

Holy Cross College (Autonomous), Nagercoil

Kanyakumari District, Tamil Nadu.

Nationally Accredited with A⁺ by NAAC IV cycle – CGPA 3.35

Affiliated to

Manonmaniam Sundaranar University, Tirunelveli



DEPARTMENT OF COMPUTER SCIENCE SYLLABUS FOR POSTGRADUATE PROGRAMME



TEACHING PLAN EVEN SEMESTER 2024 – 2025

Vision

To provide a high-quality postgraduate education in computer science that prepares students for productive careers and lifelong learning.

Mission

1. To demonstrate proficiency in problem-solving techniques using the computer.
2. To demonstrate proficiency in at least two high-level programming languages and two operating systems
3. To show the ability to analyze a problem, identify and define the computing requirements appropriate to its solution.
4. To show the ability to function effectively on teams to accomplish a common goal.
5. To sensitize the students to the social realities around them with the vision of making them responsible citizens.

Programme Educational Objectives (PEOs)

PEO	Upon completion of M.Sc Computer Science Degree Programme, the graduates will be able to:
PEO1	apply scientific and computational technology to solve socio ecological issues and pursue research.
PEO2	continue to learn and advance their career in industry both in private and public sectors
PEO3	develop leadership, teamwork, and professional abilities to become a more cultured and civilized person and to tackle the challenges in serving the country.

Programme Outcomes (POs)

POs	Upon completion of M.Sc. Degree Programme, the graduates will be able to:
PO1	apply their knowledge, analyze complex problems, think independently, formulate and perform quality research.
PO2	carry out internship programmes and research projects to develop scientific and innovative ideas through effective communication.
PO3	develop a multidisciplinary perspective and contribute to the knowledge capital of the globe.
PO4	develop innovative initiatives to sustain ecofriendly environment

PO5	through active career, team work and using managerial skills guide people to the right destination in a smooth and efficient way.
PO6	employ appropriate analysis tools and ICT in a range of learning scenarios, demonstrating the capacity to find, assess, and apply relevant information sources.
PO7	learn independently for lifelong to execute professional, social and ethical responsibilities promoting sustainable development.

Programme Specific Outcomes (PSOs)

PSOs	Upon completion of M.Sc. Degree Programme, the graduates will be able to:
PSO1	apply profound knowledge to analyze and design software and systems containing hardware and software components of varying complexity.
PSO2	apply mathematical model, algorithmic principles, and computer science theory in the design of real-time applications
PSO3	apply knowledge of computing to produce effective designs and solutions for specific problems.
PSO4	identify, analyze, design, optimize and implement system solutions using appropriate algorithms of varying complexity.
PSO5	work in multidisciplinary teams in small and large-scale projects by utilizing modern software tools and emerging technologies to develop complex products for the societal needs.

Department : Computer Science
Class : I M. Sc Computer Science
Title of the Course : Core Course III: Data Mining and Warehousing
Semester : II
Course Code : SP232CC1

Course Code	L	T	P	S	Credits	Inst. Hours	Total Hours	Marks		
								CIA	External	Total
SP232CC1	6	-	-	-	5	6	90	25	75	100

Pre-requisite:

Basics of RDBMS & Algorithms.

Objectives:

1. To enable the students to learn the concepts of Mining tasks, classification, clustering and Data Warehousing.
2. To develop skills of using recent data mining software for solving practical problems.

Course Outcomes

On the successful completion of the course, student will be able to:		
1	understand the basic data mining techniques and algorithms	K1,K2
2	understand the Association rules, Clustering techniques and Data warehousing contents	K2,K3
3	compare and evaluate different data mining techniques like classification, prediction, Clustering and association rule mining	K4,K5
4	design data warehouse with dimensional modeling and apply OLAP operations	K5,K6
5	identify appropriate data mining algorithms to solve real world problems	K6

Teaching Plan

Total Contact hours: 90 (Including lectures, Assignments and Tests)

Unit	Module	Topics	Teaching hours	Cognitive level	Pedagogy	Assessment/ Evaluation
I	BASICS AND TECHNIQUES					
	1	Basic data mining tasks	2	K2 (U)	Lecture Introducing	Overview

	2	Data mining versus knowledge discovery in databases, Data mining issues, data mining metrics, social implications of data mining,	4	K2 (U)	Interactive Learning	Quizzes
	3	Data mining from a database perspective.	2	K3 (Ap)	PPT	Group Discussion
	4	Data mining techniques: Introduction,	2	K1, K2 (U)	Lecture Introducing	Overview
	5	A statistical perspective on data mining, similarity measures and Decision trees.	4	K3, K4(An)	Hands-on Practice	Written test
	6	Neural networks, Genetic algorithms.	4	K2, K3 (Ap)	Collaborative Learning	MCQ
	ALGORITHMS					
	1	Introduction, Statistical based algorithms, Regression and Bayesian	4	K2, K3 (U, Ap)	Problem Based Learning	Quizzes
	2	Distance-based algorithms, Hamming distance, Euclidean Distance.	4	K3 (Ap)	Work out examples	Assignment
II	3	decision tree-based algorithms- Use of A Decision Tree-Decision Tree Induction	3	K3, K4 (Ap, An)	Hands-on Practice	Problem solving
	4	Neural network based algorithms - Neural Network Architecture, Neural Network Method in Data Mining.	4	K4 (An)	Role- Play	Quiz
	5	Rule-based algorithms- Combining Techniques.	3	K4, K5 (An, E)	Collaborative Code Reviews	Assignment
	CLUSTERING AND ASSOCIATION					
III	1	Clustering: Introduction	1	K2 (U)	Lecture Introducing	Discussion

	2	Similarity and Distance Measures, Outliers	2	K4 (An)	Practice on dataset analysis	Quiz
	3	Hierarchical Algorithms, Partitional Algorithms.	4	K3, K4 (Ap, An)	Lab sessions with real datasets	Practical test
	4	Association rules: Introduction, large item sets.	2	K3, K4 (Ap, An)	Lecture method	Group Discussion
	5	Basic algorithms and Parallel & distributed algorithms	3	K2, K3 (U, Ap)	Lab Exercises	True / False
	6	Comparing approaches, incremental rules, Advanced Association rules and Techniques.	4	K4 (An)	Gamified Learning	MCQ
	7	Measuring the quality of Rules.	2	K3, K4 (Ap, An)	Debate Session	Seminar
	DATA WAREHOUSING AND MODELING					
IV	1	Data warehousing: Introduction	2	K2 (U)	Lecture Introducing	Overview
	2	Characteristics of data warehouse, Data marts, other aspects of data mart.	4	K2 (U)	Interactive PPT	Quiz
	3	Online analytical processing: introduction OLTP & OLAP systems Data modelling, Star schema for multi-dimensional view data modelling.	6	K2, K3 (U, Ap)	Hands – on Practice	MCQ
	4	Multi-fact star schema or snow flake schema.	3	K4(An)	Videos	Design Star Schema
	5	OLAP TOOLS, State of the market, OLAP TOOLS and the internet.	3	K4, K5 (An, E)	Solving Exercises	Problem solving
	APPLICATIONS OF DATA WAREHOUSE					
V	1	Developing a data Warehouse: why and	4	K4 (An)	Flipped Class room	Group Discussion

		how to build a data warehouse, architectural strategies and organization issues.				
2		Design consideration, data content, metadata distribution of data, Tools for data warehousing.	4	K3, K4 (Ap, An)	Lecture Method	MCQ
3		Performance considerations, crucial decisions in designing a data warehouse.	3	K3 (Ap)	PPT	Test
4		Applications of data warehousing and data mining in government: Introduction	4	K3, K5 (Ap, E)	Group Discussion	Seminar
5		National data warehouses, other areas for data warehousing and data mining.	3	K3, K5 (Ap, E)	Using visual images	Quiz

Course Focussing on Employability/ Entrepreneurship/ Skill Development:

1. Employability – Compare data mining and knowledge discovery in databases.
2. Entrepreneurship – Seminar on Star schema.
3. Skill Development – Implement the algorithm using R tool.

Assignment : Rule-based algorithms, OLTP and OLAP data modelling.

Seminar Topic : Measuring the quality of Rules, Applications of Data Warehousing.

Sample questions:

Part - A (1 Mark)

1. Which of the following is not a data mining task?
 - a) Classification
 - b) Regression
 - c) OLAP Operations
 - d) Clustering
2. What is the main purpose of data mining metrics?
 - a) Measure storage efficiency
 - b) Evaluate the quality of patterns extracted
 - c) Reduce database size
 - d) Ensure database normalization
3. Which algorithm is commonly used for association rule mining?
 - a) K-Means
 - b) Apriori
 - c) Naive Bayes
 - d) Decision Trees
4. In clustering, which of the following measures is used to calculate similarity?
 - a) Precision
 - b) Euclidean Distance
 - c) Support
 - d) Accuracy

5. Which schema is widely used in data warehouse design?

- a) Star Schema b) Flat Schema c) Tree Schema d) Graph Schem

Part - B (6 Marks)

6. Explain the basic tasks involved in data mining.
7. Describe the key differences between supervised and unsupervised learning in the context of data mining. Provide examples.
8. Discuss the importance of similarity measures in clustering and provide examples.
9. Illustrate the process of generating association rules using the Apriori algorithm.
10. Explain the design challenges associated with data warehouses.

Part - C (16 Marks)

11. Compare and evaluate the advantages and limitations of hierarchical & partitional algorithms.
12. Design a data warehouse for a retail organization using a star schema.
13. Explain the knowledge discovery process in data mining. Illustrate with an example.
14. Evaluate the impact of OLAP tools on business decision-making with examples.
15. Develop a framework for implementing a data mining solution to detect fraudulent transaction.

Head of the Department

Mrs. J. Anto Hepzie Bai

Course Instructor

Mrs. SelvaSanthi

Department : Computer Science
Class : I M. Sc Computer Science
Title of the Course : Core Course IV: Advanced Java Programming
Semester : II
Course Code : SP232CC2

Course Code	L	T	P	S	Credits	Inst. Hours	Total Hours	Marks		
								CIA	External	Total
SP232CC2	6	-	-	-	5	6	90	25	75	100

Pre-requisite:

Basics of Java and its usage.

Learning Objectives:

1. Enable the students to learn the basic functions, principles, and concepts of advanced Java programming.
2. Learn JDBC, Servlet packages, JQuery, Java Server Pages, and JAR file format.

Course Outcomes

On the successful completion of the course, students will be able to:		
1	understand the advanced concepts of Java Programming	K1, K2
2	understand JDBC and RMI concepts	K2, K3
3	apply and analyze Java in Database	K3, K4
4	handle different events in Java using the delegation event model, event listener, and class	K5
5	design interactive applications using Java Servlet, JSP, and JDBC	K5, K6

Teaching plan

Total Contact hours: 90 (Including lectures, assignments and tests)

Unit	Module	Topic	Teaching Hours	Cognitive level	Pedagogy	Assessment/ Evaluation
I	Basics of Java					
	1.	Java Basics Review: Components and event handling, Types of Exceptions	3	K1(R)	Interactive lecture with examples	Concept recall quiz
	2.	Threading, Concurrency, Synchronization	2	K2(U)	Group discussion with problem-solving exercises	Written Q&A task
	3.	Networking features, java.net Package,	2	K3(AP)	Lecture using Chalk and talk	Practical network-based task
	4.	Client and Server Programs, Content, and Protocol Handlers	3	K3(AP)	Demonstration with sample programs	Create a client-server application
	5.	Network Class Overview, Java Security, and the Network classes	3	K3(AP)	Lecture with real-world examples	Diagrammatic analysis task
	6.	Java Socket Programming	3	K3(AP)	Step-by-step practical demonstration	Code a simple socket program
	7.	Media Techniques, Applet, Java Graphics, Basic Animation	3	K3(AP)	Interactive problem-solving using examples	Implement a simple Java animation
II	Remote Method Invocation					
	1.	Remote Method Invocation, Working of RMI	3	K2(U)	Lecture using Chalk and talk	Evaluation through a short test
	2.	Distributed Application Architecture	3	K2(U)	Demonstration with design walkthrough	Group discussion
	3.	Creating stubs and skeletons	3	K2(U)	Video-assisted explanation	Compare stubs and skeletons Short note
	4.	Defining Remote objects, Remote Object Activation, Object Serialization	4	K3(Ap)	Lecture with coding demos	Seminar
	5.	Java Spaces, Benefits and Limitations of Java Spaces	3	K3(Ap)	Interactive PPT	Write and test a Java Spaces application

III Database						
	1.	Java in Databases, java. SQL package, JDBC Driver, JDBC principles	4	K6(C)	Lecture with practical coding session	Code a database connection program
	2.	JDBC API, database access, Interacting-database search	3	K5(E)	Video-based demonstration with live coding	Write and test a JDBC query program
	3.	Meta Data Interfaces, Stored Procedures	3	K4(AN)	Lecture with sample database tasks	Design and execute stored procedures
	4.	Extending JDBC, Creating multimedia databases	4	K6(C)	Interactive PPT	Evaluation through a short test
	5.	Database support in web applications	3	K3(Ap)	Lecture using Chalk and talk	Short Summary
	6.	Components of Web-Based Database Applications	4	K3(Ap)	Problem-solving and application development	Build a simple web-based database application
IV Servlets						
	1.	Java Servlets: Java Servlet and CGI programming	3	K2(U)	Lecture with coding walkthrough	Write basic servlet code
	2.	A simple Java Servlet, Anatomy of a Java Servlet, Reading data from a client, Reading HTTP request header	4	K6(C)	Interactive PPT	Build a simple servlet program.
	3.	sending data to a client and writing the HTTP response header	3	K6(C)	Hands-on demonstration	Complete a servlet task
	4.	working with cookies	2	K3(AP)	Interactive PPT	Practical cookie management task
	5.	Java Server Pages: JSP Overview, Installation, JSP tags, Components of a JSP page	4	K5(E)	Lecture with group coding sessions	Implement a JSP page with tags and directives
	6.	Expressions, Script lets, Directives, Declarations, A complete example	3	K4(Ap)	Problem-solving	Complete a JSP-based application

V	Advanced Techniques					
	1.	JAR file format creation, Internationalization	3	K2(U)	Lecture with step-by-step examples	Create and demonstrate a JAR file
	2.	Locales, Resource Bundles, MVC Architecture	3	K2(U)	Demonstration with examples	Short test
	3.	Swing Programming, Swing Components: Text Fields, Buttons, Toggle Buttons, Check Boxes and Radio Buttons	4	K3(AP)	Problem-solving	Group discussion
	4.	Advanced java Techniques	2	K4(AN)	Interactive PPT	MCQ

Course Focussing on Employability/ Entrepreneurship/ Skill Development: Skill Development

Activities (Em/ En/SD):

1. Use Java socket programming to create a simple client-server chat application.
2. Design a web application using JSP and Servlets that interacts with a database (e.g., an employee management system).
3. Implement a distributed calculator application that performs basic arithmetic operations using Java RMI.

Assignment: Distributed Application Architecture

Seminar Topic: Exploring Java RMI: Building Distributed Applications

Sample questions

Part A (1 Mark)

1. Which of the following is used for socket programming in Java?
a) java.util b) java.net c) java.io d) java.lang
2. What is the main purpose of the synchronized keyword in Java?
a) Networking b) Exception Handling
c) Thread Safety d) Data Serialization
3. In JDBC, which method executes a query that returns a ResultSet?
a) execute() b) executeUpdate()
c) executeQuery() d) executeBatch()
4. What does Java RMI Registry use as the default port?
a) 1099 b) 8080 c) 1433 d) 1521

5. Which of the following is not a part of the Java Servlet lifecycle?
a) destroy() b) init() c) doFilter() d) service()

Part B (6 Marks)

6. Explain how the synchronized block works in Java with an example.
7. Describe the steps involved in Java RMI, including the roles of stubs and skeletons.
8. Write a program to demonstrate socket communication between a client and server in Java.
9. Explain the JDBC architecture and describe how the ResultSet object is used.
10. Discuss the differences between Java Servlets and JSP with examples.

Part C (12 Marks)

11. Explain the threading model in Java, including thread lifecycle, concurrency, and synchronization. Provide examples for each concept.
12. Discuss the process of creating a simple distributed application using Java RMI. Include steps for defining, registering, and invoking remote objects.
13. Describe the role of the java.sql package in database programming. Explain the JDBC API in detail with a focus on database connectivity, metadata, and stored procedures.
14. Explain the lifecycle of a Java Servlet with an example of how to handle HTTP requests and responses.
15. Discuss the key components and features of Swing in Java. Write a program to create a simple Swing GUI with buttons and text fields.

Head of the Department

Mrs. J. Anto Hepzie Bai

Course Instructor

Mrs. J. Jackulin Reeja

Department : Computer Science
Class : I M. Sc Computer Science
Title of the Course : Elective Course III: Mobile Computing
Semester : II
Course Code : SP232EC2

Course Code	L	T	P	Credits	Inst. Hours	Total Hours	Marks		
							CIA	External	Total
SP232EC2	4	-	-	3	4	60	25	75	100

Learning Objectives:

1. Present the overview of Mobile computing, Applications and Architectures.
2. Enable to understand the futuristic computing challenges

Course Outcomes

On the successful completion of the course, student will be able to:		
1	understand the need and requirements of mobile communication	K1,K2
2	focus on mobile computing applications and techniques	K2,K3
3	demonstrate satellite communication in mobile computing	K4
4	analyze about wireless local loop architecture	K5,K6
5	analyze various mobile communication technologies	K6

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6**– Create

Teaching plan

Total Contact hours: 60 (Including lectures, assignments and tests)

Unit	Module	Topic	Teaching Hours	Cognitive level	Pedagogy	Assessment/ Evaluation
I	Introduction					
	1.	Introduction: Advantages of Digital Information - Introduction to Telephone Systems	1	K1(R)	Introductory session	Questioning
	2.	Mobile communication: Need for Mobile Communication	3	K2(U)	Interactive PPT	Case study
	3.	Requirements of Mobile Communication	3	K2(U)	E-Content-MS Word	MCQ - Edmodo
	4.	History of Mobile Communication	3	K2(U)	Lecture using Chalk and talk	Short test
	5.	Properties of Wireless medium	2	K2(U)	Nearpod using PPT	Evaluation essay
II	Mobile Communication					
	1.	Introduction to Cellular Mobile Communication – Mobile Communication Standards	2	K2(U)	Blended Learning	Evaluation through short test
	2.	Mobility Management – Hand off	2	K2(U)	PPT	Seminar
	3.	Radio link transfer- Roaming Management	2	K2(U)	Lecture using Chalk and talk	Short summary
	4.	Frequency Management	2	K3(Ap)	Multimedia Video	Quiz - Quizzes
	5.	Cordless Mobile Communication Systems	2	K3(Ap)	Interactive PPT	Recall definitions
	6.	Cordless- Multichannel- Wireless Communications	2	K3(Ap)	Group discussion with role-playing	MCQ in Slido
III	Mobile Computing					
	1	History of data networks – Classification of Mobile data networks	2	K2(U)	Interactive PPT	Nearpod
	2	CDPD System	2	K4(An)	Flipped Classroom	Slido using Poll
	3	Satellites in Mobile Communication: Satellite classification – Global Satellite Communication	3	K3(Ap)	Interactive PPT	Class Test
	4	Changeover from one satellite to other – Global	3	K3(Ap)	Video	Recall steps

		Mobile Communication				
	5	Interferences in Cellular Mobile Communication.	2	K3(Ap)	Lecture using videos	True/False
IV	Mobile Communication System					
	1	Important Parameters of Mobile Communication System – Mobile Internet: Working of Mobile IP	2	K4(An)	Case Study	MCQ - Kahoot
	2	Wireless Network Security	3	K5(E)	Lecture using videos	Concept explanations
	3	Wireless Local Loop Architecture: Components in WLL – Problems in WLL	2	K4(An)	Video	Recall Steps
	4	Modern Wireless Local Loop	2	K5(E)	PPT	Evaluation through short test
	5	Local Multipoint Distribution Service – Wireless Application Protocol.	3	K5(E)	Reflective Thinking	Short summary
V	Communication Technology					
	1	WCDMA Technology and Fiber Optic Microcellular Mobile Communication	2	K5(E)	Lecture using Chalk and talk	True/False using Mentimeter
	2	Ad hoc Network and Bluetooth technology	3	K4(An)	Interactive PPT	Class test
	3	Intelligent Mobile Communication system	2	K2(U)	Multimedia Video	Recall topic
	4	Power Delivery-Processing Gain	3	K4(An)	Lecture	Seminar
	5	Fourth Generation Mobile Communication systems.	2	K5(E)	Reflective Thinking	Slido using Poll

Course Focussing on Employability/ Entrepreneurship/ Skill Development: Skill Development

Activities (Em/ En/SD): 1. Draw and explain CDPD systems.

2.Explain Bluetooth technology with suitable diagram

3. Explain WCDMA technology with diagram.

Assignment: Bluetooth Technology

Seminar Topic: Satellite Communication

Sample questions

Part A (1 Mark)

1. Which of the following is *not* a typical requirement of mobile communication?
 - a. High mobility
 - b. Low latency
 - c. Wired connectivity
 - d. Reliable data transfer
2. What is the primary purpose of "handoff" in cellular mobile communication?
 - a. To improve call quality
 - b. To transfer a call to a new channel as the user moves
 - c. To manage billing between networks
 - d. To increase network frequency
3. What is the primary purpose of CDPD (Cellular Digital Packet Data)?
 - a. To increase voice call quality
 - b. To transmit data over cellular networks
 - c. To connect satellites directly to mobile phones
 - d. To manage frequency interference
4. What is the primary function of Mobile IP in mobile communication systems?
 - a. To provide encryption for wireless data
 - b. To manage internet connectivity as a user moves between networks
 - c. To handle call handoff between cell towers
 - d. To increase data transmission speed
5. Which technology is primarily used for high-speed mobile communication and provides increased processing gain?
 - a. Bluetooth
 - b. Ad hoc Networks
 - c. WCDMA
 - d. Fiber

Part B (6 Marks)

6. What is the need for mobile communication? Discuss its significance in modern society.
7. Describe the process and significance of frequency management in cellular mobile communication systems
8. Explain the classification of satellites used in mobile communication and discuss how they facilitate global satellite communication.
9. Describe the architecture of a Wireless Local Loop (WLL) and identify two main problems associated with it.
10. Explain the concept of processing gain in mobile communication and discuss its significance in enhancing communication quality.

Part C (12 Marks)

11. Describe the properties of wireless medium. Discuss the advantages and challenges these properties bring to mobile communication systems.
12. Explain mobility management in cellular mobile communication, including the concepts of handoff and roaming management.
13. Describe the history of data networks and the classification of mobile data networks.
14. Explain the working of Mobile IP and discuss its importance in mobile internet.
15. Describe the advancements in Fourth Generation (4G) mobile communication systems.

Head of the Department
Mrs.J.Anto Hepzie Bai

Course Instructor
Mrs. Sahaya Rose Vigita.E

Department : Computer Science
Class : I M. Sc Computer Science
Title of the Course : Elective Course IV b): Web Services
Semester : II
Course Code : SP232EC5

Course Code	L	T	P	Credits	Inst. Hours	Total Hours	Marks		
							CIA	External	Total
SP232EC5	4	-	-	3	4	60	25	75	100

Objectives

1. Present the web services, building real world enterprise applications using web services with technologies XML, SOAP, WSDL, UDDI.
2. Get overview of distributed computing, XML, and its technologies.

Course Outcomes

CO	Upon completion of this course, the students will be able to:	PSO addressed	Cognitive level
CO – 1	understand web services and its related technologies	PSO – 1	K1, K2
CO – 2	understand XML concepts	PSO – 2	K2, K3
CO – 3	analyze on SOAP and UDDI model	PSO – 4	K4, K5
CO – 4	demonstrate the road map for the standards and future of web services	PSO – 5	K5
CO – 5	analyze QoS enabled applications in web services	PSO – 3	K5, K6

Teaching plan

Total Contact hours: 60 (Including lectures, assignments and tests)

Unit	Module	Topic	Teaching Hours	Cognitive level	Pedagogy	Assessment/ Evaluation
I	1.	Introduction: Introduction to web services	2	K1(U)	Introductory session	Word Cloud
	2.	Overview of Distributed Computing	2	K2(R)	Concept Explanations	Simple definitions and logic
	3.	Evolution and importance of web services-Industry standards	2	K2(U)	Lecture using Chalk and talk	MCQ
	4.	Technologies and concepts underlying web services	2	K2(U)	Interactive PPT	Quiz using Slido
	5.	Web services and enterprises	2	K2(U)	Computational Thinking	Present the Key characteristic and use cases of Web Services
	6.	Web services standards organization	1	K3(A)	Demonstration	Concept definitions
	7.	Web services platforms	1	K2(U), K3(A)	Logical Thinking	Identify the best Web services platforms
	II	1.	XML Fundamentals: Introduction	1	K1(R)	Lecture using Chalk and talk
2.		XML documents: XML Syntax, XML Elements, XML Attributes, XML Namespaces	1	K2(U)	Syntax Explanations	Create an XML Document
3.		XML DOM - Validation of XML Documents	1	K2(U)	Lecture using videos	Validating XML documents- Exercises
4.		XML DTD	1	K2(U)	Demonstration	Review XML documents for correct syntax and structure

	5.	XML Schema – XML Server	2	K3(A)	Lecture	Seminar
	6.	Processing XML – XML XSLT	2	K3(A)	Inquiry Based Teaching	Slip Test
	7.	XML XQuery	2	K2(U)	Logical Thinking	MCQ
	8.	XML XLink	2	K1(R)	Project Based	Create XML document
III	16.	SOAP MODEL: SOAP: The SOAP model- Introduction	1	K2(U)	PPT	Short essays
	17.	SOAP messages-SOAP encoding	3	K1(R)	Context based learning	SOAP Messaging practice
	18.	WSDL: WSDL structure- interface definitions-bindings-services	3	K5(E)	Flipped Classroom	Recall
	19.	Using SOAP and WSDL- UDDI: About UDDI- UDDI registry Specification	3	K4(An)	Lecture using videos	Case study of UDDI for a real world example
	20.	Core data structures- Accessing UDDI	2	K3(A)	Blended Learning	MCQ Using Nearpod
	IV	7.	Technologies and Standards: Advanced web services technologies and standards	2	K2(U)	Context Based
8.		Conversations overview-web services conversation language- WSCL interface components	2	K3(A)	Discussion Forum	MCQ
9.		Workflow: business process	2	K3(A)	Computational Learning	Create a workflow for a business scenario
10.		Management workflows and workflow management systems Security: Basics	2	K4(An)	Interactive PPT	Evaluation through short test
11.		Data handling and forwarding- storage-errors and data	2	K3(A)	Simulation	Quiz using Question Well tool

	12.	Web services security issues	2	K6(C)	Analytical Study	Research common security threats to web services
V	5.	Quality of Service: Quality of Service: Importance of QoS for web services	1	K1(R)	Context Based	True/False
	6.	QoS metrics-holes-design patterns	2	K3(A)	Lecture	Identify relevant QoS metrics
	7.	QoS enabled web services	2	K3(A)	Analytical Study	Collect and analyze QoS services
	8.	QoS enabled applications	1	K4(An)	Lecture method	MCQ
	9.	Web services management	2	K3(A)	Problem solving	Case study on implementing QoS in a web service
	10.	Web services standards and future trends	2	K2(U)	Industry Interaction	Clarify the technical scenarios

Course Focussing on Employability/ Entrepreneurship/ Skill Development: Skill Development

Activities (Em/ En/SD): 1. Expose the current trends in Web Services
2. SOAP Messaging practice

Course Focussing on Cross Cutting Issues (Professional Ethics/ Human Values/Environment Sustainability/ Gender Equity): Professional Ethics

Activities related to Cross Cutting Issues : Nil

Assignment : 1. SOAP

2. Case Study on UDDI for a real world example

Seminar Topic: Web Services Platforms and QoS enabled applications

Sample questions

Part A

1. What does SOAP stand for?

- a) Simple Object Access Protocol
- b) Simple Open Application Protocol
- c) Secure Online Application Protocol
- d) Structured Object Application Protocol

2. Which of the following is NOT an XML validation method?
a) XML DTD b) XML Schema c) XML XSLT d) None
3. Which organization is responsible for web services standards?
a) IEEE b) W3C c) ISO d) ICANN
4. What is an XML namespace used for?
a) To link multiple XML files b) To avoid name conflicts in XML elements
c) To validate XML against a schema d) To convert XML to other formats
5. UDDI is used for describing how to access a web service's operations. **Say True or False**

Part B

6. Distinguish UDDI and WSDL.
7. Explain SOAP communication and messaging.
8. What is DOM? What are the different levels of DOM?
9. What are the security issues in Web Services?
10. Explain the various QoS metrics.

Part C

11. Explain core web services, standards and technologies for enabling web services.
12. Describe the importance of Distributed Computing.
13. What are the steps involved in validating an XML document? Explain with an example of XML Schema.
14. Describe in detail the importance of QoS for web services.
15. Explain how workflows are managed in business process management systems.

Head of the Department

Mrs. J. Anto Hepzie Bai

Course Instructor

Dr. S. Immaculate Shyla

Department : Computer Science
Class : II M.Sc
Title of the Course : Core Course VII: Big Data Analytics
Semester : IV
Course Code : SP234CC1

Course Code	L	T	P	S	Credits	Inst. Hours	Total Hours	Marks		
								CIA	External	Total
SP234CC1	6	-	-	-	5	6	90	25	75	100

Objectives

1. To make the students understand Big Data Analytics
2. To understand the various algorithms in Big Data Analytics

Course Outcomes

CO	Upon completion of this course, the students will be able to:	PSO addressed	Cognitive level
CO – 1	learn and explore the fundamental concepts of big data analytics	PSO - 1	K1(R), K2(U)
CO – 2	understand the various search methods and apply visualization techniques.	PSO - 3	K2(U), K3(AP)
CO – 3	apply and analyze the big data using intelligent techniques	PSO - 2	K3(AP), K4(An)
CO – 4	use and evaluate various techniques for mining data stream.	PSO - 4	K3(Ap), K5(E)
CO – 5	understand the analytics process in simple terms and supporting useful methods in its application.	PSO -	K6(C)

Teaching Plan

Total Contact hours: 90 (Including lectures, assignments and tests)

Unit	Module	Topic	Teaching Hours	Cognitive level	Pedagogy	Assessment/ Evaluation
I	From Data to Big Data					
	1.	From Data to Big Data: Introduction - No analytics without data - Databases - Raw data - Text - Images, audios and videos	3	K2(U)	Introductory Lecture and Demonstration	Simple Definitions
	2.	From bytes to yottabytes: the data revolution - Big data: definition - The 3Vs model	3	K2(U)	Hands – on practice	Guided practice with step-by-step instructions
	3.	Big Data: Introduction - Beyond the 3Vs - From understanding data to knowledge	3	K3(Ap)	Collaborative Learning	Q & A Sessions
	4.	Improving decision-making	3	K4(An)	Problem Solving	Brain Storming
	5.	Things to take into account- Data quality: Data security	3	K2(U)	Lecture Method	Short Test
	6.	Big data and businesses - Opportunities - Challenges – Conclusions	3	K4(An)	Context Based Lecture	Group Discussion
II	Building an Understanding of Big Data Analytics					
	1.	Introduction - Before breaking down the process. What is data analytics?	2	K2(U)	Experimental Learning	Interactive Quiz
	2.	Before and after big data analytics	2	K3(Ap)	Demonstration	Map knowledge
	3.	Traditional versus advanced analytics: What is the difference?	2	K3(Ap)	Lecture using videos	Online Assignment
	4.	Advanced analytics: new paradigm - New statistical and computational paradigm within the big data context	4	K4(An)	Comparison Exercises	Kahoot
	5.	Why Data Analytics	4	K3(Ap)	Chalk and Talk	Map

		and When Can We Use It? Introduction - Understanding the changes in context When real time makes the difference -				Knowledge
	6.	Analytics culture within companies - Big data analytics application: examples	4	K4(An)	Video Lecture	MCQ
III	Data Analytics Process					
	1.	Introduction - Understanding data analytics is good but knowing how to use it is better! (What skills do you need?)	3	K3(Ap)	Presentation using videos	Recall steps
	2.	When real time makes the difference - - Analytics culture within companies - Big data analytics application: examples	3	K3(Ap)	Demonstration	MCQ
	3.	First phase: find the data - Second phase: construct the data - Third phase: go to exploration and modelling	4	K3(Ap)	Demonstration	Recall steps
	4.	Fourth phase: evaluate and interpret the results - Fifth phase: transform data into actionable knowledge	4	K4(An)	Lecture using videos	Hands - on practice
	5.	Disciplines that support the big data analytics process	4	K2(U)	Chalk and Talk	Discussion
IV	Supervised versus Unsupervised Algorithms					
	1.	Introduction - Supervised and unsupervised learning	3	K2(U)	Demonstrative videos	Short summary
	2.	Supervised learning: predict, predict and predict!	4	K2(U)	Lecture using videos	Short Quiz
	3.	Unsupervised learning: go to profiles search!	4	K2(U)	Interactive PPT	Discussion and Questioning
	4.	Regression versus classification - Regression –	3	K3(Ap)	Video Lecture	Map Knowledge

		Classification				
	5.	Clustering gathers data - What good could it serve? - Principle of clustering algorithms - Partitioning your data by using the K-means algorithm	4	K4(An)	Lecture Method	Quiz
V	Applications and Examples					
	1.	Introduction - Which algorithm to use? - Supervised or unsupervised algorithm	4	K2(U)	KWL(What do you Know/Want to know/What did you Learn)	Hands –on practice
	2.	Supervised or unsupervised algorithm: in which case do we use each one?	2	K3(ap)	Video LECTure	Short Summary
	3.	What about other Machine Learning algorithms? - Applications	6	K6(C)	Demonstration	Practical Assignments
	4.	The duo big data/Machine Learning : examples of use	6	K6(C)	Interactive Presentation	Hands - on Practice

Course Focussing on Employability/ Entrepreneurship/Skill Development: Skill Development

- Activities (Em/ En/SD):
1. Data Exploration and Visualization Workshop
 2. Building Predictive Models with Machine Learning
 3. Mock Data Analytics Job Interviews

Assignment: Big Data and Big Data Analytics.

Seminar Topics: Clustering, Classification, Machine Learning Algorithms

Sample questions

Part A

1. What aspect of data is NOT included in the 3Vs model?
 - a. Velocity
 - b. Variety
 - c. Viability
 - d. Volume
2. Data analytics should not be used for unstructured data. True or False
3. What is the first phase in the data analytics process?
 - a. Evaluation and interpretation
 - b. Data construction
 - c. Finding the data
 - d. Modelling

4. Clustering is typically associated with unsupervised learning. True or False.
5. Supervised learning algorithms use labeled data for training. True or False.

Part B

6. What differentiates raw data from processed data?
7. What role does data analytics play in modern decision-making?
8. What is the first step in the data analytics process?
9. What does clustering achieve in data analysis?
10. What are some common applications of unsupervised algorithms?

Part C

11. Discuss the definition of big data and the importance of the 3Vs model.
12. Explain why a new statistical and computational paradigm is essential within the context of big data analytics.
13. Describe the skills necessary for effective data analytics and why they are important.
14. Discuss the differences between regression and classification in supervised learning and give real-world examples.
15. Describe how machine learning algorithms can transform data analysis in business and healthcare, highlighting specific examples.

Head of the Department

Ms. J. Anto Hepzie Bai

Course Instructor

Dr. V.S.Harilakshmi

Department : Computer Science
Class : II M. Sc Computer Science
Title of the Course : Core Course VIII: Software Project Management
Semester : IV
Course Code : SP234CC2

Course Code	L	T	P	S	Credits	Inst. Hours	Total Hours	Marks		
								CIA	External	Total
SP234CC2	6	-	-	-	5	6	90	25	75	100

Pre-requisite

To Study the Software Project Management.

Learning Objectives

1. To gain knowledge in software development.
2. To study software project planning and control.

Course Outcomes

On the successful completion of the course, students will be able to:		
1	explain project management in terms of the software development process	K1, K2
2	describe the responsibilities of IT project managers	K2, K3
3	implement communication, modeling, construction & deployment practices in software development	K3, K4
4	apply project management concepts and techniques to an IT project	K5, K6
5	integrate project frameworks into the operations of their organisation.	K6

Teaching plan

Total Contact hours: 90 (Including lectures, assignments and tests)

Unit	Module	Topic	Teaching Hours	Cognitive level	Pedagogy	Assessment/ Evaluation
I	Introduction To Software Project Management					
	1.	Project Definition, Contract Management,	3	K2(U)	Interactive lecture with case studies	Conceptual quiz
	2.	Activities Covered by Software Project Management, Plans, methods and methodologies,	4	K1(R)	Group discussion with role-playing	Multiple-choice questions (MCQ)
	3.	Stakeholders, Project success and failure	3	K2(U)	Lecture using Chalk and talk	Case study analysis
	4.	What is management, Management control	3	K2(U)	Interactive PPT	Process mapping
	5.	Overview of Project Planning,	3	K4(AN)	Group problem-solving using diagrams	Written evaluation essay
	6.	Stepwise Project Planning.	3	K3(AP)	Demonstration and step-by-step practical example	Design a sample project plan
II	Project Evaluation					
	1.	Strategic Assessment, Technical Assessment	3	K4(AN)	Interactive lecture using real project data	Evaluation through a short test
	2.	Project portfolio management, Evaluation of individual projects,	3	K5(E)	Case study walkthrough	Comparative analysis task
	3.	Cost Benefit Analysis, Cash Flow Forecasting, Cost Benefit Evaluation Techniques, Risk Evaluation	4	K5(E)	Video-assisted explanation and interactive worksheet	Discussion-based assessment
	4.	Program management, Managing the allocation of resources within programmes	4	K3(AP)	Interactive presentation with group discussions	Create a resource allocation strategy
III	Activity Planning					
	1.	Objectives, Project Schedule, Sequencing and Scheduling Activities,	4	K3(AP)	Lecture with activity breakdown diagrams	Short note submission
	2.	Network Planning	4	K4(AN)	Problem-solving	

		Models, Forward Pass, Backward Pass,			workshop with hands-on activities	Diagram-based assessment
	3.	Activity Float, Shortening Project Duration, Activity on Arrow Networks,	4	K3(AP)	Demonstration	Open book test
	4.	Risk Management, Nature of Risk, Types of Risk, Framework for dealing with risk- Risk identification Risk assessment -	4	K4(AN)	Group problem-solving with simulation tools	Conceptual presentation
	5.	Risk Planning and Control. Evaluating risks to the schedule, Applying the PERT technique	4	K3(AP)	Lecture with practical examples	Short Summary
IV	Monitoring and Control					
	1.	Creating a Framework, Collecting the Data,	3	K6(C)	Lecture with brainstorming activities	Report creation
	2.	Visualizing Progress, Cost Monitoring, Earned Value, Prioritizing Monitoring	4	K4(AN)	Demonstration using project management tools	Group analysis task
	3.	Getting Project Back to Target, Change Control, Managing Contracts, Introduction,	4	K3(AP)	Case studies with expert guidance	Evaluation through Q&A
	4.	Types of Contracts, Stages in Contract Placement.	3	K1(R)	Interactive seminar with examples	Quiz
	5.	Typical Terms of a Contract, Contract Management, Acceptance	2	K2(R)	PPT with peer discussion	Short-answer questions
V	Managing People and Organizing Team					
	1.	Introduction, Understanding Behavior, Organizational Behavior Background	3	K2(U)	Lecture using Chalk and talk	MCQs
	2.	Selecting the Right Person for the Job, Instruction in the Best Methods, and Motivation	4	K2(U)	Interactive discussion	Case study write-up

3.	The Old Man, Hackman Job Characteristics Model,	4	K3(AP)	Group activity with brainstorming	Diagram-based submission
4.	Working In Groups, Becoming a Team,	2	K3(AP)	Group Discussion	Quiz on team-building concepts
5.	Decision Making, Leadership,	2	K3(AP)	Seminar	Case Study
6.	Organizational Structures, Stress, Health and Safety, Case Studies.	3	K4(AN)	Seminar	Case Study
7.	Expert Lectures, Seminars, Webinars	3	K2(U)	Interactive PPT	Concept explanations

Course Focussing on Employability/ Entrepreneurship/ Skill Development: Employability and Skill Development

Activities (Em/ En/SD):

1. Develop a project plan for a software application, including timelines, resources, and risk analysis.
2. Perform a cost-benefit analysis and calculate the Return on Investment (ROI) for a sample project proposal.
3. Use tools like Microsoft Project or Gantt charts to simulate project scheduling with forward and backward passes.

Assignment: Developing a Comprehensive Risk Management Plan for a Software Project

Seminar Topic: Effective Stakeholder Management in Software Projects

Sample questions

Part A (1 Mark)

1. What is the primary purpose of project management in software development?
 - a) Coding the application
 - b) Managing the resources and timelines
 - c) Writing test cases
 - d) Debugging software
2. Which technique is used to visualize project schedules and dependencies?
 - a) Gantt Chart
 - b) Flowchart
 - c) Entity-Relationship Diagram
 - d) Class Diagram
3. What is the primary objective of risk management in software projects?
 - a) Eliminating all risks
 - b) Identifying, assessing, and mitigating risks
 - c) Reducing project cost
 - d) Ensuring on-time delivery
4. Which metric is used to monitor the progress of a project?
 - a) ROI
 - b) Earned Value
 - c) Break-Even Point
 - d) Quality Assurance

5. What is a deliverable in a software project?
 - a) The hardware required for the project
 - b) A tangible or intangible product produced during the project
 - c) The documentation prepared by developers
 - d) The final testing report

Part B (6 Marks)

6. Explain the difference between project planning and project control.
7. Describe the stepwise project planning process with an example.
8. What are the key components of cost-benefit analysis in project evaluation?
9. How does stakeholder management impact the success of a software project?
10. Explain the importance of project portfolio management in software projects.

Part C (12 Marks)

11. Discuss the role of risk identification, assessment, and mitigation in managing software projects.
12. Explain Earned Value Management (EVM) and its application in project monitoring.
13. Describe network planning models and their use in sequencing and scheduling project activities.
14. Discuss how software project success and failure are evaluated. Provide examples.
15. Explain the challenges of resource allocation in program management and strategies to overcome them.

Head of the Department

Mrs. J. Anto Hepzie Bai

Course Instructor

Mrs. J. Jackulin Reeja

Department : Computer Science
Class : II M. Sc Computer Science
Title of the Course : Elective Course VI: Wireless Sensor Networks
Semester : IV
Course Code : SP234EC1

Course Code	L	T	P	S	Credits	Inst. Hours	Total Hours	Marks		
								CIA	External	Total
SP234EC1	4	-	-	-	3	4	60	25	75	100

Pre-requisite:

Basic concepts in Wireless sensor networks.

Objectives:

1. To understand the Medium Access control and its protocols.
2. To understand the routing metrics and network layer protocols.

Course Outcomes

On the successful completion of the course, students will be able to:		
1	learn and understand the channel encoding and modulation mechanism	K1, K2
2	use the contention free and contention based MAC protocols	K3
3	analyse the QoS based routing protocols	K4
4	evaluate the challenges, design goals and architecture of wireless sensor networks	K5, K6
5	develop protocols for sensor networks and network layer.	K6

Teaching Plan

Total Contact hours: 60 (Including lectures, Assignments and Tests)

Unit	Module	Topics	Teaching hours	Cognitive level	Pedagogy	Assessment / Evaluation
I	INTRODUCTION					
	1	Components of a Wireless Sensor Node, Motivation for a Network of Wireless Sensor Nodes	2	K1 (R)	Visual Images, Discussion	MCQ
	2	Classification of Sensor Networks	2	K2 (U)	Interactive Lecture	Quiz

	3	Characteristics of Wireless Sensor Networks	2	K2 (U)	Visual Aids	Descriptive Questions
	4	Challenges of Wireless Sensor Networks	2	K2 (U)	Group Problem solving	Problem solving
	5	Comparison Between WSNs and Wireless Mesh Networks	2	K4 (An)	Comparative Analysis	Evaluation Comparison chart
	6	Limitations in Wireless Sensor Networks, Design Challenges and Hardware Architecture.	2	K5,(E)	Discussion	True / False Questions
BASIC ARCHITECTURAL FRAMEWORK						
II	1	Physical Layer, Basic Components, Source Encoding, Channel Encoding,	3	K2 (U)	Tutorials	Quiz
	2	Modulation, Types of Modulation -Amplitude, Frequency, Phase Shift Keying and Pulse Amplitude Modulation.	3	K2 (U)	Diagrams and Discussion	Diagram based questions
	3	Network Architecture and Sensor Network Scenarios.	2	K3 (Ap)	Interactive PPT	Assignment
	4	Optimization Goals and Figures of Merit.	2	K3 (Ap)	Group Discussion	Problem solving
	5	Gateway concepts.	2	K5 (E)	Case studies	Presentation
MEDIUM ACCESS CONTROL						
III	1	Wireless MAC Protocols, Issues in designing a MAC protocol for AdHoc Wireless Networks and Characteristics of MAC protocol in Sensor Networks.	4	K2 (U)	Conceptual Teaching	Short answer questions
	2	Classifications of MAC Protocols – Contention Free MAC protocols, Contention Based MAC protocols and Hybrid MAC protocols.	4	K4 (An)	Comparative Learning	Written Test

	3	Location Discovery, Quality and other issues.	2	K4 (An)	Problem solving Exercises	Analytical Assignment
	4	S-MAC, IEEE 802.15.4	2	K3 (Ap)	Lab based Learning	Quiz
IV	NETWORK LAYER					
	1	Routing Metrics and Objectives, Flooding and Gossiping	3	K2 (U)	Interactive Lecture	Analytical Questions
	2	Data-Centric Routing, Proactive Routing.	2	K4 (An)	Case Studies	Quiz
	3	Classification of Routing Protocols – On Demand Routing, Hierarchical Routing and Location – based Routing Protocols.	5	K4 (An)	Interactive PPT	MCQ
	4	QoS-Based Routing Protocols.	2	K4(An)	Discussion	Assignment
V	WIRELESS LANs					
	1	IEEE 802.11, Bluetooth, connecting LANs and connecting devices.	3	K1 (R)	Flipped Class room	Group Discussion
	2	Wireless WANs - Cellular Telephony and Satellite Networks.	3	K2 (U)	Visual Images	MCQ
	3	Network Layer - IPv4 and IPv6 Address & Internetworking.	2	K3 (Ap)	Interactive Learning	Test
	4	Transport Layer – UDP and TCP	2	K3 (Ap)	Group Discussion	Seminar
	5	Application Layers – Name space and DNS.	2	K3 (Ap)	Real World Problems	Quiz

Course Focussing on Employability/ Entrepreneurship/ Skill Development:

Employability – Analyse real-world implementations of Wireless Sensor Networks.

Assignment : Network Architecture, QoS-Based Routing Protocols.

Seminar Topic : Gateway Concepts, Transport Layer – UDP & TCP.

Sample questions:

Part - A (1 Mark)

1. What is the primary function of the transceiver in a wireless sensor node?

- a) Power management b) Data transmission c) Sensing d) Routing

2. Which of the following protocols is designed for low-power wireless sensor networks?
a) IEEE 802.11 b) Ethernet c) S-MAC d) TCP / IP
3. Which characteristic differentiates wireless sensor networks from traditional networks?
a) Centralized Control b) Fault tolerance
c) High Bandwidth d) Unlimited power
4. What is the main limitation of battery-powered sensor nodes in wireless sensor networks?
a) Processing power b) Memory capacity
c) Signal range d) Energy supply
5. In data-centric routing, how is data transmitted?
a) Based on node IDs b) Based on data queries
c) Based on shortest path d) Based on node hierarchy

Part - B (6 Marks)

6. Explain the components of a wireless sensor node and their individual roles in the network.
7. Discuss the characteristics of wireless sensor networks that make them suitable for IoT applications.
8. Compare contention-free and contention-based MAC protocols. Provide examples.
9. Describe the classification of routing protocols in wireless sensor networks with examples.
10. List and explain the design challenges in developing wireless sensor networks.

Part - C (12 Marks)

11. Analyze the architectural differences and performance trade-offs between wireless sensor networks and wireless mesh networks.
12. Evaluate the effectiveness of QoS-based routing protocols in maintaining network reliability.
13. Design a wireless sensor network for environmental monitoring. Specify the architecture, routing protocol, and challenges.
14. Examine how energy-efficient MAC protocols enhance the lifespan of wireless sensor networks. Provide a detailed explanation.
15. Propose a hybrid routing protocol that addresses energy efficiency and scalability for large-scale WSNs.

Head of the Department

Ms. J. Anto Hepzie Bai

Course Instructor

Ms. Selvasanthi

Department : Computer Science
Class : I M. Sc Computer Science
Title of the Course : Elective Course VII: a) Principles of Programming Languages
Semester : IV
Course Code : SP232EC4

Course Code	L	T	P	S	Credits	Inst. Hours	Total Hours	Marks		
								CIA	External	Total
SP234EC4	4	-	-	-	3	4	60	25	75	100

Pre-requisite

Adequate knowledge in programming and Logical Thinking

Learning Objectives

1. To describe the basics of computer and understand the problem-solving aspect.
2. To demonstrate the algorithm and flow chart for the given problem.

Course Outcomes

On the successful completion of the course, students will be able to:		
1	remember and recall technical project reports and present them orally among the user.	K1
2	understand and design program to evaluate simple expressions and logical operations.	K2, K5
3	communicate computer science concepts, designs, and solutions effectively and professionally.	K2, K3
4	demonstrate and analyse the concept of pointer and perform I/O operations.	K4, K5
5	develop and implement programs with suitable modules to solve the given problem.	K6

K1 - Remember; **K2** - Understand; **K3** – Apply; **K4** – Analyze; **K5** – Evaluate; **K6** – Create

Teaching Plan

Total contact hours: 60 (Incl. lectures, assignments and test)

Unit	Module	Topics	Lecture Hours	Cognitive level	Pedagogy	Assessment/ Evaluation
I	1	Preliminary Concepts: Reasons for studying concepts of programming languages	3	K1(R)	Introductory session	Discussions
	2	language categories- language design trade-offs- implementation methods-programming environments	3	K2(U)	Lecture	Simple definitions Questioning
	3	Evolution of Major			Interactive	Slido(MCQ)

		Programming Languages.	3	K2(U)	PPT	
	4	Syntax and Semantics: General problem of describing syntax-formal methods of describing syntax- attribute grammars- describing the meanings of programs.	3	K2(U)	Collaboration	WhatsApp Poll
II	1	Names- Bindings- an Scopes: Introduction- names- variables- concept of binding- scope and lifetime- referencing environments	3	K2(U)	Reflective Thinking	Upload Assignment in google class room
	2	named constants Data types: Introduction- primitive- character- string types-	3	K2(U)	Lecture Method	Problem Solving Method
	3	user defined ordinal types- array- associative arrays- record- tuple types- list types- union types- pointer and reference types- type checking-	3	K2(U)	Chalk and Talk	Creative Writing
	4	Expressions and Statements: Arithmetic expressions- overloaded operators- type conversions- relational and boolean expressions- short- circuit evaluation- Control Structures – Guarded commands.	3	K2(U)	Problem Solving	Home Work
III	1	Subprograms: Fundamentals of subprograms- design issues for subprograms- local referencing environments- parameter passing methods- parameters that are subprograms- -	3	K2(U)	Collaboration	Discussion and Questioning
	2	calling subprograms indirectly- overloaded subprograms- generic subprograms- design issues for functions	3	K2(U)	Lecture using Chalk and talk	Formative Assesment

	3	user defined overloaded operators- closures- co routines Implementing subprograms	3	K2(U)	KWL(What do you know)	Peer Review
	4	Abstract Data types: The concept of abstraction-introductions to data abstraction- design issues- language examples- parameterized ADT- encapsulation constructs- naming encapsulations	3	K2(U)	Blended Learning	Slido
IV	1	Object Oriented Programming Design issues for OOP- OOP in Smalltalk- C++- Java- Ada 95- Ruby- Implementation of Object-Oriented constructs.	3	K2(U)	Lecture Method	Discussion
	2	Concurrency: Introduction- introduction to subprogram level concurrency- semaphores- monitors- message passing- Ada support for concurrency- Java threads- concurrency in functional languages- statement level concurrency.	3	K2(U)	Collaboration	Student Presentation
	3	Exception Handling and Event Handling: Introduction- exception handling in Ada- C++- Java-	3	K2(U)	Inquiry-Based Approach	Quiz
	4	introduction to event handling- event handling with Java and C#.	3	K2(U)	Demonstration	Formative assessment
V	1	Risk Management Functional Programming Languages: Introduction- mathematical functions- fundamentals of functional programming language- LISP	3	K2(U)	Context Based	Seminar Presentaion
	2	support for functional				

		programming in primarily imperative languages- comparison of functional and imperative languages	3	K2(U)	Chalk and Talk	Open Book Test
	3	Logic Programming Language: Introduction- an overview of logic programming- basic elements of prolog- deficiencies of prolog- applications of logic programming.	3	K2(U)	Construction	Student Presentation
	4	Scripting Language: Pragmatics- Key Concepts.	3	K2(U)	Case Study Method	Class Test

Course Focussing on Employability/ Entrepreneurship/ Skill Development: Skill Development

Activities (Em/ En/SD): 1. Comparative Analysis of Programming Paradigm

2. Syntax and Semantics Exercise.
3. Exploring concurrency and Exception Handling

Assignment: OOPs Concept

Seminar Topic: Logical Programming Language

Sample questions

Part A (1 Mark)

1. What is the primary goal of studying the concepts of Programming Language?
2. Which of the following is NOT a programming paradigm?
 - a) Object-Oriented Programming
 - b) Functional Programming
 - c) Relational Programming
 - d) Procedural Programming
3. In programming languages, the _____ of a variable determines the period during which it retains its allocated memory and value.
4. What does the term 'scope' refer to in programming languages?
5. Short-circuit evaluation is a technique where the evaluation of a Boolean expression stops as soon as the result is determined. Say True or False

Part B (4 Marks)

6. Explain the primary factors influencing the design of programming languages.
7. Describe the concept of binding in programming languages..
8. Compare primitive, associative arrays, and list data types.
9. What are parameter passing methods in subprograms?

10. Discuss exception handling mechanisms in Java.

Part C (8 Marks)

11. Explain the evolution of major programming languages.

12. Describe the different methods for defining the syntax of programming languages.

13. Discuss the various parameter-passing methods in programming languages.

14. Explain the key features of object-oriented programming (OOP).

15. Describe concurrency mechanisms in programming languages.

Head of the Department

Mrs.J.Anto Hepzie Bai

Course Instructor

Mrs. Saravana Bala.