

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

Programme: M. Sc.(Information Technology)

Department: Computer science

Syllabus Revision 2017-2018

S.No.	Courses	Number of courses having changes
1.	Core Course	04
2.	Elective Course	02
	TOTAL	06

Total Number of Courses : 23

Total Number of Courses having changes : 06

Percentage of Revision : 26.1 %

Note:

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

M.Sc. (INFORMATION TECHNOLOGY) 2017-2018

S. no	Semester	Category	Course code	Title of the paper	Maximum marks			Minimum marks for pass			Hours /week	Credits
					CIA	E.E	TOTAL	CIA	E.E	TOTAL		
1	I	Core	17P1ITC1	Java Programming	25	75	100	10	30	50	6	6
2		Core	17P1ITC2	Object Oriented Analysis and Design	25	75	100	10	30	50	6	6
3		Core	17P1ITC3	Database Management System	25	75	100	10	30	50	6	6
4		Core-PL	17P1ITCP1	Java Programming Lab	40	60	100	16	24	50	3	2
5		Core-PL	17P1ITCP2	DBMS Lab	40	60	100	16	24	50	3	2
6		Major Elective-I	17P1ITEL1A 17P1ITEL1B 17P1ITEL1C	Computer Networks / TCP-IP / Open Source Technology	25	75	100	10	30	50	6	4
7	II	Core	17P2ITC4	Internet and Web Technology	25	75	100	10	30	50	5	5
8		Core	17P2ITC5	. Net framework and C# Programming	25	75	100	10	30	50	5	5
9		Core	17P2ITC6	Cross Platform - Mobile Applications Development	25	75	100	10	30	50	5	5
10		Core	17P2ITC7	Ontological Engineering	25	75	100	10	30	50	5	5
11		Core-PL	17P2ITCP3	C# and Web Technology Lab	40	60	100	16	24	50	3	2
12		Core-PL	17P2ITCP4	Cross Platform-Mobile Applications Development Lab	40	60	100	16	24	50	3	2
13		Major Elective-II	17P2ITEL2A 17P2ITEL2B 17P2ITEL2C	Enterprise Resource Planning / Management Information System / Software Project Management	25	75	100	10	30	50	4	4
14	III	Core	17P3ITC8	Big Data Analytics	25	75	100	10	30	50	5	5
15		Core	17P3ITC9	Cloud Based Web services	25	75	100	10	30	50	5	4
16		Core	17P3ITC10	Internet-of-Things	25	75	100	10	30	50	5	5
17		Core	17P3ITC11	Advanced Software Engineering	25	75	100	10	30	50	6	6
18		Core	17P3ITCP5	Web Services Lab	40	60	100	16	24	50	3	2
		EDC	17P3ITEDC	M-Commerce	25	75	100	10	30	50	4	-
19				Communicative Skills	-	-	-	-	-	-	2	
20	IV	Major Elective-III	17P4ITEL3A 17P4ITEL3B 17P4ITEL3C	Data Analytics Lab / Haskell Lab / Python Lab	40	60	100	16	24	50	6	4
21		Core-PL	17P4ITCP6	Object Oriented Analysis and Design Lab	40	60	100	16	24	50	4	3
22		Project	17P4ITPR	Project	40	60	100	16	24	50	-	4
23		CN	17P4ITCN	Comprehension	-	100	100	-	50	50	4	2
Total Marks-2100Credits - 90												

Semester	Subject code	Title of the course	Hours of Teaching / Week	No. of Credits
II	17P2ITC6	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 15

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

Unit III

Xamarin Controls

Hrs 15

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

Unit IV

Navigation & Database

Hrs 15

Navigation Patterns – Xamarin. Forms Navigation – android Navigation – iOS Navigation – Data Access with SQLite and Data Binding.

Unit V

Custom Renderers & Cross – Platform Architecture

Hrs 15

Custom Renderers – Preparing custom renderers – Creating Custom renderers – android, iOS, Windows phone custom renderers – 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, Apress.

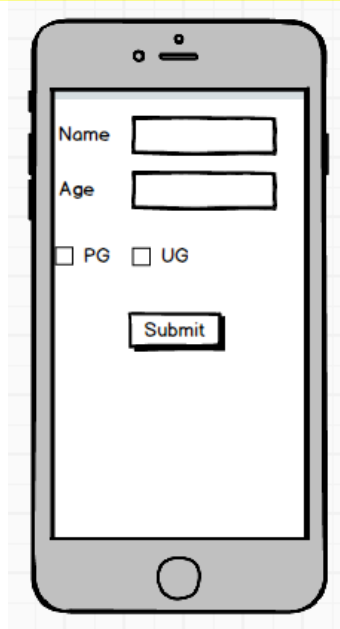
Semester	Subject code	Title of the course	Hours of Teaching/ Week	No. of Credits
II	17P2ITCP4	Cross Platform - Mobile Applications Development Lab	3	2

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	17P2ITEL2A	Major Elective- II ENTERPRISE RESOURCE PLANNING	4	4

Objective

- * To know about the Peer-to-Peer computing techniques.

Unit I

Hrs 12

Integrated Management Information - seamless Integration - Supply Chain Management - Integrated data Model - Benefits of ERP - Business Engineering and ERP - Definition of Business engineering - principles of business engineering - Business engineering with information technology.

Unit II

Hrs 12

Building the Business model - ERP implementation - an Overview - Role of Consultant, Vendors and Users, Customization - precautions - ERP post implementation options - ERP Implementation Technology - Guidelines for ERP Implementation.

Unit III

Hrs 12

ERP domain - MPG / PRO - IFS /Avalon - Industrial and financial System - Baan IV SAP - Market Dynamics and dynamic strategy.

Unit IV

Hrs 12

Description - Multi - Client Server solution - Open technology - User Interface - Application Integration.

Unit V

Hrs 12

Basic architectural Concepts - The system control interfaces - Services - presentation interface - Database Interface.

Reference:

1. Vinod kumar Garg and N.K. Venkita Krishnan, "Enterprise Resource Planning - Concepts and practice", Ph, 1998.

General Reference:

1. Jose Anonio Fernandez, "The SAP R/3 Handbook", Tata Mc Graw Hill publications, 1998.

Semester	Subject code	Title of the course	Hours of Teaching/ Week	No.of Credits
III	17P3ITC8	Big Data Analytics	5	5

Objectives:

1. To provide an overview of an exciting growing field of big data analytics.
2. To introduce the tools required to manage and analyze big data like Hadoop, NoSql Map- Reduce.
3. To teach the fundamental techniques and principles in achieving big data analytics with scalability and streaming capability.
4. To enable students to have skills that will help them to solve complex real-world problems in for decision support.

Unit I : Introduction to Big Data, Hadoop and NoSQL

Hrs 15

Introduction to Big Data, Big Data characteristics, types of Big Data, Traditional vs. Big Data business approach, Case Study of Big Data Solutions - What is Hadoop? Core Hadoop Components; Hadoop Ecosystem; Physical Architecture; Hadoop limitations - What is NoSQL? NoSQL business drivers - NoSQL case studies - NoSQL data architecture patterns: Key-value stores, Graph stores, Column family (Bigtable) stores, Document stores, Variations of NoSQL architectural patterns - Using NoSQL to manage big data: What is a big data NoSQL solution? - Understanding the types of big data problems - Analyzing big data with a shared-nothing architecture - Choosing distribution models: master-slave versus peer-to-peer - Four ways that NoSQL systems handle big data problems

Unit II: Map Reduce and the New Software Stack

Hrs 15

Distributed File Systems : Physical Organization of Compute Nodes, Large-Scale File-System Organization - **MapReduce:** The Map Tasks, Grouping by Key, The Reduce Tasks, Combiners, Details of MapReduce Execution, Coping With Node Failures - **Algorithms Using MapReduce:** Matrix-Vector Multiplication by MapReduce , Relational-Algebra Operations, Computing Selections by MapReduce, Computing Projections by MapReduce, Union, Intersection, and Difference by MapReduce, Computing Natural Join by MapReduce, Grouping and Aggregation by MapReduce, Matrix Multiplication, Matrix Multiplication with One MapReduce Step.

Unit III: Finding Similar Items and Mining Data Streams

Hrs 15

Applications of Near-Neighbor Search, Jaccard Similarity of Sets, Similarity of Documents, Collaborative Filtering as a Similar-Sets Problem - **Distance Measures:** Definition of a Distance Measure, Euclidean Distances, Jaccard Distance, Cosine Distance, Edit Distance, Hamming Distance - **The Stream Data Model:** A Data-Stream-Management System, Examples of Stream Sources, Stream Query, Issues in Stream Processing - **Sampling Data in a Stream :** Obtaining a Representative Sample , The General Sampling Problem, Varying the Sample Size - **Filtering Streams:** The Bloom Filter, Analysis - **Counting Distinct Elements in a Stream:** The Count-Distinct Problem, The Flajolet-Martin Algorithm, Combining Estimates, Space Requirements -

Counting Ones in a Window: The Cost of Exact Counts, The Datar-Gionis-Indyk-Motwani Algorithm, Query Answering in the DGIM Algorithm, Decaying Windows.

Unit IV: Link Analysis and Frequent Itemsets

Hrs 15

Page Rank Definition, Structure of the web, dead ends, Using Page rank in a search engine, Efficient computation of Page Rank: Page Rank Iteration Using Map Reduce, Use of Combiners to Consolidate the Result Vector - Topic sensitive Page Rank, link Spam, Hubs and Authorities - **Handling Larger Datasets in Main Memory:** Algorithm of Park, Chen, and Yu, The Multistage Algorithm, The Multihash Algorithm - **The SON Algorithm and Map Reduce - Counting Frequent Items in a Stream:** Sampling Methods for Streams, Frequent Item sets in Decaying Windows

Unit V: Clustering, Recommendation Systems and Mining Social-Network Graphs

Hrs 15

CURE Algorithm - Stream-Computing - A Stream-Clustering Algorithm - Initializing & Merging Buckets - Answering Queries - A Model for Recommendation Systems - Content-Based Recommendations - Collaborative Filtering - Social Networks as Graphs - Clustering of Social-Network Graphs - Direct Discovery of Communities - SimRank - Counting triangles using Map-Reduce

Text Books:

1. Anand Rajaraman and Jeff Ullman "Mining of Massive Datasets", Cambridge University Press,
2. Alex Holmes "Hadoop in Practice", Manning Press, Dreamtech Press.
3. Dan McCreary and Ann Kelly "Making Sense of NoSQL" – A guide for managers and the rest of us, Manning Press.
4. Study Material for "Big Data Analytics" based on Stanford Info-Lab Manual, Compiled by ANURADHA BHATIA, Mumbai University.

References:

1. Bill Franks , "Taming The Big Data Tidal Wave: Finding Opportunities In Huge Data Streams With Advanced Analytics", Wiley
2. Chuck Lam, "Hadoop in Action", Dreamtech Press

Semester	Subject code	Title of the course	Hours of Teaching /Week	No. of Credits
III	17P3ITC10	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 – IoT Application 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 (REST) – 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 Standardisation 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.

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 – Conclusions.

UNIT V

Hrs 15

Internet of Things Applications- Form Research and Innovation to Deployment: Introduction – Open IoT – Project Design and Implementation – Execution and Implementation Issues- Project Results – Acceptance and Sustainability – Compose – Project Design and Implementation – The IoT Communication Technology - Execution and Implementation Issues – Expected Project Results.

Text Book:

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

Semester	Subject code	Title of the course	Hours of Teaching/ Week	No.of Credits
IV	17P4ITEL3A	Major Elective – III Data Analytics Lab	6	4

Objectives

- To have a practical experience in Data Analytics.

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.