDE (Eclipse)

Test the JDE setup by implementing a small programs

-Addition of two numbers for fixed values

-Addition of two numbers using Scanner class

-Finding greatest of three numbers using logical operators

-Arithmetic operators using switch case.

-Reversing the digits and finding sum of digits

-Finding sum of numbers between given range using logical operators

-Display * pattern

2. Develop a program for implementation of a single constructor and multiple constructors in a class.

-Define a class 'cube' with data members 'length' , 'breadth' & 'height',Initialize 3 objects using different constructors and display its volume.

- Define a class 'mobile' with data members 'company_name'& 'screen_size'.

Initialize and display values of data members for five mobiles

3. Develop a program for implementation of different functions of string class.

-Check password entered by user with set password

-Check palindrome of a string

-Display reverse of given string

-Count number of vowels in given string

-count number of characters in given string

4. Develop a program for implementation of wrapper class convert primitive into object & convert object into primitive

5. Develop a program for implementation of single & multilevel inheritance.

-Single Level Inheritance

Write to create a class "Book" having data members 'author', 'title', 'publisher'. Derive a class "BookInfo" having data members 'price', 'stock position' and a method 'show()'. Initialize and display information for 3 objects of "BookInfo".

-. MultiLevel Inheritance

Write to create a class "Book" having data members 'author', 'title', 'publisher'. Derive a class "BookInfo" having data members 'price', 'stock in position' . Derive next level class "BookSales" from BookInfo having data members 'noofcopiessold' and methods RevenueGenerated() and AllShow(). Accept and display information for all three classes data through BookSales class

- Multiple Inheritance:

Declare FY and SY as base class / interface with data members rollno, name and result. Create a subclass Student from these two to accept and display both class data.

6. Develop a program to create & import different classes of package.
- Define a package named 'useful' with a class name 'useme' having following methods:
  i) area()-To calculate area of given shape
  ii) salary()-To calculate salary
  iii) percentage()- To calculate percentage

7. Develop a program for implementation of multithreading operations.
- Write a program to create 2 threads such that one thread will print numbers from 1 to 10 & other reads numbers from 10 to 1. First thread should transfer control to second thread after printing second number
- Write a program to create 2 threads such that one thread will print odd numbers and the other thread will print even numbers from 1 to 20.
- Write a program to create 2 threads such that one thread will print numbers from 10 to 20 & other reads numbers from 20 to 1. First thread should transfer control to second thread after printing second number. (Use sleep() method)

8. Develop program for implementation of try, catch block & finally block
-Write a program to catch an error when divide by zero situation occurs in a program
-Write a program to catch an error when array index goes out of given size of an array

9. Develop a program for implementation of throw & throws.
- Write a program to accept password from the user and throw "Authentication Failure!" exception if the password is incorrect.
- Write a program to accept a number from the user and throw an exception if the number is not even.

11. Write Java program to demonstrate lambda expressions
  - with no parameters
  - Single parameter
  - and multiple parameters

12. Write a sample java program to implement Functional interface.
  - Write a sample java programs to demonstrate built in (predefined) Functional interface including
  -Consumer
  -Predicate
  -Function
  -Supplier

13. Write a sample java programs to demonstrate use of Time API
  Write a sample java programs to demonstrate use of Date API
  (Suggested to use JODA API)

14. Write a sample java program to implement List Interface
  Write a sample java programs to demonstrate use of ArrayList
  Write a sample java programs to demonstrate use of LinkedList

15. Write a sample java program to implement set Interface

16. Write a Program to create a Student Table in database having columns Roll no, Name and Percentage. Insert a record in a Student Table.
-Develop a program to display the name and roll_no of students from "student table" having percentage > 70.

Note: Under each experiment, the teacher can give more problem statements related to that concept.

Learning Resources: Reference Books:-

1. *Balguruswamy E., Programming with Java, Mcgraw Hill Education (India)Private Limited, New Delhi,5th Edition ISBN-978-93-5134-320-2*
2. *Java 8 Programming Black Book Dt Editorial Services Dreamtech Press, New Delhi Isbn-978-39-5119-758-4*
3. *Schildt Herbert, Java Complete Reference, Mcgraw Hill Education (India)Private Limited, New Delhi*
4. *Roy Uttam K., Advanced Java Programming, Oxford university*
5. *Dr.Rajendra Kawale, Java Programming, Devraj Publication*

Web Resources:-

a. HTTP://docs.oracle.com/javase8/docs
b. http://www.nptelvideos.com/java/ava_video-lectures_tutorials.php
c. http://nptel.ac.in/courses/106105084/25
d. http://www.iitk.ac.in/esc 101/08Jul/notes.html
e. https://www.tutorialpoint.com/java/

Pedagogy :-

The pedagogy for this course involves use of:-

- Lecture and question answer session.
- Classroom Interactive
- Class Discussion
- Hand on Practice

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COURSE STRUCTURE

Course Code	CSE0PM13A				
Course Category	Program Major				
Course Title	Foundation of Network Security				
Teaching Scheme	Lectures	Tutorials	Laboratory / Practical	Project	Total
Weekly load hours	3	0	2	0	5
Credits	3	0	1	0	4
Assessment Schema Code	TL3				

Prerequisites:

Foundation of Computer Network

Course Objectives:

1. To explore the concepts of security
2. Understand different symmetric and asymmetric cryptographic algorithms.
3. To impart the concept of hashing and authentication protocols.
4. Understand various email ,web and network security concepts.

Course Outcomes:

1. Understand the risks faced by Computer Systems
2. Use cryptography algorithms and protocols to achieve Computer Security.
3. To apprehend the authentication and integrity process of data for various applications.
4. Apply measures to prevent attacks on the network using a firewall.
5. To know the fundamentals of email and web Security.

Course Contents:

Unit 1: Basics of Computer Security

Security basics: CIA Model.
Risk and Threat Analysis,Password Security,Concept of Biometrics security.
Access controls: Definition, principle, policies: DAC, MAC and RBAC.

Unit 2: Cryptography

Symmetric key cryptography techniques -Introduction to stream cipher and block cipher,DES,AES,IDEA,Block cipher operations,Random bit generation and RC4.
Asymmetric key cryptography techniques : principles, RSA, EIgamal, Elliptic curve cryptography,Homomorphic encryption and secret sharing,key distribution and key exchange protocols,Diffie Hellman key exchange,MITM attack.

Unit 3 : Hash Function and Authentication Protocols

Hash function - Requirement and security,MD5,SHA
Digital Signature Authentication - Authentication ,Authentication protocols,RSA Digital Signature,EIgmal based digital signature
Kerberos: Working, AS, TGS, SS

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