IV SEMESTER

S No	CODE	Subject	Hours	Credits	Internal Marks	External Marks
1	T4	Tamil	6	3	25	75
2	E4	English	6	3	25	75
3	CS8	Java Programming	4	4	25	75
4	CS9	**Lab 7:** Java Programming	4	3	40	60
5	CS10	System Software	4	4	25	75
6	AS4	Numerical Methods	4	4	25	75
7	SBS4	**Lab 8:** PHP Programming	2	2	40	60
8	EA	Extension Activities		1	100	
		Total	30	24		

CS8: Java Programming

(4 Hours – 4 Credits)

Unit 1 :

FUNDAMENTALS OF OBJECT – ORIENTED PROGRAMMING: Introduction, Object Oriented paradigm, Basic Concepts of OOP, Benefits of OOP, Applications of OOP, Java features: **OVERVIEW OF JAVA LANGUAGE:** Introduction, Simple Java program structure, Java tokens, Java Statements, Implementing a Java Program, Java Virtual Machine, Command line arguments. **CONSTANTS, VARIABLES & DATA TYPES:** Introduction, Constants, Variables, Data Types, Declaration of Variables, Giving Value to Variables, Scope of variables, Symbolic Constants, Type casting, Getting Value of Variables, Standard Default values; **OPERATORS & EXPRESSIONS**.

Unit II

DECISION MAKING & BRANCHING: Introduction, Decision making with if statement, Simple if statement, if. Else statement, Nesting of if. else statements, the else if ladder, the switch statement, the conditional operator. **DECISION MAKING & LOOPING**: Introduction, The While statement, the do-while statement, the for statement, Jumps in loops.

CLASSES, OBJECTS & METHODS: Introduction, Defining a class, Adding variables, Adding methods, Creating objects, Accessing class members, Constructors, Method overloading, Static members, Nesting of methods;

Unit III

INHERITANCE: Extending a class, Overloading methods, Final variables and methods, Final classes, Finalizer methods, Abstract methods and classes; **ARRAYS, STRINGS AND VECTORS:** Arrays, One-dimensional arrays, Creating an array, Two – dimensional arrays, Strings, Vectors, Wrapper classes **INTERFACES:**

MULTIPLE INHERITANCE: Introduction, Defining interfaces, Extending interfaces, Implementing interfaces, Assessing interface variables;

Unit IV

MULTITHREADED PROGRAMMING: Introduction, Creating Threads, Extending the Threads, Stopping and Blocking a Thread, Lifecycle of a Thread, Using Thread Methods, Thread Exceptions, Thread Priority, Synchronization, Implementing the 'Runnable' Interface. MANAGING ERRORS AND EXCEPTIONS: Types of errors : Compile-time errors, Runtime errors, Exceptions, Exception handling, Multiple Catch Statements, Using finally statement

Unit V

PACKAGES: Introduction, Java API Packages, Using System Packages, Naming conventions, Creating Packages, Accessing a Package, using a Package.

MANAGING INPUT/OUTPUT FILES IN JAVA: Introduction, Concept of Streams, Stream classes, Byte Stream Classes, Input Stream Classes, Output Stream Classes, Character Stream classes: Reader stream classes, Writer Stream classes, Using Streams, Reading and writing files.

Text Book

Programming with JAVA, A Primer, E.Balagurusamy, 5 th Edition, McGraw-Hill Company, 2015

Unit I : Chapters 1 - 5
Unit II : Chapters 6 ,7 and 8.1-8.10
Unit III : Chapter 8.11-8.18, Chapters 9 and 10
Unit IV : Chapter 12 and 13
Unit V : Chapter 14,11.1-11.7 and 16

Reference Books:

1.Programming in Java, Sachin Malhotra, Oxford University Press
2.Programming with Java, John R. Hubbard, Second Edition, Schaum's outline Series, Tata McGraw-Hill Company.
3.Java TM: How to Program, Deitel & Deitel, PHI, 2007
4. Java 2- The Complete Reference, Herbert Scheldt , 5th Edition, McGraw Hill Education (India) Private Limited,2002379

CS9: Lab 7: Java Programming

(4 Hours – 3 Credits)

Section: A

Write Programs in Java for the following:

1. To implement a simple temperature conversion program.
2. To perform addition and subtraction of complex numbers using class and objects.
3. To perform volume calculation using method overloading.
4. Using command line arguments, test if the given string is palindrome or not.
5. String manipulation using String Methods (Use of any five String methods are preferred).
6. Write a program to fill names into a list .Also, copy them in reverse order into another list. If the name contains any numeric value throw an exception Invalid Name
7. Program to demonstrate the use of any two built-in exceptions in Java.

Section: B

8. To perform multiplication of matrices using class and objects.
9. Using multilevel inheritance process student marks.
10. Implement multiple inheritance for payroll processing.
11. Implement interface for area calculation for different shapes.
12. Create a package called Arithmetic that contains methods to deal with all arithmetic operators. Also write a program to use the package.
13. Create two threads such that one of the thread generate Fibonacci series and another generate perfect numbers between two given limits.
14. Define an exception called **: Marks Out of bound:** Exception, that is thrown if the entered marks are greater than 100.
15. Program to demonstrate the use of Wrapper class methods.
16. File Processing using Byte stream.
17. File Processing using Character Stream.
18. Write applets to draw the following Shapes:
(a). Cone **(b).** Cylinder **(c).** Square inside a Circle **(d).** Circle inside a Square
19. Write an applet Program to design a simple calculator.
20. Write an Applet Program to animate a ball across the Screen.380

CS10: System Software

(4 Hours – 4 Credits)

Unit I:

Introduction- System Software and Machine Architecture- Simplified Instructional Computer (SIC)- SIC Machine Architecture- SIC/XE Machine Architecture- Traditional (CISC) Machines- VAX Architecture- Pentium Pro Architecture – RISC Machines – UltraSPARC Architecture- PowerPC Architecture- Cray T3E Architecture.

Unit II:

Assemblers- Basic Assembler Functions- A simple SIC Assembler- Assembler Algorithm and Data Structures. Machine-Dependent Assembler features Instruction formats and addressing modes. Machine-Independent Assembler features-Literals- Expressions-Program blocks. Assembler Design options--One pass Assemblers- Multi-pass Assemblers.

Unit III:

Loaders & Linkers: Basic Loader Functions- Design of Absolute Loader Simple Bootstrap Loader-Machine Dependent Loader features-Relocation Program linking-Algorithm and Data structures for a Linking loader. Loader Design options.

Unit IV:

Compilers - Basic compiler Functions – Grammars - Lexical Analysis – Syntactic Analysis- Code Generation-Compiler Design options.

Unit V:

Other System Software: Text Editors- Interactive Debugging Systems.

Text Book

System Software – An Introduction to Systems Programming- Leland L. Beck, 3 rd Edition, Pearson Education Asia, 2000.
Unit I : Chapter 1
Unit II : Chapter 2
Unit III : Chapter 3 (3.1, 3.2, 3.4)
Unit IV : Chapter 5 (5.1, 5.4)
Unit V : Chapter 7 (7.2 & 7.3)

Reference Books

1. D. M. Dhamdhere, Systems Programming and Operating Systems , Second Revised Edition, Tata McGraw-Hill, 1999.
2. John J. Donovan Systems Programming , Tata McGraw-Hill Edition, 1992.
3. System Software, Santana Chattopadhyay, PHI Learning Private Limited, Delhi, Fifth printing, June 2013.381

AS4: Numerical Methods

(4 Hours – 4 Credits)

Unit I:

Algebraic and Transcendental Equations: Errors in numerical computation Iteration method-Bisection method-Regula-Falsi method-Newton-Raphson method-Horner's method.

Unit II:

Simultaneous Equations:

Introduction-Simultaneous equations-Back substitution-Gauss Elimination method-Gauss –Jordan Elimination method Calculation of Inverse of a matrix- Crout's method-Iterative methods-Gauss Jacobi Iteration method-Gauss seidal Iteration method-Newton Raphson's method for simultaneous equations.

Unit III:

Interpolation & Introduction: Newton's interpolation Formulae-Central difference Interpolation formulae-Gauss forward, Gauss backward, Lagrange's interpolation formulae- Divided differences-Newton's divided difference formula-Inverse Interpolation.

Unit IV:

Numerical Differentiation and Integration: Introduction-Derivates using Newton's forward difference formula-Derivates using Newton's backward difference formula- Numerical Integration-Newton-cotes quadrature formula Trapezoidal Rule-Simpson's one third rule-Simpson's 3/8 th rule.

Unit V:

Numerical Solution of Ordinary Differential Equations: Introduction-Taylor series method-Picard's method-Euler's method-Runge-kutta method of second, third, fouth order- Predictor & corrector methods-Mile's method.

Text Book:

Numerical Methods, Second Edition, S.Arumugam, A.Thangapandi Issac, A.Somasundaram, SCITECH publications, 2009.
Unit I : Chapter-3
Unit II : Chapter-4 (excluding Relation method and its related problems)

Unit III : Chapter-7 (Sections: 7.0, 7.1, 7.2((i), (ii) and related problems); 7.3,7.4,7.5,7.6)
Unit IV : Chapter-8 (Sections: 8.0,8.1,8.2 related problems, 8.5 (excluding Weddles rule, Booles rule, Romberg's method and related problems))

Unit V : Chapter-10 (Sections : 10.0,10.1,10.2,10.3(excluding modified Euler's method & its related problems) 10.4,10.5,10.6)

Reference Books:

1. Mathews J.H. Numerical Method for Maths, Science and Engineering; PHI, New Delhi, 2001.
2. Iqbal H. Khan & Q. Hassan Numerical Methods for Engineers and Scientist - Galgotia Publications (P) Ltd., New Delhi - 1997.
3. M.K. Jain, S.R.K. Iyengar & R.K.Jain - Numerical Methods for Scientific and Engineering Computation - New Age International(P) Ltd., New Delhi - 1996

SBS4: Lab 8: PHP Programming

(2 Hours - 2 Credits)

Write PHP programs for the following

1) To demonstrate all array operations (array_search() ,array_diff(),array_combine(),array_m atch(),sort()
2) To demonstrate all control statements (find factorial of the given number using IF, While, Do-while.)
3) To display inventory table using Key & value pairs
4) To print student table using key & value pairs and search particular student number(whether it is present or not)
5) To illustrate user defined function (define all function type)
1. Function without input argument and no return value.
2. Function without input argument and return value.
3. Function with input argument and no return value.
4. Function with input argument and return value.
5. Function with default argument.
6) To find factorial of the given number using recursion
7) To calculate nCr using include command to include the factorial function
8) Write a PHP program to store current date-time in a COOKIE and display the 'Last visited on' date-time on the web page upon reopening of the same page. To perform string manipulation
9) To process personal details using File
10) To design an student mark database using HTML Form and process using PHP