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SRM UNIVERSITY
(Under section 3 of UGC Act 1956)

MASTER OF SCIENCE
IN
INFORMATION TECHNOLOGY

CURRICULUM AND SYLLABUS
(For students admitted from the academic year 2015 – 2016)

UNDER CHOICE BASED CREDIT SYSTEM

DEPARTMENT OF COMPUTER SCIENCE
FACULTY OF SCIENCE AND HUMANITIES
SRM UNIVERSITY
SRM Nagar, Kattankulathur – 603203

M.Sc INFORMATION TECHNOLOGY

(For students admitted from the academic year 2015-16)

SEMESTER I

Career Stream Title	Course Code	Course Title	L	T	P	Total of LTP	Credit
Compulsory Core	PIT15101	Data Structures and Algorithms	4	1	0	5	4
	PIT15102	Database Management Systems-Design and Principles	4	1	0	5	4
	PIT15103	Java Programming	3	2	0	5	3
Compulsory lab	PIT15104	Database Management Systems Lab	0	0	4	4	2
	PIT15105	Java Programming Lab	0	0	4	4	2
Skill Based Elective	PIT15E51	Grid Computing	3	2	0	5	3
	PIT15E52	Computer Networks					
	PIT15E53	Software Engineering					
Supportive Couse (Internal valuation)	PIT15106	Quantitative Aptitude And Reasoning	2	0	0	2	2
		Total	16	6	8	30	22

SEMESTER II

Career Stream Title	Course Code	Course Title	L	T	P	Total of LTP	Credit
Compulsory Core	PIT15201	Advanced Java Programming	4	1	0	5	4
	PIT15202	Web Technology	4	1	0	5	4
	PIT15203	Information Storage and Management	2	2	0	4	4
Compulsory lab	PIT15204	Advanced Java Programming Lab	0	0	4	4	2
	PIT15205	Web Technology Lab	0	0	4	4	2
Skill Based Elective	PIT15E54	Big Data Analytics	2	2	0	4	4
	PIT15E55	Network Protocols					
	PIT15E56	Software Process Management					
Non - Major Elective		open elective - I	1	0	1	2	2
Supportive course (Internal Evaluation)	PIT15206	Information Literacy and Software Documentation	2	0	0	2	2
		Total	15	6	9	30	24

SEMESTER III

Career Stream Title	Course Code	Course Title	L	T	P	Total of LTP	Credit
Compulsory Core	PIT15301	Mobile Application Development	4	1	0	5	4
	PIT15302	Open Source Technologies	4	1	0	5	4
	PIT15303	Enterprise Resource Planning	2	2	0	4	4
Compulsory lab	PIT15304	Mobile Application Development Lab	0	0	4	4	2
	PIT15305	Open Source Technologies Lab	0	0	4	4	2
Skill Based Elective	PIT15E57	Business Intelligence	2	2	0	4	4
	PIT15E58	Cryptography and Network Security					
	PIT15E59	Object Oriented Analysis and Design					
Non - Major Elective		open elective – II	1	0	1	2	2
Supportive course	PIT15306	Mini Project	1	0	1	2	2
		Total	14	6	10	30	24

SEMESTER IV

Career Stream Title	Course Code	Course Title	L	T	P	Total of LTP	Credit
Major Core Project	PIT15401	Industrial Project	0	0	30	30	14
		Total			30	30	14

Total Credits = 84

SEMESTER-I

Course Code	Course Title	L	T	P	Total of L+T+P	C
PIT15101	DATA STRUCTURES AND ALGORITHMS	4	1	0	5	4

OBJECTIVES:

At the end of this course, the learner is expected

1. To gather extensive knowledge in Data Structures.
2. To improve the problem solving quality using data structure techniques.
3. To strengthen the knowledge in algorithms.

UNIT I - LINEAR DATA STRUCTURES 12Hours

Introduction - Abstract Data Types (ADT) – Arrays – Stack – Queue – Circular Queue - Applications of stack ,queue – Infix to postfix conversion – evaluation of expression – Linked Lists – Doubly Linked lists – Applications of linked list.

UNIT II - TREE STRUCTURES 12 Hours

Need for non-linear structures – Trees and its representation – Binary Tree – expression trees –Binary tree traversals – Data structures for general trees – applications of trees – Huffman Algorithm - Binary search tree.

UNIT III - BALANCED SEARCH TREES, SORTING AND INDEXING 12 Hours

AVL trees –B-Trees - Sorting – Bubble sort - Quick Sort - Insertion Sort – Heap sort – Hashing - Hashing functions - Collision Resolution Techniques - Separate chaining - Open addressing - Multiple hashing.

UNIT IV - GRAPHS 12 Hours

Definitions – Representation of graph - Graph Traversals - Applications of graphs - Topological sort – Shortest path algorithms – Minimum cost spanning tree – Prim's and Kruskal's algorithms..

UNIT V - ALGORITHM DESIGN AND ANALYSIS 12 Hours

Algorithm Analysis – Asymptotic Notations - Divide and Conquer: Binary Search - Greedy Algorithm: Knapsack Problem – Dynamic Programming: Multistage Graph – Backtracking: Sum of Subset Problem – Branch and Bound: Travelling Salesman Problem.

TEXT BOOKS:

1. Seymore Litschutz,Schaum Outline ,"Data Structures", Adapted by G.A.V PAI, McGrawHill. (For Units I to IV).
2. Anany Levitin (2011), "Introduction to the Design and Analysis of Algorithms", Addison Wesley Professional. (Unit V).

REFERENCE BOOKS:

1. Q. Ashton Acton (2013), "Algorithms-Advances in Research and Application", Scholarly Editions.
2. Stefan Brandle, Jonathan Geisler, James Roberge,David Whittington(2008), "C++ Data Structures".

Course Code	Course Title	L	T	P	Total of L+T+P	C
PIT15102	DATABASE MANAGEMENT SYSTEMS – DESIGN AND PRINCIPLES	4	1	0	5	4

OBJECTIVES:

At the end of this course the learner is expected:

1. Understand the role of a database management system in an organization.
2. Understand the concept of a database transaction and related database facilities, including concurrency control, backup and recovery and data object locking and protocols.
3. To describe and discuss selected advanced database topics.

UNIT I - THE RELATIONAL MODEL OF DATA AND DATABASE DESIGN

12 Hours

Structure of Relational Database – Relational Algebra – Relational Query Languages: Introduction – SQL – ER Model : Basic ER Concepts – ER Diagram Symbols – Enhanced Entity Relationship Model(EER) : Specialization and Generalization. DBLC - Functional Dependency Diagram and Examples -. Normalization: Boyce-Codd Normal Form – Multi-valued Dependencies and Fourth Normal Form – Join Dependencies and Fifth Normal Form.

UNIT II - QUERY, TRANSACTION PROCESSING & CONCURRENCY CONTROL

12 Hours

Query Processing – Syntax Analyzer – Query Decomposition and Optimization – Cost Estimation in Query Optimization – Pipelining and Materialization – Structure of Query Evaluation Plans – Transaction Processing and Concurrency Control – Transaction Concepts – Concurrency Control Locking Methods for Concurrency Control.

UNIT III- RECOVERY AND SECURITY **12 Hours**

Database Recovery Concepts – Types of Database Failures – Types of Database Recovery – Recovery Techniques – Buffer Management – Database Security – Goals of Database Security – Discretionary Access Control – Mandatory Access Control – Firewalls – Statistical Database Security – Data Encryption

UNIT IV - PARALLEL AND DISTRIBUTED DATABASES **12 Hours**

Parallel Database Systems: Introduction – Parallel Databases – Architecture – Key Elements of Parallel Database Processing – Query Parallelism. Distributed Database Systems: Introduction – Distributed Databases – Architecture – Distributed Database System Design – Distributed Query Processing – Concurrency Control – Recovery Control

UNIT V - EMERGING DATABASE TECHNOLOGIES **12 Hours**

Object Oriented database concepts; Object Relational database concepts; Temporal database concepts; Spatial database concepts and architecture; Mobile Databases; Geographic Information Systems.

TEXT BOOK:

1. Singh. S. K (2006), "Database Systems Concepts- Design and Applications", Pearson Education Publications. (For Units I to V)

REFERENCE BOOKS:

1. Raghu Ramakrishnan, Johannes Gehrke (2004), "Database Management Systems", McGraw-Hill publications.
2. Korth, Silberchatz, Sudarshan (2000), "Database System Concepts", McGraw-Hill publications.

Course Code	Course Title	L	T	P	Total of L+T+P	C
PIT15103	JAVA PROGRAMMING	3	2	0	5	3

OBJECTIVES:

At the end of this course the learner is expected:

1. To have complete understanding on fundamentals of programming.
2. To have understanding on object oriented programming.
3. To have the ability to write a computer program to solve specific problems.

UNIT I - FUNDAMENTALS **12 Hours**

History of Java-Java Buzzwords- Installing the JDK-Programming Structure in Java : First Java Program, Comments, Data Types, Variables, Operators, Constants, Casts, Parenthesis and Operator Hierarchy, Strings: Substring, Concatenation, Immutable, Testing for equality, String API, Building Strings. Input and Output: Reading Input, Formatting Output, File Input and Output. Control Flow: Conditional Statements, Loops, Switch, Breaking Control Flow, Arrays: The "for each" loop, Array initializers, Array Copying, Command Line Parameters, Array Sorting, Multidimensional Array, Ragged Array.

UNIT II - OBJECTS AND CLASSES **12 Hours**

Introduction to Object Oriented Programming: Classes, Objects, Relationship between classes, using predefined classes, defining your own class: Constructors, Implicit & Explicit parameters, Encapsulation, Access Privileges, Private methods, Final Instance Fields, Static fields and methods, Method Parameters, Object Construction and Overloading. Default Field Initialization, Default Constructor, Explicit Field Initialization, Parameter Names, Calling another constructor, Initialization blocks, Object Destruction and finalize Method.

UNIT III - PACKAGES, INHERITANCE, INTERFACES, REFLECTIONS **12 Hours**

Packages: Class import, static import, adding your class to a package, package scope. Class Path. Inheritance: Classes, Subclasses, Super Class, Polymorphism, Dynamic Binding, Preventing Inheritance, Casting, Abstract Class, Protected. Interfaces: Defining and Writing interfaces, implement and Extend. Reflection: The Class class, Using Reflection to analyze capabilities of Classes, Objects, Using Reflection to Write Generic Array Code- Exception handling.

UNIT IV - COLLECTION CLASS, INNER CLASSES, THREADS, GENERICS

12 Hours

The Collection Interfaces: Concrete Collections, Legacy Collections. Inner Classes: Member Classes, Local Classes, Anonymous Classes, Instance Initializes, Static Nested Classes. Threads: non-threaded applications, threaded applications, creating threads, thread states, coordinating threads, interrupting threads, runnable interface, thread groups. Generic Programming: Why Generics, A simple Generic class, Generic Methods, Bounds of Type variables, Restrictions and Limitations, Inheritance Rules for Generic Types, Reflection and Generics.

UNIT V - USER INTERFACE PROGRAMMING **12 Hours**

Applets: Simple Applet, the Applet HTML tags, Parameter passing to applet, accessing image and Audio files, Applet context. Swing : Introduction, Creating a Frame, Positioning a Frame, Layout Management, Text Input, Choice Components, Menus, Dialog Boxes. Event Handling- Basics of Event Handling, The AWT Event Hierarchy.

TEXT BOOKS:

1. Cay S. Horstmann, Gary Cornell (2008), "Core Java volume 1 - Fundamentals", Eigth Edition, Pearson Education. (For Units I to III)
2. Java 6 Programming Black Book, Kogent Learning Solutions Inc. (For Units IV to V).

REFERENCE BOOKS:

1. Herbert Schildt (2006), "Java - The Complete Reference", Seventh Edition, Tata McGraw Hill.

Course Code	Course Title	L	T	P	Total of L+T+P	C
PIT15104	DATABASE MANAGEMENT SYSTEMS LAB	0	0	4	4	2

OBJECTIVES:

At the end of this course the learner is expected:

1. To explore the features of a Database Management Systems

2. To interface a database with front end tools
3. To understand the working of a database system

SQL

1. Simple Queries using DDL, DML and DCL
2. SQL Aggregate Functions
3. SET Operations
4. Views and Snapshots
5. Multiple Tables and Nested Queries, Correlated Queries
1. PL/SQL
6. PL/SQL Block
7. Function and Procedures
8. Subprograms and Packages
9. Triggers
10. Cursors

APPLICATION DEVELOPMENT

1. Design and develop any two of the following:
2. Library Information System
3. Students Information System
4. Hotel Management System
5. Inventory Control
6. Employee Information System
7. Payroll System

NOTE:

1. Clearly mention the scope of the system. Use standard tools for expressing the design of the systems.
2. Frontend should be Java

Course Code	Course Title	L	T	P	Total of L+T+P	C
PIT15105	JAVA PROGRAMMING LAB	0	0	4	4	2

OBJECTIVES:

At the end of this course the learner is expected:

1. To understand the working of programming such as variables, conditional and iterative execution, methods, etc.
2. To understand fundamentals of object-oriented programming in Java, including defining classes, 3.invoking methods, using class libraries, etc.
3. To use the Java SDK environment to create, debug and run simple Java programs.

EXERCISES

1. Reading Input and Formatting Output
2. Method Overloading and Overriding
3. Class and Objects
4. Static members
5. Inheritance and Interfaces
6. Packages
7. Inter thread communication
8. Exception Handling
9. Reflection
10. Generic Class

Course Code	Course Title	L	T	P	Total of L+T+P	C
PIT15E51	GRID COMPUTING	3	2	0	5	3

OBJECTIVES:

At the end of this course the learner is expected:

1. To differentiate the classical distributed environment and grid computing environment.
2. To understand the need for grid middle ware and justify grid resources as commodity.

UNIT - I CONCEPTS AND ARCHITECTURE **12 Hours**

Introduction-Parallel and Distributed Computing-Cluster Computing-Grid Computing- Anatomy and Physiology of Grid-Review of Web Services-OGSA-WSRF.

UNIT - II GRID MONITORING **12 Hours**

Grid Monitoring Architecture (GMA) - An Overview of Grid Monitoring Systems-GridICE -– JAMM -MDS-Network Weather Service-R-GMA-Other Monitoring Systems- Ganglia and GridMon

UNIT - III GRID SECURITY AND RESOURCE MANAGEMENT **12 Hours**

Grid Security-A Brief Security Primer-PKI-X509 Certificates-Grid Security-Grid Scheduling and Resource Management-Scheduling Paradigms- Working principles of Scheduling -A Review of Condor, SGE, PBS and LSF-Grid Scheduling with QoS.

UNIT - IV DATA MANAGEMENT AND GRID PORTALS **12 Hours**

Data Management-Categories and Origins of Structured Data-Data Management Challenges-Architectural Approaches-Collective Data Management Services-Federation Services-Grid Portals-First-Generation Grid Portals-Second-Generation Grid Portals.

UNIT - V GRID MIDDLEWARE **12 Hours**

List of globally available Middlewares - Case Studies-Recent version of Globus Toolkit and gLite - Architecture, Components and Features.

TEXT BOOK:

1. Maozhen Li, Mark Baker (2005), "The Grid Core Technologies", John Wiley & Sons.

REFERENCE BOOKS:

1. Ian Foster & Carl Kesselman (2004), "The Grid 2 – Blueprint for a New Computing Infrastructure ", Morgan Kaufman Publisher.
2. Joshy Joseph & Craig Fellenstein (2004), "Grid Computing", Pearson Education.

Course Code	Course Title	L	T	P	Total of L+T+P	C
PIT15E52	COMPUTER NETWORKS	3	2	0	5	3

OBJECTIVES:

At the end of this course the learner is expected:

1. To learn the fundamental concepts of computer networking.
2. To familiarize the student with the basic taxonomy and terminology of the computer networking area.
3. To allow the student to gain expertise in some specific areas of networking such as the design and maintenance of individual networks.

UNIT I - INTRODUCTION TO COMPUTER NETWORKS 12 Hours

History and Need for Networking - Service Description – Connectionless and Connection-Oriented Services – Circuit and Packet Switching – Access Networks and Physical Media – Wireless Links and Characteristics – OSI Reference Model - Service Models –Ad-hoc network, GPS, Sensor network.

UNIT II - APPLICATION LAYER 12 Hours

Principles of Network Applications – The Web and HTTP – FTP – Electronic Mail – SMTP – Mail Message Formats and MIME – DNS – Socket Programming with TCP and UDP. Multimedia Networking: Internet Telephony – RTP – RTCP – RTSP. Network Security: Principles of Cryptography – Firewalls – Application Gateway – Attacks and Counter measures.

UNIT III - TRANSPORT LAYER 12 Hours

Transport Layer Services – Multiplexing and Demultiplexing – UDP – Reliable Data Transfer – Go-Back-N and Selective Repeat. Connection-Oriented Transport: TCP – Segment Structure – RTT estimation – Flow Control – Connection Management – Congestion Control – TCP Delay Modeling – SSL and TLS. Integrated and Differentiated Services: Intserv– Diffserv.

UNIT IV - NETWORK LAYER 12 Hours

Forwarding and Routing – Network Service Models – Virtual Circuit and Datagram Networks – Router – Internet Protocol (IP) – IPv4 and IPv6 – ICMP – Link State Routing – Distance Vector Routing – Mobile IP

UNIT V - LINK LAYER **12 Hours**

Layer Services – Error Detection and Correction Techniques – Multiple Access Protocols – Link Layer Addressing – ARP – DHCP – Ethernet – Hubs, Bridges, and Switches –PPP. Ring Topology - Physical Ring – Logical Ring.

TEXT BOOKS:

1. James F. Kurose and Keith W. Ross (2006), "Computer Networking: A Top-Down Approach Featuring the Internet", 3rd Edition, Pearson Education.
2. Andrew S. Tanenbaum (2003), "Computer Networks", 4th edition, Prentice-Hall of India.

REFERENCE BOOKS:

1. Larry L. Peterson and Bruce S. Davie (2007), "Computer Networks: A Systems Approach", 4th edition, Elsevier Publishing.

Course Code	Course Title	L	T	P	Total of L+T+P	C
PIT15E53	SOFTWARE ENGINEERING	3	2	0	5	3

OBJECTIVES:

At the end of this course the learner is expected:

1. To classify the various Software Process Models
2. To build an Analysis Model and subsequently architect a suitable design
3. To understand Testing Strategies and Testing Tactics

UNIT I - INTRODUCTION TO SOFTWARE ENGINEERING **12 Hours**

Basic Concept about Software Engineering, Professional and ethical responsibility - Socio-technical Systems: Emergent system properties, Systems engineering, Organizations, people and computer systems, Legacy systems - Critical Systems: A simple safety-critical system - Software Processes: Software process models - Process iteration - Process activities - Rational Unified Process - Computer-aided software engineering - Project Management: Management activities - Project planning - Project scheduling - Risk management.

UNIT II - REQUIREMENTS ENGINEERING AND ANALYSIS MODEL **12 Hours**

Software Requirements: Functional and non-functional requirements - User requirements - System requirements - Interface specification - Software Requirements Document - Requirements Engineering Process: Feasibility studies - Requirements elicitation and analysis - Requirements validation - Requirements

management - System Models: Context models - Behavioral models - Data Models - Object models - Structured methods.

UNIT III - DESIGN ARCHITECTURAL DESIGN 12 Hours

Architectural design decision, System organization, Decomposition styles, Control styles, Reference architectures - Distributed Systems Architecture: Multiprocessor architectures, Client-server architectures, Distributed object architectures - Application Architectures: Data processing systems - Transaction processing systems - Object-oriented Design: Objects and object classes - An object-oriented design process- Design evolution - User Interface Design : Design issues - User interface design process-User analysis - User interface prototyping - Interface evaluation.

UNIT IV - SOFTWARE DEVELOPMENT AND TESTING 12 Hours

Rapid Software Development: Agile methods, Extreme programming, Rapid application development, and Software prototyping - Component-based Software Engineering: Components and component models -The CBSE process - Component composition. - Verification and Validation: Planning Verification and validation, Software inspections, Automated static analysis, Verification and formal methods - Software Testing: System testing, Component testing, Test case design, Test automation.

UNIT V - MANAGEMENT, QUALITY AND CONFIGURATION 12 Hours

Managing People: Selecting staff, Motivating people, Managing groups, People Capability Maturity Model - Software Cost Estimation: Software productivity, Estimation techniques, Algorithmic cost modeling, Project duration and staffing - Quality Management: Process and product quality - Quality assurance and standards- Quality planning- Quality control- Software measurement and metrics - Configuration Management: Configuration management Planning - Change management - Version and release management- System building- CASE tools for configuration management.

TEXT BOOKS:

1. Ian Sommerville (2004), “Software Engineering”, 7th Edition, Addison Wesley.(For Units I to III)
2. Roger Pressman (2005), “Software Engineering A practitioner‘s Approach”, 6th Edition, McGraw-Hill International Edition.(For Units IV to V)

REFERENCE BOOKS:

1. Pankaj Jalote (1997), "An Integrated Approach to Software Engineering", Second Edition, Narosa Publishing House.
2. Richard Fairley (2004). "Software Engineering Concepts", Tata McGraw Hill Edition.

Subject Code	Subject Title	L	T	P	Total of LTP	C
PIT15106	QUANTITATIVE APPTITUDE AND REASONING	2	0	0	2	2

INSTRUCTIONAL OBJECTIVES:

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

- Critically evaluate various real life situations by resorting to Analysis of key issues and factors
- Demonstrate various principles involved in solving mathematical problems and thereby reducing the time taken for performing job functions.

COURSE REQUIREMENT: At the end of every unit, the students will be expected to answer a model quantitative aptitude test for internal assessment.

UNIT I

Simple equations - Ratio & Proportion – Variation

UNIT II

Percentages - Profit and loss – Partnership - Simple interest and Compound interest

UNIT III

Deductions – Connectives

UNIT IV

Analytical Reasoning puzzles - Problems on Linear arrangement -Problems on Circular arrangement

UNIT V

Clocks – Calendars - Blood relations

TEXT BOOKS:

1. Agarwal R S (2013), 'Quantitative Aptitude' S.Chand Publishers,

2. Agarwal R S,'A modern approach to Logical reasoning' S.Chand Publishers

REFERENCE BOOKS

1. Abhijit Guha, Quantitative Aptitude - Mc Graw Hills Publishers
2. Agarwal R S, 'A modern approach to Logical reasoning' S.Chand Publishers

II SEMESTER

Course Code	Course Title	L	T	P	Total of L+T+P	C
PIT15201	ADVANCED JAVA PROGRAMMING	4	1	0	5	4

OBJECTIVES:

At the end of this course the learner is expected:

1. To be familiarize with Advanced Concepts of Java like Swing and RMI
2. To understand the Java Servlets and Database connectivity.

UNIT I - APPLICATIONS IN DISTRIBUTED ENVIRONMENT 12 Hours

Remote method invocation – Activation models – RMI custom sockets – Object Serialization – RMI – IIOP implementation – CORBA – IDL technology – Naming services – CORBA programming models – JAR file creation.

UNIT II - DATABASE ACCESS AND SERVLET PROGRAMMING 12 Hours

Database Access: Overview of JDBC, JDBC Drivers, Connecting to a Database, Statement Interfaces, ResultSets, Using MetaData.

Servlet – Introduction – Types : Generic Servlet, HttpServlet – Servlet Life Cycle – Servlet Classes: Servlet, ServletRequest, ServletResponse, ServletContext, ServletConfig – Single Thread Model – Session Tracking: Cookies, URL Rewriting, Hidden Fields, The Session API

UNIT III - JSP and XML 12 Hours

JSP: JSP Overview, How JSP works, Components of a JSP page, Implicit objects, RequestDispatching: Anatomy of Request Processing, Include Directive, JSP:include Action, Forwarding Requests, RequestDispatcherObject, Model1 Vs Model2. JSP and Java Bean: Java Bean, JSP Actions, JSP and XML: XML Overview, XML Parsers, XSL Transformations with XSLT.

UNIT IV - ENTERPRISE APPLICATIONS 12 Hours

EJB Architecture: Logical Architecture, Software Architecture,-View of EJB Conversation - Building and Deploying EJB's, - Roles in EJB- EJB Session Beans: constraints on session beans, Life Cycle with example- EJB Entity Beans: When to use Entity Bean, Bean-Managed Versus Container-Managed Persistence, primary keys, Entity Bean Life Cycle, Example:Container Managed Persistence, Bean-Managed persistence- Message Driven Beans: Life Cycle.

UNIT V - INTEGRATING SERVLETS AND JSP: MVC ARCHITECTURE 12 Hours

Understanding the need for MVC – frameworks, implementing MVC with request dispatcher – defining Beans to represent the data, writing servlets to handle requests, populating Beans, storing the results, forwarding the requests, summarizing the MVC code, interpreting relative URL, three data sharing approaches, forwarding requests from JSP pages

TEXT BOOKS:

1. Elliotte Rusty Harold, (2013), "Java Network Programming", O'Reilly Publishers. (For Unit I to III)
2. Antonio Goncalves, (2010), "Beginning Java EE 6 Platform with GlassFish 3", Apress, Second Edition. (For Units IV to V)

REFRENCE BOOKS:

1. Phil Hanna, "JSP: The Complete Reference", Osborne/Tata McGraw-Hill
2. Ed Roman,(2009), "Mastering Enterprise Java Beans", John Wiley and Sons Inc.
3. Tom Valesky, (2008), "Enterprise Java Beans", Addison-Wesley.
4. Marty Hall, Larry Brown, (2004), "Core Servlets and Java Server Pages", II Edition, Pearson Education.

Course Code	Course Title	L	T	P	Total of L+T+P	C
PIT15202	WEB TECHNOLOGY	4	1	0	5	4

OBJECTIVES:

At the end of this course the learner is expected:

1. To familiarize basics of Internet.
2. To manage the Web designing and uploading.
3. To understand various scripting languages like Java scripting and VB scripting.

UNIT I - INTERNET CONCEPTS **12 Hours**

Fundamental of Web ,History of Web, Web development overview, Domain Name System (DNS), DHCP,and SMTP and other servers ,Internet service provider (ISP), Concept of IP Address, Internet Protocol, TCP/IP Architecture and protocol (IP) ,Web Browser and Web Server.

UNIT II - HTML and DHTML **12 Hours**

HTML Tag, Rules of HTML, Text Formatting & Style, List, Adding Graphics to Html Document, Tables and Layout , Linking Documents, Frame, Forms, Project in HTML, Introduction to DHTML, CSS, Class & DIV, External Style Sheet.

UNIT III - JAVA SCRIPT AND VB SCRIPT **12 Hours**

Java Script (JS) in Web Page, Advantage of Java Script, JS object model and hierarchy ,Handling event, Operators and syntax of JS, Function, Client side JS Vs Server side JS ,JS security Introduction to VB Script, Operator & Syntax of VB Script, Dialog Boxes, Control & Loop, Function in VBS.

UNIT IV - XML **12 Hours**

Introduction to XML, XML in Action, Commercial Benefits of XML, Gaining Competitive advantage with XML, Programming in XML, XML Schema ,XSLT ,DOM structure model ,XML quires and transformation .

UNIT V - JQUERY **12 Hours**

Introduction to jQuery : What Does jQuery Do for Me?, Obtaining jQuery, Installing jQuery - Selecting and Filtering : Using the Selectors API, Filtering a Selection, Searching within a Selection with find method, Finding an Element‘s Siblings with siblings method, Searching Ancestors Using the parents and parent Methods - Events - Filtering Selections and Arrays : Basic Iteration, Filtering Selections and Arrays - jQuery CSS : CSS Method, The outerWidth and outerHeight Methods - jQuery Effects : Showing and Hiding Elements, Sliding Elements, Fading Elements, Custom Animation.

TEXT BOOKS:

1. Margaret Levine Young, “Internet-The Complete Reference”, McGraw Hill, 2nd Edition (For Unit I to III)
2. Jon Ducket, (2005), “Web Programming with HTML, CSS and JavaScript”, Wiley Publishing. (For Unit IV to V)

REFERENCE BOOKS:

1. Sean, “XML By Example”.

2. Flangam .O, “Java Script :The Definite Guide “
3. ”Mastering VB Script”, BPB Publication
4. Jack Franklin, (2013), ”Beginning JQuery”, APress.
5. Adam Boduch,(2013), JQuery UI Cookbook”.

Course Code	Course Title	L	T	P	Total of L+T+P	C
PIT15203	INFORMATION STORAGE AND MANAGEMENT	2	2	0	4	4

OBJECTIVES:

At the end of this course the learner is expected:

1. To understand the responsibility data storage and protection as it is the crucial component of any computing system
2. To understand the need for networking to store and access data across multiple storages
3. To understand security needs.

UNIT I - INTRODUCTION 12 Hours

Review data creation and the amount of data being created and understand the value of data to a business, Challenges in Data Storage and Management, Data Storage Infrastructure. Storage Systems Environment: Components of a Storage System Environment: Disk drive components, Disk Drive Performance, Logical Components.

UNIT II - DATA PROTECTION 12 Hours

Concept of RAID and its Components, Different RAID levels and their suitability for different application environments: RAID 0, RAID 1, RAID 3, RAID 4, RAID 5, RAID 0+1, RAID 1+0, RAID 6, Comparison of Levels. Intelligent Storage Systems: Components, Intelligent Storage Array, High-level architecture and working of an intelligent storage system.

UNIT III - INTRODUCTION TO NETWORKED STORAGE 12 Hours

Evolution of networked storage, Architecture, Overview of FC-SAN, NAS, and IP-SAN. Network-Attached Storage (NAS): Benefits of NAS, Components, Implementations, File Sharing, I/O operations, Performance and Availability. Content Addressed Storage (CAS): features and Benefits of a CAS. CAS Architecture, Storage and Retrieval, Examples. Storage Virtualization: Forms, Taxonomy, Configuration, Challenges, Types of Storage Virtualizations.

UNIT IV - INFORMATION AVAILABILITY, MONITORING, MANAGING 12 Hours

Datacenter: Information Availability, Business continuity, Failure Analysis, Business impact Analysis, Differentiate between business continuity (BC) and disaster recovery (DR). Disaster Recovery: Backup, Methods, And Technologies, Replication technologies: Local replicas, Technologies, Restore and Restart, Multiple Replicas. Remote Replication. DR in practice.

UNIT V - STORAGE SECURITY AND MANAGEMENT SECURITY 12 Hours

Framework, Storage security domains, List and analyzes the common threats in each domain, Security Implementations. Managing the Storage Infrastructure - Monitoring the Storage Infrastructure, Storage Management Activities, Challenges and solutions.

TEXT BOOK:

1. EMC Corporation, Information Storage and Management, Wiley India. (For Unit I toV)

REFERENCE BOOKS:

1. Robert Spalding, (2003), "Storage Networks: The Complete Reference", Tata McGraw Hill, Osborne.
2. Marc Rarley, (2001), "Building Storage Networks, Tata McGraw Hill, Osborne.
3. Meeta Gupta,(2002), Storage Area Network Fundamentals, Pearson Education Limited.

Course Code	Course Title	L	T	P	Total of L+T+P	C
PIT15204	ADVANCED JAVA PROGRAMMING LAB	0	0	4	4	2

OBJECTIVES:

At the end of this course the learner is expected :

1. To be familiarize with Advanced Concepts of Java like Swing and RMI
2. To understand the Java Servlets and Database connectivity.
3. To learn about the networking principle and implementation

EXERCISES

1. Create a distributed application to download various files from various servers using RMI.
2. Typical experiment to investigate the use of CORBA technology with Java.
3. Create a GUI based application which can demonstrates the use of JDBC for Database Connectivity
4. Create a GUI based application which can use for database modification using JDBC
5. Web Application Using Servlet
   a) HTTP handling (Get Request and post request)
      i) Create telephone Bill table
      ii) Use GET and POST method to interact with the telephone table.

b) Session and cookies
   i) Create web page calculate hit count using session and cookies.

c) Applet to Servlet communication
   i) Create applet to enter query.
   ii) Execute query using Servlet.

d) Program that demonstrates the use of session management. .

6. Web Application using JSP
   a) Use Bean Methods
      i) Create Bean for Banking Transaction using Java
      ii) Interact the Bean Using JSP
   b) Shopping cart using session
      i) Create shopping cart for Book Shop
      ii) Session maintained in the web page.
7. Create a JSP based Web application which allows the user to edit his/her database Information.
8. An EJB application that demonstrates Session Bean.
9. An EJB application that demonstrates Entity Bean.

10. An EJB application that demonstrates MDB.
11. MVC Architecture
    (i) Implementing MVC with Request Dispatcher
    (ii) Data Sharing Approaches

Other than these possible lab exercises related to syllabus can also be included.

Course Code	Course Title	L	T	P	Total of L+T+P	C
PIT15205	WEB TECHNOLOGY LAB	0	0	4	4	2

OBJECTIVES:

At the end of this course the learner is expected :

1. To provide knowledge on Internet and its related concepts.
2. To enrich the knowledge of scripting languages.
3. To enable the learner to become a Web Designer.

HTML

1. Creating HTML page and Run
2. Font tag, colors and images
3. Hyperlinks, Lists in HTML
4. Tables
5. Physical and Logical Tags
6. Forms Controls
7. Frames with tags
8. CSS – Format all web pages in the common format using CSS

JAVA SCRIPT

1. Data types and variables, operators
2. Conditional Statements and Looping
3. Functions
4. Strings, Date and Time
5. Array and Math
6. Cookies
7. Debugging JavaScript
8. Handling Mouse Events
9. Develop Digital Clock & Calculator
10. Web Page with forms and Validations
11. Authentication and Verifications
12. Events Handling

VBSCRIPT

1. Data Types & Variables
2. Procedures, Conditional, Looping
3. Functions, Date, Time
4. Constants, Events, Methods, Objects, Operators
5. Validation
6. Error Handling

JQUERY

1. Obtaining and installing jQuery
2. Selectors
3. Events
4. Effects
5. Callback
6. HTML
7. CSS

Course Code	Course Title	L	T	P	Total of L+T+P	C
PIT15E54	BIG DATA ANALYTICS	2	2	0	4	4

OBJECTIVES:

At the end of this course the learner is expected:

1. To understand the basics of Hadoop, MapReduce, Pig Latin
2. To understand how the analysis of data derives from the statement of a research problem or hypothesis and the availability of empirical data.
3. Gain experience looking at analytics from a strategic perspective

UNIT I - INTRODUCTION TO BIG DATA **12 Hours**

Introduction to BigData Platform – Challenges of Conventional Systems - Intelligent data analysis Nature of Data - Analytic Processes and Tools - Analysis vs Reporting - Modern Data Analytic Tools

UNIT II - STATISTICAL DATA ANALYSIS **12 Hours**

Parameter and Statistic- Sampling Distribution- Meaning-Standard Error and its uses. Tests of Significance- Null and Alternative Hypotheses. Type-I and Type-II Error- Critical Region and Level of Significance. One tailed and Two tailed Tests. Critical values or Significant values. Tests of Significance for Large Samples- Test of Significance for Single Proportion- Test of Significance for Difference of Proportions- Test of Significance for Single Mean- Test of Significance for Difference of Means. Chi-Square Distribution – Definition- Applications of Chi-Square Distribution- To test the goodness of fit.- To test the independence of Attributes. Student's" t" -Distribution-Definition- Applications of Student's "t" – Distribution- To test for Single Mean- To test for Difference of Means- Paired t-test for Difference of Means F-Distribution- Definition- To Test for Equality of Two Population variances. Meaning of Resampling and its uses. Basic ideas of Randomization, Exact Test, Cross Validation Jacknife and Bootstrap. Prediction Error and its uses.

UNIT III - HADOOP **12 Hours**

History of Hadoop- The Hadoop Distributed File System – Components of Hadoop- Analyzing the Data with Hadoop- Scaling Out- Hadoop Streaming- Design of HDFS- Java interfaces to HDFS- How Map Reduce Works-Anatomy of a Map Reduce Job run-Failures-Job Scheduling-Shuffle and Sort – Task execution – Map Reduce Features

UNIT IV - HADOOP ENVIRONMENT **12 Hours**

Setting up a Hadoop Cluster - Cluster specification - Cluster Setup and Installation - Hadoop Configuration-Security in Hadoop - Administering Hadoop – HDFS - Monitoring-Maintenance

UNIT V - FRAMEWORKS **12 Hours**

Applications on Big Data Using Pig and Hive – Data processing operators in Pig – Hive services – HiveQL – Querying Data in Hive - fundamentals of HBase and ZooKeeper.

TEXT BOOKS:

1. Michael Berthold, David J. Hand, (2007), "Intelligent Data Analysis", Springer. (For Unit I to III)
2. Tom White (2012), " Hadoop:The Definitive Guide" Third Edition, O'reilly Media (For Unit IV to V)

REFERENCE BOOKS:

1. Anand Rajaraman and Jeffrey David Ullman, (2012) "Mining of Massive Datasets", Cambridge University Press.
2. Viktor Mayer,Schonberger,Kenneth Cukier , "BIg Data : A Revolution That Will Transform How We Live, Work and Think".

Course Code	Course Title	L	T	P	Total of LTP	C
PIT15E55	NETWORK PROTOCOLS	2	2	0	4	4

OBJECTIVES:

At the end of this course the learner is expected:

1. To Know which protocols are part of the TCP/IP protocol suite
2. To Understand how each protocol fits into the Internet Protocol Stack and the OSI Model
3. To Understand how the protocols relate to one another

UNIT I - FUNDAMENTALS OF NETWORKING STANDARDS AND PROTOCOLS 12 Hours

Network Communication Architecture and Protocols - OSI Network Architecture seven Layers Model - Definition and Overview of TCP/IP Protocols -TCP/IP Four Layers Architecture Model - Other Network- Architecture Models: IBM SNA.

UNIT II - ROUTED AND ROUTING PROTOCOLS 12 Hours

Application Layer Protocols-Presentation Layer Protocols- Session Layer Protocols - Transport Layer -Protocols - Network Layer Protocols - Data Link Layer Protocols - Routing Protocols - Multicasting Protocols - MPLS.

UNIT III - ISDN AND NETWORK MANAGEMENT PROTOCOLS 12 Hours

Overview of ISDN – Channels – User access Protocols - Network management requirements – Network monitoring – Network control – SNMP V1, V2 and V3 – Concepts, MIBs –Implementation issues-RMON.

UNIT IV - SECURITY AND TELEPHONY PROTOCOLS 12 Hours

Network Security Technologies and Protocols - AAA Protocols - Tunnelling Protocols - Security Protocols- Private key encryption – Data encryption system,

public key encryption – RSA – Elliptic curve cryptography – Authentication mechanisms– Web security -Secured Routing Protocols - IP telephony -Voice over IP and VOIP Protocols –Signalling Protocols- Media/CODEC.

UNIT V - NETWORK ENVIRONMENTS AND PROTOCOLS 12 Hours

Wide Area Network and WAN Protocols - Frame relay - ATM - Broadband Access Protocols -PPP Protocols - Local Area Network and LAN Protocols - Ethernet Protocols - Virtual LAN Protocols - Wireless LAN Protocols - Metropolitan Area Network and MAN Protocol - Storage Area Network and SAN Protocols.

TEXT BOOKS:

1. Javvin, (2005), "Network Protocols" , Javvin Technologies Inc , II Ed. (For Unit I to III)
2. William Stallings, (2000), "Cryptography and Network Security", PHI. (For Unit IV to V)

REFERENCE BOOKS:

1. Mani Subramanian, (2000), "Network Management–Principles and Practices", Addison Wesley.
2. William Stallings, (1999), "SNMP, SNMPV2, SNMPV3 and RMON1 and 2", 3rd Edition, Addison Wesley.

William Stallings, (1999), "Data and Computer Communications", 5th Edition, PHI.

Course Code	Course Title	L	T	P	Total of LTP	C
PIT15E56	SOFTWARE PROCESS MANAGEMENT	2	2	0	4	4

OBJECTIVES:

At the end of this course the learner is expected:

1. To understand software process patterns, frameworks, and the need for assessing the software.
2. To understand the need for time management in developing a software and the software quality

UNIT I : INTRODUCTION TO SOFTWARE ENGINEERING 12 HOURS

Evolving role of software –Legacy Software –Software Myths -A Generic View of Process: Software Engineering-Layered technology – Process framework –CMMI – Process Patterns – Process Assessment – Personal and Team Process Models – Process Technology – Product and Process.

UNIT II - PERSONAL SOFTWARE STRATEGY 12 Hours

Personal Software Process strategy- the logic for a software engineering discipline – Software process– Process Maturity –Logic & productivity of PSP - Baseline process –PSP process elements – PSPO process, measures & project plan summary – Time & Defect recording log –Measurement overview – Fundamental process measures – Goal-Question-Metric Paradigm – General PSP objectives, Goals and questions – GQM example – Gathering data –– Establishing a baseline for your personal process.

UNIT III - PLANNING PROCESS 12 Hours

Planning process- Contents of a software plan – Planning a software project – Producing a quality plan - Measuring software size - Size measures & framework – Establishing a counting standard – Using LOC counts & counters – Reuse considerations – Line of code Accounting – Calculating Productivity–Estimating software size: Background – Popular estimating methods – Proxy-based estimating – the PROBE size estimating method – Object categories – Estimating considerations -Resource and schedule estimating: Resource planning – Estimating development time – Combining multiple estimates – Using multiple regression – Schedule Estimating – Earned value tracking – Estimating accuracy

UNIT IV- SOFTWARE DESIGN & QUALITY 12 Hours

Design and code reviews- Personal reviews – Reviews principles –Design review principles – Review measures – Check lists –Relationship between reviews and

inspections -Software Quality Management–Economics of software quality–Developing a quality strategy–Process Benchmarking – Yield Management – Defect removal strategies – Defect prevention strategies - Design process – Design quality – Structuring the design process–Design notation–Design Templates–Functional specification template – State specification template – Logic specification template – Operational scenario template – Using templates in design – Design Guidelines

UNIT V - SOFTWARE VERIFICATION **12 Hours**

Design Verification– Design standards – Verification methods – Verifying the object state machine – Program tracing – Verifying program correctness – Comments on verification methods -Scaling up the personal software process: Using abstractions –Stages of product size – Developing large-scale programs – Potential problem with abstractions – Development strategy – PSP3 -Defining the software process– Software process basics – Process definition – Defining process phases – Process development considerations – Process evolution – Development Process.

TEXT BOOKS:

1. Roger S Pressman, (1997), "Software Engineering", 4th Edition, McGraw Hill International Edition. (Unit I)
2. Watts S. Humphrey, (2001), "A Discipline for Software Engineering", Pearson Education. (Units II – V)

REFERENCE BOOKS:

1. Watts S. Humphrey, (2005), "A Self-Improvement Process for Software Engineers", Addison Wesley Professional.
2. Watts S. Humphrey, (1996),"Using a defined and measured Personal Software Process", IEEE Software.

Course Code	Course Title	L	T	P	Total of L+T+P	C
PIT15206	INFORMATION LITERACY AND SOFTWARE DOCUMENTATION	2	0	0	2	2

PURPOSE:

Information literacy is a set of abilities requiring individuals to "recognize when information is needed and have the ability to locate, evaluate, and use effectively the needed information." Information is available through libraries, community resources, special interest organizations, media, and the Internet—and increasingly, information comes to individuals in unfiltered formats, raising questions about its authenticity, validity, and reliability. In addition, information is available through multiple media, including graphical, aural, and textual, and these pose new challenges for individuals in evaluating and understanding it. Information literacy forms the basis for lifelong learning. It enables learners to master content and extend their investigations, become more self-directed, and assume greater control over their own learning. An information literate individual is able to:

- Determine the extent of information needed
- Access the needed information effectively and efficiently
- Evaluate information and its sources critically
- Incorporate selected information into one's knowledge base
- Use information effectively to accomplish a specific purpose
- Understand the economic, legal, and social issues surrounding the use of information, and access and use information ethically and legally

Evaluation Scheme

1. Report

Topic Selection	05 Marks
Problem Definition	05 Marks
Paper Work Schema	10 Marks
Survey of Literature	20 Marks
Technical Exposition	10 Marks
Summary of Discourse	05 Marks
Bibliography & References	05 Marks

2. Presentation

Evaluation by the Supervisor 20 Marks

Evaluation by the Peers 20 Marks

Reference:

Information Literacy Competency Standards for Higher Education, American Library Association, 2000. http://www.ala.org/acrl/ilcomstan.html.

SEMESTER III

Course Code	Course Title	L	T	P	Total of L+T+P	C
PIT15301	MOBILE APPLICATION DEVELOPMENT	4	1	0	5	4

OBJECTIVES:

At the end of this course the learner is expected :

1. To learn and apply software patterns for the development of the application models described above.
2. To learn and work within the capabilities and limitations of a range of mobile computing devices.
3. To design and implement and deploy mobile applications using an appropriate software development environment.

UNIT I - INTRODUCTION TO MOBILE DEVELOPMENT 12Hours

What is mobile computing? History of mobile environments – early mobile phones to smart phones and tablets, Development for mobile environments, Differences from traditional application development, Trends in mobile development.

UNIT II - MOBILE DEVELOPMENT 12Hours

Introduction, Advantages, Limitations, Features useful for mobiles – Geolocation, offline web applications, offline web storage, animations, 2D/3D graphics, Audio/Video etc. , Frameworks -HTML5 , Phone Gap (Apache Cordova) framework and jQuery Mobile framework.

UNIT III - INTRODUCTION TO ANDROID 12Hours

Android Overview -- Features, Architecture, Applications, Application frameworks, Libraries, Runtime, Kernel, Android Ecosystem – Application stores, publishing,Android Development Tools – Android SDK, Android emulator, Development on hardware devices

UNIT IV - BASIC ANDROID DEVELOPMENT 12Hours

Writing Android Applications, Activity Lifecycle, Multi device support, Fragments, Data storage, Intents, Data sharing, Audio playback, Photo capture

UNIT V - ADVANCED ANDROID DEVELOPMENT 12Hours

Animations. OpenGL ES, Wireless connections, Data syncing, Location aware applications, Best practices for development, Security, Distribution and Monetizing

TEXT BOOKS:

1. Ed Burnette, (2010) "Hello Android: Introducing Google's Mobile Development Platform", The Pragmatic Programmers, 3rd edition. (For Units I to III)
2. Jeff McWherter and Scott Gowell, (2012)"Professional Mobile Application Development", Wrox. (For Units IV to V)

REFERENCE BOOKS:

1. Charlie Collins, Michael Galpin and Matthias Kappler, (2012), "Android in Practice", DreamTech.
2. James Dovey and Ash Furrow, (2012), "Beginning Objective C", Apress.

Course Code	Course Title	L	T	P	Total of LTP	C
PIT15302	OPEN SOURCE TECHNOLOGIES	4	1	0	5	4

OBJECTIVES:

At the end of this course the learner is expected :

1. To develop knowledge on dynamic objects, Graphical, Database objects used in Web sites.
2. To understand the advanced dynamic web page development.
3. To enable the learner for aiming careers in PHP Programming and content management.

UNIT I - BASIC PHP **12 Hours**

Web Server-Apache-PHP-Data Types-User defined Variables-Constants-Operators-Control Structures-User defined Functions-Directory Functions-File system Functions-Arrays-String Functions-Date and Time Functions-Mathematical Functions-Miscellaneous Functions

UNIT II - ADVANCED PHP with MySQL **12 Hours**

Exceptions handling-Error Handling Functions-Predefined Variables-Cookies-Sessions-COM-DOM-CURL-SOAP-Classes and Objects-Mail Function-URL Functions. PHP with MySQL: PHP MySQL Functions-Database driven application.

UNIT III - ADVANCED PHP with AJAX, SEO and CMS **12 Hours**

PHP with AJAX: Introducing Ajax-Ajax Basics-PHP and Ajax-Database Driven Ajax. PHP with SEO: Basic SEO-Provocative SE Friendly URLs-Duplicate Content- CMS: Wordpress Creating an SE-Friendly Blog

UNIT IV - BASIC PERL **12 Hours**

Introduction-Scalar Data- Lists and Arrays-Subroutines-Input and Output- Hashes-Regular Expressions-Control Structures-Perl Modules-File Tests

UNIT V - ADVANCED PERL **12 Hours**

Directory Operations-Strings and Sorting-Smart Matching-Process Management-Advanced Perl Techniques

TEXT BOOKS:

1. Mehdi Achour, Friedhelm, Betz Antony Dovgal, Nuno Lopes, Hannes Magnusson, Georg Richter, Damien Seguy, Jakub Vrana And several others, (1997-2011), "PHP Manual (Download the manual from PHP official website www.php.net)", The PHP Documentation Group. (For Units I to III)
2. Lee Babin,(2007), "Beginning Ajax with PHP From Novice to Professional", Apres., (For Units IV to V)

REFERENCE BOOKS:

1. Jaimie Sirovich and Cristian Darie, (2007), "Professional Search Engine Optimization with PHP A Developer's Guide to SEO", Wiley Publishing, Inc., Indianapolis, Indiana.
2. Randal L. Schwartz, Tom Phoenix, brian d foy, "Learning Perl, Fifth Edition.

Course Code	Course Title	L	T	P	Total of L+T+P	C
PIT15303	ENTERPRISE RESOURCE PLANNING	2	2	0	4	4

OBJECTIVES:

At the end of this course the learner is expected:

1. To understand the need for ERP in business
2. To incorporate information technology in business

UNIT I - INTRODUCTION **12 Hours**

Integrated Management: Information Seamless Integration-Supply Chain Management - Integrated Data Model - Benefits of ERP-Business Engineering and ERP - Definition of Business Engineering - Principle of Business Engineering - Business Engineering with Information Technology.

UNIT II - BUSINESSS MODELLING FOR ERP **12 Hours**

Coding techniques in fault tolerant-Self checking and fail safe circuits-Fault tolerant in combinatorial and sequential circuits - Synchronous and asynchronous fail safe circuits.

UNIT III - ERP AND THE COMPETITIVE ADVANTAGE **12 Hours**

ERP domain -MPGPRO - IFS/ Avalon - Industrial and financial systems - Baan IV SAP - Market Dynamics and dynamic strategy.

UNIT IV - COMMERCIAL ERP PACKAGE **12 Hours**

Description - Multi - client server solution - Open technology - User Interface-Application Integration.

UNIT V - ARCHITECTURE **12 Hours**

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

TEXT BOOKS:

1. Vinod Kumar Garg and N. K. Venkita Krishnan, "Enterprise Resource Planning - Concepts and Practice", Prentice Hall of India, 1998 (For Unit I to III)
2. Jose Antonio Fernandz, "The SAP R/ 3 Handbook", Tata McGraw Hill, 1998(For Unit IV to V)

Course Code	Course Title	L	T	P	Total of L+T+P	C

PIT15304	MOBILE APPLICATION DEVELOPMENT LAB	0	0	4	4	2

OBJECTIVES:

At the end of this course the learner is expected :

1. Design and develop useful Android applications with compelling user interfaces by using, extending, and creating your own layouts and Views and using Menus.
2. To transfer apps to mobile.Understanding the new technology in java integrated with android.

Exercises using PhoneGap and the Android SDK using various features of Android.

Course Code	Course Title	L	T	P	Total of L+T+P	C
PIT15305	OPEN SOURCE TECHNOLOGIES LAB	0	0	4	4	2

OBJECTIVES:

At the end of this course the learner is expected:

1. To create dynamic Web pages and web platform Applications and understand Open source communities

2. To create and to use Graphical, Database objects for interactive web applications such as Cloud solutions

EXERCISES

1. Write a PHP program to store current date-time in a COOKIE and display the "Last visited on" date-time on the web page upon reopening of the same page.
2. Write a PHP program to store page views count in SESSION, to increment the count on each refresh, and to show the count on web page.
3. Using PHP and MySQL, develop a program to accept book information viz. Accession number, title, authors, edition and publisher from a web page and store the information in a database and to search for a book with the title specified by the user and to display the search results with proper headings.
4. Develop a online shopping cart application using PHP and My Sql
5. Write a Perl program to display various Server Information like Server Name, Server Software, Server protocol, CGI Revision etc.

6. Write a Perl program to insert name and age information entered by the user into a table created using MySQL and to display the current contents of this table.
7. Write perl program using input and output statements to verify password.
8. Write Perl program for
9. String manipulation
10. Arrays
11. Hashing
12. Implement Smart Matching and Process Management using Perl.

Course Code	Course Title	L	T	P	Total of L+T+P	C
PIT15E57	BUSINESS INTELLIGENCE	2	2	0	4	4

OBJECTIVES:

1. To introduce the idea of decision making in complex industrial and service environments
2. To understand the science behind better predictions and decisions
3. To generate an ability to design, analyze and perform experiments on real life problems using various Decision making methodologies.

UNIT I - INTRODUCTION AND CHARACTERISTICS OF COMPLEX BUSINESS PROBLEMS 12 Hours

Introduction to decision making methods, AHP, SAW,VIKOR,WPM MCDM,MADM methods and examples Number of Possible Solutions, Time-Changing Environment, Problem Specific Constraints , Multi-objective Problems , Modeling the Problem, A Real-World Example

UNIT II - ADAPTIVE BUSINESS INTELLIGENCE AND PREDICTION METHODS AND MODELS 12 Hours

Data Mining, Prediction, Optimization ,Adaptability,the Structure of an Adaptive Business Intelligence System ,Data Preparation, Different Prediction Methods, Mathematical Methods, Distance Methods: Logic Methods, Modern Heuristic Methods Additional Considerations, Evaluation of Models

UNIT III - MODERN OPTIMIZATION TECHNIQUES 12 Hours

Local Optimization Techniques, Stochastic Hill Climber, Simulated Annealing, Tabu Search, Evolutionary Algorithms, Constraint Handling

UNIT IV- COMPUTATIONAL INTELLIGENCE AND EXPERT TECHNIQUES IN DECISION MAKING 12 Hours

Design of an expert system for decision making using Neural Network, fuzzy logic and genetic algorithm, Classifiers, Evolutionary Computation: Ant colony optimization, Particle

UNIT V - HYBRID SYSTEMS AND ADAPTIVE BUSINESS INTELLIGENCE MARKETING 12 Hours

Hybrid Systems for Prediction, Hybrid Systems for Optimization, Adaptability, Campaigns, Manufacturing, Investment Strategies, Emergency Response Services, Credit Card Fraud

TEXT BOOKS:

1. Zbigniew Michalewicz, Martin Schmidt, Matthew Michalewicz, Constantin Chiriac ,"Adaptive Business Intelligence", Springer Publications.
2. Venkata Rao, “Decision Making in the Manufacturing Environment:Using Graph Theory and Fuzzy Multiple Attribute Decision Making Methods”, Springer publications.
3. Da Ruan, “Computational Intelligence in Complex Decision Systems”, Atlantis Press, Amsterdam Press, World Scientific.
4. Hans Jurgen Zimmermann, “ Fuzzy sets, decision making and expert system” , Kluwer Academic Publishers, Boston
5. B Carlo Vercellis “Business Intelligence: Data Mining and Optimization for Decision Making”, Wiley Publications

Course Code	Course Title	L	T	P	Total of L+T+P	C
PIT15E58	CRYPTOGRAPHY AND NETWORK SECURITY	2	2	0	4	4

OBJECTIVES:

At the end of this course the learner is expected:

1. To understand the need for cryptography in networks security.
2. To incorporate the learnt concepts in authentication application programs

UNIT I **12 Hours**

Overview – Symmetric Ciphers: Classical Encryption Techniques

UNIT II **12 Hours**

Symmetric Ciphers: Block ciphers and Data Encryption Standards. Public-key encryption and Hash Functions: Public-Key Cryptography and RSA

UNIT III **12 Hours**

Network Security Practices: Authentication applications – Electronic Mail Security

UNIT IV **12 Hours**

Network Security Practices: IP Security – Web security

UNIT V **12 Hours**

System Security: Intruders – Malicious Software – Firewalls

TEXT BOOKS:

1. William Stallings, (2003), "Cryptography and Network Security – Principles and Practices', Prentice Hall, Third Edition, (For Unit I to V)

REFERENCE BOOKS:

1. Johannes A, Buchanan, "Introduction to cryptography", Springer Verlag.
2. Atul Kahate, "Cryptography and Network Security", TMH.

Course Code	Course Title	L	T	P	Total of L+T+P	C
PIT15E59	OBJECT ORIENTED ANALYSIS & DESIGN	2	2	0	4	4

OBJECTIVES:

At the end of this course the learner is expected:

1. Develop a working understanding of normal object-oriented analysis and design processes
2. Develop an appreciation for and understanding of the risks inherent to large-scale software development
3. Develop an understanding of the application of OOAD practices from a software project

UNIT I - MODELING IN GENERAL **12 Hours**

Object Oriented development – Evidence for Usefulness of Object Oriented development - Modeling Concepts: Modeling – Abstraction - The Three Models – Overview of Unified Modeling Language and introduction to UML diagrams.

UNIT II - CLASS MODELING **12 Hours**

Class Modeling: Object and Class Concepts – Link and Association Concepts - Inheritance - Sample Class Model - Navigation of Class Models - Advanced Class Modeling: Advanced Object & Class Concepts - Association Ends -N-ary Associations – Aggregation - Abstract Classes - Multiple Inheritance –Metadata – Reification – Constraints - Derived Data – Packages.

UNIT III - DYNAMIC MODELING **12 Hours**

State Modeling: Events – States – Transitions & Conditions - State diagrams - State Diagram Behavior - Advanced State Modeling: Nested State Diagrams - Nested States - Signal Generalization – Concurrency - Sample State Model - Relation of Class & State Models - Interaction Modeling: Use Case Models - Sequence Models - Activity Models - Advanced Interaction Modeling: Use Case Relationships - Procedural Sequence Models - Special Constructs for Activity Models.

UNIT IV - SYSTEM ANALYSIS **12 Hours**

Process Overview: Development Stages - Development Life Cycle - System Conception: Devising a System Concept - Elaborating a Concept- Preparing a problem Statement - Domain Analysis: Overview of Analysis - Domain Class Model - Domain State Model - Domain Interaction Model - Iterating the Analysis - Application Analysis: Application Interaction Model -Application Class Model - State Model – Operations.

UNIT V - SYSTEM DESIGN **12 Hours**

System Design: Overview of System Design - Estimating performance - Making a Reuse plan - Breaking a System into Subsystems - Identifying Concurrency- Allocation of Subsystems - Management of Data Storage - Handling Global Resources - Choosing a Software Control Strategy - Handling Boundary Conditions -Setting Trade-off Priorities - Common Architectural Styles - Architecture of the ATM System - Class Design: Bridging the Gap - Realizing Use Cases - Designing Algorithms - Recursing Downward – Refactoring - Design Optimization - Reification of Behavior -Adjustment of Inheritance – Organizing Class Design.

TEXT BOOKS:

1. Michael Blaha and James Rumbaugh,Object-Oriented Modeling and Design with UML, Prentice Hall of India Private Limited, New Delhi. (For Units I to III)
2. Ali Bahrami, (1999), Object-oriented Systems Development using UML, McGraw Hill, Boston(For Units IV to V) .

REFERENCE BOOKS:

Object-Oriented Modeling and Design with UML,(2006) **Michael** Blaha and James Rumbaugh, Prentice Hall of India Private Limited, New Delhi.

1. Object-Oriented Analysis and Design with Applications (3rd Edition) Grady Booch,Robert A.Maksimchuk,Michael W.Engle.

Course Code	Course Title	L	T	P	Total of L+T+P	C
PIT15306	MINI- PROJECT	1	0	1	2	2

The Students can choose a topic according to the current trend, select a problem, solve it and show Demonstrations.

SEMESTER-IV

Course Code	Course Title	L	T	P	Total of L+T+P	C
PIT15401	INDUSTRIAL PROJECT	0	0	30	30	14

Review	Tentative Dates
Zeroth Review	In 2 Weeks of time
First Review	In 6 Weeks but within schedule of 1st Assessment
Second Review	In 12 Weeks but within schedule of 2nd Assessment
Third Review	In 18 Weeks but within schedule of 3rd Assessment
Viva voce	End of April

DEPARTMENT OF COMPUTER SCIENCE
M.SC (Information Technology)

S.No	Semester	Course Code	Course Title	L	T	P	Total of LTP	Credit
1		PIT15E81	PROGRAMMING IN C	1		1	2	2
2		PIT15E82	SPSS – STATISTICAL PACKAGE FOR SOCIAL SCIENCES	1		1	2	2
3	II	PIT15E83	HTML	1		1	2	2
4		PIT15E84	TALLY	1		1	2	2
5		PIT15E85	OFFICE AUTOMATION	1		1	2	2
6	III	PIT15E86	DHTML and XML	1		1	2	2

NON-MAJOR ELECTIVE PAPERS
Semester –II

Course Code	Course Title	L	T	P	Total of L+T+P	C
PIT15E81	PROGRAMMING IN C	1		1	2	2

INSTRUCTIONAL OBJECTIVES:

At the end of this course the learner is expected:

1. To acquire basic knowledge about Programming in C
2. To gather knowledge in C programming and developing programming skills
3. To strengthen the knowledge on structures, arrays etc., of C programming

UNIT I - OVERVIEW OF C (6 Hours)

Introduction- Importance of C- Basic Structure of C program- Tokens-Variables- Data types- Operators and Expression- Managing Input and Output Operators.

UNIT II - CONDITIONAL STATEMENTS (6 Hours)

If statement- switch statement- goto statement- while statement- do statement- for statement- continue statement- break statement.

UNIT III - ARRAYS (6 Hours)

One dimensional array- Two dimensional array- Multidimensional array

UNIT IV - FUNCTIONS (6 Hours)

Built in functions (Library functions): String Handling functions-User defined functions.

UNIT V – STRUCTURES AND UNIONS (6 Hours)

Structure definition- Arrays of structures- Structures and functions- Unions

TEXT BOOK

1. E. Balagurusamy, (2008), "Programming in ANSI C" , Second Edition, Tata McGraw Hill. (For Unit I to V)

REFERENCE BOOKS:

1. Kamthane Ashok.N, (2013), "Programming in C", 2nd Edition, Pearson Education.
2. Yashvant P. Kanetkar, (2008), "Let us C", 8th Edition, Infinity science press.

Course Code	Course Title	L	T	P	L+T+P	C
PIT15E82	SPSS - STATISTICAL PACKAGE FOR SOCIAL SCIENCES	1	0	1	2	2

1. Construction of Frequency tables: Univariate Frequency tables -- Cross-Tabulation
2. Graphical representation of Data: Bar diagram – Simple Bar diagram, Multiple Bar Diagram, Sub divided Bar Diagram, Histogram Pie Diagram
3. Calculation of Measures of Central Tendencies: Mean, Median and Mode, Geometric mean
4. Calculation of Methods of Dispersion - Standard Deviation, Quartiles, Skewness, Kurtosis
5. Calculation of Correlation Coefficient: (a) Karl Pearson's Correlation Coefficient, (b) Spearman's Rank Correlation Coefficient
6. Calculation of Regression Trend: (a) Trend Line
7. Test of Significance for Single and two Samples – Large Sample Test (Z-Test) (a) Test for Mean, (b) Test for Proportion, (c) Test for Standard Deviation
8. Test of Significance for Single and two Samples – Small Sample Test (t-Test, F-test) (a) Test of Mean, (b) Test of Variances
9. Non-Parametric Test (a) One –Way Chi-square test (test for Homogeneity) (b) Two–Way Chi-square test (test for Attributes)
10. Test of Homogeneity of Means for more than 2 samples (a) One –Way ANOVA (b) Two–Way ANOVA

TEXT BOOK:

1. Vijay Gupta, (1999), "SPSS for Beginners", VJBooks Inc.

Course Code	Course Title	L	T	P	L+T+P	C
PIT15E83	HTML	1	0	1	2	2

1. Develop a HTML document, which displays your name as <h1> heading and displays any four of your friends. Each of your friend's names must appear as hot text. When you click your friend's name, it must open another HTML document, which tells about your friend.
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. Design a HTML document describing you. Assign a suitable background design and background color and a text color.
4. Develop a Complete Web Page using Frames and Framesets which gives the Information about a Hospital using HTML.
2. Develop complete set of web pages to describe you skills in various areas using HTML.
3. Develop a web site to publish your family and the details of each member-using HTML.
4. Develop a HTML document to display a Registration Form for an intercollegiate function.
9. Develop a HTML document to design Alumni Registration form of your college.
10. Create a HTML table with rows and columns and split them using Rowspan and Colspan.
11. Create a web page in the format of front page of a news paper using Text links. Align the text with colors

Non Major Elective - II
Semester-III

Course Code	Course Title	L	T	P	L+T+P	C
UCS15E84	TALLY	1	0	1	2	2

OBJECTIVES:

At the end of this course, the learner is expected,,

1. To manage the company accounts through this software

1. Creating a new company
2. Creation of essential ledgers
3. Capital account
4. Purchase account
5. Sales account
6. Direct expenses
7. Cash account
8. Profit & Loss account
9. Debtors account
10. Creditors account
11. Creation of inventory
12. Stock group Unit of measure Stock item
13. Creation of ledger
    Single ledgers
    Multiple ledgers
14. Voucher posting
15. sales order
16. Making actual sales
17. Purchase order
18. Making actual purchase
19. Returns accounting for receipts and payments
20. Reports

TEXT BOOK:

1. Palanivel. V, (2008), "Tally Accounting Software", II Edition, Margham Publications, Chennai.

Course Code	Course Title	L	T	P	Total of L+T+P	C

PIT15E85	OFFICE AUTOMATION	1	0	1	2	2

OBJECTIVES:

At the end of this course the learner is expected:

1. To have clear understanding in open source softwares
2. To have hands on experience in open office

UNIT I - WRITER – THE WORD PROCESSOR (6 Hours)

Creating a Document -Opening a Document -Laying Out the Page-Setting paper size, margins, and orientation -Creating headers and footers -Numbering pages -Entering and Editing Text-Modifying text-Moving and copying text -Finding and replacing text -Correcting mistakes automatically-Printing

UNIT II - WRITER – THE WORD PROCESSOR (6 Hours)

Adding character to your characters -Planning Your Paragraphs-Aligning paragraphs -Spacing your lines -Making Lists -Bulleting lists-Numbering lists-Using a style -Creating a style - tables and columns

UNIT III - CALC – THE SPREADSHEET (6 Hours)

Creating a Spreadsheet -Inputting Your Data -Entering your data -Editing your data -Filling cells automatically -Managing Columns and Rows-Copying, pasting, cutting, dragging, and dropping your cells -Adding the Art -Formula Basics-Adding, Subtracting, and More -Adding and other arithmetic -Adding with the Sum function –

UNIT IV - CALC – THE SPREADSHEET (6 Hours)

Rocketing into Orbit with Functions Using the AutoPilot: Functions dialog box -Editing functions -Entering functions manually -Copying and pasting formulas -Creating formula arrays -Recalculating formulas -Creating Magic Formula-Nesting functions -Creating conditional formulas

UNIT V - IMPRESS – THE PRESENTATION (6 Hours)

Creating a Presentation -Opening an existing presentation -Adding Slides -Adding text to a slide -Saving Your Presentation for Posterity - Making Presentations Picture Perfect -Adding Images -Clipping art -Drawing objects -Coloring Backgrounds -Creating a plain-colored background -Creating a gradient background -Hatching a background -Using a bitmap image as a background -Creating 3-D text-Inserting 3-D objects -Animating Impressively -Using Text Effects Effectively -Creating Animation Effects -Creating Animated GIF files -Adding Slide Transition Effects - Showing a Presentation -Setting slide timing -Hiding slides -Specifying slide show settings -Delivering a Slide Show .

TEXT BOOKS:

1. Keir Thomas and Andy Channelle with Jaime Sicam, (2009), "Beginning Ubuntu Linux" , Apress.(Unit I & II)
2. Gurdy Leete, Ellen Finkelstein and Mary Leete (2004), "Openoffice.org for dummies", Wiley Publishing, Inc.(Unit III,IV & V)

REFERENCE BOOK

1. Andy channelle, (2009), "Beginning OpenOffice 3", Aprèss.

Course Code	Course Title	L	T	P	L+T+P	C
PIT15E86	DHTML and XML	1	0	1	2	2

UNIT - I

Intro, DHTML coding, examples, Pong Program, Database Design - Normalization Readings, Pong

UNIT - II

Normalization, Database Design, ASP and SQL examples, XML, DOM and XSL, Database examples- Normalization practice - XML resume with DOM, XSL

UNIT - III

Normalization and XML review, Intro to Java, Basic applet IO, control structures, methods, tracing the runtime stack - Applet In, Applet Out, Km to miles - Read and write code examples

UNIT - IV

2 dim arrays, OOP, multiple classes, inheritance and polymorphism, arrays of classes - Magic Square Rollodex

UNIT - V

Final, Programming help, Data Structures, Dynamic Memory, Recursion

TEXT BOOKS:

1. Robert B. Mellor Franklin, (2003), "DHTML: Learning by Example", Beedle & Associates, Incorporate.
2. Williamson, (2001), "Xml: The Complete Reference", Tata McGraw-Hill Education.