A.V.V.M. SRI PUSHPAM COLLEGE (AUTONOMOUS), POONDI

Programme: M. Sc.
Department: Computer science

Syllabus Revision 2017-2018

S.No.	Courses	Number of courses having changes
1.	Core Course	07
2.	Elective Course	03
	TOTAL	10

Total Number of Courses : 23

Total Number of Courses having changes : 10

Percentage of Revision : 43.5 %

Note:

The content of the syllabus which has been revised is highlighted.

M.Sc. COMPUTER SCIENCE (2017-2018)

S. No	Semester	Category	Course code	Course Title	Maximum marks			Minimum marks for pass			Hours week	Credits
					CIA	E.E	TOTAL	CIA	E.E	TOTAL		
1	I	Core	17P1CSC1	Mathematical Foundations of Computer Science	25	75	100	10	30	50	6	6
2		Core	17P1CSC2	Java Programming	25	75	100	10	30	50	6	6
3		Core	17P1CSC3	.Net framework and C# Programming	25	75	100	10	30	50	6	5
4		Core-PL	17P1CSCP1	Java Programming Lab	40	60	100	16	24	50	3	2
5		Core-PL	17P1CSCP2	C# Programming Lab	40	60	100	16	24	50	3	2
6		Major Elective-I	17P1CSEL1A 17P1CSEL1B 17P1CSEL1C	Advanced Software Engineering Design and Analysis of Algorithm Object Oriented System Development	25	75	100	10	30	50	6	4
7	II	Core	17P2CSC4	Cloud Based Web Services	25	75	100	10	30	50	4	5
8		Core	17P2CSC5	Distributed Programming using J2EE	25	75	100	10	30	50	5	5
9		Core	17P2CSC6	Cross Platform-Mobile Applications Development	25	75	100	10	30	50	5	5
10		Core	17P2CSC7	Big Data Analytics	25	75	100	10	30	50	5	5
11		Core-PL	17P2CSCP3	Distributed Programming using J2EE Lab	40	60	100	16	24	50	3	2
12		Core-PL	17P2CSCP4	Cross Platform–Mobile Applications Development Lab	40	60	100	16	24	50	3	2
13		Major Elective-II	17P2CSEL2A 17P2CSEL2B 17P2CSEL2C	PIC Microcontroller And Applications Ubiquitous Computing Wireless and Mobile Networks	25	75	100	10	30	50	5	4
14	III	Core	17P3CSC8	Compiler Design	25	75	100	10	30	50	6	6
15		Core	17P3CSC9	Human Computer Interaction	25	75	100	10	30	50	5	5
16		Core	17P3CSC10	Internet of Things	25	75	100	10	30	50	5	5
17		Core	17P3CSC11	Soft Computing	25	75	100	10	30	50	5	5
18		Core	17P3CSCP5	PIC Programming Lab	40	60	100	16	24	50	3	3
19		EDC	17P3CSEDC	M-Commerce	25	75	100	10	30	50	4	-
20				Communicative Skills	-	-	-	-	-	-	2	
21	IV	Major Elective-III	17P4CSEL3A 17P4CSEL3B 17P4CSEL3C	Data Analytics Lab Haskell Lab Python Lab	40	60	100	16	24	50	6	4
22		Core-PL	17P4CSCP6	Object Oriented System Development Lab	40	60	100	16	24	50	4	2
23			17P4CSPR	Project	40	60	100	16	24	50	-	5
			17P4CSCN	Comprehension	-	100	100	-	-	50	4	2
							Total 2300				**120**	**90**

Semester	Subject code	Title of the course	Hours of Teaching / Week	No. of Credits
I	**17P1CSC2**	**JAVA Programming**	**6**	**6**

Objective

To provide an exposure on network programming in Java, how to interface with swing, the basic database connectivity, how to develop client-server programming model using servlets and JSP and also deals with component programming using Java beans.

UNIT- I **Hrs 18**

Networking Basics - Socket Programming - Proxy server - TCP/IP Sockets - Net address- datagrams.

UNIT- II **Hrs 18**

Introducing Swing: swing- components and containers - the swing packages - Painting in a Swing - Exploring Swing: Jlabel and ImageIcon - JtextField - The Swing Buttons – Jtabbed - Pane - Jscroll Pane - Jlist - JcomboBox - Trees- Jtable.

UNIT- III **Hrs 18**

Java Database Connectivity: JDBC Architecture - Installing the ODBC Driver - Connecting to a Database - Structured Query language. JDBC programming concept: Database URL— Executing the action commands - Query with JDBC - Populating a Database - Executing Queries - Metadata - Scrollable and Updatable Result Sets.

UNIT- IV **Hrs 18**

Introduction to Servlets- Servlets: Java Servlets: Servlet Life Cycle – Generic and HTTP Servlet - A simple Servlets - The servlet API - Servlet Package - Handling HTTP Request and Response – Servlet with Database Connectivity- Session Tracking: Hidden Form Fields – URL Rewriting – The Cookie Class – The Session Tracking class.

UNIT- V **Hrs 18**

Bean Development Kit - Jar Files - Introspection - Design Pattern for properties, events and methods - Constrained Properties - Persistence – Customizers.

Books for Study:

1. Herbert Schildt," ***The Complete Reference Java***", Tata McGraw Hill Publishing Company Limited,Edition 7, 2007,ISBN: 9780070636774.
2. Cays Horstmann and Gary Cornell, "***Core Java***", Volume II, Pearson Edition, 2001, ISBN: 978-0137081899 and 978-0137081608

Semester	Subject code	Title of the course	Hours of Teaching / Week	No. of Credits
I	**17P1CSCP1**	**Java Programming LAB**	**3**	**2**

OBJECTIVES

1. Java program to demonstrate the use of Java Swing components, namely, buttons, text boxes, lists/combos, menus etc
2. Java program to store, delete and update data in a database with the support of JDBC-ODBC connectivity
3. Java program with Servlets to create a dynamic HTML form to accept and display user name and password with the help of 'get()' and 'post()' methods
4. Java Servlet program for 'auto refreshing' the webpage after given period of time
5. Java Servlet program to demonstrate the use of cookies
6. Java Servlet program to demonstrate the use of session
7. Java program with Servlets to store only valid data in a database with the support of JDBC-ODBC connectivity

Semester	Subject code	Title of the course	Hours of Teaching/ Week	No.of Credits
I	**17P1CSEL1C**	**Major Elective -I Object Oriented System Development**	**6**	**4**

Objective

- To understand object oriented analysis and design techniques.

UNIT- I **Hrs 18**

An Overview of Object Oriented Systems Development - Object Basics - Object Oriented Systems Development Life Cycle.

UNIT- II **Hrs 18**

Rumbaugh Methodology - Booch Methodology - Jacobson Methodology - Patterns-Frameworks - Unified Approach - Unified Modeling Language - Use case - class diagram - Interactive Diagram - Package Diagram - Collaboration Diagram - State Diagram - Activity Diagram.

UNIT- III **Hrs 18**

Identifying use cases - Object Analysis - Classification – Identifying Object relationships - Attributes and Methods.

UNIT- IV **Hrs 18**

Design axioms - Designing Classes - Access Layer - Object Storage - Object Interoperability.

UNIT- V **Hrs 18**

Designing Interface Objects - Software Quality Assurance – System Usability - Measuring User Satisfaction

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BOOKS FOR STUDY:

1. Ali Bahrami, "Object Oriented Systems Development", Tata McGraw-Hill, 1999

REFERENCES:

1. Stephen R. Schach, "Introduction to Object Oriented Analysis and Design", Tata McGraw-Hill, 2003.
2. James Rumbaugh, Ivar Jacobson, Grady Booch "The Unified Modeling Language Reference Manual", Addison Wesley, 1999.
3. Hans-Erik Eriksson, Magnus Penker, Brain Lyons, David Fado, "UML Toolkit", OMG Press Wiley Publishing Inc., 2004.

Semester	Subject code	Title of the course	Hours of Teaching/ Week	No.of Credits
II	**17P2CSC5**	**DISTRIBUTED PROGRAMMING USING J2EE**	**5**	**5**

Objective:

To impart knowledge about the distributed environment, its architecture, application development with RMI, Java Servlets, Java Server Pages, Struts and EJB using J2EE technologies.

Unit – I **Hrs 15**

Distributed Hardware Architecture: Evolution of Personal Computer – PC to PC Communica-tion – Local Area Network – File Server Architecture – Client-Server Architecture – Database Server Architecture – Corporate Network – Intranet – Wide Area Network – Internet. Distributed Software Architecture: Mainframe – File Server - Client-Server Architecture: Single–two tier–three tier–N-tier Architecture–Distributed Application.

Unit – II: **Hrs 20**

Distributed Computing using RMI: Introduction - RMI Architecture – RMI Exceptions – Developing Applications with RMI –RMI with Database Connectivity. Evolution of the Web Application--Overview of the HTTP - JSP: JSP Overview– JSP syntax and semantics- Expressions.

Unit – III: **Hrs 20**

Java Server Pages: JSP Basic Concepts – JSP Elements – Expressions – Scriplets – Request and Response Objects – Redirection and Forwarding –JSP with Database Connectivity - Session Tracking: Hidden Form Fields – URL Rewriting – The Cookie Class – The Session Tracking Class

Unit IV: **Hrs 20**

The Struts Framework: Introduction - J2EE Platform: J2EE Architecture – Containers – J2EE Technologies: Component – Service – Communication Technologies – Developing J2EE Application- EJB Architecture and Design: Introduction to EJB – The EJB Container and its Services

Unit – V: **Hrs 20**

Working with EJB – Session Bean and Business Logic – Entity Bean and Persistence.

Books for Study:

1. Ivan Bayross, " ***Web Enabled Commercial Applications Development using Java 2***", Edition 2000, BPB Publications.
2. Jason Hunter with William Crawford, "***Java Servlet Programming***", Shroff Publishers & Distributors Pvt. Ltd
3. Phil Hanna, "***JSP 2.0 The Complete Reference***", Tata McGraw Hill Publishing Company Limited.
4. James Holmes,"***Struts :The Complete Reference",*** Second Edition, Tata McGraw Hill Publishing Company Limited..
5. Subrahmanyam Allamaraju, "***Professional Java Server Programming – J2EE Edition Volume 1",*** Shroff Publishers & Distributors Pvt. Ltd..

Semester	Subject code	Title of the course	Hours of Teaching /Week	No. of Credits
II	**17P2CSC6**	**Cross Platform – Mobile Applications Development**	**5**	**5**

Unit I

Mobile Development Using Xamarin **Hrs 15**

What is Xamarin – What's new: Mobile Development Techniques – Mobile UI – Xamarin Forms Custom Renderers – Building Mobile User Interfaces – Xamarin Forms Architecture – Platform UI Specification Approach – Xamarin Forms or a Platform-Specific UI.

Unit II

Xamarin Views **Hrs 20**

Xamarin Forms - Creating Xamarin Forms Solution –Adding Xamain.Forms views – UI Design Using Layouts – Xamarin Forms Layouts – Android Layout – iOS Layout

Unit III **Hrs 20**

Xamarin Controls

Xamain. Forms Views – Android controls – iOS controls – Making a Scrollable List – Data Adapters – Xamarin. Forms List view – Android List view – iOS Table View

Unit IV **Hrs 20**

Navigation, Database & Custom Renderers

Navigation Patterns – Xamarin. Forms Navigation – android Navigation – iOS Navigation – Data Access with SQLite and Data Binding - Custom Renderers – Preparing custom renderers – Creating Custom renderers – android, iOS, Windows phone custom renderers –

Unit V **Hrs 20**

Cross – Platform Architecture

Cross platform Architecture – Shared code and Platform specific code – Core Library – PCL – Dependency Injection.

Text book:

Xamarin Mobile Application Development: Cross-Platform C# and Xamarin. Forms Fundamentals 2015 by Dan Hermes, A press

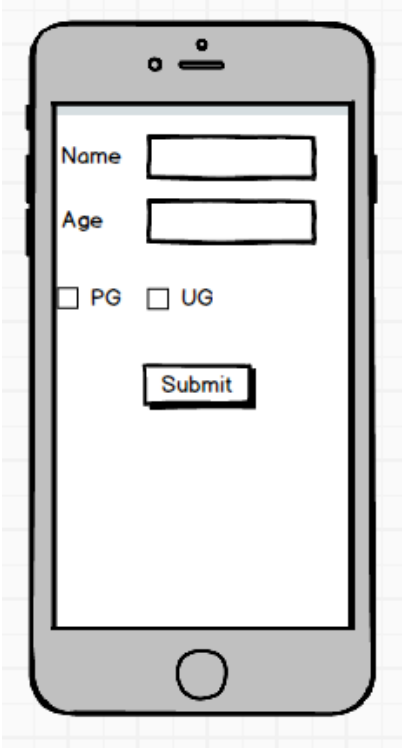
Semester	Subject code	Title of the course	Hours of Teaching/ Week	No. of Credits
II	**17P2CSCP4**	**Cross Platform - Mobile Applications Development LAB**	**3**	**2**

OBJECTIVES

- Building mobile applications.
- Availing variety of mobile brands and models for testing objectives in same location.
- Pushing the innovation in mobile applications.

Perform the experiments in J2ME / Android SDK framework

1. Timer: Create a Page, change the background and Foreground colour randomly using Xamarin Timer
2. Platform Specific: Create a form like below based on the platform change the Font Name, Font Size and display the form information in the Message Box.



3. Zoom:Using Pinch gesture class to Zoom the image in Xamarin Forms.
4. Animation: Create a button, using button click event animate images in Xamarin Forms.
5. Dependency Service: Using Dependency Service find the sum of anumber, which enters by the user in the Xamarin Forms.
6. Android DB: Store& Retrieve the Form data into the SQLite.
7. Windows Phone DB: Store & Retrievethe Form data into the SQLite.
8. Navigation: Implementing Navigation using Pushing and Popping and Handling the Back button.
9. Master Detail Page: Create Navigation drawer using the MasterDetailPage.
10. Tabbed Page: Using Tabbed page load different page based on Tab click, one tab form should be implemented Popup menu handling.

Semester	Subject code	Title of the course	Hours of Teaching/ Week	No. of Credits
II	**17P2CSEL2A**	**Major Elective – II PIC MICROCONTROLLER AND APPLICATIONS**	**5**	**4**

Objectives

- To understand the function of RISC architecture and On-Chip peripherals of PIC microcontroller.

Unit -I PIC Architecture **Hrs 15**

Overview of the PIC 18 family – The WREG in the PIC – The PIC file register – Using instructions with the default access bank – PIC status register – data formats and directives- program counter and ROM space – RISC architecture in the PIC

Unit -II Instructions of PIC **Hrs 15**

Branch, Call and Time Delay Loop – I/O port programming – Arithmetic, logic instructions and programs

Unit -III PIC programming in C **Hrs 15**

Data types and time delays in C – I/O programming in C – Logic operations in C – Data conversion – Programming Timers 0 and 1 – Counter Programming – Programming timers 0 and 1 in C- Programming timers 2 and 3.

Unit -IV PIC18 Serial Port and Interrupt Programming **Hrs 15**

Serial Port: Basics of Serial Communication – Serial Port Programming in Assembly and C. PIC interrupts- Programming Timer Interrupts – External Hardware Interrupts – Serial Communication Interrupts - Interrupt Priority

Unit -V Interfacing **Hrs 15**

LCD and Key board interfacing – ADC, DAC and sensor interfacing – SPI protocol - DS1306 RTC Interfacing –DC motor interfacing- Stepper motor.

Book for Study

1. Muhammad Ali Mazidi, RolindD.Mckinlay, Danny Causey, "PIC Microcontroller and Embedded Systems Using Assembly and C for PIC 18", Pearson, 2012.

Book for Reference

1. Ramesh Gaonkar, "Fundamentals of Microcontrollers and Applications in Embedded Systems", Penram International Publishing Pvt. Ltd.
2. Han-Way Huang, "*PIC Microcontroller an Introduction to Software and Hardware Interfacing*", Delmar Cengage Learning, New Delhi,2012.

Semester	Subject code	Title of the course	Hours of Teaching /Week	No. of Credits
II	**17P3CSC10**	**Major Elective – II Internet-of-Things**	**5**	**5**

OBJECTIVES:

- To Understand the concepts and techniques of IoT.

UNIT I **Hrs 15**

Internet of Things Strategic Research and Innovation Agenda: Internet of Things Vision – Internet of Common Definition – IoT Strategic Research and Innovation Directions – IoT Strategic Research and Innovation Directions – IoTApplication and Use Case Scenarios – IoT Functional View – Application Areas - IoT Smart-X Applications – Smart Cities – Smart Energy and the Smart Grid - Smart Mobility and Transport – Smart Home , Smart Buildings and Infrastructure – Smart Factory and Smart manufacturing – Smart Health – Food and Water Tracking and Security –Participatory Sensing - Smart Logistics and Retail

UNIT II **Hrs 15**

Internet of Things and Related Future Internet Technologies: Cloud Computing –IoT and Semantic Technologies – Networks and Communication – Networking Technology – Communication Technology - Processes – Adaptive and Event-Driven Processes – Processes Dealing with Unreliable Data – Processes dealing with unreliable resources – Highly Distributed Processes – Data Management – Data Collection and Analysis (DCA) – Big Data – Semantic Sensor Networks and Semantic – Annotation of data – Virtual Sensors –Security , Privacy & Trust – Trust for IoT – Security for IoT – Privacy for IoT – Device Level Energy Issues –Low Power Communication – Energy Harvesting – Future Trends and Recommendations – Related Standardization – The Role of Standardization Activities – Current Situation – Area for Additional Consideration – Interoperability in the Internet-of –Things – IoT Protocols Convergence – Message Queue Telemetry Transport (MQTT) - Constrained Applications Protocol (CoAP) – Advanced Message Queuing Protocol (AMQP) - Java Message Service API (JMS) – Data Distribution Service (DDS) – Representational State Transfer (RESET) – Extensible Messaging and Presence Protocol (XMPP)

UNIT III **Hrs 15**

Internet of Things Global Standardisation – State of Play: Introduction – General –IoT Vision –IoT Drivers _IoT Definition – IoT Standerdisation Landscape – CEN\ISO and CENELEC/IEC – ETSI – IEEE – IETF – ITU-T - OASIS - OGC – oneM2M – GS1 – IERC Research Projects Positions – BETaas – Advisory Board Experts Position – IoT6 Position.

UNIT IV **Hrs 15**

Dynamic Context-Aware Scalable and Trust-Based IoT Security, Privacy Framework: Introduction – Background Work – Main Concept and Motivation of the Framework – Identity Management – Size and Heterogeneity of the System – Anonymization of user Data and Metadata - Action's Control – Privacy by Design Context Awareness – summary – A policy-based framework for Security and Privacy in Internet of Things – Deployment in a Scenario – Policies and Context Switching – Framework Architecture and Enforcement – Conclusion and Future Developments – Acknowledgments.

UNIT V **Hrs 15**

Scalable Integration Framework for Heterogeneous Smart Object , Applications and Services: Introduction – IPv6 Potential – IoT6 – IPv6 for IoT – Adapting IPv6 to IoT Requirements – IoT6 Architecture- DigCovery – IoT6 Integration with the Cloud and EPICS – Enabling Heterogeneous Integration – IoT6 Smart Office Use-case – Scalability Perspective.

Text Book:

Internet of Things – From Research and Innovation to Market Deployment by Ovidiu Vermesan and Peter Friess River Publications, 2014.

Semester	Subject code	Title of the course	Hours of Teaching/ Week	No.of Credits
III	**17P3CSCP5**	**PIC Programming Lab**	**3**	**3**

Objective

- To gain knowledge of the PIC processor

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1. I/O PORT PROGRAMMING-LED BLINKING

2. LCD INTERFACING

3. STEPPER MOTOR INTERFACING

4. STUDY OF ANALOG TO DIGITAL CONVERTER PROGRAMMING

5. TIMER PROGRAMMING- (TIMER0,TIMER1,TIMER2,TIMER3)

6. COUNTER PROGRAMMING

7. COMPARE MODE PROGRAMMING

8. CAPTURE MODE PROGRAMMING

9. PWM PROGRAMMING

10.TIMER PROGRAMMING USING INTERRUPTS

11.SERIAL COMMUNICATION- USART- POLLING AND INTERRUPTS

12.KEYPAD INTERFACING

13.INTERFACING OF DIGITAL TO ANALOG CONVERTER

14.ADC – TEMPERATURE MEASUREMENT USING LM35

15.OBJECT COUNTING USING IR sensor

16.SPI programming

Semester	Subject code	Title of the course	Hours of Teaching/ Week	No.of Credits
IV	**17P4CSEL3A**	**Major Elective – III** **Data Analytics Lab**	**6**	**4**

1. Study of Hadoop ecosystem

2. Programming exercises on Hadoop

3. Programming exercises in No SQL

4. Implementing simple algorithms in Map- Reduce (3) - Matrix multiplication, Aggregates, joins, sorting, searching etc.

5. Implementing any one Frequent Itemset algorithm using Map-Reduce

6. Implementing any one Clustering algorithm using Map-Reduce

7. Implementing any one data streaming algorithm using Map-Reduce

8. Mini Project: One real life large data application to be implemented (Use standard Datasets available on the web)
    a. Twitter data analysis
    b. Fraud Detection
    c. Text Mining etc.