Since 1881

THE AMERICAN COLLEGE

(An Autonomous Institution affiliated to Madurai Kamaraj University)

POSTGRADUATE DEPARTMENT OF COMPUTER SCIENCE
(SELF FINANCED)

Proposed Syllabus incorporating outcome based education

Presented at the

Board of Studies Meeting

For its approval

Date
15th September 2023

Venue
MCA Library, PLL Hall

BOARD OF STUDIES

MASTER OF SCIENCE

IN

COMPUTER SCIENCE

15thSEPTEMBER 2023

THE AMERICAN COLLEGE

(An Autonomous Institution Affiliated to Madurai Kamaraj University)

Re-accredited (3rd Cycle) by NAAC with Grade "A+", CGPA – 3.47 on a 4-point scale

Madurai - 625002

Programme-Specific Outcomes(PSOs) for M.Sc., Computer Science

PSO1: identify, formulate and analyse complex problems, reach conclusions using principles of mathematics and computer science.

PSO2: To prepare the students who will demonstrate respectful engagement with others ideas, behaviours, beliefs and apply diverse frames of reference to decisions and actions.

PSO3: demonstrate their mastery in emerging technologies in the field of computer science and realize the necessity of IT field for professional development.

PSO4: Communicate effectively with the team members and society and able to make effective presentations and writing reports and documentation.

PSO5: Function effectively as an individual/member or leader in diverse teams and multidisciplinary environment.

PSO6: To create effective entrepreneurs by enhancing their critical thinking, problem solving, decision making and leadership skill that will facilitate startups and high potential organizations.

PSO7: Make use of research knowledge and research methods to provide valid conclusions.

PSO8: Recognize the need for passion towards independent and life-long learning in the context of technological change in the field of computer science.

PSO9: Toproduceemployable,ethicalandinnovativeprofessionalstosustain in the dynamic business world.

PSO10: Contribute to the development of the society by appraising environmental and social issues with ethics and interact with diverse individuals form pluralistic democratic society.

Mapping of Courses Outcomes (COs) with Programme Specific Outcomes (PSOs)

Courses	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9	PSO10
PCS4501	X	X	X		X	X		X	X	X
PCS4503	X	X	X	X	X	X		X	X	X
PCS4301	X	X	X		X	X	X		X	X
PCS4303	X	X	X		X	X	X		X	X
PCS4201	X	X	X		X	X	X		X	X
PCS4305	X	X	X		X	X		X	X	X
PCS4502	X	X	X	X	X	X	X		X	
PCS4504	X	X	X		X	X		X	X	X
PCS4302	X	X	X		X	X		X	X	X
PCS4304	X	X	X		X	X	X		X	X
PCS4202	X	X	X		X	X	X		X	X
PCS4306	X	X	X		X	X		X	X	X

Programme Outcomes (POs) for Post Graduates

Postgraduate programmes are expected to have developed in postgraduates the following graduate attributes:

1. **Academic Excellence:** Being a member of the academic community with advanced discipline-specific knowledge and professional skills in the relevant field with the prowess to communicate complex ideas and to engage in current critical debates with all sensitivity and fairness.

2. **Higher Order Thinking Skills:** Ability to critically think, analyse, evaluate, and create new knowledge and skills both in the chosen discipline and across other fields.

3. **Subscription to Quality Research:** Ability to design and carry out independent research, to update oneself with current research trends and contemporary inputs in the discipline, and to evaluate research contributions.

4. **Lifelong Learning:** Ability to learn, unlearn, and relearn knowledge and skills in the emerging areas of the field of specialization.

5. **ICT Literacy:** Ability to be digital natives so that they can access a wide range of technologies for personal, academic and professional use and to be members of online communities enjoying the unlimited access blending transparency with accountability and fair practices.

6. **Good Communication:** Ability to participate in public discourse on varied themes and topics in one's mother tongue as well as in English as a global link language.

7. **Individuals as Assets:** To be academically honest, intellectually curious, ethically responsible, professionally competent, and spiritually inspiring citizens.

8. **Civic and Social Responsibility:** Ability to function as matured democratic citizens with participation in issues of equity, gender equality, social justice, sustainable development, and poverty alleviation.

9. **Continuous Professional Development:** Ability to continuously develop oneself professionally and to critically improve one's self with a view to taking appropriate decisions in diverse professional and real life environments.

10. **Global Citizenship:** Ability to work effectively and to live responsibly in a global context of cross-cultural life and capability, to value human diversity and lead life of timeless learning and endless opportunities.

Mapping of Programme Specific Outcomes (PSOs) with Programme Outcomes (POs)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
PSO1	X	X	X	X	X	X	X			
PSO2	X	X	X	X	X	X		X		
PSO3	X	X	X	X	X	X				
PSO4	X	X	X	X	X			X		
PSO5	X	X	X	X	X		X		X	
PSO6	X	X	X		X	X	X			X
PSO7	X	X	X	X	X		X	X		
PSO8	X	X	X		X		X		X	X
PSO9	X	X	X		X				X	X
PSO10	X	X		X		X			X	X

PROPOSED CURRICULUM PLAN FOR

POST GRADUATE COMPUTER SCIENCE

FROM THE ACADEMIC YEAR 2023-24

FIRST YEAR PROGRAM

SEMESTER I

Course No.	Course Title	Hours	Credits
PCS4501	Design andAnalysis of Algorithms	6	5
PCS4503	Python Programming	6	5
PCS4301	Advanced Software Engineering	5	3
PCS4303	Advanced Java Programming	5	3
PCS4201	Advanced Java Lab	4	2
PCS 4305	CBCS (NME)*	4	3
	Total	30	21

SEMESTER II

Course No.	Course Title	Hours	Credits
PCS4502	Soft Computing	6	5
PCS4504	Advanced Operating Systems	6	5
PCS4302	Data Mining and Warehousing	5	3
PCS4304	Web Programming	5	3
PCS4202	Web Programming Lab	4	2
PCS 4306	CBCS (NME)*	4	3
	Total	30	21

SECOND YEAR PROGRAM

SEMESTER III

Course No.	Course Title	Hours	Credits
PCS 5501	Machine Learning	6	5
PCS 5503	Compiler Design	6	5
PCS 5401	Network Security and Cryptography	5	4
PCS 5403	Digital Image Processing	5	4
PCS 5301	Digital Image Processing Lab	4	3
PCS 5303	Operations Research	4	3
	Total	30	24

SEMESTER IV

Course No.	Course Title	Hours	Credits
PCS 5502	Data Analytics Using R	6	5
PCS 5504	Block Chain Technology	6	5
PCS 5506	Internet of Things	6	5
PCS 5508	Distributed Database	6	5
PCS 5402	Project	6	4
	Total	30	24

*CBCS courses:

PCS 4305 – Introduction to Word Press

PCS 4306 – Documentation Using Latex

DESIGNANDANALYSIS OF ALGORITHMS (T)

Category	CC1	Course Code	PCS 4501	6 Hrs / 5 Cr

This course enables the students to learn the elementary data structures and algorithms. It also helps to understand the various design and analysis of the algorithms.

Course Outcomes:

At the end of the course, students will be able to

CO1: Get knowledge about algorithms and determines their time complexity. Demonstrate specific search and sort algorithms using divide and conquer technique.

CO2: Gain good understanding of Greedy method and its algorithm.

CO3: Able to describe about graphs using dynamic programming technique.

CO4: Demonstrate the concept of backtracking & branch and bound technique.

CO5: Explore the traversal and searching technique and apply it for trees and graphs.

Unit I: INTRODUCTION   17 Hrs

Introduction: - Algorithm Definition and Specification – Space Complexity-Time Complexity- Asymptotic Notations - Elementary Data Structure: Stacks and Queues – Binary Tree - Binary Search Tree - Heap – Heapsort- Graph.

Unit II: TRAVERSAL AND SEARCH TECHNIQUES   19 Hrs

Basic Traversal and Search Techniques: Techniques for Binary Trees-Techniques for Graphs -Divide and Conquer: - General Method – Binary Search – Merge Sort – Quick Sort.

Unit III: GREEDY METHOD   18 Hrs

The Greedy Method: General Method–Knapsack Problem – Minimum Cost Spanning Tree– Single Source Shortest Path.

Unit IV: DYNAMIC PROGRAMMING   18 Hrs

Dynamic Programming- General Method–Multi stage Graphs–All Pair Shortest Path– OptimalBinary Search Trees – 0/1 Knapsacks – Traveling Salesman Problem – Flow Shop Scheduling.

Unit V: BACKTRACKING   **18 Hrs**

Back tracking: General Method–8-QueensProblem–Sum of Subsets–Graph Coloring–
Hamiltonian Cycles – Branch and Bound: - The Method – Traveling Salesperson.

Learning Resources:

Text Book(s):

1. Ellis Horowitz, "Computer Algorithms", Galgotia Publications.
2. Alfred V. Aho, John E. Hopcroft, Jeffrey D. Ullman, "Data Structures and Algorithms".

References:

1. Good rich, "Data Structures & Algorithms in Java", Wiley 3rdedition.
2. Skiena," The Algorithm Design Manual", Second Edition, Springer,2008
3. Anany Levith," Introduction to the Design and Analysis of algorithm", Pearson Education Asia, 2003.
4. Robert S edge wick, Phillipe Flajolet," An Introduction to the Analysis of Algorithms",Addison- Wesley Publishing Company,1996.

Websites/e-Learning Resources:

1. https://nptel.ac.in/courses/106/106/106106131/
2. https://www.tutorialspoint.com/design_and_analysis_of_algorithms/index.htm
3. https://www.javatpoint.com/daa-tutorial

	K1	K2	K3	K4	K5	K6
CO1		2				
CO2			3			
CO3				4		
CO4					5	
CO5						6

Mean = 20/5 = 4.0

PYTHON PROGRAMMING (TL)

Category	CC2	Course Code	PCS 4503	6 Hrs / 5 Cr

The course aims at enable the students to enable the students to understand the fundamentals of python and its concepts. In completion of this course the student will be able to do statistical analysis and use appropriate tools for data visualization.

Course Outcomes:

At the end of the course, the student should be able to:

CO1: Demonstrate the building blocks, statements and data structures in Python.

CO2: Explain the various programming paradigms in Python.

CO3: Create scripts using arrays, functions, lists, tuples and dictionaries.

CO4: Discover the relationship among the numerical data using Numpy for doing statistical analysis.

CO5: Derive the appropriate tools for plotting and interpret the data through Matplotlib for visualization to give possible solutions.

UNIT I: THE WAY OF THE PROGRAM   16 Hrs

Program – Running Python - The First Program – Arithmetic Operators – Values and Types – Formal and Natural language - Debugging. Variables - Expressions and Statements**:** Assignments Statements – Variable Names – Expressions and Statements – Script mode – Order of Operations- String Operations – Comments. Functions –Function Call – Math Functions – Composition – Adding New Functions – Definitions and Uses – Flow of Execution – Parameters and Arguments – Variable and Parameters – Stack Diagrams.

UNIT II: CONDITIONALS AND RECURSION   20 Hrs

Floor Division and Modulus – Boolean Expression – Logical Operators- Conditional Execution – Alternative Execution – Chained Conditionals – Nested Conditionals – Recursion – infinite Recursion – Keyboard Input. Fruitful Functions: Return values - Incremental Development – Composition- Boolean Functions – More Recursion – Leap of faith. Iteration: reassignment – Updating variables – while – Break – algorithms.

UNIT III: STRINGS 19 Hrs

Len – Traversal – String Slices – Strings are immutable – searching – Looping and Counting – String methods – The in operator – string Operation. Lists: A List is a sequence – lists are mutable – traversing a List – List Operations – List slices – List methods- Map, filter and Reduce – Deleting Elements – Lists and strings – Objects and values – Aliasing – List arguments. Dictionaries: A Dictionary is a Mapping – Dictionary as a collection of counters – Looping and Dictionaries – Reverse Lookup – Dictionaries and Lists- Memos- Global Variables. Tuples: Tuples Are Immutable - Tuple Assignment - Tuples as Return Values - Tuples as Return Values - Variable-Length Argument Tuples - Lists and Tuples - Dictionaries and Tuples.

UNIT IV: THE NUMPY LIBRARY 17 Hrs

Numpy a Little History – N-dimensional array - The Heart of the library – Basic Operations – Indexing, Slicing and Iterating – Conditional and Boolean Arrays – Shape Manipulation – Array Manipulation - General Concepts - Structured Arrays – Reading and Writing Array Data on Files. PANDAS library – An Introduction: Introduction to Pandas Data Structures - Functionalities on Indexes - Operation between Data Structures – Function Application and mapping – Sorting and Ranking – Correlation and Covariance – Not a Number – Hierarchical indexing and Levelling.

UNIT V: DATA VISUALIZATION WITH MATPLOTLIB 18 Hrs

Matplotlib Library – Architecture – pyplot – The Plotting Window – kwargs – Adding Elements to The Chart – Saving Charts – Handling Date Values – Chart Typology – Line Charts – Histograms – Bar Charts – Pie Charts – Advanced Charts – 3D Toolkit – Multi-Panel Plots.

Learning Resources:

Text Book(s):

1. Allen B. Downey, Think Python, 2nd Edition, Published by O'Reilly Media Inc., USA, 2015.
2. Fabio Nelli, Python Data Analytics with Pandas, NumPy, and Matplotlib, 2nd Second Edition, Apress, UK, 2018.

References:

1. Michael Minelli, Michele chambers, Ambiga Dhiraj, Big Data Analytics-Emerging Business Intelligence and Analytic Trends for Today's Business, Wiley CIO Series, New Jersey, USA, 2014.

2. Chun, J Wesley, Core Python Programming, 3rd Edition, Pearson, UK, 2012.

3. Jake VanderPlas, Python Data Science Handbook, O'Reilly Media Publishers, USA, 2016.

Websites/e-Learning Resources:

1. https://www.programiz.com/python-programming/

2. https://www.tutorialspoint.com/python/index.htm

3. https://onlinecourses.swayam2.ac.in/aic20_sp33/preview

	K1	K2	K3	K4	K5	K6
CO1			3			
CO2		2				
CO3						6
CO4			3			
CO5						6

Mean = 20/5 = 4.0

13

ADVANCED SOFTWARE ENGINEERING (T)

Category	CC3	Course Code	PCS 4301	5 Hrs / 3 Cr

This course enables the students to learn the concepts of Software Engineering, Software Project Management, Software Design and Testing.

Course Outcomes:

At the end of the course, students will be able to

CO1: Understand about software engineering process.

CO2: Understand about software project management skills, design and quality management.

CO3: Analyze on Software Requirements and Specification.

CO4: Analyze on Software Testing,Maintenance and Software Re-Engineering.

CO5: Design and conduct various types and levels of software quality for a softwareproject.

Unit I: INTRODUCTION   15 Hrs

Introduction: The Problem Domain – Software Engineering Challenges - Software Engineering Approach – Software Processes: Software Process – Characteristics of a Software Process – Software Development Process Models – Other software processes.

Unit II: SOFTWARE REQUIREMENTS   15 Hrs

Software Requirements Analysis and Specification: Requirement engineering – Type of Requirements – Feasibility Studies – Requirements Elicitation – Requirement Analysis – Requirement Documentation – Requirement Validation – Requirement Management – SRS - Formal System Specification – Axiomatic Specification – Algebraic Specification - Case study: Student Result management system. Software Quality Management –Software Quality, Software Quality Management System, ISO 9000, SEI CMM.

Unit III: PROJECTMANAGEMENT   15 Hrs

Software Project Management: Responsibilities of a software project manager – Project planning – Metrics for Project size estimation – Project Estimation Techniques – Empirical Estimation Techniques – COCOMO – Halstead's softwarescience – Staffinglevelestimation – Scheduling– Organization and Team Structures – Staffing – Risk management – Software Configuration Management – Miscellaneous Plan.

Unit IV: SOFTWARE DESIGN   **15 Hrs**

SoftwareDesign:OutcomeofaDesignprocess–Characteristicsofagoodsoftwaredesign–
Cohesionandcoupling-StrategyofDesign–FunctionOrientedDesign–ObjectOrientedDesign -
DetailedDesign-IEEERecommendedPracticefor SoftwareDesignDescriptions.

Unit V: SOFTWARE TESTING   **15 Hrs**

SoftwareTesting:A Strategicapproach to software testing – Terminologies –
Functionaltesting–   Structuraltesting–Levelsoftesting–Validationtesting-Regressiontesting–
ArtofDebugging– Testing tools-Metrics-Reliability Estimation. Software Maintenance-
MaintenanceProcess-Reverse Engineering – Software Re-engineering - Configuration
Management Activities.

Learning Resources:

Text Book(s):

1. A Practitioners Approach – Software Engineering - R. S. Pressman, McGrawHill.
2. An Integrated Approach to Software Engineering – Pankaj Jalote, Narosa Publishing House,Delhi, 3rd Edition.

References:

1. Software Engineering–K. K. Aggarwal and Yogesh Singh, New Age InternationalPublishers,3rd edition.
2. Fundamentals of Software Engineering– Rajib Mall, PHI Publication, 3rd Edition.
3. Fundamentals of Software Engineering – Carlo Ghezzi, M. Jarayeri, D. Manodrioli, PHI Publication.

Websites/e-Learning Resources:

1. https://www.javatpoint.com/software-engineering-tutorial
2. https://onlinecourses.swayam2.ac.in/cec20_cs07/preview
3. https://onlinecourses.nptel.ac.in/noc19_cs69/preview

	K1	K2	K3	K4	K5	K6
CO1		2				
CO2				4		
CO3					5	
CO4				4		
CO5					5	

Mean = 20/5 = 4.0

ADVANCED JAVA PROGRAMMING (T)

Category	CC4	Course Code	PCS 4303	5 Hrs / 3 Cr

This course enables the students to learn the basic function, principles and concepts of advanced Java Programming;it provides knowledge on concepts needed for distributed application architecture. It also aims to learn Window based applications using Swing Objects, TCP/IP socket programming, JDBC and Server Side Programming.

Course Outcomes:

At the end of the course, the student should be able to:

CO1: Find solutions for a range of problems using object-oriented programming.

CO2: Understand the Java GUI Components

CO3: To design and develop Java program using Swings Components.

CO4: Apply and analyze Java in Database and Networking concepts.

CO5: Design interactive applications using Java Servlet and JSP.

Unit I: CLASS & OBJECTS   15 Hrs

General Form of a Class - Creation of Objects -Usage of Constructors - 'this' Keyword-Constructor Overloading-Copy Constructors- Inheritance and Polymorphism-Inheriting Variables in a Class - Inheriting Methods in a Class - Inheritance and Constructors Abstract Classes - Final Classes

Unit II: APPLET   15 Hrs

Applets: The Life Cycle of an Applet – Syntax of Applet Tag -Display method in Applet – Methods in the Graphic Class-Displaying graphics in Applet -The Applet Class Development and Execution of a Simple Applet –Layout Managers in Java.

Unit III: AWT AND SWING   15 Hrs

AWT Component Classes- Labels-Buttons-Checkboxes-List-Text field-Text area Menu bar-Swing Component Classes-Hierarchy of Java Swing Classes-Swing Components- JLabel Control - JOptionPane Class - JTextField Control -JButton Control - JCheckBox Control - JRadioButton Control Menus-JProgress Bar.

Unit IV: NETWORKING AND JDBC   **15 Hrs**

Networking in Java –Java Socket Programming -TCP Server Socket Class - TCP Socket Class. Java Database Connectivity: Common JDBC Components-Establishing A Connection - Creation of Data Tables Entering Data into The Tables.

Unit V: SERVERSIDE PROGRAMMING-JSP AND SERVLET   **15 Hrs**

Java Server Pages (JSP): Introduction –architecture – advantages -Life Cycle –Components of JSP Page –The Scriptlet-JSP Directives-JSP Actions-Comments-JSP implicit Object-Control Flow in JSP-Servlet-Dynamic Webpages- Life Cycle of a Servlet - Handling HTTP Request and Response (GET / POST Request) .

Learning Resources:

Text Book(s):

1. "Core and Advanced Java , Black Book DT Editorial Services,2018

2. "Advanced Java Programming" E.Ramaraj –,2020

References:

1. E Balagurusamy, Programming with JAVA, 6th Edition, Tata McGraw Hill, New Delhi, 2019.
2. Herbert Schildt, Java 2: Complete Reference, 11th Edition, Tata McGraw Hill, New Delhi, 2018.
3. Mark Lassoff, Java Programming for Beginners, 1st Edition, Packt Publishing, UK, 2017.

Websites/e-Learning Resources:

1. https://www.tutorialspoint.com/java/java_object_classes.htm
2. https://www.geeksforgeeks.org/component-class-in-java/
3. https://www.tutorialride.com/core-java/applet-programming-in-java.htm
4. https://www.baeldung.com/a-guide-to-java-sockets
5. https://www.techarge.in/jdbc-components/
6. https://www.turing.com/kb/javaserver-pages-overview-and-elements

	K1	K2	K3	K4	K5	K6
CO1		2				
CO2						6
CO3				4		
CO4						6
CO5						6

Mean = 24/6 = 4.0

ADVANCED JAVA LAB (L)

Category	CC5	Course Code	PCS 4201	4 Hrs / 2 Cr

This course enables the students to implement the advanced Java programming for solving problems and provide knowledge on using Applets and Servlets. It helps the students to introduce and develop and design GUI applications using Swings and also enhance knowledge to manipulate and store data by JDBC and understand Socket programming and its implementation.

Course Outcomes:

At the end of the course, the student should be able to:

CO1: Understand the concepts related to Java Technology.

CO2: Able to develop Applets for GUI applications.

CO3: Must be capable of implementing JDBC.

CO4: Implement networking applications using socket programming concepts.

CO5: Create interactive web based applications using servlets and jsp.

List of Programs:

1. Develop a java program to display the employee details using class and object.

2. Develop a program to demonstrate the method overloading concept in Java.

3. Develop a Java Program to implement inheritance.

4. Write a java program to create an abstract class named Shape that contains two integers and an empty method named printArea(). Provide three classes named Rectangle, Triangle and Circle such that each one of the classes extends the class Shape. Each one of the classes contain only the method printArea( ) that prints the area of the given shape.

5. Write a program for passing parameters using Applet.

6. Develop an Applet that receives an integer in one text field & compute its factorial value & returns it in another text filed when the button "Compute" is clicked.

7. Develop a Java Applet program to show the animation of a bouncing ball.

1. Write an applet to display selected geometric figure from a list.

2. Write a Java program that works as a simple calculator. Use a grid layout to arrange

3. buttons for the digits and for the +, -,*, % operations. Add a text field to display the result.

4. Write a java program to create a frame containing three buttons (Yes, No, Close). When button yes or no is pressed, the message "Button Yes/No is pressed" gets displayed in label control. On pressing CLOSE button frame window gets closed.

5. Write a Java program to create a combo box which includes list of subjects. Display the selected subject in the text field using Swing.

6. Develop a Java program to implement a Jprogress bar.

7. Develop a Java program to implement a Menubar where we can select multiple menu and display it.

8. Develop a Java program to draw a rectangle using swing.

9. Write a Java swing program to print a wave form with output.

10. Develop a Java program with JDBC to store the details of a person on to the database table.

11. Write a Java program with JDBC to access and display the details of a person stored in the database table.

12. Write a Java program with JDBC to access and delete the details of a given person stored in the database table.

13. Develop a java program to create a sample TCP chat application where client and server can chat with each other.

14. Write a program in JSP to auto refresh a page.

15. Develop a JSP application to demonstrate the session tracking.

16. Develop a JSP application to count the total number of visits on your website.

17. Write an application to auto refresh a page in servlet.

18. Develop a servlet program that accepts the employee details from user and displays the details on the next page.

Learning Resources:

Text Book(s):

1. Jamie Jaworski,"Java Unleashed", SAMS Tech media Publications,1999.

2. Campione, Walrath and Huml,"The Java Tutorial", AddisonWesley, 1999.

References:

1. Deitel and Deitel, "Java How to Program", Third Edition, PHI/ Pearson Education Asia.

Websites/e-Learning Resources:

1. https://www.knowledgehut.com/tutorials/java-tutorial/java-applet

2. https://www.tutorialride.com/servlets/servlets-tutorial.htm

3. https://data-flair.training/blogs/jsp-hello-world-example/

	K1	K2	K3	K4	K5	K6
CO1		2				
CO2			3			
CO3				4		
CO4					5	
CO5						6

Mean = 20/5 = 4.0

INTRODUCTION TO WORDPRESS (TL)

Category	CBCS(NME)	Course Code	PCS 4305	4 Hrs/3 Cr

This course enables the students will be able to create websites using WordPress and able to create content management system.

Course Outcomes:

At the end of the course, students will be able to

CO 1: Understand what WordPress is and what it can do.

CO 2: Demonstrate installing and setting up for WordPress.

CO 3: Apply graphics and images usage.

CO 4: Analyze layout of your website and selecting a theme**.**

CO 5: Applyusing templates and plugins.

Unit I: INTRODUCTION   12 Hrs

WordPress – Getting Started-Creating an account on WordPress.com-Setting up your blog or web site- WordPress Settings-Take a tour of the Dashboard-Building and editing your Profile-Customizing the front page-Managing users-Managing comments-Permalinks.

Unit II: POSTS AND PAGES   12 Hrs

Posts-Posts vs. Pages-Text Formatting-Creating text links, adding images, and external URLs Setting up categories, tags, and other Elements-Publishing and editing a post- Pages-Creating basic Pages-Page organization and hierarchy.

Unit III: MEDIA AND WIDGETS   12 Hrs

Images, Video, and other Media-Media and the Admin panel-Media from within posts and pages-Inserting external media from YouTube- The Appearance Tab-Selecting a theme-Understanding page widgets.

Unit IV: THEMES AND MENUS   **12 Hrs**

Using a Theme-Changing the Background-Changing the header Image-Changing Formatting-Creating featured header images in posts and Pages-Using asides to create short Posts-Creating custom menus.

Unit V: LAUNCHING AND INSTALLATION   **12 Hrs**

Launching a Self-Hosted WordPress Site-Installing WordPress-Understanding the WordPress File Structure-Importing and exporting existing content from different sources-plug-ins.

Learning Resources:

Text Book(s):

1. WordPress 5 Complete: Build beautiful and feature-rich websites from scratch, 7th Edition.

References:

1. WordPress 4.0 Site Blueprints 2nd Edition: Build Your Own Website Using Best Practices.

Websites/e-Learning Resources:

1. https://learn.wordpress.org/tutorial/introduction-to-wordpress/
2. https://www.w3schools.in/wordpress/posts
3. https://www.w3schools.in/wordpress/creating-a-website-or-blog-in-wordpress

	K1	K2	K3	K4	K5	K6
CO1			3			
CO2		2				
CO3						6
CO4			3			
CO5						6

Mean = 20/5 = 4.0

<div align="center">**SOFT COMPUTING (T)**</div>

Category	CC6	Course Code	PCS 4502	6 Hrs / 5 Cr

The course aims at enable student tolearn the basics of fuzzy logic. It provides knowledge on optimization and neural networks. It helps the students to study about Applications of computational intelligence.

Course Outcomes:

At the end of the course the student will be able to

CO1: Define fuzzy Set Theory.

CO2: Recall Mamdani Fuzzy, Sugeno Fuzzy and Tsukamoto Fuzzy Models.

CO3: Apply the Neural Networks with Supervised Learning, Unsupervised Learning and Competitive Learning Networks.

CO4: Inspect the Neuron Functions for Adaptive Networks

CO5: Appraise the Application of Computational Intelligence in Soft Computing.

Unit I: INTRODUCTION   18 Hrs

Introduction to Neuro – Fuzzy and Soft Computing – Fuzzy Sets – Basic Definition and Terminology – Set – Theoretic Operations – Member Function Formulation and Parameterization – Fuzzy Rules and Fuzzy Reasoning – Extension Principle and Fuzzy Relations –Fuzzy If Then Rules – Fuzzy Reasoning – Fuzzy Inference Systems– Mamdani Fuzzy Models –Sugeno Fuzzy Models – Tsukamoto Fuzzy Models – Input Space Partitioning and Fuzzy Modelling.

Unit II: DERIVATIVE BASED OPTIMIZATION   18 Hrs

Derivative based Optimization – Descent Methods – The Method of Steepest Descent Classical Newton's Method-Step-Size-Determination-Derivative-Free-Optimization- Genetic Algorithms – Simulated Annealing – Random Search – Downhill Simplex Search.

Unit III: SUPERVISED LEARNING NEURAL NETWORKS   18 Hrs

Supervised Learning Neural Networks – Perceptron – Adaline Backpropagation Multilayer perceptron's – Radial Basis Function Networks – Unsupervised Learning and Other Neural

Networks – Competitive Learning Networks – Korhonen Self – Organizing Networks – Learning Vector Quantization – Hebbian Learning.

Unit IV: NEURO FUZZY MODELLING **18 Hrs**

Adaptive Neuro – Fuzzy Inference Systems – Architecture – Hybrid Learning Algorithm – Learning Methods that Cross fertilize ANFIS and RBFN – Coactive NeuroFuzzy Modelling – Framework – Neuron Functions for Adaptive Networks – Neuro Fuzzy Spectrum.

Unit V: APPLICATION OF COMPUTATIONAL INTELLIGENCE **18 Hrs**

Printed Character Recognition – Inverse Kinematics Problems – Automobile Fuel Efficiency Prediction – Soft Computing for Color Recipe Prediction.

Learning Resources:

Text Book(s):

1. J.S.R. Jang, C.T. Sun and E. Mizutani, "Neuro Fuzzy and Soft Computing", PHI, PearsonEducation, 2004.

References:

1. Timothy J. Ross, "Fuzzy Logic with Engineering Application, "McGraw Hill,19 77.
2. Davis E. Goldberg, "Genetic Algorithms Search, Optimization and Machine Learning",Addision Wesley, 1989.
3. S. Rajasekaran and G.A.V. Pai, "Neural Networks, Fuzzy Logic and Genetic Algorithms",PHI, 2003. EmereoPtv Limited, July 2008.
4. Ahmar, Abbas, "Grid Computing - A Practical Guide to technology and Applications",Charles River Media, 2003.

Websites/e-Learning Resources:

1. https://whatis.techtarget.com/definition/soft-com puting/
2. https://www.igi-global.com/dictionary/soft-meth ods-automatic-drug-infusion/27620/
3. https://towardsdatascience.com/soft-computing- 6cef872f7704/
4. https://www.youtube.com/watch?v=7C19X6pJE uU/

	K1	K2	K3	K4	K5	K6
CO1		2				
CO2			3			
CO3				4		
CO4					5	
CO5						6

Mean = 20/5 = 4.0

ADVANCED OPERATING SYSTEM (T)

Category	CC7	Course Code	PCS4504	6 Hrs/5 Cr

This course enables the students to learn the different types of operating systems and their functioning. It helps the students to gain knowledge on Distributed Operating Systems and gain insight into the components and management aspects of real time and mobile operating systems. It also helps the students to learn case studies in Linux Operating Systems.

Course Outcomes:

At the end of the course, students will be able to

CO1: Understand the design issues associated with operating systems.

CO2: Master various process management concepts including scheduling, deadlocks and distributed file systems.

CO3: Prepare Real Time Task Scheduling.

CO4: Analyze Operating Systems for Hand held Systems

CO5 Analyze Operating Systems like LINUX and iOS.

Unit I: BASICS OF OPERATING SYSTEMS   18 Hrs

Basics of Operating Systems: What is an Operating System? – Main frame Systems –Desktop Systems – Multiprocessor Systems – Distributed Systems – Clustered Systems –Real-Time Systems – Handheld Systems – Feature Migration – Computing Environments -Process Scheduling – Cooperating Processes – Inter Process Communication- Deadlocks –Prevention – Avoidance – Detection – Recovery.

Unit II: DISTRIBUTED OPERATING SYSTEMS   18 Hrs

Distributed Operating Systems: Issues – Communication Primitives – Lamport‟s Logical Clocks – Deadlock handling strategies – Issues in deadlock detection and resolution- distributed file systems –design issues – Case studies – The Sun Network File System-Coda.

Unit III: REAL TIME OPERATING SYSTEM   **18 Hrs**

Real time Operating Systems: Introduction – Applications of Real Time Systems – Basic Model of Real Time System – Characteristics – Safety and Reliability - Real Time Task Scheduling.

Unit IV: HAND HELD SYSTEM   **18 Hrs**

Operating Systems for Hand held Systems: Requirements–Technology Overview–Handheld Operating Systems–Palm OS - Symbian Operating System - Android –Architecture of android Securing hand held systems

Unit V: CASE STUDIES   **18 Hrs**

Case Studies: Linux System: Introduction – Memory Management – Process Scheduling – Scheduling Policy - Managing I/O devices – Accessing Files- iOS: Architecture and SDK Framework - Media Layer - Services Layer - Core OS Layer - File System.

Learning Resources:

Text Book(S):

1. Abraham Silberschatz; Peter Baer Galvin; Greg Gagne,"Operating System Concepts", Seventh Edition, John Wiley & Sons, 2004.
2. Mukesh Singhal and Niranjan G. Shivaratri, "Advanced Concepts in Operating Systems –Distributed, Database, and Multiprocessor Operating Systems", Tata McGraw-Hill, 2001.

References

1. Rajib Mall, "Real -Time Systems: Theory and Practice", Pearson Education India,2006.

2. Pramod Chandra P.Bhatt, An introduction to operating systems, concept and practice, PHI, Third edition, 2010.

3. Daniel. P. Bovet & Marco Cesati, "Understanding the Linux kernel", 3rd edition, O"Reilly, 2005.

Websites/e-Learning Resources:

1. https://onlinecourses.nptel.ac.in/noc20_cs04/preview
2. https://www.udacity.com/course/advanced-operating-systems--ud189
3. https://minnie.tuhs.org/CompArch/Resources/os-notes.pdf

	K1	K2	K3	K4	K5	K6
CO1		2				
CO2				4		
CO3					5	
CO4					5	
CO5						6

Mean = 22/5 = 4.4

DATA MINING AND WAREHOUSING (T)

Category	CC8	Course Code	PCS 4302	5 Hrs/ 3 Cr

The course aims at enable the students to learn the concepts of Mining tasks, classification, clustering and Data Warehousing. It helps the students to develop skills of using recent datamining software for solving practical problems. It also helpful to develop and apply critical thinking, problem-solving, and decision-making skills.

Course Outcomes:

At the end of the course, the student should be able to:

CO1: Understand the basic datamining techniques and algorithms.

CO2: Understand the Association rules, Clustering techniques and Data warehousing contents.

CO3: Compare and evaluate different datamining techniques like classification, prediction, Clustering and association rule mining.

CO4: Design data warehouse with dimensional modelling and apply OLAP operations.

CO5: Identify appropriate datamining algorithms to solve real world problems.

Unit I: BASICS AND TECHNIQUES   18 Hrs

Basic data mining tasks – data mining versus knowledge discovery in databases – data mining issues – data mining metrics – social implications of data mining – data mining from a database perspective.

Data mining techniques: Introduction – a statistical perspective on data mining – similarity measures – decision trees – neural networks – genetic algorithms.

Unit II: ALGORITHMS   18 Hrs

Classification: Introduction – Statistical–based algorithms - distance–based algorithms- decision tree-based algorithms - neural network–based algorithms – rule-based algorithms – combining techniques.

Unit III: CLUSTERING AND ASSOCIATION   **18 Hrs**

Clustering: Introduction–Similarity and Distance Measures–Outliers–Hierarchical Algorithm-Partitional Algorithms.Association rules: Introduction - large item sets - basic algorithms – parallel &distributed algorithms – comparing approaches- incremental rules – advanced association rules techniques – measuring the quality of rules.

Unit IV: DATAWAREHOUSING AND MODELLING   **18 Hrs**

Data warehousing: Introduction-characteristics of data warehouse–data marts–other aspects of data mart. Online analytical processing: Introduction – OLTP & OLAP systems. Data modelling –star schema for multidimensional view –data modelling – multi fact star schema or snow flake schema – OLAP TOOLS – State of the market – OLAP TOOLS and the internet.

Unit V: APPLICATIONS OF DATA WAREHOUSE   **18 Hrs**

Developing a data WAREHOUSE: why and how to build a data warehouse –data warehouse architectural strategies and organization issues - design consideration – data content – metadata distribution of data – tools for data warehousing – performance considerations – crucial decisions in designing a data warehouse.Applications of data warehousing and data mining in government: Introduction - national data warehouses – other areas for data warehousing and data mining.

Learning Resources:

Text Book(s):
   1. Margaret H. Dunham, "Data Mining: Introductory and Advanced Topics", Pearson education,2003.
   2. C.S.R.Prabhu, "Data Warehousing Concepts, Techniques, Products and Applications", PHI, Second Edition.

References:
   1. Arun K. Pujari,"Data Mining Techniques", Universities Press(India) Pvt. Ltd.,2003.

2. Alex Berson, Stephen J. Smith,"Data Warehousing, Data Mining and OLAP", TMCH, 2001.

3. Jiawei Han & Micheline Kamber, Academic press. Allen I. Holub, Compiler Design in C, Prentice Hall of India, 2001.

Websites/e-Learning Resources:

1. https://www.javatpoint.com/data-warehouse
2. https://nptel.ac.in/noc/courses/noc20/SEM1/noc20-cs12/
3. https://www.btechguru.com/training--it--database-management-systems--file-structures--introduction-to-data-warehousing-and-olap-2-video-lecture--12054--26--151.html

	K1	K2	K3	K4	K5	K6
CO1		2				
CO2			3			
CO3					5	
CO4						6
CO5						6

Mean = 22/5 =4.4

34

WEB PROGRAMMING (T)

Category	CC9	Course Code	PCS 4304	5 Hrs / 3 Cr

This course aims at preparing the students to gain theoretical skills and practical experience required for designing web pages and use variety of latest technologies to create responsive websites.

Course Outcomes:

At the end of the course, students will be able to

CO1: Recall Web Basics, history of Internet and use HTML tags, attributes and write simple web pages.

CO2: Apply DHTML to web pages and make it dynamic.

CO3: Define PHP commands and write programs.

CO4: Explain database connectivity in the context of PHP.

CO5: Create web page with Angular JS.

Unit I: WEB BASICS AND HTML   15 Hrs

Introduction, Concept of Internet- History of Internet, Protocols of Internet, World Wide Web, URL, Web Server, Web Browser. Introduction, History of HTML, Structure of HTML Document: Text Basics, Structure of HTML Document: Images and Multimedia, Links and webs, Document Layout, Cascading Style Sheet- HTML 4 style sheet features, Creating Forms, Frames and Tables.

Unit II: DYNAMIC HTML   15 Hrs

Introduction of DHTML- HTML vs. DHTML, Advantages of DHTML, CSS of DHTML, Event Handling, Data Binding, Browser Object Models.

Unit III: PHP   15 Hrs

Introduction and basic syntax of PHP, decision and looping with examples, PHP and HTML, Arrays, Functions, Browser control and detection, string, Form processing, Files, Advance Features: Cookies and Sessions, Object Oriented Programming with PHP.

Unit IV: PHP AND MYSQL   **15 Hrs**

Basic commands with PHP examples, Connection to server, creating database, selecting a database, listing database, listing table names, creating a table, inserting data, altering tables, queries, deleting database, deleting data and tables, PHPMyAdmin and database bugs.

Unit V: ANGULAR JS   **15 Hrs**

Introduction to Angular JS, Expressions, modules, Directives, data binding, services, tables, Events, forms, API, SQL, DOM.

Learning Resources:

Text Book(s):

1. "HTML5 Black Book: Covers CSS3, and PHP ", Kogent Learning Solutions Inc 2016.
2. Moulding, Peter, "PHP Black Book", Dreamtech Press Ltd, 2001.

References:

1. Ecky Putrady, "Practical Web Development with Haskell: Master the essential skills to build fast and scalable web applications", 1st edition, Apress, 2018.
2. Danny Goodman, "Dynamic HTML" 3rd Edition, O'reilly, 2006.
3. Jon Duckett, "PHP & MYSQL Server side development", 1st edition 2019.
4. Nathan Murray, Felipe Coury, "Ng Book: The Complete guide to Angular", 5th edition, Createspace Independent Publishing Platform, 2018.

Websites/ e-Learning Resources

1. https://www.tutorialspoint.com/html/index.htm
2. https://www.geeksforgeeks.org/dhtml-introduction/
3. https://www.tutorialspoint.com/php/index.htm
4. https://www.tutorialspoint.com/angularjs/index.htm
5. https://www.tutorialspoint.com/angularjs/index.htm
6. https://www.w3resource.com/angular/getting-started-with-angular.php

	K1	K2	K3	K4	K5	K6
CO1				4		
CO2			3			
CO3			3			
CO4						6
CO5						6

Mean = 22/5 = 4.4

WEB PROGRAMMING LAB (L)

Category	CC10	Course Code	PCS 4202	4 Hrs/2 Cr

This course enables the students to use Framesets, hyperlinks, different formatting features of HTML tags, forms and other controls in a webpage. It helps the students to design a web page using HTML tags. It also enables the students to interactive application using PHP.

Course Outcomes:

At the end of the course, students will be able to

CO1: Understand & implement the basic HTML tags to create static web pages.

CO2: Capable of using hyperlinks, frames, images, tables in a webpage.

CO3: Able to write dynamic web applications using HTML forms.

CO4: Must be able to write dynamic web applications in PHP & HTML tags using XAMPP.

CO5: Practice various triggers, procedures, and cursors using PL/SQL.

List of Programs:

1. Develop a website for your college using advanced tags of HTML.

2. Write names of several countries in a paragraph and store it as an HTML document, world.html. Each country name must be a hot text. When you click India (for example), it must open india.html and it should provide a brief introduction about India.

3. Develop a HTML document to i) display Text with Bullets / Numbers - Using Lists ii) to display the Table Format Data.

4. Develop a Complete Web Page using Frames and Framesets which gives the Information about a Hospital using HTML.

5. Write a HTML document to print your Bio-Data in a neat format using several components.

6. Develop a HTML document to display a Registration Form for an inter-collegiate function.

7. Using HTML form accept Customer details like Name, City, Pin code, Phone number and Email address and validate the data and display appropriate messages for violations using PHP (Eg. Name is Mandatory field; Pin code must be6digits, etc.).

8. Write a program to accept two numbers n1 and n2 using HTML form and display the Prime numbers between n1 andn2using PHP.

Learning Resources:

Text Book:

1. Ivan Bayross, "Web Enabled Commercial Applications Development Using HTML, JavaScript, DHTML and PHP", BPB Publications, 4th Revised Edition, 2010.

References:

1. A.K. Saini and Sumint Tuli, "Mastering XML", First Edition, New Delhi, 2002.

Websites/e-Learning Resources:

1. https://www.tutorialspoint.com/xml/index.htm

2. https://www.tutorialspoint.com/internet_technologies/websites_development.htm

3. https://www.youtube.com/watch?v=PlxWf493en4

	K1	K2	K3	K4	K5	K6
CO1		2				
CO2			3			
CO3					5	
CO4					5	
CO5						6

Mean = 21/5 = 4.2

DOCUMENTATION USING LATEX (TL)

Category	CBCS(NME)	Course Code	PCS 4306	4 Hrs/3 Cr

The course aims at introduce a software that is being widely used for type setting especially in Mathematics field for students. To make students know importance of this software for publishing research articles, papers, project reports and books and thereby help them to be comfortable with the software.

Course Outcomes:

At the end of the course, students will be able to

CO1: Prepare a Latex document, to make scientific article and project report.

CO2: Include figures and tables in a Latex document.

CO3: Make conference proceedings and presentations.

CO4: Use the preamble of LaTeX file to define document class and layout options.

CO5: Use BibTeX to maintain bibliographic information and to generate a bibliography for a particular document.

Unit I: INSTALLATION OF LATEX   12 Hrs

Installation of LaTeX: Installation of Kile and MikeTeX - Class and packages - Latex programming and commands,sample packages - Beginning typesetting using LaTeX:

Basics: What is LaTeX - Basics for document structuring - preamble preparation - saving a folder.

Unit II: FORMATING OF OUTPUT DOCUMENT   12 Hrs

Formating of output document: Latex commands for font colour - font size - make title -begin document - new page - sectioning.

Unit III: MATHEMATICAL FORMULAE   **12 Hrs**

Mathematical formulae: Insert mathematical symbols and Formulas - Tables andFigures: Creating Tables - Inserting figures - enumeration list - itemized list - font effects - inserting equations – Add references to figures and tables in text.

Unit IV: DRAWING WITH LATEX   **12 Hrs**

Drawing with LaTeX: Picture environments- extended pictures - other drawing packages - Preparing book,project report in LaTeX.

Unit V: REFERENCE AND CITATION   **12Hrs**

Reference and Citation: Inserting references - Manual reference - Reference using BibTex - citing reference.

Learning Resources:

Text Book(s):

1. Learning Latex, D.F.Griffits, D.J.Higham, Siam, Philadelpha, 1997
2. Guide to LATEX, fourth edition, Helmut Kopka,Patrick W.Daly

References:

1. Latex for beginners Work book 5th edition, Document Reference:3722-2014, March 2014
2. Martin J. Erickson and Donald Bindner, A Student's Guide to the Study,Practice, and Tools of Modern Mathematics, CRC Press, Boca Raton, FL,2011.
3. L. Lamport. LATEX: A Document Preparation System, User's Guide and Reference Manual. Addison-Wesley, New York, second edition, 1994.

	K1	K2	K3	K4	K5	K6
CO1			3			
CO2		2				
CO3						6
CO4			3			
CO5						6

Mean = 20/5 = 4.0