M. Sc. COMPUTER SCIENCE
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 - COMPUTER SCIENCE

Part	Semester	Specification	No. of Courses	Hours	Credits	Total Credits
1	I-IV	**Core Courses**				
		Theory	9	43	33	
		Practical	6	18	12	
	II	**Self Paced Learning**	1	-	2	81
	III	**Common Core**	1	5	4	
	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)**	1	4	4	
		IDC (Common)	1	4	4	12
		IDC (BS)	1	4	4	
4	I-IV	**Additional Core Courses**	-	-	-	
5	IV	SHEPHERD & Gender Studies	1	-	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	**PCS**	**1**	**1**	**01**

For Example :

I M.Sc. Computer Science, first semester, Mathematical Foundations
The code of the paper is 14PCS1101.
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:

Sum total of weighted Grade Points
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. Computer Science
Course Pattern - 2014 Set

Sem.	Code	Course	Hrs.	Crs
I	14SCS3101	Java Programming	5	4
	14SCS3102	Database Systems	5	4
	14PCS1101	Mathematical Foundations	5	4
	14PCS1102	Advanced Microprocessors & Micro Controllers	5	4
	14PCS1103	Software Lab - I(Java)	3	2
	14PCS1104	Software Lab - II(RDBMS & MICROPROCESSOR SIMULATOR)	3	2
	14PCS1201 A	Core Elective I: Data Warehousing and Data Mining OR	4	4
	14PCS1201 B	Core Elective I: OOAD & UML		
		Total for Semester I	**30**	**24**
II	14PCS2105	Web Development with ASP.NET	5	4
	14PCS2106	J2EE	5	4
	14PCS2107	Software Lab - III (ASP.NET)	3	2
	14PCS2108	Software Lab - IV(J2EE)	3	2
	14PCS2202 A	Core Elective II: XML and Web Services OR	4	4
	14PCS2202 B	Core Elective II: Compiler Design		
	14PCS2109	Self-paced Learning: Open Source Technology	--	2
	14PSS2401	IDC: Soft Skills	4	4
	14PCS2401	IDC(WS): Mobile Computing	4	4
	14PCS2110	Technical Aptitude	2	1
		Total for Semester II	**30**	**27**
III	14PCS3111	PHP with MYSQL	5	4
	14PCS3112	Software Engineering	5	4
	14PCS3113	Android Programming	5	4
	14PCS3114	Software Lab – V (PHP with MYSQL)	3	2
	14PCS3115	Software Lab – VI (Android)	3	2
	14PCS3203 A	Core Elective III: Network Security OR	4	4
	14PCS3203 B	Core Elective III: Cloud Computing		
	14PCS3402	IDC (BS): Advances in Computer Science	4	4
	14PCS3116	Mini Project (II Semester Vacation)	-	8
	14PCS3117	Comprehensive Examination	-	2
		Library	1	
		Total for Semester III	**30**	**34**
IV	14PCS4118	Project Dissertation and Viva Voce	-	20
		Total for Semester IV	**30**	**20**
	14PCW4501	SHEPHERD & Gender Studies		5
		Total for All Semesters	**120**	**110**

Sem. I   **Hours/Week: 5**
14SCS3101   **Credits: 4**

JAVA PROGRAMMING

Objective
- To understand the power of Java language and advanced concepts of Java.

Unit I   **12 Hr**

FUNDAMENTAL PROGRAMMING STRUCTURES IN JAVA: Data Types - Variables - Operators - Strings - Control flow - Arrays. OBJECTS AND CLASSES: Introduction to Object-Oriented Programming - Predefined Classes - Defining Your Own Classes - Static Fields and Methods - Methods Parameters - Object Constructions - Packages.

Unit II   **12 Hr**

INHERITANCE: Classes, Super classes and Subclasses - Object: The Cosmic Superclass - Generic Array List - Object Wrappers and Auto boxing. INTERFACES AND INNER CLASSES: Interfaces - Object Cloning - Interfaces and Call backs - Inner classes. EVENT HANDLING: Basic of Event Handling - AWT Event Hierarchy - Semantic and Low Level Events in the AWT - Low Level Event Types - Actions - Multicasting.

Unit III   **12 Hr**

USER INTERFACES COMPONENTS WITH SWING: The Model-View-Controller Design Pattern - Layout Management - Text Input - Choice Components - Menus - Sophisticated Layout Management - Dialog Boxes. DEPLOYING APPLETS AND APPLICATIONS: Applet Basics - Applet HTML Tags and Attributes. EXCEPTION AND DEBUGGING: Dealing with Errors - Catching Exceptions. STREAMS AND FILES: Streams - Complete Stream Zoo - Use of Streams - File Management.

Unit IV   **12 Hr**

MULTITHREADING: Threads - Thread Properties - Interrupting Threads - Thread Priorities - Synchronization. NETWORKING: Connecting to a Server - Implementing Server - Sending E-Mail - URL Connections.

Unit V   **12 Hr**

DATABASE CONNECTIVITY: JDBC - Structured Query Language - Installing JDBC - Basic JDBC Programming Concepts - Populating a Database - Executing Queries. JAVA BEANS: Need for Beans - Bean-Writing Process - BDK and the Bean Box - Building an Image Viewer Application via Beans - Naming Patterns for Beans Properties and events - Bean Property Types.

Text Books

1. Cay S. Horstmann and Gary Cornell, Core Java2 Volume I - Fundamentals, Pearson Edn in South Asia, 7th Ed., 2007. UnitS: I, II & III
2. Cay S. Horstmann and Gary Cornell, Core Java2 Volume II - Advanced Features, Pearson Education Asia Pvt. Ltd, 2000. UnitS: IV & V

Books for Reference

1. Herbert Schildt, Java 2: Complete Reference, Tata McGraw Hill, 5th Ed., 2009.
2. Deitel&Deitel, Java How to Program, PHI, 8th Ed.
3. Kogent Learning Solution, Java 6 Programming Black Book, Dreamtech Press, 2007.

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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 Hr**

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 Hr**

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

Unit III   **12 Hr**

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

Unit IV   **12 Hr**

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 Hr**

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
14PCS1101	Credits: 4

MATHEMATICAL FOUNDATIONS

Objectives

1. To impart the mathematical concepts and numerical methods required to Information Technology.
2. To make the student solve real life problems in Business and Management.

Unit I   **12 Hr**

OPERATION RESEARCH: Introduction - Basics of OR - OR & Decision Making -Linear Programming- Mathematical Formulation- Graphical Solution - Canonical & Standard Forms of LPP.

Unit II   **12 Hr**

SIMPLEX METHOD: Simplex Method for $<, =, >$ constraints - Charne's Method of Penalties- Transportation Problem and its Solution.

Unit III   **12 Hr**

MATHEMATICAL LOGIC: Propositions - Precedence Rules for Operators - Tautologies- Laws of Equivalence -Substitution Rules - Natural Deduction System - Developing Natural Deduction System Proofs.

Unit IV   **12 Hr**

INTERPOLATION: Lagrange's and Newton Interpolation- Interpolating Polynomials using Finite Difference NUMERICAL INTERGRATION: Trapezoidal, Simpson's rules and Romberg Integration.

Unit V   **12 Hr**

NUMERICAL METHODS: Polynomial Equation: Brige- Vieta, Graeffe's Root Squaring Methods. INTEGRATION: Gauss Lagrange - Gauss Chebyshev- Gauss Hermite Methods.

Text Books

1. Manmohan& Gupta, "Operations Research", Sultan Chand Publishers, New Delhi, 2002. Unit: I

2. KantiSwarup, Gupta, ManMohan,"Operations Research", 7th Ed., 1994. Unit: II

3. David Gries, "The Science of Programming", Narosa Pub. House, New Delhi, 1993. Chapters: 1, 2, 3.1 to 3.3. Unit: III.

4. M.K.Jain, S.R.K. Lyengar, R.K.Jain," Numerical Methods for Scientific and Engineering Computation", 3rd Ed., New Age Pub., New Delhi, 1992. Chapters: 2.8, 5.8. Units: IV & V.

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ADVANCED MICROPROCESSORS AND MICRO CONTROLLERS

Objective

* To understand the concepts of different types Microprocessors, Microcontrollers and Embedded System.

Unit I   **12 Hr**

8086:Architecture- PIN Diagrams - Timing Diagrams - Register Organization of 8086 - Architecture - Instruction Set of 8086. MICROPROCESSOR WITH MEMORY MANAGEMENT AND PROTECTION: Features of 80286 - Internal Architecture - Register Organization - Internal Block Diagram - Interrupts - Real and Protected Virtual Addressing - Interfacing Memory and I/O Devices with 80286 - Addressing Modes - Math Coprocessor.

Unit II   **12 Hr**

BEGINNING OF 32-BIT MICROPROCESSORS: Architecture of 80386 - Register Organization - Addressing Modes of 80386 - Data Types - Concepts of Addressing in Real and Protected Modes - Segmentation and Paging - Conversion of a Linear Address to a Physical Address - Features of 80486 - Architecture and Register Organization of 80486.

Unit III   **12 Hr**

PROCESSORS OF NEW MILLENNIUM: Salient Features of Pentium 4 - Modules of Pentium 4 Architecture: Front End Module, Out of Order Execution Engine, Execution Module, Memory Subsystem Module - Superscalar Execution - Pipelining -Hyper Threading in Pentium - RISC Processors: Basic Features and Advantages only.

Unit IV   **12 Hr**

MICROCONTROLLERS:Architecture of 8051 - Register set - Memory and I/O Addressing - Interrupts - Six Addressing Modes - Ports of 8051 and their Operation - Architecture of 16-bit Microcontroller 80196.

Unit V   **12 Hr**

EMBEDDED SYSTEMS AND REAL TIME OPERATING SYSTEMS (RTOS): Introduction to Multitasking - Simple Embedded Multitasking Systems - RTOS - Tasks in RTOS - Scheduling of Tasks - Resource Protection by Semaphore Concept - Examples of Applications: Temperature Monitor (Tasks,

Programming, Hardware Requirements, Dealing with Numbers) - A Model
Train Controller - Length Measurement for Rolling Paper.

Text Books

1. A.K.Ray&K.M.Bhurchandi, "Advanced Microprocessors and Peripherals", TMH, 2nd Ed., 2007. UnitS: I, II & III
2. Rajiv Kapadia, "8051 Microcontroller & Embedded Systems", Jaico Publishing House, 2006. UnitS: IV & V

Books for Reference

1. Tim Wilmshurst, "An Introduction to the Design of Small Scale Embedded Systems", Palgrave Publishers, 2004.
2. Muhammad Ali Mazidi et al., "The 8051 Microcontroller and Embedded Systems" Pearson Education, 2nd Ed., 2006.

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Sem. I   Hours/Week: 3
14PCS1103   Credits: 2

Software Lab-I
JAVA

1. Classes & Objects
2. Packages & Interfaces
3. Inheritance
4. Exception Handling
5. Multithreading
6. Applet
7. Swing
8. Event Handling Mechanisms
9. Streams and Files
10. Networking
11. JDBC
12. Java Beans

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Sem. I   Hours/Week: 3
14PCS1104   Credits: 2

Software Lab-II
RDBMS & MICROPROCESSOR SIMULATOR

SQL

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

PL/SQL

4. Cursors
5. Database Triggers and Packages.

FORMS AND REPORTS

6. Designing Oracle Forms with Menus, Buttons and LOVs.
7. Developing Oracle Reports (Tabular, Master / Detail, Matrix and Mailing label).

MICROPROCESSOR PROGRAMS USING SIMULATOR

1. Write an ALP to find factorial of number for 8086.
2. The 8 data bytes are stored from memory location E000H to E007H. Write 8086 ALP to transfer the block of data to new location B001H to B008H.
3. Write a program to display string "DEPARTMENT OF INFORMATION TECHNOLOGY"
4. Write a program to reverse the given string for 8086.
5. Write a program to multiply 2 numbers (16-bit data) for 8086.
6. Write a program to find Largest No. in a block of data. Length of block is 0A. Store the maximum in location RESULT.
7. Sum of series of 10 numbers and store result in memory location total.

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Sem. I   **Hours/Week: 4**
14PCS1201A   **Credits: 4**

Core Elective-I:
DATA WAREHOUSING AND DATA MINING

Objective

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

Unit I   **10 Hr**

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 Hr**

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 Hr**

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 Hr**

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 Hr**

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. I   **Hours/Week: 4**
14PCS1201B   **Credits: 4**

Core Elective-I:
'OOAD' AND 'UML'

Objective

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

Unit I   **10 Hr**

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   **10Hr**

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 Hr**

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 Hr**

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

Unit V   **10 Hr**

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

Books for Reference

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

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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 Hr**

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 Hr**

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 Hr**

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 Hr**

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 Hr**

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

Books for Reference

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

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Sem. II	**Hours/Week: 5**
14PCS2106	**Credits: 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 Hr**

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 Hr**

JAVA REMOTE METHOD INVOCATION: RMI Concept-Remote Interface-Passing Objects - The RMI Process - Sever side - Client side. JAVA INTERFACE DEFINITION LANGUAGEAND 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 Hr**

JSP: JSP - JSP Tags- Variables and Objects- Methods -Control Statements-Loops -Tomcat-Request String -User Session - Cookies - Session Objects. JAVA NAMING ANDDIRECTORY 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 Hr**

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

Unit V   **12 Hr**

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, New Delhi, 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. II	**Hours/Week: 3**
14PCS2107	**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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Software Lab-IV:
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. II   Hours/Week: 4
14PCS2202A   Credits: 4

Core Elective-II:
XML AND WEB SERVICES

Objective

* To understand the basics of XML documents, style sheets and document type definitions and also the basic concepts of web services and its technologies like SOAP, etc.

Unit I   10 Hr

INTRODUCTION TO XML: An Eagle Eye View of XML - XML Definition - Life of an XML Document - Related Technologies. STRUCTURING THE DATA: Examining the Data - XMLizing the Data - Advantages of the XML format - Preparing a Style Sheet for Document Display. ATTRIBUTES, EMPTY TAGS AND XSL: Attributes - Attributes Vs Elements - Empty Tags. XSL WELL FORMEDNESS: Well Formed Rules - XML Documents - Text in XML - Processing Instructions.

Unit II   10 Hr

DOCUMENT TYPE DEFINTION: Document Type Definition and Validity - Document Type Declaration - Validation against DTD - Listing Elements - Element Declaration - Comments in DTD - Entities and External DTD Subset - Attribute Declaration in DTD's - Attribute type - Predefine Attribute.

Unit III   10 Hr

WEB SERVICES:Concepts of Web Services - SOAP, WSDL, UDDI - Importance of Web Services - Evolution of Web Applications - Distributed Computing Platform - Web Services and Enterprises.

Unit IV   10 Hr

BASIC WEB SERVICES STANDARDS, TECHNOLOGIES AND CONCEPTS: SOAP Model - SOAP - SOAP Messages - SOAP Encoding - SOAP RPC - Using Alternative SOAP Encodings - Document, RPC, Literal , Encoded SOAP.

Unit V   10 Hr

UDDI: UDDI at a Glance - UDDI Business Registry - Accessing UDDI. WSDL: WSDL using SOAP and UDDI.

Text Books

1. Elliotte Rusty Harold, " XML Bible", IDG Books India, New Delhi, 2004. UnitS: I & II
2. Sandeep Chatterjee, James Webber, " Developing Enterprise Web Services - An Architect's Guide", PHI, New Delhi, 2003. UnitS: III, IV and V

Books for Reference

1. Gold forb, "XML hand book", Pearson Education, New Delhi, 2003.
2. B V Kumar, S V Subramanya, "Web Services: An Introduction", Tata McGraw Hill Publishing Co., New Delhi, 2006.

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Sem. II   **Hours/Week: 4**
14PCS2202B   **Credits: 4**

Core Elective-II:
COMPILER DESIGN

Objective

* To introduce various phases of a compiler and also to develop skills in designing a compiler.

Unit I   **10 Hr**

INTRODUCTION: Different Phases of Compiler - Finite State Automation and Lexical analysis - A Simple Approach to the Design of Lexical Analyzers - Regular Expressions - A Language for Specifying Lexical Analyzers.

Unit II   **10 Hr**

SYNTAX SPECIFICATION: Context Free Grammars - Parsers - Derivation and Parse trees - Shift Reduce Parsing - Operator Precedence Parsing - Top-Down Parsing - Predictive Parsers.

Unit III   **10 Hr**

CODE GENERATION: Intermediate Code Generation - Translation - Implementation of Syntax - Directed Translators - Intermediate Code - Postfix Notation - Parse Trees and Syntax Trees - Three Address Codes, Quadruples and Triples.

Unit IV   **10 Hr**

SYMBOL TABLES: Contents of a Symbol Table - Data Structures for Symbol Tables - Implementation of a Simple Stack Allocation Scheme - Implementation of Block Structured Languages - Storage Allocation in Block Structured Languages - Errors - Lexical Phase Error.

Unit V   **10 Hr**

CODE OPTIMIZATION AND CODE GENERATION: Elementary Code Optimization technique - Loop Optimization - DAG Representation of Basic Blocks - Value Numbers and Algebraic Laws - Object Programs - Problems in Code Generation - A Machine Model - A Simple Code Generator.

Text Book

1. Alfred V. Aho, Jeffery D.Ullman, "Principles of Compiler Design", Narosa, New Delhi, 2002. Ch:1.1-1.11,3.1-3.7,4.1,4.2,5.1-5.5,7.1-7.6,9.1,9.2,10.1, 10.2,11.1,11.2,12.1-12.4,15.1-15.4

Books for Reference

1. Dick Grune, Henri E. Bal, CerielJ.H.Jacobs, Koen G. Langondeon, "Modern Compiler Design", Wiley, Singapore, 2003.

2. Louden K., "Compiler Construction, Principles and Practice", Thomson, New Delhi, 2003.

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Sem. II
14PCS2109   **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 Book

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: 5
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**
14PCS2401   **Credits: 4**

IDC (WS):
MOBILE COMPUTING

Objective
* To provide basis for various techniques in Pervasive and Mobile Computing.

Unit I   10 Hr
MOBLIE COMPUTING: Adaptability - The Key to Mobile Computing - Mechanisms for Adaptation - Development or Incorporation of Adaptations in Applications. MOBILITY MANAGEMENT: Concept of Mobility Management - Location Management - Principles and Techniques.

Unit II   10 Hr
Data Dissemination - Mobile Data Caching - Mobile Cache Maintenance Schemes - Moblie Web Caching. CONTEXT-AWARE COMPUTING: Ubiquitous of Pervasive Computing - Various Definitions and Types of Contexts - Context Aware Computing & Applications - Middleware Support. INTRODUCTION TO MOBILE MIDDLEWARE:Definition of Mobile Middleware - Application - Agents - Service Discovery.

Unit III   10 Hr
INTRODUCTION TO AD-HOC AND SENSOR NETWORKS: Overview - Properties of an Ad-hoc Network -Unique Features of Sensor Networks - Proposed Applications -Challenges - Constrained Resources - Security - Mobility.

Unit IV   10 Hr
WIRELESS SECURITY: Traditional Security Issues - Mobileand WirelessSecurity Issues. - Problems in Ad-hoc Networks. APPROACHES TO SECURITY: Limit the Signal -Encryption - Integrity Codes - IPSec - Other Security Related Mechanisms.

Unit V   10 Hr
SECURITY IN WPAN: Security in Wireless Personal Area Networks - Basic Idea - Bluetooth Security Modes - Basic SecurityMechanisms - Encryption: Authentication - Limitation and Problems. SECURITY IN WLAN: Security in Wireless Local Area Networks - Basic Ideas - Wired-Equivalent Privacy (WEP) - WEP Fixes and Best Practices.

Text Books
1. Frank Adelstein, Sandeep K.S., Gupta Golden G. Richard III Loren Schwibert "Fundamentals of Mobile and Pervasive Computing", TMG Edn. Pvt. Ltd.,2005.

Books for Reference
1. Roopa R Yavagal, Hasan Ahmed, Asoke K Talukder, "Mobile Computing: Technology, Applications and Service Creation", 2nd Ed., Tata McGraw Hill Pvt. Ltd., 2010
2. UweHansmann, Martin S. Nicklous, LotharMerk, Thomas Stober, "Principles of Mobile Computing", 2nd Ed., Springer, 2006.

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

UNIT II   **12 Hr**
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   **12Hr**
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 Hr**
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 Hr**
Sending Emails - User Logins, Profiles and Personalization. CASE STUDY: Content Management System - Online Stores.

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

Unit I   **12 Hr**
INTRODUCTION: Software Process- Generic Process Model-Prescriptive Process Model-Specialized, Unified Process. SOFTWARE ENGINEERING KNOWLEDGE: Core Principles-Principles that Guide Each Framework Activity.

Unit II   **12 Hr**
SOFTWARE REQUIREMENTS AND ANALYSIS: Requirements Engineering - Establishing the Groundwork-Eliciting Requirements - Developing Use Cases - Building the Requirements Model - Negotiating, Validating Requirements-Requirements Analysis - Requirements Modeling Strategies - Requirement Modeling for WebApps.

Unit III   **12 Hr**
DESIGN CONCEPTS: Context of Software Engineering - The Design Process - Design Principles - Design Concepts - Design Model. ARCHITECTURAL DESIGN: Software Architecture - Architectural Styles - Architectural Design - Assessing Alternative Architectural Design - Architectural Mapping Using Dataflow. COMPONENT LEVEL DESIGN: Component - Designing Class Based Components - Component Based Development. USER INTERFACE DESIGN: The Golden Rules - User interface Analysis Design - Interface Analysis - Interface Design Steps - WebApp Interface Design.

Unit IV   **12 Hr**
SOFTWARE TESTING: Software Testing Fundamentals - White Box Testing - Basis Path Testing - Control Structure Testing - Black Box Testing - Testing for Specialized Environments, Architectures and Applications. SOFTWARE TESTING STRATEGIES: A Strategic Approach to Software Engineering - Strategic Issues - Unit Testing - Integration Testing - Validation Testing - System Testing - The Test Strategies for Object Oriented Software and WebApps - The Art of Debugging.

Unit V   **12 Hr**

PROJECT MANAGEMENT: The Management Spectrum - People - Product - Process - Project. PROJECT ESTIMATION: The Project Planning Process - Resources - Software Project Estimation - Decomposition Techniques - Empirical Estimation Models. PROJECT SCHEDULING: Basic Concepts - Project Scheduling - Scheduling.QUALITY MANAGEMENT: Quality Concepts - Software Quality Assurance. REVIEW TECHNIQUES: Formal Technical Reviews. SOFTWARE CONFIGURATION MANAGEMENT: SCM - SCM Repository - SCM Process.

Textbooks

1. Roger S. Pressman, "Software Engineering. A Practitioner's Approach", 7th Ed., 2009.

Books for Reference

1. Software Engineering, Somerville, Pearson Education.
2. C. Ghezzi, M. Jazayeri and D. Mandrioli, "Fundamentals of Software Engineering", Pearson Education.

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Sem. III   **Hours/Week: 5**
14PCS3113   **Credits: 4**

ANDROID PROGRAMMING

Objective

* To understand the concepts and learn the tools for developing applications on mobile platforms like Android.

Unit I   **12 Hr**

INTRODUCTION TO MOBILE DEVELOPMENT: Mobile Computing - History of Mobile Environments - Early Mobile Phones to Smartphones and Tablets - Development for Mobile Environments - Differences from Traditional Application Development - Trends in Mobile Development.

Unit II   **12 Hr**

MOBILE DEVELOPMENT: Advantages - Limitations - Features useful for mobiles - Geolocation - offline web applications - offline web storage - animations - 2D/3D graphics - Audio/Video - FRAMEWORKS: HTML5 - Phone Gap (Apache Cordova) framework and jQuery Mobile framework.

Unit III   **12 Hr**

INTRODUCTION TO ANDROID: 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   **12 Hr**

BASIC ANDROID DEVELOPMENT: Writing Android Applications - Activity Lifecycle - Multi Device Support - Fragments - Data Storage - Intents - Data Sharing - Audio Playback - Photo Capture.

Unit V   **12 Hr**

ADVANCED ANDROID DEVELOPMENT: Animations - OpenGL ES - Wireless Connections - Data Syncing - Location Aware Applications - Best Practices for Development - Security - Distribution and Monetizing.

Textbook

1. Ed Burnette, "Hello Android: Introducing Google's Mobile Development Platform", The Pragmatic Programmers, New Delhi, 3rd Ed., 2010

Book for Reference

1. Wei-Meng Lee, "Beginning Android 4 Application Development" Wiley India Pvt. Ltd., 2011.

Sem. III   **Hours/Week: 3**
14PCS3114   **Credits: 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. 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**
14PCS3115   **Credits: 2**

Software Lab-VI:
ANDROID

1. Simple Programs
2. Using Buttons
3. Changing Colors and Backgrounds
4. Manipulating Text
5. Working with Images
6. Links
7. Adding Audio & Video
8. Fragments
9. Intents
10. Data Sharing

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Sem. III   **Hours/Week: 4**
14PCS3203A   **Credits: 4**

Core Elective-III:
NETWORK SECURITY

Objective

* To provide the concepts of Cryptography, Key Management, User Authentication, Transport Level Security, Wireless Network Security, IP Security and Firewalls.

Unit I   **11 Hr**
INTRODUCTION: OSI Security Architecture - Security Attacks - Security Services - Security Mechanisms - A Model for Network Security. CLASSICAL ENCRYPTION TECHNIQUES: Symmetric Cipher Model - Substitution Techniques - Transposition Techniques - Steganography.

Unit II   **13 Hr**
BLOCK CIPHER AND DATA ENCRYPTION STANDARD: Block Cipher Principles - The Data Encryption Standard - The Strength of DES. ADVANCED ENCRYPTION STANDARD: AES Structure - AES Transformation Functions - AES Key Expansion - AES Implementation.PUBLIC- KEY CRYPTOGRAPHY AND RSA: Principles of Public Key Cryptosystems - The RSA Algorithm.

Unit III   **14 Hr**
CRYPTOGRAPHIC HASH FUNCTIONS: Applications of Cryptographic Hash Functions - Simple Hash Functions - Secure Hash Algorithm (SHA). MESSAGE AUTHENTICATION CODES: Requirements - Functions - Security - HMAC - Data Authentication Algorithm (DAA) - Cipher-Based Message Authentication Code (CMAC). DIGITAL SIGNATURES: Digital Signatures - Digital Signature Standard.

Unit IV   **13 Hr**
KEY MANAGEMENT AND DISTRIBUTION: Symmetric key Distribution Using Symmetric, Asymmetric Encryption - X.509 Certificates . USER AUTHENTICATION: Remote User-Authentication Principles - Remote User Authentication using Symmetric, Asymmetric Encryption - Kerberos. TRANSPORT-LEVEL SECURITY: Secure Socket Layer - Transport Layer Security - Secure Shell (SSH).

Unit V   **14 Hr**

WIRELESS NETWORK SECURITY: IEEE 802.11 Wireless LAN - IEEE 802.11i Wireless LAN Security - Wireless Application Protocol - Wireless Transport Layer Security. IP SECURITY: IP Security Overview - IP Security Policy - Encapsulating Security Payload - Combining Security Associations - Internet Key Exchange. FIREWALLS: Need for Firewalls - Firewall Characteristics - Types of Firewalls.

Textbooks

1. William Stallings, "Cryptography and Network Security - Principles and Practices", Prentice Hall (Pearson Education), 5th Ed., Dorling Kindersley India Pvt. Ltd., 2011.

Books for Reference

1. Atul Kahate, "Cryptography and Network Security", Tata McGraw Hill Publications, NewDelhi, 2008.
2. Jie Wang, "Computer Network Security: Theory and Practice", Springer Publisher, Higher Education Press, 2009.

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Sem. III   **Hours/Week: 4**
14PCS3203B   **Credits: 4**

Core Elective-III:
CLOUD COMPUTING

Objective

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

Unit I   **10 Hr**

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 Hr**

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 Hr**

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 Hr**

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 Hr**

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

Textbooks

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

Books for Reference

1. George Reese, "Cloud Application Architectures", Shroff O'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
14PCS3402   Credits: 4

IDC (BS):
ADVANCES IN COMPUTER SCIENCE

Objective

*   To understand the recent trends in the field of Computer Science.

Unit I   10 Hr

MOBILE COMPUTING: Mobile Computing Environment- Functions - Architecture- Design Considerations, Content Architecture - CC/PP Exchange Protocol, Context Manager - Data Management in WAE - Security in Mobile Computing.

Unit II   10 Hr

ANDROID: History of Android - Android Architecture - App Architecture - Components - Intents - Manifest - App Package - Activities - Services - Broadcast Receivers - Content Providers - Creating an Android Virtual Device

Unit III   10 Hr

CLOUD COMPUTING: Cloud Computing - History of Cloud Computing - Cloud Architecture - Cloud Storage - Why Cloud Computing Matters - Advantages of Cloud Computing - Disadvantages of Cloud Computing - Companies in the Cloud Today - Cloud Services.

Unit IV   10 Hr

BIG DATA: Analytics - Nuances of Big Data - Value - Issues - Case for Big data - Big Data Options Team Challenge - Big Data Sources - Acquisition - Nuts and Bolts of Big data. Features of Big Data -Security, Compliance, Auditing and Protection - Evolution of Big data - Best Practices for Big Data Analytics - Big Data Characteristics.

Unit V   10 Hr

HACKING: Hacking Windows - Network Hacking - Web Hacking - Password Hacking. A Study on Various Attacks: Input Validation Attacks - Buffer Overflow Attacks - Privacy Attacks.

Text Books

1. Asoke K Taukder, Roopa R, Yavagal, "Mobile Computing", TMG, New Delhi, 2005. Unit : I

2. Dave Smith and Jeff Friesen, "Android Recipes: A Problem - Solution Approach", Rakmo Press (P) Ltd, New Delhi, 2011. Unit : II

3. Michael Miller, "Cloud Computing: Web-Based Applications That Change the Way You Work and Collaborate Online", Que Publishing, 2008. Unit : III

4. Frank J Ohlhorst, "Big Data Analytics: Turning Big Data into Big Money", Wiley and SAS Business Series, 2012. Unit : IV

5. AnkitFadia, " Ethical Hacking" 2nd Ed., Macmillan India Ltd, 2006. Unit : V

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Sem. III
14PCS3117   Credits: 2

COMPREHENSIVE EXAMINATION

Unit I   :
JAVA, Database

Unit II   :
Microprocessors, ASP.NET

Unit III   :
J2EE, Software Engineering

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MAJOR PROJECT DISSERTATION
&
VIVA VOCE

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