DEPARTMENT OF COMPUTER SCIENCE

B.Sc. Computer science

U.G. PROGRAMME

SYLLABUS

Effective from the Academic Year 2012-2013

Loyola College (Autonomous)

Chennai- 600 034

LOYOLA COLLEGE (AUTONOMOUS)
CHENNAI - 600 034.

LOYOLA COLLEGE (AUTONOMOUS)
DEPARTMENT OF COMPUTER SCIENCE
BACHELOR OF SCIENCE in COMPUTER SCIENCE
(Effective from the Academic year 2012 -2013 onwards)

SEMESTER III

PART	CATEGORY	TITLE OF THE PAPER	CONTACT HOURS	CREDITS
I				
II		GE	6	3
III	MC	Data Structures using C++	4	4
	MC	Data Structures using C++ - Lab	5	5
	AO	Allied Optional	6	4
IV		T/Lang	3	1
		EG	3	1
		FC	3	1
V		ORA		
Tot Hrs			30	19

SEMESTER IV

PART	CATEGORY	TITLE OF THE PAPER	CONTACT HOURS	CREDITS
I				
II		GE	6	3
III	MC	RDBMS and Oracle	5	5
	MC	RDBMS and Oracle- lab	4	4
	AO	Allied Optional	6	4
IV		T/Lang	3	1
	EG		3	1
	FC		3+3	2
V	ORA			2
Tot Hrs			30(+3)	22

SEMESTER V

PART	CATEGORY	TITLE OF THE PAPER	CONTACT HOURS	CREDITS
I	SSP			
II	SSP			
III	MC	C# with ASP.Net	5	
	MC	C# with ASP.Net – LAB	4	
	MC	Operating Systems	4	
	MC	Object Oriented Technology and Software Engineering	4	
	MC	Web Programming with PHP AND MYSQL	3	
	MC	Web Programming With PHP AND MYSQL - LAB	4	
	ES	Data Communication and Networks / Data Mining/ Linux and Shell Programming / Cloud Computing/ Cellular and Mobile Computing [Any Two]	3+3	2+2
	SSP		2	
Tot Hrs			30	28+2

SEMESTER VI

PART	CATEGORY	TITLE OF THE PAPER	CONTACT HOURS	CREDITS
III	MS	Software Testing / Network Administration	15	15
	MS	Project Work	6	5
	SK	Programming in Java / Multimedia technologies	9	15
Tot Hrs			30	35

Semester: III **Credits:4**
Category: MC **No. of Hrs/week:4**

CS 3504 -DATA STRUCTURES USING C ++

Objectives:

1. To introduce the fundamentals of Data Structures, Abstract concepts and how these concepts are used in problem solving.
2. To create and use new, simple and complex data types within C++ programs.

UNIT I

Principles of Object Oriented Programming: Procedure Oriented Programming – OOP Paradigm-Basic concepts of OOP-Benefits of OOP-Object Oriented Language Applications of OOP. Beginning with C++, Tokens, Expressions and Control Structure. Functions in C++: Introduction-Main function prototyping- call by, return by reference-inline functions-default, constant arguments-Function overloading-friend and virtual functions. Classes and Objects.

UNIT II

Constructors and Destructors. Constructors-Parameterized, Multiple Constructors- dynamic constructors-destructors .Operator overloading and Type Conversions, Inheritance: Extending classes. Pointers, virtual functions and polymorphism.

UNIT-III

Managing console I/O Operations: C++ streams-C++ stream classes-Unformatted I/O Operations-Formatted console I/O Operations, Working with files: classes for file stream operations-opening and closing a file-EOF-File modes-File pointers-sequential I/O Operations. Templates, Exception Handling.

UNIT IV

Stack and Queue —– Fundamentals of stack and Queues – Evaluation of Expressions –
Linked List: Singly Linked List – Polynomial Addition – Doubly Linked List -Tree: Binary Tree Representation and Traversal. Sequential search, Binary search Graphs – Graphs representation –Graph Traversal – Depth First Search – Breadth First Search

UNIT V

Sorting – Insertion Sort – Quick Sort – Merge Sort – Heap Sort – Hashing – Hash tables Hash functions-Priority Queues- Single and double ended Priority Queues- Multiway Search Trees – B-Trees – B^+ Trees

Text Book :

1. E. Balagurusamy, Object-Oriented Programming with C++, Tata McGraw-Hill Education, 2008

2. Horowitz Ellitz & Sahni Satranj, Mehta Dinesh, “Fundamentals of Data Structures in C++” , 2006, Silicon Press.

Reference Books:

1. Ullman J.D. Aho & J.E. Hopcraft, “Data Structures and Algorithms” , 4th Edition, Addison
Wesley Publishers.

2. Tremblay Paul Jean, Sorenson G. Paul, “An introduction to Data Structures with Applications”, 2nd edition , Tata Mcgraw Hill.

Semester: III **Credits: 5**
Category: MC **No. of Hrs/week: 5**

CS 3505 -DATA STRUCTURES USING C++ - LAB

Objectives:

1. To acquire skills in C++ programming with object oriented concepts

2. To understand the data structures and implement through C++ programming language

Develop C ++ programs to perform the following:

1. To implement call by reference and return by reference
2. To implement the concept Function overloading
3. To develop and use virtual and inline functions
4. To find the sum and average of n numbers using friend function.
5. To read two matrices of size m x n and perform addition / subtraction.
6. To read two matrices and perform multiplication if the order satisfies the criteria.
7. To find the sum of two complex number using constructor.
8. To generate Fibonacci series using class.
9. To simulate the working of a queue of integers using array with the operations Insert, Delete and Display through arrays.
10. To read and display the "Employee information" using the class with the following details a)Emp id b) Name c) Designation d)Dept e) Basic pay
11. To prepare payroll for 'n' employees.
12. To create a String type class and implement the string operations
13. To create a class called STACK using an array of integers and to implement the stack operations.
14. To create a class called LIST (linked list) with the member functions to insert and delete elements at the front position of the list.
15. To implement the Queue and perform the operations over it.
16. To perform a) Sequential search b) Binary search
17. To perform a) Insertion sort b) Bubble Sort

Semester: III	**Credits: 5**
Category: MC	**No. of Hrs/week: 5**

CS 4504 -RDBMS AND ORACLE

Objectives:

1. To inculcate the basics of relational database systems.
2. To practice the fundamentals operations of a database system.
3. To master the different query constructs and utilize the features of Oracle.

UNIT I

Introduction to databases- three levels of database architecture- introduction to relational databases- introduction to SQL- Relational algebra- Relational Calculus- integrity constraints- key- E/R model- E/R diagrams- database design with E/R model.

UNIT II

Functional dependencies- normalizations- first normal form-second normal form- third normal form-Boyce Codd normal form- transactions-transaction recovery- system recovery-Two phase commit-save points- concurrency- concurrency problems- locking- deadlock- serializability- isolation levels-intent locking – dropping ACID.

UNIT III

creating –dropping and altering tables-simple queries- creating -dropping and altering views creating indexes. Character functions-number functions-date functions –conversion functions- Group Functions -Sub queries -advanced use of functions and variables-Decode and case-Adding and removing constraints to tables**.**

UNIT IV

PL/SQL programming-Declaring variables-control statements-case statements- Cursors-Exception handling-views-synonyms-sequences-indexes-Clusters.

UNIT V

Procedures-functions-packages-syntax - creation-package over loading- Triggers –types of triggers-trigger syntax-Enabling Disabling - replacing and dropping triggers--Java Stored procedures.

Text Books:

1. C.J. Date,A. Kannan, S. Swaminathan, “An Introduction to Database Systems”, Pearson Education, Eighth edition

2. Shah Nilesh, “Database Systems Using Oracle A simplified Guide to SQL and PL/SQL” 2005.,Second edition, Prentice Hall of India,

Reference Books:

1. Raguramakrisnan , “Database Management Systems”, Tata McGraw Hill, Third Edition,2003.

2. Loney Kevin and Koch George, “Oracle 9i The complete reference “,, 2002,Tata McGraw Hill.

Semester: III **Credits: 4**
Category: MC **No. of Hrs/week: 4**

CS 4505 - RDBMS AND ORACLE -LAB

Objectives:

1. To acquire skills in SQL statements with various constructs
2. To acquire skills in PL/SQL Programming
3. To practice with stored Objects

Exercises:

1. Creating, modifying and dropping Tables.
2. Inserting, modifying and deleting rows.
3. Working with *Decode* and *case*.
4. Creating tables with Adding ,Dropping ,disabling /enabling constraints.
5. Retrieving rows with Character functions.
6. Retrieving rows with Number and Date functions.
7. Retrieving rows with Group functions and HAVING.
8. Retrieving rows with Sub Queries.
9. PL/SQL programs with control structures.
10. PL/SQL programs with Cursors.
11. PL/SQL programs with Exception Handling.
12. Creating and Calling Procedures.
13. Creating and Calling Functions.
14. Creating and Calling Packages.
15. Overloading Packages.
16. Working with Sequences, synonyms, partition, index and clusters
17. Preparing SQL PLUS Reports.

Semester: V **Credits:5**
Category: MC **No. of Hrs/Week: 5**

CS 5508 - C# PROGRAMMING WITH ASP.NET

Objectives :

1. To understand the goals and objectives of the .NET Framework.
2. To apply C#.NET programming techniques to various real world problems.

UNIT I

.Net Architecture: Common Language Runtime, Intermediate Language, Assemblies, .Net Frame work classes, Basics: Variables, Predefined data types, Flow control, Enumerations. Objects and Types: Classes, Structs, Object class.

UNIT II

Inheritance: Types, Implementation, modifiers, Interfaces. Generics: Overview, Generic classes. Arrays and Tuples: Simple, multidimensional and jagged arrays, array class, arrays as Parameters. Operators and Casts: Operators, type safety, Comparing objects for Equality, Operator Overloading.

UNIT III

String and Regular expressions: StringBuilder members, Format string, regular expressions. Collections: Queue, Stack, Language integrated Query: Overview, Standard Query Operators, Parallel LINQ. Error and Exceptions: Catching Exceptions, User defined Exception classes.

UNIT IV

Threads: Thread Class, Parallel classes. Manipulating Files: Managing the file system, Moving, Copying and Deleting files, Reading and writing to files. ADO.NET: Overview, Database Connections, Commands, Data Reader, Dataset, Persisting Dataset changes.

UNIT V

Manipulating XML: Reading and writing streamed XML. Windows Forms: Standard controls and components. ASP.NET: Introduction, Web forms, ADO.NET and Data Bindings.

Text Book:

Nagel Christian , Evjen Bill, Glynn Jay, Watson Kari , skinner Morgan, " Professional C# 4 and .Net4" 2012 ,Wrox Publication, Delhi.

Reference Books:

1. Nash Trey, "Accelerated C# 2010", 2010, A Press, Delhi.

2. Watson Ben , "C# 4.0" 2010, Pearson ,Delhi.

3. Griffiths Ian, Adams Matthew, Liberty Jesse, "Programming C# 4.0" 2010, O'REILLY, Delhi

Web resources:

1. http://csharp.net-tutorials.com

2. http://asp.net-tutorials.com

Semester: V **Credits: 4**
Category: MC **No. of Hrs/Week: 4**

CS 5509 - C# with ASP .NET LAB

Objectives :

1. To provide basic programming constructs of C#.NET programming language.
2. To Provide skills to create a ASP.NET Web Application

C#.NET

1. Create an application to work as a calculator to perform all the arithmetic calculations.
2. Write a program to display dates in different formats.
3. Write a program to implement abstract class and inheritance.
4. Develop an application to demonstrate polymorphism.
5. Develop an application to illustrate the working of instance and shared constructors and destructors.
6. Write a program using parameterized constructor.
7. Write a program to store information in memory variables using class.
8. Develop an application to demonstrate implementation of inheritance.
9. Write a program which implements the concept of overriding.
10. Develop an application and include code to handle errors using user defined exceptions.
11. Write a program which implements FileStream class.
12. Write a program which implements StreamReader and StreamWriter class.
13. Write a program using ArrayList.
14. Write a program to demonstrate data base connection and displaying the data using disconnected architecture using SQL.
15. Develop an application to display data from the database in a DataGrid using SQL Data provider.
16. Write a program to navigate through the records in a table.

ASP.NET

17. Create an application which demonstrates the use of web server controls.
18. Create a program to populate the Drop Down List.
19. Write a program to demonstrate output caching.
20. Demonstration of using web services in web application.
21. Creating a web service to perform calculations.
22 Create a complete web page using ASP.NET.

Semester: V **Credits:4**
Category: MC **No. of Hrs/Week:4**

CS 5510 - OPERATING SYSTEMS

Objectives:

1. To have a basic knowledge of processes, Scheduling concepts, memory management.
2. To have a better understanding in Input and Output and File system.

UNIT I

Introduction: Views- Goals - OS Structure - Components - Services – system calls - System Structure - Virtual Machines - System Design and Implementation. Process Management: Introduction - Process - Process Scheduling – Operations on processes - Cooperating Process - Inter-process Communication. – Threads.

UNIT II

CPU Scheduling: CPU Schedulers - Scheduling Criteria - Scheduling Algorithms. Process Synchronization: Critical - Section Problem – Semaphores. Deadlocks: Characterization - Methods for Handling Deadlocks - Deadlock Prevention - Avoidance - Detection - Recovery.

UNIT III

Memory Management: Introduction- Address Binding - Dynamic Loading and Linking - Overlays -Logical and Physical Address Space – swapping - Contiguous Allocation - Internal & External Fragmentation. Non-Contiguous Allocation: Paging and Segmentation Schemes.

UNIT IV

Virtual Memory: Demand Paging - Page Replacement - Page Replacement Algorithms - Thrashing. File System: Introduction - File Concepts -. Access Methods - Directory Structures – Protection.

UNIT V

File System Structures - Allocation Methods - Free Space Management. I/O System: Introduction - I/O Hardware - Application I/O Interface - Kernel I/O Subsystem - Disk Structure – Disk Scheduling - Disk Management – Swap-Space Management.

Text Book:

1.Silberschatz Abraham, Galvin Baer Peter and Gagne Greg , “Operating System Concepts”, Sixth Edition, 2003,John Wiley & Sons Pvt. Ltd.

Reference Books:

1. Tanenbaum S. Andrew, “Modern Operating Systems”, Third Edition, 2008, Prentice-Hall, Inc

2. Stallings William, “Operating Systems” , Seventh Edition, 2011,Pearson Education.

Semester: V **Credits:4**
Category: MC **No. of Hours/Week: 4**

CS 5511 - OBJECT ORIENTED TECHNOLOGY AND SOFTWARE ENGINEERING

Objectives:

1. To understand about object oriented analysis and design and apply the concepts in software engineering .
2. To understands the fundamentals of software engineering based on object oriented concept

UNIT I

Introduction: An Overview of Object Oriented Systems Development – Object Basics: Object oriented philosophy-Objects-Attributes-Behavior and Methods-Encapsulation and Information Hiding-Class Hierarchy-Polymorphism-Object Relationships and Associations-Case study: A Payroll Program – Object Oriented Systems Development Life Cycle

UNIT II

Object-Oriented Methodologies: Rumbaugh Methodology – BoochMethodology – Jacobson Methodology – Patterns Frameworks – Unified Approach – Unified Modeling –Language-Use Case- Class diagram-Interactive Diagram – Package Diagram – Collaboration Diagram – State Diagram –Activity Diagram.

UNIT III

Object-Oriented Analysis: Identifying use cases- Use-Case Model-Developing the Effective Documentation -Case study : Analyzing the ViaNet bank ATM- Analysis – Classification – Identifying Object relationships ,Attributes and Methods –Case study: Relationship Analysis for the ViaNet Bank ATM System.

UNIT IV

Software Engineering **:**Software Engineering Process paradigms - Project management - Process and Project Metrics – Risk analysis - Software project scheduling- Analysis modeling-Software design - Abstraction - Modularity - Cohesion and Coupling-user Interface design-code documentation - Code efficiency- Software Configuration Management.

UNIT V

Software Quality : Software Quality Assurance - Quality metrics - Software Reliability - Software testing - Path testing – Control Structures testing - Black Box testing - Integration, Validation and system testing - Software Maintenance-Reverse Engineering and Reengineering.

Text Books:

1. Bahrami Ali , “Object Oriented Systems Development”, 1999,Tata McGraw Hill.
2. Pressman. S. Roger., “Software Engineering A Practioners approach” 6th Edition, 2005 ,Tata Mcgraw Hill.

Reference Books:

1. Schach R. Stephen, “Introduction to Object Oriented Analysis and Design”, 2003,Tata McGraw Hill.
2. Booch Grady; Maksimchuk A. Robert; Engle .W. Michael; Young .J. Bobbi Ph.D.; Conallen Jim; Houston .A. Kelli “Object-Oriented Analysis and Design with Applications”, Third Edition, 2007, Addison-Wesley.

Semester: V **Credits: 3**
Category: MC **No. of Hours/Week: 3**

CS 5512 - WEB PROGRAMMING WITH PHP AND MYSQL

Objectives:

1. To understand open source, Server Side Script and database concept.
2. To gain knowledge in developing application using PHP and MySQL .

UNIT I

Introduction: History of PHP, Apache Web Server, MySQL and Open Source - Relationship between Apache, MySQL and PHP - PHP configuration in IIS - Apache Web server-WAMP Server- Installation of WAMP server- execution of PHP.

UNIT II

Basics of PHP : PHP structure and syntax - Creating the PHP pages -Rules of PHP syntax - Integrating HTML with PHP - Constants, Variables : static and global variable - Conditional Structure & Looping- PHP Operators –Arrays-User defined function- return function-argument-variable function.

UNIT III

Working with functions and Data : Variable Functions-String functions-Math function-Date function-Array Function-File Function-Form elements-User input- Validating user input- passing variables with session-cookies-forms- Error handling in PHP.

UNIT IV

Introduction to MySQL : MySQL structure and syntax- Types of MySQL tables and storages engines - MySQL commands - Integration of PHP with MySQL -Connection to the MySQL server - Working with PHP and arrays of data -Referencing two tables -Joining two tables.

UNIT V

Working with Data : Creating a table - Manipulating the table - Filling the table with data- Adding links to the table Adding data to the table -Displaying the new information - Displaying the movie details - Editing the database -Inserting a record - Deleting a record -Editing data-Searching a record-designing of complete application.

Text Book:

1. Naramore Elizabeth, Gerner Jason , Scouarnec Le Yann, Stolz Jeremy, Beginning PHP, Apache, MySQL Web Development

Reference Books:

1. Melone .C. Julie “PHP, MySQL and Apache”, Pearson Education
Doyle Matt “Beginning PHP 5.3” , Wrox Publication

Semester: V **Credits: 4**

Category: MC **No. of Hours/Week:4**

CS 5513 - WEB PROGRAMMING WITH PHP AND MYSQL LAB

Objectives:

1. To acquire practical knowledge of the Server Side Scripting and database basics.
2. To develop applications using PHP and MySQL

1. Installation of WAMP server.
2. Designing your profile page using PHP
3. Working with PHP operators
4. Working with different types of looping statements using php
5. Working with different types of array using php
6. Working with PHP functions
7. Working with PHP forms
8. PHP form validation
9. Working with PHP math/date function
10. Executing DML and DDL commands using MySQL
11. Joining tables
12. Retrieving data from table using PHP
13. Inserting data into table using PHP
14. Create an application using PHP and MySQL.
15. Filtering the data
16. Create a complete webpage using PHP and MySQL

Semester: V **Credits: 2**

Category: ES **No. of Hours/Week: 3**

CS 5404 - DATA COMMUNICATION AND NETWORKS

Objectives:

1. To have a depth knowledge about data communication and networks.
2. To describe various transmissions and multiplexing methods.

UNIT I

Introduction to Data Communication- Networks – Protocols-A basics for Protocol Design-Protocol Layering. Basic Concepts: Line configuration – Topology- Transmission Mode- Categories of Networks – Internet-works. Case Study: Standard Organizations for developing Protocols.

UNIT II

The OSI model: The model – Functions of the layers, Signals: Analog and Digital – Aperiodic – periodic Signals – Simples analog signals – Digital Signals.

UNIT III

Encoding – Digital -to- Digital – Analog-to- Analog-Transmission of Digital Data: Digital Data Transmission – DTE – DCE Interface . Case Study: EIA232 Standard.

UNIT IV

Modems: Transmission Rate- Modem Standards – Transmission Media: Guided Media – Unguided Media. Case Study: Modem Standards.

UNIT V

Multiplexing: Many-to-One, One-to-Many – Types – Multiplexing - The Telephone System, Error Detection and Correction: types of Errors – Detection – Error Correction.
Case Study: Multiplexing Application- The Telephone System.

Text Book:

1. Behrouz Forouzan, " Introduction to Data Communications and Networking ", Tata McGraw Hill Edition, 2007.

Reference Books:

1. D.P.Nagpal,"Data Communications and Networking", First Edition, S.Chand,2011.

2. Stallings William, "Data & Computer Communications", Sixth Edition, Pearson Education, 2001.

3.Halsall Fred, "Data Communications, Computer Networks and Open Systems", Addison Wessley, 1995.

Semester: V **Credits: 2**

Category: ES **No. of Hours/Week: 3**

CS 5405 - DATA MINING

Objectives:

1. To reveal the principles of data retrieval from large databases through data mining
2. To acquire knowledge in different mining principles
3. To acquire knowledge in prediction and classification

UNIT I

Introduction - Data mining: Motivation - On what kind of data - Data Mining Functionalities - Classification of Data Mining systems - Major Issues in Data Mining systems. Data Preprocessing - Data cleaning - Data Integration and Transformation - Data Reduction - Discretization and concept Hierarchy Generation.

UNIT II

Mining Association Rules in Large Databases - Association Rule Mining - Mining Single-Dimensional Boolean Association rules from Transactional Databases - Mining Multilevel Association Rules - Mining Multidimensional Association Rules - From Association Mining to Correlation Analysis - Constraint- Based Association Mining.

UNIT III

Classification and Prediction - What is Classification and Prediction - Issues regarding Classification and Prediction - Classification by Decision Tree Induction - Bayesian Classification - Classification by Back propagation - Other Classification Methods - Prediction - Classifier Accuracy.

UNIT IV

Cluster Analysis - What is Cluster Analysis? Types of Data in Cluster Analysis - A Categorization of Major Clustering Methods - Partitioning Methods - Hierarchical Methods - Density-Based Methods - Grid-Based Methods - Outlier Analysis.

UNIT V

Applications and Trends in Data Mining - Data Mining Applications - Data Mining System Products and Research Prototypes - Additional Themes on Data Mining - Social Impacts of Data Mining - Trends in Data Mining.

Text Book:

Han Jiawei Han and Kamber Micheline , "Data Mining Concepts and Techniques", Morgan Kaufmann Publishers,Second Edition,2006.

Reference Books:

1. M Barry and G.Linoff ", Mastering Data Mining", John Wiiley, Second Edition
2.Dunham H. Margaret ,"Data Mining- Introductory and advanced topics", Pearson Education, 2011

Semester: V **Credits: 2**
Category: ES **No. of Hrs/Week: 3**

CS 5406 - LINUX AND SHELL PROGRAMMING

Objectives:

1. To give a detailed overview of Linux Structure
2. Provides the skills in Linux Shell Script.

UNIT I

Introduction to Linux, Shell, Shell Programming - Pipes and redirections, creating and executing shell scripts – Environment Variables - Parameter Variables-Shell syntax, Variables.

UNIT II

Conditions - Control structures –For, While, Until, Case, User defined Functions Shell Commands - Arithmetic Expansion- Parameter Expansion - Linux file structure - Library functions.

UNIT III

Low level file access - standard I/O library- File and directory maintenance Program arguments – Time and date - File locking.

UNIT IV

Inter Process Communication - Process structure – Starting new process – Pipe - Process pipes- Pipe call- Parent and child Process - Named pipes.

UNIT V

Client server using FIFO Semaphores - shared memory - Message queues – Sockets - Socket types - Creating sockets - Socket Communications.

Text Book:

Matthew Neil, Stones Richard , “Beginning Linux Programming”, 2008, Wiley publication, 4 th Edition, Delhi.

Reference Books:

1. Masters Jon, Blum Richard “Professional Linux Programming,2007 , Wiley Publications, Delhi.
2. Wall Kurt, ” Linux Programming unleashed”, 2001, Sams publication, Delhi.

Web Resources :

http://www.ee.surrey.ac.uk/Teaching/Unix/
http://www.freeos.com/guides/lsst/

Semester: V **Credits: 2**
Category: ES **No. of Hrs/Week: 3**

CS 5407 - CLOUD COMPUTING

Objectives:

1. To learn the different types of cloud computing services
2. To make a cloud computing application unique, managing and working with cloud security.

UNIT I
Defining Cloud Computing: Definition - Cloud Types - Characteristics of Cloud Computing - Role of Open standards - Cloud Architecture: Cloud Computing Stack: Composiblity.

UNIT II
Infrastructure - Platforms - Virtual Appliances - Communication protocols - Applications - Connecting to the cloud - Cloud Services: Infrastructure as a Service - Platform as a Service - Software as a Service

UNIT III
Identity as a Service - Compliance as a Service - Platforms: Load balancing and visualization– Understanding Hypervisors - Cloud Security: Securing the Cloud.

UNIT IV
Securing the data - Moving applications to the cloud - Cloud Storage: Definition – Provisioning -Cloud storage - Cloud Backup solutions - Cloud storage Interoperability

UNIT V
Moving applications to the Cloud - Case Study: Google Web Services, Amazon Web Services - Microsoft Cloud Services.

Text Book:
Barrie Sosinsky, Cloud Computing Bible, Wiley India Pvt. Ltd., 2011.

Reference Books:
1. Roger Jennings, Cloud Computing with Windows Azure Platform, Wiley India Pvt. Ltd,2009.
2. Miller Michael, Cloud Computing: Web-Based Applications That Change the Way You Work and Collaborate Online, Que Publishing, 2008.

Web Resources:
1.http://www.mb.net/resources/cloud-computing-resources.aspx
2.http://www.mastertheboss.com/cloud-computing/in-the-cloud-computing-a- beginners-tutorial
3.http://www.south.cattelecom.com/technologies/cloudcomputing/indes.aspx

Semester: V **Credits: 2**
Category: ES **No. of. Hrs/Week: 3**

CS 5408 - CELLULAR AND MOBILE COMPUTING

Objectives:

1. To understand the basic concepts of wireless transmission, networks and wireless LANs.
2. To gain the knowledge about message services.

UNIT I

Introduction to Wireless Networks, Mobile Computing and Mobile development frameworks. Wireless Transmission : Cellular System: Cells – Clusters – Frequency Reuse – Cell Splitting – Handoff – Cellular Radio-Medium Access Control: Introduction – Hidden/Exposed Terminals – The Basic Access Method – Near/Far Terminals – SDMA, FDMA, TDMA, CDMA

UNIT II

Wireless LANs: Wireless LAN and Communication – Infrared – Radio Frequency – IR Advantages & Disadvantages - RF Advantages & Disadvantages – Wireless Network Architecture: Logical Types of WLAN-IEEE 802.11: MAC layer – Security – Synchronization – Power Management – Roaming-Bluetooth Overview. Ubiquitous Wireless Communication: Introduction – Scenario of Mobile Communication – Mobile Communication Generations: 1G to 3G – 3rd Generation Mobile Communication Network-Universal Mobile Telecommunication System (UMTS):

UNIT III

Mobile IP: Overview – Working with Mobile IP – Mobile IP Entities – Mobile Agents – Components of Mobile IP – Mobile IPv6 Features - Mobile IPv6 Address Types - Mobile IPv6 Address Scope - Mobile IP Operation – Mobile Transport Layer: Traditional TCP and implications on mobility – Indirect TCP – Snooping TCP – Mobile TCP – Selective Retransmission – Transaction oriented TCP

UNIT IV

Mobile Computing: WWW architecture for mobile computing-Need for WAP-Benefits of WAP-Examples of WAP-WAP architecture-WAP protocol-WAP push architecture-Push and pull based data acquisition-I-mode-WAP 2.x.Wireless Telecomm Networks :GSM-GPRS-IS-95-CDMA-2000 – W- CDMA – Wireless Sensor Networks. Messaging Services: Short Message Services (SMS)-Multimedia Message Services (MMS)-Multimedia transmission over wireless

UNIT V

Pervasive Computing and Information Access : Introduction – Pervasive Computing History – Pervasion Computing Technology – Pervasive Computing Characteristics – Application Framework – Issues. Web Services and Mobile Web: Introduction to web services-SOAP-UDDI-WSDL-EDGE-WiFi- WiMax-Introduction to mobile web-mobile web browser. Introduction to developing mobile application with J2ME and SMART PHONE

Text Book:

.Dr. Jani N. N, Lakhtaria. I. Kamaljit, Dr. Jani .N. Ashish , Kanabar Neeta, “Mobile Computing” , First edition ,2009, S .Chand & company Ltd.

Reference Books:

1. Pahlavan Kaveh and Krishnamurthy Prashant, “Principles of wireless Networks”, 2004,Pearson education,.

2. Schiller Jochen, “Mobile Communications”, Second Edition, Pearson Education

Web Resources:

1. www.scribd.com.
2. www.slideshare.net

Semester: VI **Credits: 15**
Category: SK **No. of Hrs/Week: 15**

SOFTWARE TESTING

Objectives:

1. To facilitate the intakes to obtain knowledge in analyzing the program flow and identify bugs over it in a systematic approach.
2. This paper provides skills to preparing test cases and use cases and test the programs through manual and automated tools.

UNIT I

Introduction and the role of Graphs: Software failures- Testing Process-Testing terminologies – Limitation of testing-V shaped software lifecycle model .Generations of Graph from program- identification of independent paths.

UNIT II

Structural Testing and Software verification: Control flow testing- Data flow testing- slice based testing- Mutation Testing. Verification methods- SRS document verification-source code review- user document verification-case study.

UNIT III

Software Testing Activities, Models and Metrics: Levels of testing- debugging- software test plan - software testing tools- case study. Software metrics- categories of metrics- Object oriented metrics in software testing- software quality attributes in prediction Model.

UNIT IV

Test cases and Use cases: Use case diagram and use cases- generation of test cases from use cases-Guidelines for generating validity checks- strategies for data validity- database testing. Regression testing- Test cases-reducing the number of test cases- risk analysis.

UNIT V

Object oriented Testing and Testing the Web: Introduction-path testing- state based testing – class testing. Web testing- Functional Testing- User interface testing- usability testing- Configuration and compatibility testing – security testing- performance testing-database testing-web metrics.

Text Book:

1. Singh Yogesh, “Software Testing”, Cambridge press, 2012.

Reference Books:

1. Mathur P Aditya, “Foundations of Software Testing”, Pearson, 2008.

2. Perry E. William, “Effective methods for software Testing”, Second Edition,PHI, 1996,.

SOFTWARE TESTING - LAB

Objectives:

1. To facilitate the automated testing through IBM's Rational Functional Tester to practice the prerequisites of testing.
2. To perform functional testing, regression testing, GUI testing and data-driven testing on sample applications of various domain.

1. Creation of script record and playback with sample application.
2. Creation of script and adding data verification point.
3. Creation of script and adding properties verification point.
4. Creation of script and including script support function.
5. Creation of a message box and adding include in a script.
6. Creation of script with handle unexpected active windows.
7. Creation of Java helper class and put unexpected active window.
8. Creation of script and use shared test object map.
9. Insertion of verification point with data pool reference
10. Creation of data pool and adding data pool records to a script.
11. Testing web applications with data pool.
12. Testing window applications (VB.NET) with data verification point.

Semester: VI **Credits: 15**
Category: SK **No. of Hrs/Week: 15**

NETWORK ADMINISTRATION

Objectives:

1. To understand the different types of network and directory services.
2. To design a network and configure the networking resources and the administrate and manage networks in an organization.

UNIT I

Purpose of computer network – Network Hardware- LAN, WAN, Wireless Networks– Network software- Layers, Protocols and Interfaces-Reference Models- OSI Reference Model, TCP/IP reference model-Network transmission media-magnetic media, coaxial cable, twisted pair, fibber optics- Network connection hardware- Router, switch, Hub, NIC, Repeaters.

UNIT II

Transmission Control Protocol (TCP) –Segment header, Connection Establishment, connection release- User Datagram Protocol (UDP) –Segment header – Routing algorithm – Shortest path routing, DVR Routing, Flooding.

UNIT III

Workstation – Loading operating system, Updating system software and architecture, Network Configuration – Server – server hardware, client and server OS configuration, Maintaining data integrity Services – single and multiple services, client requirements, operational requirements- Data Centres- Location, access, security, Racks, wiring, labels.

UNIT IV

Designing Network – Accessing Network Needs, Applications, Users, Network Services, Security and Safety, Growth and Capacity Planning, Meeting Network Needs – Choosing Network Type, Choosing Network Structure, Choosing Servers. Installing and Configuring Windows 2003 Server - Preparing for Installation, Creating windows 2003 server boot disk, Installing windows 2003 server, Configuring server/ client Setting windows 2003 server - Creating Domain controller, Adding the DHCP and WINS roles, Adding file server and print server, Adding Web based Administration.

UNIT V

Working With User Accounts - Adding a User, Modifying User Account, Deleting or Disabling a User Account. Working With Windows 2000 Security Groups – Creating Group, Maintaining Group Membership. Working with Shares – Understanding Share Security, Cresting Shares, Mapping Drives Administering Printer Shares – Setting up Network Printer, Working with Windows 2000 Backup – Using Windows 2000 Servers Backup Software- Network security – Firewall

Text Books:

1. Tanenbaum S. Andrew," Computer Networks", 4th edition, Prentice Hall,
2. Celli Limon Thomas, Hogan Christina, Challup Strata, "Practice of system and network administration", 2nd edition, Addison-wesley, 2004
3. Zacker Craig, "The Complete Reference: Networking", Tata McGraw-Hill Edition, 2002

Reference Books:

1. Hallberg Bruce, "Networking A Beginner's Guide", Tata McGraw-Hill, 2000
2. Richard A. McMohan, "Introduction to Networking", Tata McGraw-Hill,
3. Zacker Craig, "CompTIA Network+ Training Kit (Exam N10-005)", Microsoft Press,2012
4. "MCSE Training Kit Networking Essential Plus", Third edition, Microsoft Press,2012

NETWORK ADMINISTRATION LAB

1. Learn Basic Network administration commands.
   a)PING b)TRACERT c)PATHPING d)NETSTAT e)AT f) NET g) ROUTE h)ARP i) IPCONFIG j) NETSH

2. Setting up simple LAN network.

3. Practice installation of windows 2003 server

4. Practice configuring server/client setting in windows 2003 server

5. Assigning IP Address to remote user.

6. Practice configuring windows 2003 server to use Domain Name System(DNS)

7. Practice on configuring windows 2003 as a DHCP client

8. Practice on configuring windows 2003 as a DHCP server

9. Practice adding new user/new group in windows 2003 server.

10. Practice sharing printer in network

11. Configuring the system to connect internet.

Semester: VI **Credits: 5**
Category: MS **No. of Hrs/Week: 6**

CS 6613- PROJECT WORK

Objectives:

1. To provide skills to identify a problem to be automated with social relevance.
2. To develop skills in analysing real world problems and prepare problem statements
3. To design with various design representation including architectural design, database design and GUI design
4. To apply the coding skills and develop the system
5. To prepare test cases and test the system through unit testing, integration testing and acceptance testing
6. Apply proper validation to the system developed .
7. To prepare user manual and maintenance guidelines
8. To provide documentation and presentation skills

Mode of Evaluation: **Internal**

Components	**Review 1**	**Review 2**	**Final Review**
Documentation	5	5	10
Seminar / presentation	10	5	10
Viva-voce	10	5	10
Demo		10	20
Total	25	25	50

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Semester: VI **Credits: 15**
Category: MS **No. of Hrs/Week: 9**

CS 6657- PROGRAMMING IN JAVA

Objectives:
1. To understand the basic programming constructs of Java Language.
2. To develop programs for window application or Web application.

UNIT I
Fundamental s of Object Oriented Programming: Introduction-Object-Oriented Paradigm-Basic Concepts of OOPS-Benefits of OOPS-Applications of OOPS. Java Evaluation: Java Features-How java differs from c and C++ -java and Internet –java Environment. Overview of Java Language: Introduction-Simple java program-More of java-An application with two classes-java program structure-java tokens-java statements-Installing and configuring java-Implementing a java program-java virtual machine- Command line argument. Constants-Variables-Data Types- declaration of variables-giving values to variables-Scope of variables-type casting.

UNIT II
Operators and Expressions: Arithmetic Operators-Relational Operators-Logical Operators-Assignment Operators-Increment and Decrement Operators-Conditional Operators-Bitwise Operators-Special Operators-Arithmetic Expressions-Evaluation of Expressions-Precedence of Expressions-Type conversion in Expression. Decision Making and Branching: If, If..Else, Nesting of If, Else if Ladder, Switch, ?: Operator. Decision Making and Looping: While, do, For Statements.

UNIT III
Classes, Objects and Methods: Defining a class-Fields declaration-Methods declaration-Creating Objects-Accessing Class members-Constructors-Methods overloading- Static Members-Inheritance-Overriding methods-Final variable and methods-Final Class-Finalizer methods- Abstract methods and classes. Arrays, Strings: One, Two dimensional-Strings. Interfaces: Multiple Inheritance: Defining Interface-Extending Interface-Implementing Interface-Accessing Interface Variable.

UNIT IV
Packages: Putting Classes Together: Java API Packages-Using System Package-Naming Conventions-Creating Packages-Accessing a package-Using a package-Adding a class to package-Hiding Classes- Static Import. Multithreaded Programming: Creating Threads-Extending a Thread class-Stopping and Blocking a Thread-Life cycle of a Thread-Using Thread methods-Thread Exception-Thread Priority-Synchronization-Implementing Runnable Interface. Managing errors and Exceptions: Types of Errors- Exceptions-Exception Handling Code-Multiple Catch Statements-Using Finally-Throwing our own Exceptions.

UNIT V
Applet Programming: Preparing to write Applet-Building Applet code-Applet Life cycle-Applet tag-Adding applet to HTML File- Running the applet-Passing parameter to Applet. Managing Input/Output Files in Java: Concept of Streams- Byte Stream Class- Character Stream Class- Using Streams-creating a file-Reading/writing Character-Reading/Writing bytes. JDBC : Introduction-Establishing a Connection- Creation of Data Tables- Entering Data into the Tables-Retrieving data from the table-Table Updating. Prepared Statements- Getting Meta Data.

Text Books:

1. E. Balagurusamy, “Programming with Java”, Fourth Edition, Tata McGraw-Hill, New Delhi.
2. C. Muthu, “Programming with Java”, Second Edition, Tata McGraw-Hill, New Delhi.

Reference Books:

1. Schildt Herbert, “The Complete Reference Java2”, Fifth Edition, Tata McGraw-Hill, New Delhi.
2. John R. Hubbard, Programming with Java, Second Edition, Schaum’s outline Series, Tata McGrawhill, 2007.

- PROGRAMMING IN JAVA- LAB

1. Write a Java Program to find out area of circle

2. Write a Java Program that will display Factorial of the given number.

3. Write a java program to perform all basic arithmetic operation

4. Write a Java Program to find out biggest of 3 numbers

5. Write a Java Program that will accept command-line arguments and display the same.

6. Write a Java Program to sort the elements of an array in ascending order.

7. Write a Java Program which will read a text and count all occurrences of a particular word.

8. Write a Java Program to print the reverse of the given string

9. Write a Java Applet that creates some text fields and text areas to demonstrate features of each.

11. File Read/Write operation using java

12. Write java program to perform Java database connectivity

Semester: VI **Credits: 15**
Category: MS **No. of. Hrs/Week: 9**

CA 6658 - MULTIMEDIA TECHNOLOGIES

Objectives:

1 To master the fundamentals of the digital Multimedia Systems.
2. To practice the multimedia technologies including sound and video, Digital Video and Animation.

UNIT I
What is mean by Animation – Why we need Animation – History of Animation– Uses of Animation – Types of Animation – Principles of Animation – Some Techniques of Animation – Animation on the WEB – 3D Animation – Special Effects -Creating Animation.

UNIT II
Creating Animation in Flash**:** Introduction to Flash Animation – Introduction to Flash – Working with the Timeline and Frame-based Animation - Working with the Timeline and Tween-based Animation – Understanding Layers - Action script.

UNIT III
3D Animation and its Concepts – Types of 3D Animation – Skeleton and Kinetic 3D Animation – Texturing and Lighting of 3D Animation – 3D Camera Tracking – Applications & Software of 3D Animation.

UNIT IV
Motion Caption – Formats – Methods – Usages – Expression – Motion Capture Software's – Script Animation Usage – Different Language of Script Animation Among the Software.

UNIT V
Concept Development –Story Developing –Audio & Video – Color Model –Device Independent Color Model – Gamma and Gamma Correction - Production Budgets- 3D Animated Movies.

Text Books:
1. Parekh Ranjan ,"Principles of multimedia", 2007, Tata McGraw Hill Publication..

2. BanerjAshok i, Ghosh Ananda Mohan ,"Multimedia Technologies", McGraw Hill Publication.

Reference Books:

1. Dowd Reinhardt**,** "Adobe Flash Cs4 Professional Bible", Tata McGraw Hill, 2009.
2. Reinhardt Robert and Lentz, "Flash 4", Edition, PHI,

- MULTIMEDIA TECHNOLOGIES- LAB

1. Animation on the web
2. Image Special Effects.
3. Drawing in flash
4. Copy a bitmap from one application and pasted into flash
5. Working with time line
6. Shape tweens
7. Motion tweens
8. Frame by frame animation
9. Texturing & Lighting of 3D Animation
10. Script Animation
11. Simple 3D Animation
12. Create a 1 minute animated movie which will convey an action
13. Story Developing with color model and Video Effects.
14. Create 3D Animated color movie.