M. Sc. IT
(INFORMATION TECHNOLOGY)
SYLLABUS - 2014

SCHOOLS OF EXCELLENCE
with
CHOICE BASED CREDIT SYSTEM (CBCS)

SCHOOL OF COMPUTING SCIENCES
St. JOSEPH'S COLLEGE (Autonomous)
Accredited at 'A' Grade (3rd Cycle) by NAAC
College with Potential for Excellence by UGC
TIRUCHIRAPPALLI - 620 002, INDIA

SCHOOLS OF EXCELLENCE WITH CHOICE BASED CREDIT SYSTEM (CBCS)

POST GRADUATE COURSES

St. Joseph's College (Autonomous), a pioneer in higher education in India, strives to work towards the academic excellence. In this regard, it has initiated the implementation of five "Schools of Excellence" from this academic year 2014 – 15, to standup to the challenges of the 21st century.

Each School integrates related disciplines under one roof. The school system allows the enhanced academic mobility and enriched employability of the students. At the same time this system preserves the identity, autonomy and uniqueness of every department and reinforces their efforts to be student centric in curriculum designing and skill imparting. These five schools will work concertedly to achieve and accomplish the following objectives.

- Optimal utilization of resources both human and material for the academic flexibility leading to excellence.
- Students experience or enjoy their choice of courses and credits for their horizontal mobility.
- The existing curricular structure as specified by TANSCHE and other higher educational institutions facilitate the Credit-Transfer Across the Disciplines (CTAD) - a uniqueness of the choice based credit system.
- Human excellence in specialized areas
- Thrust in internship and / or projects as a lead towards research and
- The **multi-discipline** nature of the newly evolved structure (School System) caters to the needs of stake-holders, especially the employers.

What is Credit system?

Weightage to a course is given in relation to the hours assigned for the course. Generally one hour per week has one credit. For viability and conformity to the guidelines credits are awarded irrespective of the teaching hours. The following Table shows the correlation between credits and hours.

However, there could be some flexibility because of practical, field visits, tutorials and nature of project work.

For PG courses a student must earn a minimum of 110 credits. The total number of courses offered by a department is given above. However within their working hours few departments / School can offer extra credit courses.

SUMMARY OF HOURS AND CREDITS
PG COURSES - INFORMATION TECHNOLOGY

Part	Semester	Specification	No. of Courses	Hours	Credits	Total Credits
1	I-IV	**Core Courses** Theory Practical	 8 6	 38 18	 29 12	
	II	**Self Paced Learning**	1	-	2	
	III	**Common Core**	2	10	8	**81**
	IV	**Comprehensive Examination**	1	-	2	
	IV	**Dissertation & Viva Voce**	2	30	28	
2	III-IV	**Core Electives**	3	12	12	**12**
3	I-III	**IDC (WS)** **IDC (Common)** **IDC (BS)**	1 1 1	4 4 4	4 4 4	**12**
4	I-IV	**Additional Core Courses**	-	-	-	
5	IV	SHEPHERD & Gender Studies	-	-	5	**5**
		TOTAL		**120**		**110**

IDC – Inter Departmental Courses
BS – Between School
WS – Within School
Total Hours : 120
Total Credits : 110

However, there could be some flexibility because of practicals, field visits, tutorials and nature of project work. For PG courses a student must earn a minimum of 110 credits. The total number of courses offered by a department is given above. However within their working hours few departments / School can offer extra credit courses.

Course Pattern

The Post Graduate degree course consists of five vital components. They are cores courses, core electives, additional core courses, IDC's and SHEPHERD. Additional Core courses are purely optional on the part of the student. SHEPHERD, the extension components are mandatory.

CORE COURSE

A core course is the course offered by the parent department related to the major subjects, components like theories, practicals, self paced learning, common core, comprehensive examinations, dissertations & viva voce, field visits, library record form part of the core courses.

CORE ELECTIVE

The core elective course is also offered by the parent department. The objective is to provide choice and flexibility within the School. There are three core electives. It is offered in different semester according to the choice of the school.

ADDITIONAL CORE COURSES (If any)

In order to facilitate the students gaining extra credit, the additional core courses are given. The students are encouraged to avail this option of enriching with the extra credits.

INTER DEPARTMENTAL COURSES (IDC)

IDC is an interdepartmental course offered by a department / School for the students belonging to other departments / school. The objective is to provide mobility and flexibility outside the parent department / School. This is introduced to make every course multi-disciplinary in nature. It is to be chosen from a list of courses offered by various departments.

There are three IDC's. Among three, one is the Soft-Skill course offered by the JASS in the II Semester for the students of all the Departments. The other one is offered "With-in the school" (WS) and the third one is offered "Between the school" (BS). The IDC's are of application oriented and inter disciplinary in nature.

Subject Code Fixation

The following code system (9 characters) is adopted for Post Graduate courses:

14	PXX	X	X	XX
↓	↓	↓	↓	↓
Year of Revision	PG Code of the Dept	Semester of the Part	Specification of Part	Running number in the part
14	**PIT**	**1**	**1**	**01**

For Example :

I M.Sc. Information Technology, first semester, C++ and Data Structures
The code of the paper is 14PIT1101.
Thus, the subject code is fixed for other subjects.

Specification of the Part

1. Core Courses: (Theory, Practical, Self paced Learning, Common Core, Comprehensive Examination, Dissertation and Viva-voce)
2. Core Electives
3. Additional Core Courses (if any)
4. Inter Departmental Courses (WS, Soft Skill & BS)
5. SHEPHERD & Gender Studies

EXAMINATION

Continuous Internal Assessment (CIA):

PG - Distribution of CIA Marks	
Passing Minimum: 50 Marks	
Library Referencing	5
3 Components	35
Mid-Semester Test	30
End-Semester Test	30
CIA	**100**

MID-SEM & END – SEM TEST

Centralised – Conducted by the office of COE

1. Mid-Sem Test & End-Sem Test: (2 Hours each); will have Objective + Descriptive elements; with the existing question pattern PART-A; PART-B; and PART-C
2. CIA Component III for UG & PG will be of 15 marks and compulsorily objective multiple choice question type.
3. The CIA Component III must be conducted by the department / faculty concerned at a suitable computer centres.
4. The 10 marks of PART-A of Mid-Sem and End-Sem Tests will comprise only: OBJECTIVE MULTIPLE CHOICE QUESTIONS; TRUE / FALSE; and FILL-IN BLANKS.
5. The number of hours for the 5 marks allotted for Library Referencing/ work would be 30 hours per semester. The marks scored out of 5 will be given to all the courses (Courses) of the Semester.

SEMESTER EXAMINATION

Testing with Objective and Descriptive questions

Part-A: 30 Marks

Objective MCQs only

Answers are to be marked on OMR score-sheet. The OMR score-sheets will be supplied along with the Main Answer Book. 40 minutes after the start of the examination the OMR score-sheets will be collected.

Part-B + C = 70 Marks

Descriptive

Part-B: 5 x 5 = 25 marks; inbuilt choice;

Part-C: 3 x 15 = 45 marks; 3 out of 5 questions, open choice.

The Accounts Paper of Commerce will have

Part-A: Objective = 25

Part-B: 25 x 3 = 75 marks.

Duration of Examination must be rational; proportional to teaching hours 90 minute-examination / 50 Marks for courses of 2/3 hours/week (all Part IV UG Courses) 3-hours examination for courses of 4-6 hours/week.

EVALUATION

Percentage Marks, Grades & Grade Points

UG (Passing minimum 40 Marks)

Qualitative Assessment	Grade Points	Grade	Mark Range %)
Exemplary	10	S	90 & above
Outstanding	9	A+	85-89.99
Excellent	8	A	80-84.99
Very Good	7	B	70-79.99
Good	6	C	60-69.99
Pass (PG)	5	D	50-59.99
RA (PG)	0	RA	< 50

CGPA - Calculation

Grade Point Average for a semester is calculated as indicated here under:

$$\frac{\text{Sum total of weighted Grade Points}}{\text{Sum of Gredits}}$$

Weighted Grade Points is ***Grade point x Course Credits.*** The final CGPA will only include: Core, Core Electives & IDCs.

A Pass in SHEPHERD will continue to be mandatory although the marks will not count for the calculation of the CGPA.

POSTGRADUATE		
CLASS	Mark Range (%)	
	ARTS	SCIENCES
Distinction	75 & above, first attempt	80 & above, first attempt
First	60 - 74.99	60 - 79.99
Second	50 - 59.99	50 - 59.99

Declaration of Result:

Mr./Ms. _____ has successfully completed the Post Graduate in _____ programme. The candidate's Cumulative Grade Point Average (CGPA) is _____ and the class secured _____ by completing the minimum of 110 credits.

The candidate has also acquired _____ (if any) additional credits from courses offered by the parent department.

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M. Sc. INFORMATION TECHNOLOGY

Course Pattern - 2014 Set

Sem.	Code	Course	Hrs.	Crs
I	14PIT1101	C++ and Data Structures	5	4
	14SCS3102	Database Systems	5	4
	14PIT1102	Operating Systems	5	4
	14PIT1103	Software Engineering	5	4
	14PIT1104	Software Lab - I(C++ and Data Structures)	3	2
	14PIT1105	Software Lab - II(RDBMS)	3	2
	14PIT1201 A	Core Elective I: OOAD & UML OR	4	4
	14PIT1201 B	Core Elective I: Linux Administration		
		Total for Semester I	***30***	***24***
II	14PIT2106	Web Development with ASP.NET	5	4
	14PIT2107	JAVA Programming	5	4
	14PIT2108	Software Lab - III (ASP.NET)	3	2
	14PIT2109	Software Lab - IV(JAVA)	3	2
	14PIT2202 A	Core Elective II: Mobile Computing OR	4	4
	14PIT2202 B	Core Elective II: Data Warehousing & Data Mining		
	14PIT2110	Self-paced Learning: Open Source Technology	--	2
	14PSS2401	IDC : Soft Skills	4	4
	14PIT2401	IDC (WS): Wireless Networks	4	4
	14PIT2111	Technical Aptitude	2	1
		Total for Semester II	***30***	***27***
III	14PIT3112	PHP with MYSQL	5	4
	14PIT3113	Data Communication Networks	5	4
	14PIT3114	J2EE	5	4
	14PIT3115	Software Lab – V (PHP with MYSQL)	3	2
	14PIT3116	Software Lab – VI (J2EE)	3	2
	14PIT3203 A	Core Elective III: Web Design OR	4	4
	14PIT3203 B	Core Elective III: Cloud Computing		
	14PIT3402	IDC (BS): Business Trends in IT	4	4
	14PIT3117	Mini Project (II Semester Vacation)	-	8
	14PIT3118	Comprehensive Examination	-	2
		Library	1	
		Total for Semester III	***30***	***34***
IV	14PIT4119	Project Dissertation and Viva Voce	30	20
		Total for Semester IV	***30***	***20***
	14PCW4501	SHEPHERD & Gender Studies		5
		Total for All Semesters	**120**	**110**

Sem. I **Hours/Week: 5**

14PIT1101 **Credits: 4**

C++ AND DATA STRUCTURES

Objective

* To develop the programming skills in C++ language and to understand the basic principles of data structures and algorithms

Unit I **12 HRS**

Principles of OOP - Beginning with C++ - Token, Expressions and Control Statements - Functions.

Unit II **12 HRS**

Classes and Objects - Constructor and Destructors - Operator Overloading and Type Conversion-Inheritance.

Unit III **12 HRS**

Polymorphism - Friend Function - Virtual Function - Working with Files - Templates - Exception Handling.

Unit IV **12 HRS**

DATA STRUCTURES: Stack - Queue - Linked List -Evaluation of Expression - Tree -Binary Trees and Traversal SEARCHING: Linear - Binary - Hash.

Unit V **12 HRS**

SORTING: Bubble Sort - Insertion Sort - Selection Sort - Heap Sort - Quick Sort.ALGORITHM DESIGN TECHNIQUES: Greedy Algorithm (Minimum Spanning Tree), Divide and Conquer (Merge Sort), Dynamic Programming (All Pairs Shortest Path) - Back Tracking (Eight Queens) - Recursion (Tower of Hanoi).

TEXT BOOKS

1. E.Balagurusamy,"Object Oriented Programming with C++", TATA McGraw Hill,4th Ed., New Delhi, 2007. UnitS: I, II & III.
2. Ellis Horowitz and Sartaj Sahni,"Fundamentals of Data Structures", Galgotia, 2005. Unit: IV
3. Nicklaus Wirth,"Alogorithms +Data Structure=Programs", PHI, New Delhi, 2002. Unit: V

BOOKS FOR REFERENCE

1. Robert Lafore,"Object -Oriented Programming in Microsoft C++", Golgotia Publications, New Delhi, 2003.
2. Aho, Hopcropt, Ullman, "Design and Analysis of Computer Algorithms", Pearson Education, New Delhi, 4th Ed., 2009.

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Sem. I **Hours/Week: 5**
14SCS3102 **Credits: 4**

DATABASE SYSTEMS

Objective

* To give a detailed knowledge about the different approaches to the Database Systems giving emphasis to Relational Approach and Concurrency Management.

Unit I **12 HRS**

INTRODUCTION TO DBS: Basic Concepts and Definitions - Data Dictionary - Database System - DBA - Database Languages - Database System Architecture: Schemas, Sub-schemas and Instances - Three-level Architecture - Data Independence - Mappings -Data Models - Types - ER Model - Specialization and Generalization . RELATIONAL ALGEBRA AND CALCULUS: Structure - Relational Algebra - Relational Calculus.

Unit II **12 HRS**

RELATIONAL QUERY LANGUAGES: Introduction - Codd's Rules - Information System Based Language - Structured Query Language (SQL) - Embedded SQL.

Unit III **12 HRS**

NORMALIZATION: Introduction to Database Design - Functional Dependency and Decomposition - Normalization - Normal Forms - BCNF - Multi-valued and Join Dependencies.

Unit IV **12 HRS**

PL/SQL:History - Fundamentals -Data types - Operators - Control Structures - Nested Blocks - SQL in PL/SQL - Data Manipulation - Transaction Control Statements - PL/SQL Cursors and Exceptions. NAMED BLOCKS: Procedures - Functions - Packages -Triggers.

Unit V **12 HRS**

Transaction Processing and Concurrency Control - Database Recovery System - Database Security. PARALLEL DATABASE SYSTEMS: Introduction to Parallel Databases - Architecture - Key Elements of Parallel Database Processing -Distributed Databases - Architecture - Distributed Database design.

TEXT BOOKS

1. S K Singh, "Database Systems Concepts, Design and Applications", Pearson Education, 2006. UnitS: I, II, III & V
2. Nilesh Shah, "Database Systems using ORACLE", Prentice Hall of India, 2005. Unit: IV

BOOKS FOR REFERENCE

1. Abraham Silberschatz, " Database Systems", McGraw Hill International, 1997.
2. CJ Date, "An Introduction to Database Systems", 6th Ed., Addison Wesley Publishing Company, New York, 1995.

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Sem. I **Hours/Week: 5**
14PIT1102 **Credits: 4**

OPERATING SYSTEMS

Objective

* To provide the basic concepts of an Operating System and explore Windows Operating System using WIN32 API with MFC and the rudiments of UNIX Operating System.

Unit I **12 HRS**

INTRODUCTION: Operating System - Mainframe Systems - Multiprocessor Systems - Distributed Systems - Real Time Systems - Hand Held Systems. OPERATING SYSTEM STRUCTURES: System components - System calls - Virtual Machines. PROCESS: Process Concept - Operation on Processes. CPU SCHEDULING: Basic concepts -Scheduling Algorithms - Real Time Scheduling.

Unit II **12 HRS**

PROCESS SYNCHRONIZATION: Background - Critical Selection Problem- Semaphores. DEADLOCKS: Methods for Handling Deadlocks - Deadlock Avoidance -Recovery from Deadlock. MEMORY MANAGEMENT: Background -Swapping-Paging - Segmentation with Paging. VIRTUAL MEMORY: Demand Paging - Page Replacement - Allocation of Frames - Thrashing.

Unit III **12 HRS**

FILE-SYSTEM INTERFACE: File Concept - Access Methods - Directory Structure. FILE SYSTEM IMPLEMENTATION: File-System Structure - Directory Implementation - Allocation Methods - Efficiency and Performance - Recovery.MASS-STORAGE STRUCTURE: Disk Structure - Disk Scheduling - Swap-Space Management.

Unit IV **12 HRS**

SECURITY: The Security Problem - User Authentication - Program Threats - System Threats - Securing Systems and Facilities.FUNDAMENTALS OF WINDOWS AND MFC: Windows programming Model - Introduction to MFC - MFC Application - Drawing in a window: Windows GDI - Drawing with GDI.

Unit V **12 HRS**

UNIX - INTRODUCTION TO THE KERNEL: Architecture of the UNIX OS - Introduction to System Concepts - Kernel Data Structure. SYSTEM CALLS

FOR THE FILE SYSTEM: Open - Read - Write - File and Record Locking - Adjusting the Position of File I/O -LSEEK - Close - File Creation - Creation of Special Files - Pipes - Dup - Mounting and Unmounting File Systems.

TEXT BOOKS

1. Abraham Silberschatz, Peter Bear Galvin and Greg Gagne, “Operating System Concepts”, 6th Ed., John Wiley & Sons Inc, 2007. UnitS: I, II & III
2. Jeff Proise, “Programming Windows with MFC”, 2nd Ed., Microsoft Press, 2003. Unit: IV
3. Maurice J.Bach,”The Design of The Unix OS”, PHI Learning Private Ltd, New Delhi, 2009. Unit: V

BOOKS FOR REFERENCE

1. Harvey M. Deitel, “An Introduction to Operating System”, Addison Wesley, New York,1999.
2. Shirly Wodtke, “Learn MFC C++ Classes”, BPB Publications, New Delhi, 1997.
3. Graham Glass, King Ables, “Unix for Programmers and Users”, 3rd Ed., Pearson Education India, 2003.

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Sem. I **Hours/Week: 5**
14PIT1103 **Credits: 4**

SOFTWARE ENGINEERING

Objective

* To provide the basic concepts of Software Engineering, Various models, Software Design, Software Development and Various Testing Strategies.

UNIT I **12 HRS**

SOFTWARE ENGINEERING: Software Engineering - A Layered Technology - A Process Framework - CMMI - PROCESS MODELS: Prescriptive Models - The Waterfall Model - Incremental Process Model - Evolutionary Process Model - Specialized Process Model. SYSTEM ENGINEERING: The System Engineering Hierarchy. REQUIREMENTS ENGINEERING: Requirements Engineering Tasks - Initiating the Requirements Engineering Process.

Unit II **12 HRS**

BUILDING THE ANALYSIS MODEL: Requirements Analysis - Data Modeling Concepts - Flow Oriented Modeling. DESIGN ENGINEERING: Design Process - Design Concepts - Design Model. ARCHITECTURAL DESIGN: Software Architecture - Architectural Styles and Patterns - Architectural Design. COMPONENT- LEVEL DESIGN: Component - Designing Class Based Components. UI DESIGN: The Golden Rules - UI Analysis and Design.

Unit III **12 HRS**

METRICS FOR PROCESS AND PROJECTS: Metrics in the Process and Project Domains - Software Measurement - Metrics for Software Quality. ESTIMATION FOR SOFTWARE PROJECT: Resources - Decomposition Techniques. PROJECT SCHEDULING: Project Scheduling - Defining a Task Set for the Software Project.

Unit IV **12 HRS**

RISK MANAGEMENT: Software Risks - Risk Identification - Risk Projection. QUALITY MANGEMENT: Quality Concepts - Software Quality Assurance - Formal Technical Reviews - Software Reliability. CHANGE MANAGEMENT: Software Configuration Management - The SCM Process.

Unit V **12 HRS**

SOFTWARE TESTING: A Strategic Approach to Software Testing - Test, Test Case and Test Suite - Verification and Validation - Alpha, Beta and Acceptance Testing - Functional Testing - Structural Testing - Levels of Testing - Validation Testing - The Art of debugging - Testing Tools.

TEXT BOOKS

1. Roger S. Pressman, “Software Engineering - A Practitioners Approach”, McGraw Hill International, 6th Ed., 2005. UnitS: I, II, III &IV
2. K.K. Aggarwal, Yogesh Singh, “Software Engineering”, 3rd Ed., New Age International Publishers, 2008. Unit: V

BOOKS FOR REFERENCE

1. Ian Sommerville, “Software Engineering”, 8th Ed., Pearson Education, South Asia, 2009.
2. SrinivasanDesikan and Gopalasamy Ramesh, “Software Testing for Principles and Practices”, Pearson Education, South Asia, 2007.

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Sem. I **Hours/Week: 3**
14PIT1104 **Credits: 2**

Software Lab-I:

C++ AND DATA STRUCTURES

C++

1. Classes and Objects
2. Constructors and Destructors
3. Operator Overloading
4. Inheritance
5. Polymorphism
6. File I/O Operations

DATA STRUCTURES

7. Stack Operation
8. Queue Operation
9. Linked List
10. Tree Traversal
11. Sorting
12. Searching

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Sem. I **Hours/Week: 3**
14PIT1105 **Credits: 2**

Software Lab-II:

RDBMS

SQL

1. Simple Queries using DDL, DML, and DCL
2. SQL Functions
3. SET Operations
4. View and Snapshots
5. Nested Queries

PL/SQL

6. PL/SQL Block
7. Cursors
8. Database Triggers
9. Subprograms and Packages.

FORMS AND REPORTS

10. Designing Oracle Forms with Menus, Buttons and LOVs
11. Master-Detail Form Design.
12. Developing Oracle Reports (Tabular, Master / Detail, Matrix and Mailing label)

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Sem. I **Hours/Week: 4**
14PIT1201A **Credits: 4**

Core Elective-I:

'OOAD' AND 'UML'

Objective

* To impart the concepts of Object Oriented Methodologies and Unified Modeling Language.

Unit I **10 HRS**

INTRODUCTION: An Overview of Object Oriented Systems Development - Object Basics - Object Oriented Systems Development Life Cycle. OBJECT ORIENTED METHODOLOGIES: Rumbaugh Methodology - Booch Methodology - Jacobson Methodology - Unified Approach.

Unit II **10 HRS**

OBJECT ORIENTED ANALYSIS: Identifying Use Cases - Object Analysis - Classification - Identifying Object Relationships - Attributes and Methods. OBJECT ORIENTED DESIGN: Object Oriented Design Process and Design Axioms - Designing Classes.

Unit III **10 HRS**

UML: Introduction-Importance of Modeling - Principles of Modeling- Object oriented Modeling- Introducing UML. BASIC STRUCTURAL MODELING: Classes -Relationships-Common Mechanisms- Diagrams - Class Diagrams.

Unit IV **10 HRS**

BASIC BEHAVIORAL MODELING: Interactions- Use Cases -Use Case Diagrams-Interaction Diagram - Activity Diagram. ADVANCED BEHAVIORAL MODELING: State Diagrams.

Unit V **10 HRS**

ARCHITECTURAL MODELING: Artifacts - Deployments - Collaborations - Patterns and Frame works- Artifacts Diagrams- Deployment Diagrams.

TEXT BOOKS

1. Ali Bahrami, "Object Oriented systems Development", Irwin - McGraw Hill, New Delhi, 2008. CHAPTERS: 1-3, 4, 6-10. UnitS: I & II
2. Grady Booch, James Rambaugh, Ivar Jacobson" The Unified Modeling Language User Guide" Pearson Education, New Delhi, 2004. Chapters: 1, 2, 4, 5-20, 25, 26, 28, 30-32. UnitS: III, IV & V

BOOK FOR REFERENCE

1. James Rumbaugh, Ivar Jacobson, Grady Booch "The Unified Modeling Language Reference Manual", Addison Wesley, 1999.

Sem. I **Hours/Week: 4**
14PIT1201B **Credits: 4**

Core Elective-I:

LINUX ADMINISTRATION

Objective

* To understand the principles of Linux Operating System for effective System administration.

Unit I **10 HRS**

LINUX INTRODUCTION AND INSTALLATION: Linux - Advantages -Red Hat Linux-New Features-Installation Procedures and Methods.

Using Desktop - GNOME - KDE - Linux Commands.

ACCESSING AND RUNNING APPLICATIONS: Installing Red Hat Linux Applications - Running Window Application - Running Windows, DOS and Macintosh Applications - Tools for using Internet and Web.

Unit II **10 HRS**

ADMINISTRATION: Understanding System Administration: Root login-super user - GUI tools, commands and Log files - Configuring Hardware - File System and Disk Management - Monitoring performances.

SETTING UP AND SUPPORTING USERS: Creating user accounts - Setting user defaults - Creating Desktops-Modifying and Deleting Accounts.

Unit III **10 HRS**

SECURITY ISSUES: Hacker versus Cracker-Password Protection-Protection from Break-in-Filtering Network Access -Firewalls- Detecting Instructions - Encryption Techniques.

Unit IV **10 HRS**

NETWORKING: Setting up a LAN- LAN- Wireless-LAN- Understanding IP Addresses. CONNECTING TO INTERNET: Dialup Connection- Red Hat Linux as a Router-VPN Connection-Red Hat Linux as a Proxy Server-Proxy Clients.

Unit V **10 HRS**

SETTING UP FILE SERVER:

Setting up- Netware File Server. SETTING UP A WEB SERVER:Web Server-

Starting Apache Web Server -Configuring Apache Server -Starting and Stopping the Server - Monitoring Activities.

TEXT BOOKS

1. Christopher Negus “Red Hat Linux 9 Bible “, WILEY - Dreamtech India Pvt. Ltd, New Delhi, First Edition, 2003

BOOK FOR REFERENCE

1. Thomas Schenk, “Red Hat Linux System Administration”, Techmedia, New Delhi, 2003.

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Sem. II **Hours/Week: 5**
14PIT2106 **Credits: 4**

WEB DEVELOPMENT WITH ASP•NET

Objective

To provide the fundamental concepts of ASP.NET programming and a brief introduction about XML & Web Services.

Unit I **12 HRS**

INTRODUCTION: The .NET Framework - Learning .NET Languages - Understanding Namespaces & Assemblies - Setting up ASP.NET and IIS. USING VISUAL STUDIO.NET: Starting VS.NET Project - Web Form Designer - Writing Code - VS.NET Debugging.

Unit II **12 HRS**

WEB CONTROLS: Stepping Up to Web Controls - Web Control Classes - AutoPostBack and Web Control Events. VALIDATION & RICH CONTROLS: Calendar - AdRotator - Validation Controls - Server Side Validation - Understanding Regular Expression. STATE MANAGEMENT:View State - Transferring Information-Cookies - Session State - Session State Configuration - Application State.

Unit III **12 HRS**

ADO.NET OVERVIEW: Characteristics of ADO.NET - ADO.NET Object Model-ADO.NET DATA ACCESS:Creating a Connection - Using Command with Data Reader - Updating Data - Accessing Disconnected Data. DATALIST AND DATAGRID - Using Templates with DataList - Data Binding with Multiple Templates - Selecting Items - Editing Items - Paging with DataGrid - Sorting with DataGrid.

Unit IV **12 HRS**

USING XML: XML Basics - XML Classes - XML Validation - XML Display and Transforms - XML in ADO.NET. CACHING AND PERFORMANCE TUNING: Caching - Data Caching - AJAX.

Unit V **12 HRS**

WEB SERVICES ARCHITECTURE: Internet Programming Then and Now - WSDL - SOAP - Communicating With a Web Service - Web Service Discovery and UDDI. CREATING WEB SERVICES:Web Service Basics - StockQuote Web Service - Documenting Web Service - Testing Web Service

TEXT BOOKS

1. Mathew MacDonald, “ASP.NET: The Complete Reference”, Tata McGraw Hill Ltd, New Delhi, 2008.

BOOK FOR REFERENCE

1. C. Muthu, “ASP.NET”, Shalom InfoTech Pvt. Ltd., 2011.

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Sem. II **Hours/Week: 5**
14PIT2107 **Credits: 4**

JAVA PROGRAMMING

Objective

* To understand the power of Java language and advanced concepts of Java.

Unit I **12 HRS**

INTRODUCING CLASSES: Class Fundamentals - Declaring Object - Assigning Object Reference Variables - Introducing Methods - Constructors - this Keyword - Garbage Collection - finalize( ) Method. METHODS AND CLASSES: Overloading Methods - Using Objects as Parameters - Argument Passing - Returning Object - Recursion - Access Control - Understanding Static - Introducing final - Nested and Inner Classes - Exploring the string Class. INHERITANCE: Inheritance Basics - Using super - Creating a Multilevel Hierarchy - When Constructor are Called - Method Overriding - Using Abstract Classes - Using final with Inheritance - Object Class.

Unit II **12 HRS**

PACKAGES AND INTERFACES: Packages - Access Protection - Importing Packages - Interfaces. EXCEPTION HANDLING: Fundamentals - Types - Uncaught Exceptions - Using try and catch - Multiple catch Clauses - Nested try Statements - throw - throws - finally - Java’s Built-in Exceptions. INPUT AND OUTPUT: Java I/O Classes and Interfaces - File - Stream Classes - Byte Streams - Character Streams - Serialization - Stream benefits.

Unit III **12 HRS**

SWING: JApplet - Icons and Labels - Text Fields - Buttons - Combo Boxes - Tabbed Panes - Scroll Panes - Tress - Tables. APPLET CLASS: Applet Basics - Applet Architecture - Applet Skeleton - Simple Applet Display Methods- Requesting Repainting - Using the Status Window - HTML APPLET Tag - Passing Parameters to Applets - getDocumentBase( ) and getCodeBase( ) - AppletContext and showDocument( ).

Unit IV **12 HRS**

MULTITHREADED PROGRAMMING: Java Thread Model - Main Thread - Creating a Thread - Creating Multiple Threads - Using isAlive( ) and join( ) - Thread Priorities - Synchronization - Inter Thread Communication - Suspending, Resuming, and Stopping Threads.JAVA DATABASE CONNECTIVITY: Establishing a Connection - Creation of Data Tables - Entering Data into the Tables - Table Updating.

Unit V **12 HRS**

NETWORKING: Networking Basics - InetAddress - TCP/IP Client Sockets - URL - URL Connection - TCP/IP Server Sockets - Datagrams. JAVA BEANS: What is a Java Beans? - Advantages - Application Builder Tools - Using the Bean Developer Kit (BDK) - JAR Files - Developing a Simple Bean using the BDK - Java Bean API. SERVLET: Life cycle of a Servlet - Using Tomcat for Servlet Development - Simple Servlet - Servlet API - javax.servlet Package - Reading Servlet Parameters - javax.servlet.http Package - Handling HTTP Requests and Responses - Using Cookies - Session Tracking - Security Issues.

TEXT BOOKS

1. Herbert Schildt, "Java 2: Complete Reference", Tata McGraw Hill, 5th Ed., 2009.
2. C. Muthu, "Programming with JAVA", Vijay Nicole Imprints Private Limited, 2nd Ed., 2011 (for Unit IV: JDBC)

BOOKS FOR REFERENCE

1. Deitel & Deitel, "Java How to Program", PHI, 8th Ed.
2. Kogent Learning Solution, "Java 6 Programming Black Book", Dreamtech Press, 2007.

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Sem. II **Hours/Week: 3**
14PIT2108 **Credits: 2**

Software Lab-III:
ASP•NET

1. Form Design using Various Web Controls
2. Ad Rotator and Calendar Control, Login Control (Page Should Expire after 3 wrong attempts)
3. Validation Controls
4. Cookie Manipulation
5. State Management (using Session and Application)
6. Data Retrieval, Updating using ADO.NET (using Stored Procedure)
7. Template Creation using DataList and DataGrid
8. Sorting and Paging using DataGrid
9. Day Planner Preparation using XML and ADO.NET
10. Data Caching
11. Partial Page Refresh using AJAX
12. Creating and Testing a Simple Web Service.

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Sem. II **Hours/Week: 3**
14PIT2109 **Credits: 2**

Software Lab-IV:
JAVA

1. Classes and Objects
2. Constructors and Method Overloading
3. Inheritance and Method Overriding
4. Packages and Interfaces
5. Input / Output streams
6. Swings
7. Applet
8. Multithreading
9. JDBC
10. Networking
11. Java Beans
12. Servlet

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Sem. II **Hours/Week: 4**
14PIT2202A **Credits: 4**

Core Elective-II:

MOBILE COMPUTING

Aim

* To understand the basic concepts and methods for building distributed and mobile computing systems

Unit I **10 HRS**

INTRODUCTION: Mobile Computing - Developing Mobile Computing Applications - Standard Bodies. MOBILE COMPUTING ARCHITECTURE: Design Considerations for Mobile Computing - Mobile Computing through Internet - Making Existing Applications Mobile Enabled. EMERGING TECHNOLOGIES:Bluetooth - RFID - WIMAX - Mobile IPV6.

Unit II **10 HRS**

GLOBAL SYSTEM FOR MOBILE COMMUNICATION (GSM): GSM Architecture - GSM Entities - Call Routing in GSM - Mobility management. GENERAL PACKET RADIO SERVICE (GPRS): GPRS Network Architecture - GPRS Network Operations - Data Services in GPRS - Applications of GPRS - Limitations of GPRS - Wireless Application Protocol (WAP). CDMA AND 3G: CDMA Versus GSM - Wireless Data - 3G Network - 3G Applications.

Unit III **10 HRS**

WIRELESS LAN: Advantages of Wireless LAN - IEEE 802.11 Standards - Wireless LAN Architecture - Mobility in Wireless LAN - Deploying Wireless LAN - Mobile AdHoc Networks and Sensor Networks - Wireless LAN Security. INTELLIGENT NETWORKS: Fundamentals of Call Processing - Intelligence in the Networks.CLIENT PROGRAMMING: Moving Beyond the Desktop - Mobile Phones - Features - PDA - Design Considerations.

Unit IV **10 HRS**

PROGRAMMING FOR PALM OS: Palm OS Architecture - Application Development. WIRLESS DEVICES WITH SYMBIAN OS: Symbian OS Architecture - Applications of Symbian. J2ME: Java in the Handset - J2ME Technology - Programming for CLDC - GUI in MIDP - UI Design Issues. WIRELESS DEVICES WITH WINDOWS CE: Windows CE Architecture- Windows CE Development Environment.

Unit V **10 HRS**

VoIP AND CONVERGENCE: VoIP - Real time Protocols - Convergence Technologies - Call Routing - VoIP Applications - IP Multimedia Subsystem

(IMS) - Mobile VoIP. SECURITY ISSUES: Information Security - Security Techniques and Algorithms - Security Protocols - PKI - Security Models - Security Frameworks for Mobile Environment.

TEXT BOOKS

1. Asoke K Taulkder, Hasan Ahmed, Roopa R Yavagal, “Mobile Computing Technology, Applications and Service Creation”, 2nd Ed., TMH Pvt. Ltd., 2011.

BOOK FOR REFERENCE

1. Raj Kamal, “Mobile Computing”, Oxford University Press, 2007.

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Sem. II **Hours/Week: 4**
14PIT2202B **Credits: 4**

Core Elective-II:

DATA WAREHOUSING AND DATA MINING

Objective

To provide an understanding of Data warehouses and Data Mining concepts.

Unit I **10 HRS**

INTRODUCTION : Data Mining What, Why - Data Mining Process - Applications - Techniques - Case Studies - Future of Data Mining - Guidelines for successful Data Mining - Data Mining Software. DATA WAREHOUSING: Introduction - Operational Data Stores - ETL - Data Warehouses, Design, Guidelines for Data Warehouse Implementation - Data Warehouse Metadata - Case Studies - OLAP: Introduction - Characteristics of OLAP Systems - Motivations for Using OLAP - Multidimensional View and Data Cube - Data Cube Operations.

Unit II **10 HRS**

ASSOCIATION RULE MINING: Introduction - Basics - Task and a Naive Algorithm - The Apriori Algorithm - Improving the efficiency of the Apriori Algorithm - Aprioir - TID - Direct Hashing and Pruning - Dynamic Itemset Counting - Mining Frequent Patterns without Candidate Generation - Performance Evaluation of Algorithms - Software for Association Rule Mining.

Unit III **10 HRS**

CLASSIFICATION: Introduction - Decision Tree - The Tree Induction Algorithm - Split Algorithm on Information Theory, Gini Index - Over fitting

and Pruning - Decision Tree Rules - Naive Bayes Method - Estimating Predictive and Improving Accuracy of Classification Methods - Other Evaluation Criteria for Classification Methods - Classification Software.

Unit IV **10 HRS**

CLUSTER ANALYSIS: Cluster Analysis, What - Desired Features of Cluster Analysis - Types of Data - Computing Distance - Types of Cluster Analysis Methods - Partitioned, Hierarchical, Density-based methods - Dealing with Large Databases, Methods - Quality and Validity of Cluster Analysis - Cluster Analysis Software.

Unit V **10 HRS**

WEB DATA MINING: Introduction - Web Terminology and Characteristics - Locality and Hierarchy in the Web - Web Content Mining - Web Usage Mining - Web Structure Mining - Web Mining Software. INFORMATION PRIVACY AND DATA MINING: Introduction - Information Privacy What - Basic Principles to Protect Information Privacy - Uses and Misuses of Data Mining - Prime Aims of Data Mining, Pitfalls - Current Principles are Ineffective.

TEXT BOOKS

1. G.K. GUPTA, Introduction to Data Mining with Case Studies" PHI Learning Pvt. Ltd., 2006.

BOOKS FOR REFERENCE

1. Jiawei Han and MichelineKamber, "Data Mining Concepts and Techniques", 2nd Ed., Morgan Kaufmann Publishers, 2006. New Delhi.
2. Margret H. Dunham, "Data Mining: Introductory and Advanced Topics", Pearson Education, 2003, New Delhi.

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Sem. II

14PIT2110 **Credits: 2**

Self-Paced Learning:

OPEN SOURCE TECHNOLOGY

Objective

* To provide an understanding of open source technology.

Unit I

OPEN SOURCE SOFTWARE DEFINITIONS AND HISTORY: Definition of Terms - A Brief History of Software. OPEN SOURCE IS SUCCESSFUL: Analytical Framework - Open source is in Widespread Successful Use. OPEN SOURCE - THE GOOD, THE BAD AND THE UGLY: Good about Open Source - Open Source is not enough by itself- Choosing Open Source is more difficult for you.

Unit II

FIVE IMMEDIATE OPEN SOURCE OPPORTUnitIES: Bring New Desktop Systems to the Underserved - Migrate Applications and Databases to Open Source. FIVE MORE OPEN SOURCE OPPORTUnitIES: Directory Services, Email, Groupware and Collaboration - Complex Web Publishing, Manage User Desktops.

Unit III

OPEN SOURCE SERVER APPLICATIONS: Infrastructure Services - Web Servers - Database Servers - Mail Servers - System Management. OPENSOURCE DESKTOP APPLICATIONS: Graphical Desktops - Web Browsers -The Office Suite - Mail and Calendar Clients - Personal Software.

Unit IV

OPEN SOURCE SOFTWARE DEVELOPMENT: Methodology, Languages used to Develop Open Source Products - Cross Platform Code. MANAGING SYSTEM IMPLEMENTATION: Implementation Roles - Open Source Impact on Team Issues - Implementation Process - Implementation Principles - Key Documents - Migration - Interacting with the Open Source Community.

Unit V

APPLICATION ARCHITECTURE: Types of Systems - Tired Design - Managing Performance and Scalability - Interoperability - Development Platform Choices. THE COST OF OPEN SOURCE SYSTEMS: Total Cost of Ownership - Types of Costs - Scenarios.

TEXT BOOKS

1. Paul Kavanagh, "Open Source Software: Implementation and Management", Elsevier Digital Press, 2004.

BOOK FOR REFERENCE

1. James Lee and Brent Ware, "Open Source Web Development with LAMP using Linux, Apache, MySQL, Perl and PHP", Dorling Kindersley(India) Pvt. Ltd., 2008.

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Sem. II **Hours/Week: 4**
14PSS2401 **Credits: 4**

IDC-1:
SOFT SKILLS

Objectives

* Introducing learners to the relevant soft skills at the territory level in order to make them gain competitive advantage both professionally and personally.

Module 1: Basics of communication and Effective communication

Basics of communication: Definition of communication, Process of Communication, Barriers of Communication, Non-verbal Communication. Effective communication: Johari Window, The Art of Listening, Kinesthetic, Production of Speech, Organization of Speech, Modes of delivery, Conversation Techniques, Dialogue, Good manners and Etiquettes.

Module II: Resume writing and Interview skills

Resume Writing: What is Resume? Types of Resume? Chronological, Functional and Mixed Resume, Steps in preparation of Resume. Interview Skills: Common interview questions, Attitude, Body Language, The mock interviews, Phone interviews, Behavioral interviews.

Module III: Group discussion and team building

Group Discussion: Group Discussion Basics, GD Topics for Practice, Points for GD Topics, Case-Based and Article based Group Discussions, Points for Case Studies, and Notes on Current Issues for GDS. Team Building: Team Vs Group - synergy, Stages of Team Formation, the Dabbawala. Leadership - Styles, Work ethics. Personal Effectiveness: Personal Effectiveness: Self Discovery, Self Esteem, and Goal setting. Conflict and Stress Management.

Module IV: Numerical Ability

Average, Percentage, Profit and Loss, Simple Interest, Compound Interest, Time and Work, Pipes and Cisterns, Time and Distance, Problems on Trains, Boats and Streams Calendar, Rations and Proportions.

Module V: Test of reasoning

Verbal Reasoning: Series Completion, Analogy, Data Sufficiency, Assertion and Reasoning, Logical Deduction. Non-Verbal Reasoning: Series, Classification

References

1. Aggarwal, R.S. 2010 Quantitative Aptitude, S.Chand & Sons
2. Aggarwal, R.S. 2010. A Modern Approach to Verbal and Non Verbal Reasoning. S.Chand
3. Covey, Stephen. 2004. 7 Habits of Highly effective people, Free Press.
4. Egan, Gerard. 1994. The Skilled Helper (5th Ed). Pacific Grove, Brooks / Cole.
5. Khera, Shiv 2003. You Can Win. Macmillan Books , Revised Edition
6. Murphy, Raymond. 1998. Essential English Grammar. 2nd ed., Cambridge Univ. Press.
7. Prasad, L. M. 2000. Organizational Behaviour, S.Chand
8. Sankaran, K., & Kumar, M. 2010 Group Discussion and Public Speaking. M.I. Pub, Agra, Adams Media.
9. Schuller, Robert. (2010). Positive Attitudes. Jaico Books.
10. Trishna's (2006). How to do well in GDs & Interviews, Trishna Knowledge Systems.
11. Yate, Martin. (2005). Hiring the Best: A Manager's Guide to Effective Interviewing and Recruiting.

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Sem. II **Hours/Week: 4**
14PIT2401 **Credits: 4**

IDC (WS):
WIRELESS NETWORKS

Objective

* To study some fundamental concepts in wireless networks, wireless LAN and wireless WAN.

Unit I **10 HRS**

INTRODUCTION: Cellular Revolution - Global Cellular Network - Broadband -Future Trends. TRANSMISSION FUNDAMENTALS: Signals - Channel Capacity - Transmission Media - Multiplexing.

Unit II **10 HRS**

SATELLITE COMMUNICATION: Satellite Parameters and Configuration - Capacity Allocation - Frequency Division and Time Division. SPREAD SPECTRUM: Frequency Hopping - Direct Sequence Spread - Code Division Multiple Access.

Unit III **10 HRS**

WIRELESS WANs: First Generation Analog -SecondGeneration TDMA - GSM - Short Messaging Service in GSM - Second Generation CDMA- Third Generation Systems - GPRS.

Unit IV **10 HRS**

WIRELESS LANs: Introduction to wireless LANs - IEEE 802.11 Architecture and Services - WLAN - MAC Sublayer - MAC Management Sublayer - HIPERLAN - Wireless ATM.

Unit V **10 HRS**

ADHOC NETWORKING: IEEE 802.15 WPAN - HomeRF. BLUETOOTH - Radio Specification - Baseband Specification - Link Manager Protocol WIRELESS GEOLOCATION: System Architecture - Technologies - E-911 Services.

TEXT BOOKS

1. William Stallings, "Wireless Communications and networks", Pearson / Prentice Hall of India, 2nd Ed., 2007. UnitS: I, II & III
2. Kaveth Pahlavan, Prashant Krishnamurthy, "Principles of Wireless Networks", Pearson Education Asia, New Delhi, 2002. UnitS: IV & V

BOOKS FOR REFERENCE

1. Dharma Prakash Agrawal & Qing-AnZeng, "Introduction to Wireless and Mobile Systems", Thomson India Edition, 2nd Ed., 2007.
2. Gary. S. Rogers & John Edwards, "An Introduction to Wireless Technology", Pearson Education, 2007.
3. Vijay. K. Garg, "Wireless Communication and Networking", Morgan Kaufmann Publishers, 2007.

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Sem. II **Hours/Week: 2**
14PIT2111 **Credit: 1**

TECHNICAL APTITUDE

Unit I : C

Unit II : JAVA

Unit III : SQL

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Sem. III **Hours/Week: 5**
14PIT3112 **Credit: 4**

PHP WITH MYSQL

Objective

* To understand the fundamental concepts of the Apache, MySQL and PHP and the vital role of open source in programming paradigm.

UNIT I **12 HRS**

INTRODUCTION: Brief Introduction to PHP, Apache, MySQL, and Open Source - Pieces of AMP Module - Configuring Installation - Apache, PHP, and MySQL.

UNIT II **12 HRS**

CREATING PHP PAGES: PHP Structure and Syntax - Creating First Program - Constants and Variables - Passing Variables - Using If/Else Arguments - Using Includes and Functions for Efficient Code - Arrays - Alternative Syntax for PHP.

UNIT III **12HRS**

USING PHP WITH MYSQL: MySQL Structure and Syntax - Connecting to MySQL Server - Querying the Database. USING TABLES TO DISPLAY DATA: Creating a Table - Populating Table - Creating Master/Child Relationship.FORM ELEMENTS: First Form - Driving the User Input

UNIT IV **12 HRS**

MANPULATING DATA AND IMAGES IN PHP - Editing Database - Working With GD Library - Allowing Users to Upload Images - Converting Image Files Types - Validating User Input - Handling and Avoiding Errors.

UNIT V **12 HRS**

Sending Emails - User Logins, Profiles and Personalization.CASE STUDY: Content Management System - Online Stores.

TEXT BOOK

1. Elizabeth Naramore, Jason Gerner, "Beginning PHP5, Apache, MySQL, with Web Development", Wiley Publishing, Inc., Indianapolis, Indiana, 2005.

Books for Reference

1. Jason Gerner Elizabeth Naramore, Morgan L. Owens, Matt Warden, "Professional Lamp, Linux, MySQL and PHP5 and Web Development", Wiley Publishing, 2006.
2. James Lee, Brent Ware, "Open Source Web Development with LAMP using Linux, Apache, MySQL, PERL and PHP", Pearson, 2003.

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Sem. III **Hours/Week: 5**
14PIT3113 **Credit: 4**

DATA COMMUNICATION NETWORKS

Objective

* To provide the concept of data communication networks with network security.

Unit I **12 HRS**

INTRODUCTION: Data Communications - Networks - The Internet - Protocols and Standards - Network Models - Layered Tasks - The OSI Model - Layers in the OSI Model - TCP/IP Protocol Suite - Addressing - PHYSICAL LAYER & MEDIA:Analog and Digital - Analog to Digital Conversion — Transmission Modes - Digital to Analog Conversion - Multiplexing - Transmission Media -Guided media - Unguided media - Switching - Circuit switched Networks - Datagram Networks - Virtual Circuit Networks.

Unit II **12 HRS**

DATA LINK LAYER:Error Detection and Correction - Introduction - Block Coding - Cyclic codes - Checksum - Data Link Control- Framing - Flow and error control - Protocols - Noiseless Channels - Noisy Channels -Point to Point Protocol - Channelization - IEEE 802.11 - Bluetooth - Cellular Telephony - Satellite Networks.

Unit III **12 HRS**

NETWORK LAYER: IPV4 Addresses - IPV6 Addresses - Internetworking - IPV4 - IPV6 - Transition from IPv4 to IPv6 - Address mapping - ICMP - IGMP - Delivery - Forwarding -Unicast Routing Protocols - Multicast Routing Protocols

Unit IV **12 HRS**

TRANSPORT LAYER: Process to Process Delivery - UDP - TCP - SCTP - Data Traffic - Congestion - Congestion Control - Quality of Service - APPLICATION LAYER: Name Space - Domain Name Space - Remote Logging - Email & File Transfer.

Unit V **12 HRS**

SECURITY: Cryptography- Introduction - Symmetric Key Cryptography - Asymmetric Key Cryptography - NETWORKING SECURITY: Security Services - Message Confidentiality - Message Integrity - Message

Authentication - Digital Signature - Entity Authentication - Key Management - SECURITY IN THE INTERNET: IP Security - SSL/TLS - PGP - Firewalls.

TEXT BOOKS

1. Behrouz A. Forouzan, “Data Communications and Networking”, 4th Ed., Tata McGraw Hill, New York, 2009.

BOOK FOR REFERENCE

1. Andrew S. Tanenbaum, “Computer Networks”, 5th Ed., Pearson Education, New Delhi, 2011.

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Sem. III **Hours/Week: 5**
14PIT3114 **Credit: 4**

J2EE

Objective

* To understand the fundamental concepts of the J2EE Technologies and communication of client and server in the programming paradigm, component and framework model.

Unit I **12 HRS**

J2EE OVERVIEW: J2EE and J2SE- The Birth of J2EE - J2EE.J2EE MULTI TIER ARCHITECTURE: The Tier - J2EE Multi-Tier Architecture - Client Tier implementation- Classification of Clients -Web Tier implementation.J2EE BESTPRACTICES: The Enterprise Application-Session Management-Presentation and Processing- Model View Controller.

Unit II **12 HRS**

JAVA REMOTE METHOD INVOCATION:RMI Concept-Remote Interface-Passing Objects-The RMI Process-Sever side -Client side. JAVA INTERFACE DEFINITION LANGUAGE AND CORBA: Java IDL and CORBA- The IDL Interface- The Client side - The Server side - Running the code.JMS:JMS Fundamentals-Flexibility-Components of a JMS Program- Messages - Sending messages to a Queue- Receiving Messages from a Queue.

Unit III **12 HRS**

JSP: JSP - JSP Tags- Variables and Objects- Methods -Control Statements-Loops -Tomcat-Request String -User Session-Cookies-Session Objects.

JAVA NAMING AND DIRECTORY INTERFACE API: Naming and Directories- JNDI- Retrieving Attributes from an Object using Directory Services - Naming Operations - Add Binding to a Directory Service - Remove Binding to a Directory Service - Replace Binding to a Directory Service - Renaming a Name in the Directory Service. JAVA MAIL API: Java Mail- Java Mail API and Java Activation Framework -Send Email Messages-Receiving Email Messages - Deleting Email Messages.

Unit IV **12 HRS**

EJB: Enterprise Java Beans- The EJB container- EJB Classes- EJB Interfaces- Referencing EJB- Relationship Elements -Session Java Bean -Stateless vs.Stateful - Creating a Session Java Bean-Entity Java Bean -CMP - BMP - Message Driven Bean - Creating an MDB -The JAR file

Unit V **12 HRS**

STRUTS: Introduction to Struts - Building a Simple Struts Application - The Model Layer - View Layer - Controller Layer - Struts Modules.

TEXT BOOKS

1. Jim Keogh," The Complete Reference J2EE ",Tata McGraw Hill, NewDelhi, 2006. UnitS: I, II, III & IV
2. James Holmes," The Complete Reference Struts", Tata McGraw Hill,New Delhi, 2004. Unit:V

BOOKS FOR REFERENCE

1. McGovern," J2EE 1.4 Bible", Wiley, Chennai, India, 2007.
2. Steven Holzner," Struts Essential Skills",Tata McGraw Hill, 2008.

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Sem. III **Hours/Week: 3**
14PIT3115 **Credit: 2**

Software Lab-V: PHP WITH MYSQL

1. Using Controls and Functions.
2. Passing Variables using HTML.
3. String Functions and Arrays.
4. Display Student Information using MySql Table.
5. Develop a College Application Form using MySql Table.
6. Check File System Functions, Network Functions, Date and Time Functions.
7. File Upload and Converting Image File Types.
8. Session.
9. Cookies.
10. Message Passing Mechanism between Pages.

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Sem. III **Hours/Week: 3**
14PIT3116 **Credit: 2**

Software Lab-VI: J2EE

1. Remote Method Invocation

Servlet

2. Cookies
3. JDBC

JSP

4. Get and Post method
5. Cookies
6. JDBC
7. Bean Class

EJB

8. Session Bean
9. Entity Bean
10. XML Parsing using DOM

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Sem. III **Hours/Week: 4**
14PIT3203A **Credit: 4**

Core Elective-III:

WEB DESIGN

Objective

* To introduce the concepts and principles of HTML5 and CSS3 standards, to build dynamic websites.

Unit I **10 HRS**

INTRODUCING HTML5: Basic HTML 5 template - Defining Page Structure - The Header Element - Section Element - Article Element - Nav Element - Aside Element - Footer Element. HTML 5 SEMANTICS:A New Perspective on Types of Content- The Document Online - New Elements in HTML5.

Unit II **10 HRS**

HTML5 FORMS: HTML 5 Attributes - HTML 5 Form Input Types- New Form Controls in HTML 5 - Changes to Existing Form Controls and Attributes.HTML 5 TABLES: Table Attributes and Elements- HTML 5 Canvas.

Unit III **10 HRS**

HTML5 AUDIO AND VIDEO: Video Container formats - Video Codecs - Audio Codecs - The Markup Attributes - Creating Custom Controls.

Unit IV **10 HRS**

INTRODUCING CSS 3: CSS3 Selectors - CSS3 Colors - Drop Shadows - Text Shadows - CSS 3 GRADIENTS AND MULTIPLE BACKGROUNDS: Linear Gradients-Radial Gradients - Repeating Gradients - Multiple Background Images.

Unit V **10 HRS**

CSS TRANSFORMS AND TRANSITIONS: Transforms - Transitions - Animations - CSS 3 Multicolumn Layouts - Geolocation and Web Storage-SVG and Drag and Drop.

TEXT BOOKS

1. Alexis Goldstein, Louis Lazaris, Estelle Weyl, “HTML5 & CSS3 for the Real World”, SitePoint Pty. Ltd., 2011.

BOOKS FOR REFERENCE

1. Matthew MacDonald, “HTML5: The Missing Manual”, O’Reilly, 2011.
2. Kogent Learning Solutions Inc. “HTML5 Black Book: Covers CSS3, Javascript, XML, XHTML, AJAX, PHP And JQuery”, Dreamtech Press, 2011.

Sem. III **Hours/Week: 4**
14PIT3203B **Credit: 4**

Core Elective-III:

CLOUD COMPUTING

Objective

* To impart the basic concepts of Cloud Computing and its applications.

Unit I **10 HRS**

INTRODUCTION TO CLOUD COMPUTING: Roots of Cloud Computing - Layers and Types of Cloud - Features of a Cloud - Infrastructure Management - Cloud Services - Challenges and Risks. Migrating into a Cloud: Introduction - Broad Approaches - Seven Step Model - Integration as a Service - Integration Methodologies - SaaS.

Unit II **10 HRS**

INFRASTRUCTURE AS A SERVICE: Virtual Machines - Layered Architecture - Life Cycle - VM Provisioning Process - Provisioning and Migration Services - Management of Virtual Machines Infrastructure - Scheduling Techniques - Cluster as a Service - RVWS Design - Logical Design - Cloud Storage - Data Security in Cloud Storage - Technologies.

Unit III **10 HRS**

PLATFORM AND SOFTWARE AS A SERVICE: Integration of Public and Private Cloud - Techniques and Tools - Framework Architecture -Resource Provisioning Services - Hybrid Cloud - Cloud Based Solutions for Business Applications - Dynamic ICT Services - Importance of Quality and Security in Clouds - Dynamic Data Center - Case Studies - Workflow Engine in the Cloud - Architecture - Utilization - Scientific Applications for Cloud - Issues - Classification - SAGA - Map Reduce Implementation.

Unit IV **10 HRS**

MONITORING AND MANAGEMENT: An Architecture for Federated Cloud Computing - Use Case - Principles - Model - Security Considerations - SLA Management - Traditional Approaches to SLO - Types of SLA - Life Cycle of SLA - Automated Policy - Performance Prediction of HPC - Grid and Cloud - HPC Performance Related Issues.

Unit V **10 HRS**

APPLICATIONS: Best Practices in Architecting Cloud Applications in the AWS Cloud - Massively Multilayer Online Game Hosting on Cloud Resources - Building Content Delivery Networks using Clouds - Resource cloud Mashups.

TEXT BOOKS

1. Rajkumar Buyya, James Broberg and AndrzejGoscinski, "Cloud Computing Principles and Paradigms", Wiley Publications, 2011

BOOKS FOR REFERENCE

1. George Reese, "Cloud Application Architectures", ShroffO'reilly, ISBN: 8184047142, 2009.
2. Michael Miller, " Cloud Computing Web Based Applications that change the way you work and collaborate online", Pearson Education, 2009.

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Sem. III **Hours/Week: 4**
14PIT3402 **Credit: 4**

IDC (BS):

BUSINESS TRENDS IN IT

Objective

* To provide awareness about the changes in emerging technologies, applications and systems.

Unit I **10 HRS**

INTRODUCTION: Business and IT - Information Age - Reality Check - Information System - INFORMATION TECHNOLOGIES IN THE MODERN ORGANIZATION: Basic Concepts - Structure and IT Support - IT Support at Different Organization Levels - Managing IT in Organization - IT People and Careers.

Unit II **10 HRS**

ELECTRONIC COMMERCE: Business - to-Customer Applications - Market Research, Advertising and Customer Service -Business-to-Business and Collaborative Commerce Applications - Innovative Applications of E-Commerce - Infrastructure and E-Commerce Support services -Legal and Ethical Issues in E-Commerce.

Unit III **10 HRS**

COMPUTER-BASED SUPPLY CHAIN MANAGEMENT AND INFORMATION SYSTEMS INTEGRATION: Supply Chains and their Management - Supply Chain Problems and Solution - IT Supply Chain

Support and Systems Integration - ERP - E-Commerce and Supply Chain Management - Order Fulfilment in E-Commerce.

Unit IV **10 HRS**

DATA, KNOWLEDGE AND DECISION SUPPORT: Management and Decision Making - Data Transformation and Management - Decision Support Systems - Enterprise Decision Support - Data and Information Analysis and Mining - Data Visualization Technologies - Knowledge Management and Organizational Knowledge Bases.

Unit V **10 HRS**

INTELLIGENT SYSTEMS IN BUSINESS: Artificial Intelligence and Intelligent Systems - Expert Systems - Other Intelligent Systems - Intelligent Agents - VIRTUAL REALITY: An Emerging Technology - Ethical and Global Issues of Intelligent Systems.

TEXT BOOKS

1. Turban, Rainer and Potter, "Introduction to Information Technology", 2nd Ed., Wiley India Pvt. Ltd , New Delhi, 2005.

BOOK FOR REFERENCE

1. WS Jawadekar, "Management Information System", Tata McGraw Hill Publishing Company Ltd., New Delhi, 1998.

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Sem. III
14PIT3117 **Credit: 8**

MINI PROJECT

(During Second Semester Vacation)

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Sem. III

14PIT3118 **Credit: 2**

COMPREHENSIVE EXAMINATION

Unit I : C++, Data Structures, and Database Systems

Unit II : Software Engineering, ASP.NET

Unit III : JAVA, Networks

Sem. IV **Hours/Week: 30**

14PIT3119 **Credit: 20**

MAJOR PROJECT DISSERTATION & VIVA VOCE
