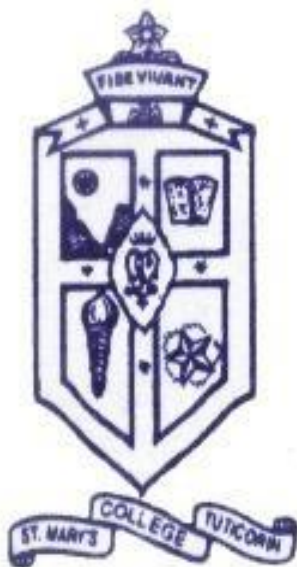**ST. MARY'S COLLEGE (Autonomous)**

(Re-accredited with 'A' Grade by NAAC)

Thoothukudi-628001, Tamil Nadu

(Affiliated to Manonmaniam Sundaranar University)

Syllabus

M.Sc. Computer Science

School of Computing Sciences

Outcome Based Curriculum

(w.e.f. 2017)

COURSE STRUCTURE

M.Sc. Computer Science (For those who join in 2017 and afterwards)

Semester – I

Subject	Subject Code	Title of The Paper	Contact Hours/ Week	Credits	Max.Marks		
					CIA	ESE	Total
Core I	17PCSC11	Mathematical Foundations of Computer Science	5	5	40	60	100
Core II	17PCSC12	Advanced Java Programming	5	5	40	60	100
Core III	17PCSC13	Design and analysis of algorithms	5	5	40	60	100
Core IV	17PCSC14	Advanced Computer Architecture	5	5	40	60	100
Practical I	17PCSCR1	Advanced Java Programming lab	5	4	40	60	100
Practical II	17PCSCR2	Design and analysis of algorithms lab	5	4	40	60	100
Total			30	28	300	300	600

Semester II

Subject	Subject Code	Title Of The Paper	Contact Hours/ Week	Credits	Max.Marks		
					CIA	ESE	Total
Core V	17PCSC21	Relational Database Management System	5	5	40	60	100
Core VI	17PCSC22	Open Source Technology	5	5	40	60	100
Core VII	17PCSC23	Data Mining	5	5	40	60	100
Core Elective	17PCSE21	Web Designing & Multimedia	6	3	40	60	100
Practical III	17PCSCR3	RDBMS Lab	5	4	40	60	100
Practical IV	17PCSCR4	Open Source Technology Lab	4	4	40	60	100
Self study Paper	17PCSSS1	Advanced Web Technologies		1			100
Total			30	26+1	300	300	600+100

Semester – III

Subject	Subject Code	Title of The Paper	Contact Hours/ Week	Credits	Max.Marks		
					CIA	ESE	Total
Common Core	17PCCC31	Transforms with MATLAB	4	3	40	60	100
Core VIII	17PCSC32	Smart Devices Programming	6	6	40	60	100
Elective I	17PCSE31	Cloud Computing	5	5	40	60	100
Mini Project	17PCSCR5	Mini Project	8	6	40	60	100
Common Core Practical	17PCCCR1	Transforms with MATLAB	2	1	40	60	100
Practical V	17PCSCR6	Smart Devices Programming Lab	5	5	40	60	100
Self study paper	17PCSSS2	TCP/IP		1			100
Total			30	26+1	200	200	500+100

Semester IV

Subject	Subject Code	Title of The Paper	Contact Hours/ Week	Credits	Max.Marks		
					CIA	ESE	Total
Project	17PCSP41	Project Work		10	100	100	200
Total				10	100	100	200

SEMESTER -I
Core I - Mathematical Foundations of Computer Science

Code:17PCSC11	Hrs/week:5	Hrs/Semester:75	Credits:5

Objectives:
- To understand concepts of graph theory, formal languages, finite automata and boolean algebra.
- To help the students to understand the uses of statistics in various competitive fields.

UNIT I

Moments-Skewness and kurtosis-Curve fitting-Method of least squares-fitting lines-parabolic, exponential & logarithmic curves

UNIT II

Correlation & regression –Scatter diagram- Karl Pearson's coefficient of correlation-properties- lines of regression coefficient & properties- rank correlation.

UNIT III

Formal Languages: Four Classes of grammars(Phase Structure, context sensitive, context free, regular) context free language-generation trees.

Finite Automata: Representation of FA- Acceptability of a string by FA- Non deterministic FA(NDFA)- Acceptability of a string by NDFA. Equivalence of FA and NDFA- Procedure for finding FA~NDFA.

UNIT IV

Algebraic Structures: Groups-subgroups-homomorphism-cosets-Lagrange's theorem-normal subgroups-semi groups-monoids-homomorphism of semigroup and monoids-subsemigroups and sub monoids.

UNIT V

Lattices and Boolean Algebra: Lattices-properties-new lattices-modular and distributionlattices. Boolean algebra: Boolean polynomials-switching circuits.

Text Books:
1. S. Arumugam and A. Issac, Statistics, New Gamma publishing House. Palayamkottai, 2011 (Unit- 1,2)
2. Tremblay and Manohar, „Discrete Mathematical Stuctures with applications to Computer Science‟, Tata McGraw Hill.(Unit-4)
3. Discrete Mathematics by Dr.M.K.Venkatraman , Dr. N. Sridharan and N.Chandrasekaran (Unit -3,5)

SEMESTER –I			
Core II - ADVANCED JAVA PROGRAMMING			
Code:17PCSC12	Hrs/week:5	Hrs/Semester:75	Credits:5

Objective:
>To understand the advanced concept of internet programming and also developing web based application using java programming

UNIT I

JDBC Overview - Connection Class - MetaData Function - SQLException–SQLwarning - Statement - ResultSet - Other JDBC Classes.

UNIT II

InetAddress - TCP/ IP client sockets - TCP/ IP server sockets - URL –URLConnection - Datagrams - Client/ Server application using RMI.

UNIT III

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

UNIT IV

Life Cycle of Servlet - Generic Servlet - HTTP Servlet - Reading InitializationParameters - Reading Servlet Parameters - Cookies - Session Tracking

UNIT V

JApplet - Button - Combo - Trees - Tables - Panes - AWT Classes –workingwith Graphics, Color and Font

Text Books:
1. Patrick Naughton& Herbert Schildt, "The Complete Reference: Java 2", TataMcGraw Hill, 1999. (Chapter - 18, 21, 24, 25, 26, 27)
2. Joseph Weber, "Using Java 2 Platform", Prentice Hall of India, 2000.
(Chapter - 39, 40)

Books for Reference:
- Deitel&Deitel, "Java How to Program", Prentice Hall, 5th Edition ,2002
- Peter Haggar, "Practical Java: Programming Language Guide", Addison-
- Wesley Pub Co, 1st Edition, 2000
- Bruce Eckel, "Thinking in Java", Pearson Education Asia, 2nd Edition, 2000

SEMESTER –I			
Core III - DESIGN AND ANALYSIS OF ALGORITHMS			
Code:17PCSC13	Hrs/week:5	Hrs/Semester:75	Credits:5

Objective:

- To introduce the classic algorithms in various domains of data structures andprovidesdifferent programming paradigms for solving problems.

UNIT- I

Introduction – Performance Analysis. Divide and conquer Method: Binary Search, Finding Maximum and Minimum, Merge Sort and Quick Sort.

UNIT - II

Greedy Methods: Knapsack Problem, Minimum Cost Spanning Trees, Optimal Storage on Tapes and Single Source Shortest Path Problem.

UNIT - III

Dynamic Programming: Multistage Graphs, 0/1 knapsack and Traveling Salesman Problem. Basic Traversal and Search Techniques: Techniques for Binary Tree, Techniques for Graphs: Depth First Search and Breadth First Search - Connected Components and Spanning Tree - Biconnected Components and DFS.

UNIT - IV

Backtracking: 8 Queens Problems, Sum of Subsets, Graph Colouring, Hamiltonian Cycle and Knapsack Problem.

UNIT - V

Branch and Bound: Least Cost Search. Bounding: FIFO Branch and Bound and LC Branch and Bound.0/1 Knapsack Problem, Travelling Salesman Problem.

Text Book:

E.Horowitz, S.Sahni and Sanguthevarrajasekaran , Fundamentals of Computer Algorithms , Second edition, Universities Press.

Books for Reference:

- S. K. Basu, Design Methods and Analysis of Algorithms , PHI, 2005.
- Goodman and S. T. Hedetniem, Introduction to the Design and Analysis of
- Algorithms , MGH, 1977.
- A.V. Aho, J.D. Ullman and J.E.Hospcraft, The Design and Analysis of
- Computer Algorithms , Pearson Education.

SEMESTER –I

Core IV- ADVANCED COMPUTER ARCHITECTURE

Code:17PCSC14	Hrs/week:5	Hrs/Semester:75	Credits:5

Objectives
- To understand various addressing modes and program and network properties ,
- Learn the computer arithmetic principles and super scalar techniques
- Learn modern techniques of message passing mechanisms

UNIT I :Review of basics and ISA design:
Fundamentals of Computer Design: Introduction – Functional units of a Computer – Recent trends in technology – CISC vs RISC. Performance measure of a Computer: Performance measures, Performance parameters –Measuring the performance –Amdahl"s Law and CPU performance. Benchmarks for evaluating the performance.
Design factors - operand and opcode types – Instruction formats and addressing modes – compiler Issues – structure of modern compilers.

UNIT II :Pipelining:
Pipelining: Definition – Basic characteristics of pipelined processing – Functional structure of pipelined computer – pipelined processor design principles - Performance issues- different types of Pipeline hazards.

UNIT III:Parallelism:
 Definition and types of parallelisms – Instruction level parallelism – Different typed of dependencies in programs. – Dynamic scheduling –Score boarding– Tomasulo"s approach-Branch prediction. Software Solution to ILP: Super Scalararchitecture – static and dynamic scheduling on a super scalar architecture. VLIW architecture – Vector processors -Compiler support for ILP.

UNIT IV:Shared Memory Architecture and Memory Organization:
Parallel processing Configurations – Flynn"s classification – Centralized and distributed memory models. Communication models and memory architectures – Performance metrics for communication mechanisms- challenge- Cache coherence – Directory based cache coherence protocols. Memory hierarchy –strategies of Cache write – cache performance and improvements –Main Memory performance issues –Interleaved memory- Virtual Memory

UNIT V: I/O issues:
.I/O : Storage types, Busses –Bus transactions – I/O device Performance metrics – Queuing theory –Bus Standards –I/O transfer using memory bus -Connecting bus to Cache –Disk arrays – RAID LEVELS – SCSI – Example Parallel Processors.

Text Books:

1. K. A. Parthasarathy et.al – Advanced Computer Architecture, 2/e, Thomson Learning, Indian Edition, 2006

2. K. Hwang & F. A. Briggs – Computer Architecture and Parallel Processing, TMH, New Delhi 2004

Books for Reference:

- Kai Hwang &NareshJotwani "Advanced Computer Architecture Parallelism, Scalability, Programmability", McGraw Hill, Second Edition,2011
- D. Sima, T. Fountain & P. Kacsuk. Advanced Computer Architectures, Pearson. Education, New

SEMESTER –I
CORE - PRACTICAL I- ADVANCED JAVA PROGRAMMING LAB

Code:17PCSCR1	Hrs/week:5	Hrs/Semester:75	Credits:4

1. Write an Applet which will play two sound notes in a sequence continuously use the play() methods available in the applet class and the methods in the Audio clip interface.

2. Create a Japplet using swing control, which will create the layout shownbelow and handle necessary events.

   Format

   Enter your Name:

   Enter your Age:

   Select your s/w: * Oracle *Visual Basic*Java

   Select your city : *Delhi *Mumbai*Chennai

   OK Cancel

3. Use JDBC connectivity and create Table, insert and update data.

4. Write a program in Java to implement a Client/Server application using RMI.

5. Write a program in Java to create Servlet to count the number of visitors to a web page.

6. Write a program in Java to create a form and validate a password using Servlet.

7. Write a program in Java to convert an image in RGB to a Grayscale image.

8. Develop Chat Server using Java.

SEMESTER –I
CORE - PRACTICAL II - DESIGN AND ANALYSIS OF ALGORITHMS LAB

Code:17PCSCR2	Hrs/week:5	Hrs/Semester:75	Credits:4

1. Sorting
2. Graph traversal
3. Prim's Algorithm-Greedy Method
4. N queen problem
5. Knapsack problem
6. Single Source Shortest Path
7. Sum of Subsets
8. Binary Search Tree
9. Graph Coloring
10. Biconnected Components
11. Travelling Salesman Problem

SEMESTER- II			
CORE V– RELATIONAL DATABASE MANAGEMENT SYSTEM			
Code: 17PCSC21	Hrs / week :5	Hrs / Semester: 75	Credits :5

Objectives:

- To develop a Database with enhanced models and techniques
- To understand the fundamentals of Relational Database Management Systems and Object oriented Databases.

UNIT I:

Introduction : Purpose of Database Systems – View of Data – Data Models – Database languages – Data Storage and querying – transaction management – Database administrator – database users – overall system structure.

UNIT II:

Relational Database Design : Anomalies in a database –Functional dependency - Lossless join and dependency – Preserving Decomposition – Third normal form – Boyce codd normal form – Multivalued Dependency – Fourth normal form

UNIT III:

SQL: Data Definition – Data manipulation – Integrity constraints – views – PL/SQL. **Recovery :**DBMS Transaction – DBMS data recovery -Recovery algorithm –DBMS data backup -Buffer management – Virtual memory and recovery – Logging schemes – Disaster recovery

UNIT IV:

Concurrency Management : Introduction – Serializability – Concurrency Control scheme – Locking schemes – Timestamp based order – Multiversion techniques – Deadlock and its resolutions – Recovery and atomicity- concurrency control and recovery.

UNITV:

Distributed databases: Introduction – Homogeneous and Heterogeneous databases – Distributed data storage – Distributed transactions –commit protocols – concurrency control – Distributed query processing – deadlocks in distributed systems.

Text Books:

Abraham Silberschatz,Henry F Korth,S.Sudharsan,"Database System Concepts" , Tata McGrawHill,6th Edition,2011

Reference Books:

1. Bipin C. Desai , " An Introduction to Database Systems" , Galgotia Publications,2002.
2. Raghu Ramakrishnan and Johannes Gehrke, " Database Management Systems",McGraw – Hill Higher Education.

3. Elmasri,Navathe,"Fundamentals of Database systems,Pearson Education Asia, Third Edition.

SEMESTER- II		
CORE VI– Open Source Technology			
Code: 17PCSC22	Hrs / week :5	Hrs / Semester: 75	Credits :5

Objectives:

- To understand the concepts of open source technology
- To gain knowledge in Linux administration and developing application based on Linux.

UNIT I

Open Source Definition, The distribution terms of open source software, open source technology importance - Free and Open Source Software (FOSS), LAMP (Linux, Apache, MySQL, PHP, Pythonand Perl. Benefits, Perspectives of Open Source software-Linux and Open Source, Linux Usage Basics: Logging into the system, changing users and editing text file-.Running Commands and Getting Help- Browsing the File system, Users- Groups and Permissions.

UNIT II

Installation of Linux interactively-Perform user and group administration-Administer the Linux printing subsystem, Automate tasks with at, cron -Install, update, query and remove software packages with RPM. Apache Web server: Starting and Stopping and Restarting Apache- Configuration - Securing Apache - Create the Web Site-Apache Log Files.

UNIT - III

My SQL: Commands - Database Independent Interface - Tables – Loading and Dumping Database.

UNIT - IV

PHP: Embedding PHP into HTML -Configuration - Language Syntax: Variables - Data Types - Web variables - Operators - Flow Control Constructs - Writing PHP Papers.

UNIT - V

Built in PHP function - Important Functions - Array Functions – String Functions - Other Functions - PHP and MySQL: MySQL Functions.

Text Books:

1. Negus Christopher "Red Hat Linux Bible", 2004, Wiley Publishers.
2. James Lee and Brent Lee "Open Source Development with LAMP - Using Linux , Apache, My SQL ,Perl and PHP", Pearson Education , 2009.

Books for Reference:

- N.B.Venkateshwarlu (Ed); Introduction to Linux: Installation and Programming, 2005, B S Publishers.
- Nemeth, "Linux Administration Handbook", 2nd edition, Pearson Education.
- VikramVaswani" How to do Everything with PHP & MySQL , 2005, McGraw Hill.
- Meloni C Julie "PHP, MySQL and Apache", 2003,Pearson Education.

SEMESTER- II			
CORE VII– DATA MINING			
Code: 17PCSC23	Hrs / week :5	Hrs / Semester: 75	Credits :5

Objective:

- To study the basic and advanced concepts in Data Mining Techniques. To understand thevarious algorithms involved in data mining and its applications.

UNIT I

Introduction: Basic Data Mining Tasks- Data Mining Versus Knowledge Discovery in Databases. Data Mining Techniques: Introduction-A Statistical Perspective on Data Mining-Similarity Measures- Decision Trees-Neural Networks-Genetic Algorithms

UNIT II

Classification: Introduction- Statistical Based Algorithms-Distance Based Algorithms-Decision Tree Based Algorithms-Neural Network Based Algorithms- Rule Based Algorithms-Combining Techniques.

UNIT III

Clustering: Introduction-Similarity and Distance Measures-Outliers Hierarchical Algorithms- PartitionalAlgorithms.

UNIT IV

Association Rules: Introduction-Large Item sets-Basic Algorithms-Parallel and Distributed Algorithms-Comparing Approaches-Incremental Rules-Advanced Association Rule Techniques- Measuring the Quality of Rules.

UNIT V

Web Mining: Introduction-Web Content Mining-Web Structure Mining-Web Usage Mining. Spatial Mining: Introduction- Spatial Data Overview- Spatial Data Mining Primitives-Generalization and Specialization-Spatial Rules- Spatial Classification Algorithms-Spatial Clustering Algorithms.

TEXT BOOK:

Margaret H. Dunham, "Data Mining Introductory and Advanced Topics", Pearson publications, Ninth Impression.

BOOKS FOR REFERENCE:

- K. P. Soman, ShyamDivakar, V. Ajay "Insight in to Data Mining Theory and Practice", PHI Learning Pvt. Ltd, 2006.

- Jiawei Han, MichelineKamber, Jian Pei " Data Mining Concepts and Techniques", Morgan Kaufmann Publishers, Third Edition

SEMESTER- II
CORE ELECTIVE – WEB DESIGNING & MULTIMEDIA

Code: 17PCSE21	Hrs / week :6	Hrs / Semester: 90	Credits :3

Objective:

- To study the basic and advanced concepts in Web designing and multimedia.

UNIT I : HTML

Introduction – Creating, Saving, Viewing HTML documents – Applying Structure tags – Linking - Images – Formatting Text

UNIT II:

Tables:Creatingtables,Inserting,Deleting,Updating,Formatting– Forms: Creating and processing forms - Frames:Understandingframes,Creatingframes,Enabling and Effective Frames,Creating inline Frames

UNIT III : XML

Introduction – New kinds on the block – displaying XML – XML in the real world – Well Formed and Valid Documents – Cascading Style sheets

UNIT IV: MULTIMEDIA

Definition – Where to use multimedia – Adobe Photoshop: Layering – Designing – Transporting – Filtering – Cropping - Rotating

UNIT V:

Flash: Text Effects – Frame by frame animation - animation using guided path animation using multilayer – text/ image morphing.

TEXT BOOKS:

- Mastering HTML 4, premium edition, Deborah S. Ray & Eric J. Ray, BPB Publications.
- Boumphrey, Stephen Mohr, Paul Houle, and others, 'XML Applications', Wrox Press Ltd, Sohr Publishers & Distributors Pvt Ltd.
- Photoshop CS5
- Flash CS5 in Simple Steps Edition-2011 Published by Dream Tech Press Authored byKogentLearing Solutions Inc

BOOKSFOR REFERENCE:

- Adobe photoshop CS6 Bible by Lisa DanaeDayley& Brad Dayley
- Web Technology & Design. Author, C. Xavier. Publisher, New Age International,

SEMESTER- II
PRACTICAL III – RDBMS AND DBA LAB

Code: 17PCSCR3	Hrs / week :5	Hrs / Semester: 75	Credits :4

1. Table creation with DDL
2. Simple queries using DML, DCL
3. SQL functions & SET operations
4. View and Snapshots
5. Nested queries & Join queries
6. Simple PL/SQL Block & Cursors
7. Functions & Procedures
8. Database triggers
9. Packages
10. User creation with profiles
11. Granting and revoking privileges
12. Locking schemes
13. Table Space Management
14. Audit trails

SEMESTER- II
PRACTICAL IV – OPEN SOURCE TECHNOLOGY LAB

Code: 17PCSCR4	Hrs / week :4	Hrs / Semester: 75	Credits :4

1 Designing your own page using PHP

2. Create user using shell script with limited privileges

3. Changing file permissions using shell script

4. Scheduling a job using cron

5. . Create and edit a document using open office

6. Working with different types of looping statements using PHP

7. Working with different types of array using PHP

8. Working with PHP forms

9. Executing DML and DDL commands using MySQL

10. Retrieving data from table using PHP

11. Inserting data into table using PHP

12. Create a feedback form using PHP and MySQL

SEMESTER-III			
COMMON CORE - TRANSFORMS WITH MATLAB			
Code: 17PCCC31	Hrs/Week: 4	Hrs/Sem: 60	Credits : 3

Objectives
- Comprehend the concepts of Z and Fourier Transforms
- To enable students develop their calculation skills using MATLAB.

UNIT I
Fourier Transforms:Introduction - Fourier Integral theorem - Fourier Transforms - Alternative form of Fourier complex integral formula - Relationship between Fourier Transforms and Laplace Transforms.
(Text Book 1 - Chapter 2 : Sections 2.1 , 2.2 , 2.3 , 2.4 , 2.5)
UNIT II

Properties of Fourier Transforms - Finite Fourier Transforms .

(Text Book 1 - Chapter 2 : Sections 2.6 , 2.7)

UNIT III

Z - Transforms : Introduction - Properties of Z- Transforms - Z-Transforms of some basic functions - Inverse Z- Transforms - Use of Z-Transforms to solve finite differential equations.

(Text Book 1 -Chapter 5 : Section 5.1 , 5.2 , 5.3 , 5.4 , 5.5)

(Exercise Problems are not included)

UNIT IV: MATLAB
Introduction : MATLAB Environment - Types of files - Search - Constants , Variables and Expressions - Vectors and Matrices - Polynomials - Input / Output statements- MATLAB graphics.
 (Text Book 2 - Chapter 1, 2, 3, 4, 5,6)
UNIT V

Control Structures - Writing Programmes and functions - Ordinary Differential Equations and Symbolic Mathematics - MATLAB Applications : Z-Transforms and Fourier Transforms.

(Text Book 2 - Chapter 7, 8, 9, 15 (Sections : 15.1, 15.6, 15.7 ,15.8)

TEXT BOOKS:

1. T.Veerarajan : Transforms and Partial Differential Equations (Updated Edition) .

2. RajkumarBansal , Ashok Kumar Goel , Manoj Kumar Sharma : MATLAB and its Applications in Engineering, Pearsons Publications.

SEMESTER- III			
CORE IX – SMART DEVICESPROGRAMMING			
Code: 17PCSC32	**Hrs / week :6**	**Hrs / Semester: 90**	**Credits :6**

Objective

Provide concepts to enable the students for creating applications for smart devices using Android.

UNIT I

Introduction to Android: History of Android - Versions of Android - Android Architecture - Application Architecture - Components - Intents - Mainfest - Application Package - Activities - Services - Broadcast Receivers - Content Providers - Installing the Android SDK - Installing an Android Platform - Creating an Android Virtual Device - Starting the AVD - Introducing UC - Creating UC - Installing and Running UC - Preparing UC for Publishing - Migrating to Eclipse - Developing UC with Eclipse.

UNIT II

User Interface: Customizing the Window - Creating and Displaying Views - Monitoring Click Actions - Resolution Independent Assets - Locking Activity Orientation - Dynamic Orientation Locking - Manually Handling Rotation - Creating Pop-up Menu Actions - Customizing Options Menu - Customizing Back Button - Emulating the Home Button - Monitoring TextView Changes - Scrolling TextView Ticker - Animating a View - Creating - Drawables as Backgrounds - Creating Custom State Drawables - Applying - Masks to Image - Creating Dialogs that Persist - Implementing Situation - Specific Layouts - Customizing Keyboard Actions - Dismissing Soft Keyboard - Customizing AdapterView Empty View - Customizing ListView Rows - Making ListView Section Headers - Creating Compound Controls.

UNIT III

Interacting with Device Hardware and Media - Interacting Device Location - Mapping Locations - Annotating Maps - Capturing Images and Videos - Making a Custom Camera Overlay - Recording Audio - Adding Speech Recognition - Playing Back Audio/Video - Creating a Tit Monitor - Monitoring Compass Orientation.

UNIT IV

Persisting Data : Marking a Preference Screen - Persisting Simple Data - Reading and Writing Files - Using Files as Resources - Managing a Database - Querying a Database - Backing Up Data - Sharing your Database - Sharing your other Data.

UNIT V

Interacting with the Systems: Notifying from the Background - Creating Timed and Periodic Tasks - Scheduling a Periodic Task - Creating Sticky Operations - Running Persistent Background Operations - Launching Other Applications - Launching System Application - other Applications - Interacting with Contacts - Picking Device Media - Saving to the MediaStore.Working with Libraries : Creating Java Library JARs - Using Java Library JARs - Creating Android Library Projects - Using Android Library Projects - Charting - Practical Push Messaging.

Text Book :

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

Web Reference

Android Developer's Guides - available at http://developer.android.com/

SEMESTER-III				
ELECTIVE I - CLOUD COMPUTING				
Code: 17PCSE31	**Hrs/week:5**	**Hrs/sem:75**	**Credits: 5**	

Objectives:

- Comprehend the core concepts of the cloud computing.
- Apply the fundamental concepts in data centers to understand the tradeoffs in power,   efficiency and cost.
- Analyze various cloud programming models and apply them to solve problems on the cloud.

UNIT I: UNDERSTANDING CLOUD COMPUTING

Cloud computing - cloud types- the cloud cube model- deployment models-service models-characteristics of cloud computing-assessing the role of open standards.

UNIT II: CLOUD ARCHITECTURE

The cloud computing stack – composability – infrastructure – platforms – virtual appliances – communication protocols – Connecting to the cloud: The Jolicloud net book OS – Chromium OS the browser as an operating system.

UNIT III: DEVELOPING CLOUD SERVICES

Infrastructure as a service (IaaS) – IaaS workloads- Platform as a service (PaaS) – Software as a service (SaaS)– Identity as a service (IDaaS) – Compliance as a service(CaaS).

UNIT IV: VIRTUALIZATION AND CLOUD APPLICATIONS

Virtualization technologies – load balancing and virtualization – advanced load balancing – the Google cloud – Google Analytics – Google translate- Google Toolkit –Google APIs-windows azure service – windows Azure App fabric.

UNIT V: CLOUD STORAGE

Cloud storage – unmanaged cloud storage – managed cloud storage – creating cloud storage systems – working with Amazon storage systems: Amazon Elastic compute cloud(EC2)- Amazon simple storage system(S3) – Amazon Elastic block store(EBS)- cloud front.

TEXT BOOK:

Barrie Sosinsky, Cloud Computing Bible, Wiley India Pvt. Ltd, 2012. New Delhi.
Chapters:1,3,4,5(pgs:94-99),8(pgs:162-173),10(pgs:201-216),15(pgs:316-321),9(pgs:185-199)

BOOK(S) FOR REFERENCE:

- Michael Miller, Cloud Computing: Web-Based Applications That Change the Way You Work and Collaborate Online, Que Publishing, Second Edition, August 2008.
- Haley Beard, Cloud Computing Best Practices for Managing and Measuring Processes for On-demand Computing, Applications and Data Centers in the Cloud with SLAs, Emereo Pvt. Limited, July 2008.

Semester III
COMMON CORE - PRACTICAL - TRANSFORMS WITH MATLAB

Code: 17PCCCR1	Hrs/Week: 2	Hrs/Sem: 30	Credits : 1

Using MATLAB:

1. Find the Fourier sine transforms of f(x) defined as $f(x) = \begin{cases} sinx, when\ 0 < x < a \\ 0, when\ x > a \end{cases}$

2. Find the Fourier cosine transform of f(x) defined as $f(x) = \begin{cases} x\ for\ 0 < x < 1 \\ 2 - x\ for\ 1 < x < 2 \\ 0\quad for\ x > 2 \end{cases}$

3. Find the Fourier transform of f(x) if $f(x) = \begin{cases} 1 - |x|\ for\ |x| < 1 \\ 0\quad for\ |x| > 1 \end{cases}$. Hence prove that $\int_0^\infty \frac{sin^4\ xdx}{x^4} = \frac{\pi}{3}$

4. Solve the equation $(D^2 - 4D + 3)\ y = \cos 3x$, $x > 0$ given that $y(0) = 0$ and $y'(0) = 0$.

5. Find the finite Fourier sine transform of cos ax and finite Fourier cosine transform of sin ax in (0 , π).

6. Find the finite Fourier sine transform and cosine transform of e^{ax} in (0 , l).

7. Find the Z-Transforms of $f(n) = \frac{1}{n(n-1)}$

8. Use convolution theorem to find the inverse Z-Transforms of $\frac{z^2}{(z+a)^2}$

9. Find $Z^{-1}\ \{ \frac{1}{1+4Z^{-2}} \}$ by the long division method.

10. Find $Z^{-1}\ \{ \frac{2z^2+4z}{(z-2)^3} \}$ by using Residue theorem.

SEMESTER- III
PRACTICAL V– SMART DEVICES PROGRAMMING

Code: 17PCSCR5	Hrs / week :5	Hrs / Semester: 75	Credits :5

Android

1. Different Layout design including nested layout for a single biodata.

2. Arithmetic Operation for two numbers

3. Business Calculator

4. Animation: Bouncing of a ball

5. Intent

6. Database SQLite: Student Biodata

7. Fragments - Tablet Programming

8. Media Player

Elective Papers

List of papers

1.Digital Image Processing

2.Bio Informatics

3.Cloud Computing

ELECTIVE PAPERS

DIGITAL IMAGE PROCESSING

Objectives:

- Give the students a general understanding of the fundamentals of digital image processing.
- Introduce the student to analytical tools which are currently used in digital image processing as applied to image information for human viewing.

UNIT I:
Introduction:Fundamentals Steps in DIP – Components of an Image Processing System.
Digital Image Fundamentals: Light and Electromagnetic Spectrum – Image Sensing and Acquisition – Image Sampling and Quantization – Some Basic Relationships between Pixels.

UNIT II:
Image Enhancement in the Spatial Domain: Some Basic Gray Level Transformations – Histogram Processing – Enhancement Using Arithmetic/Logic Operations – Basics of Spatial Filtering – Smoothing Spatial Filters – Sharpening Spatial Filters.
Image Enhancement in the Frequency Domain: Introduction to the Fourier Transform and the Frequency Domain – Smoothing Frequency-Domain Filters – Sharpening Frequency Domain Filters.

UNIT III:
Image Restoration: A Model of the Image Degradation/Restoration Process – Noise Models – Restoration in the presence of Noise Only-Spatial Filtering.
Image Compression: Fundamentals – Image Compression Models – Error-free Compression – Lossy Compression – Image Compression Standards.

UNIT IV:
Morphological Image Processing: Preliminaries – Dilation and Erosion – Opening and Closing – The Hit-or-Miss Transformation – Some Basic Morphological Algorithms.
Segmentation: Detection and Discontinuities – Edge Linking and Boundary Detection – Thresholding – Region-Based Segmentation.

UNIT V:
Representation and Description: Representation – Boundary Descriptors – Regional Descriptors.
Object Recognition: Patterns and Pattern Classes – Structural Methods.

Text Book:
1. Digital Image Processing – Rafael C.Gonzalez and Richard E.Woods, Pearson Education, 2009.

Books For Reference:
- Digital Image Processing and Analysis – B.Chanda and D.DuttaMajumder, Prentice Hall India – 2009.
- Digital Image Processing – S.Jayaram, S.Esakkirajan, T.Veerakumar, Tata McGraw Hill Education Private Limited, New Delhi, 2011.

BIO-INFORMATICS

Objective:

- To develop skills in application of computation techniques in biological problems relevantapplications.

UNIT I

Introduction: The Central Dogma - Killer Application - Parallel Universes - Watson's Definition -Top Down Vs Bottom Up Approach- Information Flow - Convergence – Data Management – Data Life Cycle– Database Technology – Interfaces – Implementation.

UNIT II

Data Visualization: Sequence Visualization – Structure Visualization – User Interface – Animation versus Simulation.

UNIT III

Statistics: Statistical Concepts – Micro Arrays – Imperfect Data – Basics – Quantifying – Randomness – Data Analysis – Tools Selection – Alignment – Clustering – Classification.

UNIT IV

Data Mining and Pattern Matching: – Data Mining Methods – Technology – Infrastructure Pattern Recognition – Discovery – Machine Learning – Text Mining – Pattern Matching Fundamentals – Dot Matrix Analysis – Substitution Matrix – Dynamic Programming – Word Method – Bayesian Method – Multiple Sequence Alignment Tools.

UNIT V

Modeling and Simulation: Drug Discovery Fundamentals – Components - process – Perspectives – Numeric considerations – Algorithms – Hardware – Issues – Protein structure – Ab Initio Methods – Heuristic methods – Systems Biology – Tools.

TEXT BOOK:
1. Bryan Bergeron, Bio-Informatics Computing, Prentice Hall, 2003.

Books for Reference:
- T.K.Affwood, D.J.Parry Smith, Introduction to Bio Informatics, Pearson Education.
- Jin Xiong, Essential Bioinformatics, Cambridge University Press, 2011.
- Pierre Baldi, Soren Brunak, Bio-Informatics –The machine Learning Approach, 2nd Edition, First East West Press, 2003.

CLOUD COMPUTING

Objectives:

- Comprehend the core concepts of the cloud computing.
- Apply the fundamental concepts in data centers to understand the tradeoffs in power, efficiency and cost.
- Analyze various cloud programming models and apply them to solve problems on the cloud.

UNIT I: UNDERSTANDING CLOUD COMPUTING
Cloud computing - cloud types- the cloud cube model- deployment models-service models-characteristics of cloud computing-assessing the role of open standards.

UNIT II: CLOUD ARCHITECTURE
The cloud computing stack – composability – infrastructure – platforms – virtual appliances – communication protocols – Connecting to the cloud: The Jolicloud net book OS – Chromium OS the browser as an operating system.

UNIT III: DEVELOPING CLOUD SERVICES
Infrastructure as a service (IaaS) – IaaS workloads- Platform as a service (PaaS) – Software as a service (SaaS)– Identity as a service (IDaaS) – Compliance as a service(CaaS).

UNIT IV: VIRTUALIZATION AND CLOUD APPLICATIONS
Virtualization technologies – load balancing and virtualization – advanced load balancing – the Google cloud – Google Analytics – Google translate- Google Toolkit –Google APIs-windows azure service – windows Azure App fabric.

UNIT V: CLOUD STORAGE
Cloud storage – unmanaged cloud storage – managed cloud storage – creating cloud storage systems – working with Amazon storage systems: Amazon Elastic compute cloud(EC2)- Amazon simple storage system(S3) – Amazon Elastic block store(EBS)-cloud front.

TEXT BOOK:

Barrie Sosinsky, Cloud Computing Bible, Wiley India Pvt. Ltd, 2012. New Delhi.
Chapters:1,3,4,5(pgs:94-99),8(pgs:162-173),10(pgs:201-216),15(pgs:316-321),9(pgs:185-199)

BOOK(S) FOR REFERENCE:
- Michael Miller, Cloud Computing: Web-Based Applications That Change the Way You Work and Collaborate Online, Que Publishing, Second Edition, August 2008.
- Haley Beard, Cloud Computing Best Practices for Managing and Measuring Processes for On-demand Computing, Applications and Data Centers in the Cloud with SLAs, Emereo Pvt. Limited, July 2008.

Web Technologies

Objectives :

To understand the concepts CSS ,XML, Script, PHP and DOM

UNIT I.

HTML, CSS and Basics of XML

Introduction to Hyper Text Markup Language

Key components of HTML document, HTML elements, Headers, Linking, Images, Unordered Lists, Nested and ordered Lists, HTML Tables and Formatting, HTML Forms, Internal Linking, Creating and Using Image Maps, <meta> Tags, frameset Element, Nested framesets.

Cascading Style Sheets (CSS)

Introduction, Inline Styles, Creating Style Sheets with the style element, conflicting styles, linking external style sheets, positioning elements, backgrounds, element dimensions, text flow and the box model, user style sheets.

Creating Markup with XML

Introduction to XML Markup, Parsers and Well-formed XML documents, Parsing an XML document, Characters, Markup, CDATA sections, XML Namespaces

Case Study: A Day Planner Application.

UNIT II.

DTD

Parsers, Well-formed and valid XML documents, Document Type Declaration, Element Type Declarations, Attribute Declarations, Attribute Types, Conditional Sections, Whitespace Characters.

Case Study: Writing a DTD for the Day Planner Application.

Schemas

Schema Vs. DTDs, Microsoft XML Schema: Describing Elements, Microsoft XML Schema: Describing Attributes, Microsoft XML Schema: Data Types, W3C XML Schema.

Case Study: Writing a Microsoft XML Schema for the Day Planner Application.

UNIT III.

JavaScript:Background, writing code, event handling, JavaScript with HTML, Practicalexamples.

PHP

Creating a simple PHP program.Accessing PHP and HTTP Data.Reading POST and GET variables. Form validation. User – defined function in PHP. Handling cookies and sessions.

UNIT IV.

PHP and XML, PHP4 XML Functions, PHP5 XML Functions-SimpleXML and Changing values.

Connecting to MySQL from PHP, PHP MySQL Connectivity, Creating Databases and Tables with PHP

Case Study: Creating a User Registration Script and an Access Logger Script.

UNIT V.

DOM:DOM Implementations, DOM with JavaScript, Setup, DOM Components, Creating nodes, Traversing the DOM.

Case Study1: Modifying the Day Planner Application to use the DOM.

Case Study2: XmlMessenger Program.

XML Processing and Implementations: Processing XML-XPath, XSLT.

XMLImplementations- XHTML, Webservices, XUL and WML

Text Book:
1. Deitel, Deitel, Nieto, Lin and Sadhu, XML How to Program, Pearson Education Asia, published by Addison Wesley Longman (Singapore) Pte Ltd., Indian Branch, Delhi, 2001.
2. Mercer W.Dave, Allan Kent, Steven D Nowichi, David Mercer, Dan Squier, Wankyer Choi Beginning PHP5 Wiley – Dreamtech India Pvt. Ltd., 2004 (ForUnit 3 & 4)
3. Bryan Pfaffenberger, Steven M. Schafer, Chuck White and Bill KarowHTML,XHTML and CSS Bibl*e* –Wiley-Eastern Private Ltd., 3rdEdition, 2004(Chapter
    25 & 32)

Books for Reference:
1. Brain Benz with John R.Durant, XML 1.1 Programming Bible, Wiley-dreamtech India Pvt Ltd, New Delhi,2003.
2. Art Gittleman ,InternetProgramming with JAVA 2 Platform, dreamtech, New Delhi, 2003.

TCP/IP

UNIT I.
The OSI Model and TCP/IP Protocol Suite
Protocols and standards, The OSI Model, TCP/IP Protocol Suite, Addressing, TCP/IP Versions.
Link Layer
ARP –Packet format, Encapsulation, Operation, ARP over ATM, Proxy ARP, ARP Package-Cache Table, Queues, I/O Module, Cache-Control module. RARP-Packet format, Encapsulation, RARP Server, Alternative solutions to RARP.

UNIT II.
ICMP & IP
ICMP overview, Message Types, ICMP Message format.CIDR – Subnetting, VLSM, Supernetting. IP Routing Principles, Routing IP Datagrams, Dynamic Routing Protocols – RIP, OSPF, HELLO, BGP. PING program. Traceroute program.

UNIT III
UDP & TCP
UDP-Process to Process Communication, User datagram, Checksum, Operation, Use of UDP, UDP Package, TCP-Services, Features, Segment, TCP connection, State Transition Diagram, Flow-Control-Nagel's Algorithm, Clark's Solution, Error-Control, Congestion Control, TCP Timers-RTT, Karn's Algorithm, Options, TCP Package.

UNIT IV

UDP & TCP Utilities
DNS – Basics, Resolution, Caching, DNS Message Format, Inverse mapping, Pointer Queries.
TELNET – concept, NVT character set, Embedding, Options, Negotiation, controlling the server, Out-Of-Band Signaling, Escape Characters, Mode of Operation, User Interface, Security Issue.
FTP – Connections, Communication, Command Processing, File Transfer, Anonymous FTP.
TFTP – Messages, Connection, Data transfer, UDP ports, TFTP example, Security,

Applications. SMTP – Architecture, User Agent, Message Transfer Agent, Message

Access Agent: POP and IMAP, Web-based mail. SNMP – SMI, MIB, SNMP.

UNIT V
IP over ATM, Mobile IP and VOIP
IP over ATM-ATM WANs-Layers, Carrying a datagram in cells, Routing the cells, ATMARP, Logical IP Subnet (LIS).
VOIP – Session Initiation Protocol, H.323 architecture and protocols.

Mobile IP – Addressing, Agents, Three Phases Inefficiency in mobile IP.

Text Book:
1. Behrouz A. Forouzan, "TCP/IP Protocol Suite", Tata Mc-Graw-Hill publications, 3rd Edition, 2006.

Books for Reference:
- Comer E. Douglas, "Internetworking with TCP/IP Principles, Protocols and Architectures", Volume 1, Pearson Education, 4th Edition, 2002.
- Siyan S Karanjit and Parker Tim, "TCP/IP Unleashed", Pearson Education Asia, 3rd Edition.