DEPARTMENT OF COMPUTER SCIENCE

B.Sc. Computer Science

U.G. PROGRAMME

SYLLABUS

Effective from the Academic Year 2016-2017

Loyola College (Autonomous)

Chennai- 600 034

B.Sc. (Computer Science)

Restructured CBCS curriculum with
Effective from June, 2016

Sl. No	Sub. Code	Title of the Paper
1	16UCS1MC01	WEB DESIGNING LAB
2	16UCS1MC02	COMPUTER ORGANIZATION AND ARCHITECTURE
3	16UCA1AL01	MATHEMATICS FOR COMPUTER SCIENCE
4	16UCS2MC01	PROGRAMMING IN C
5	16UCS2MC02	PROGRAMMING IN C LAB
6	16UCA2AL01	MICROPROCESSOR - 8085
7	16UCS3MC01	DATA STRUCTURES
8	16UCS3MC02	OBJECT ORIENTED PROGRAMMING USING C
9	16UCS3MC03	OBJECT ORIENTED PROGRAMMING USING C-LAB
10	16UBU3AL02	HUMAN RESOURCE MANAGEMENT
11	16UCS4MC01	RELATIONAL DATABASE MANAGEMENT SYSTEM
12	16UCS4MC02	RELATIONAL DATABASE MANAGEMENT SYSTEM-LAB
13	16UCS4ES01	DATA COMMUNICATION AND NETWORKS CLOUD
14	16UBU4AL01	ORGANISTIONAL BEHAVIOR
15	16UCS5MC01	OPEN SOURCE TECHNOLOGY

16	16UCS5MC02	VISUAL PROGRAMMING
17	16UCS5MC03	VISUAL PROGRAMMING-LAB
18	16UCS5MC04	SOFTWARE ENGINEERING
19	16UCS5ES01	DATA MINING
20	16UCS5ES02	SOFT COMPUTING
21	16UCS5ES03	SYSTEMS PROGRAMMING
22	16UCS5ES04	COMPUTER GRAPHICS
23	16UCS5SK01	NETWORK ADMINISTRATION
24	16UCS5SK02	RUBY ON RAILS
25	16UCS6MC01	WIRELESS COMMUNICATION NETWORKS
26	16UCS6MC02	PROGRAMMING IN JAVA
27	16UCS6MC03	OPERATING SYSTEM
28	16UCS6MS01	MOBILE COMPUTING
29	16UCS6PJ01	PROJECT
30	16UCS6MS02	SECURITY IN INFORMATION TECHNOLOGY

16UCS1MC01 WEB DESIGNING LAB

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

Objectives:

1. To impart knowledge in designing web pages with text and images.
2. To validate and perform actions on web pages through scripting languages.
3. To learn and implement XML Concepts.

UNIT I **[7 Hrs]**

Overview of HTML5: Fundamentals of HTML–Working with text in HTML- Organizing Text in HTML-Lists-Working with Links and URLs-Creating Tables-Working with Images-Colors and Canvas-Working with HTML Forms-Interactive Elements.

UNIT II **[7 Hrs]**

Dynamic HTML: Overview of CSS-Backgrounds and Color Gradients in CSS- Font and Text Styles-Creating Boxes and Columns using CSS-Displaying ,Positioning and Floating an Element-List Styles-Table Layouts.

UNIT III **[5 Hrs]**

JavaScript: Introduction to scripting –operators: logical-Increment and decrement operators –Control structures-Arrays: Declaring arrays -sorting arrays-object: Math object-string Object-Date object-Boolean object and Numberobject.

UNIT IV **[6 Hrs]**

XML Overview-Working with basics of XML--HTML XML –Processing instructions-Applications of

XMLCOMMENTS- XML Namespaces-XML Schema-Style sheets: Cascading style sheets (CSS).

UNIT V **[5 Hrs]**

Extensible Style Language Transformations (XSL)-Defining Document Type Definition Entities (DTD)-Working with attributes-Document object model (DOM) -DOM methods-SAX parser.

TEXT BOOKS:

1. Kogent Learning Solutions Inc,"Html5 Black Book: Covers CSS3, JavaScript, XML, XHTML, AJAX, PHP and jQuery", Dreamtech Press, 2011.
2. Ivan Bayross, "Web Enables Commercial Application Development Using HTML, DHTML Java Script, Perl CGI", BPB Publications, New Delhi, 3rd Edition, 2005.
3. Heather Williamson, "XML: The Complete reference", Tata McGraw Hill Pub, 2008.

REFERENCE BOOKS:

1. Paul J. Deitel, Harvey Deitel, Abbey Deitel, Internet and World Wide Web How to Program , Edition 5, 2011.
2. Deitel, Nieto, Lin, Sadhu, "XML HOW TO PROGRAM" Pearson Education, 2009.

Exercises:

1. To design Biodata using basic HTML tags.
2. Create application form using various text formats.
3. Linking documents.
4. Creation of hyperlinks and images as hyperlinks in HTML.

5. Creation of Lists in HTML.
6. Create Time Table preparation using table in HTML.
7. Create LOYOLA COLLEGE website using HTML.
8. Targeting the named frame in HTML.
9. Internal CSS with the style elements.
10. Inline CSS with style elements
11. External CSS with style elements.
12. Create Calculator format using Java script.
13. Create Login format using arrays in Java Script.
14. Functions in JavaScript.
15. Dialog boxes using Java script.
16. Create Objects using Java script.
17. To validate websites, interactive forms through JavaScript.
18. Create Employee details using schemas.
19. Create our department details using CSS
20. Create Internal and External DTD which contains student information using XML.
21. Create Payroll system using XSL.
22. Food Menu with CSS
23. CD Catalogue with XSL.

16UCS1MC02 COMPUTER ORGANISATION AND ARCHITECTURE

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

Objectives:

1. To understand the basic concepts of Logic Gates.
2. To learn the salient features basic computer Organization .
3. To understand the concept of Central Processor Organization.

UNIT I : **[10 hrs]**

Digital Logic Circuits: Digital Computers - Logic Gates - Boolean algebra - Map Simplification - Product - of - Sums Simplification - Don't - Care Conditions - Combination Circuits - Flip-Flops - SR, D, JK, T - Excitation Tables.

UNIT II: **[7 hrs]**

Digital Components - Decoders - Encoders - Multiplexers - Registers with Parallel Load - Shift Registers - Bi-directional Shift Registers with Parallel Load - Binary Counters with Parallel Load

UNIT III: **[10 hrs]**

Basic Computer Organization: - Instruction codes - Operation codes - Stored Program Organization - Indirect Address - Effective Address - Computer Registers - Common Bus System - Computer Instructions - Instruction Formats – Cotrol Unit

UNIT IV : **[8 hrs]**

Complete Computer Description – Instruction cycle-Register-Reference Instruction-Memory Reference Instructions-I/O Instructions-Interrupt Cycle-Flowchart for computer operation.

UNIT V **[13 hrs]**

Central Processor Organization: - General Register Organization - Instruction Formats - Three, Two, One, Zero instruction formats- Addressing Modes - Data Transfer and Manipulation: Set of Basic Operations - Data Transfer Instructions - Data Manipulation Instructions - Arithmetic Instructions - Logical and Bit Manipulation Instructions - Shift Instructions –status bit conditions.

TEXT BOOKS:

1. M. Morris Mano, Computer System Architecture, III Edition, Prentice Hall of India, 2007.
2. Andrew S. Tanenbaum, Structured Computer Organization, IV Edition, Prentice Hall of India,1998

REFERENCE BOOKS:

1. William Stallings," Computer Organization and Architecture", Eighth edition, Pearson Education, 2012.
2. Carl Hamacher, "Computer Organization",V Edition, McGraw Hill International,2011.
3. Andrew S. Tanenbaum, Structured Computer Organization, IV Edition, Prentice Hall of India,2006 .

16UCA1AL01 MATHEMATICS FOR COMPUTER SCIENCE

Semester: I **Credits: 3**

Category: AL **No. of Hrs/week: 6**

Objectives:

1. To know the basic mathematics
2. To apply this techniques in computation
3. To implement some techniques using programming languages.

UNIT I **18 Hrs**

Matrices: Symmetric, Skew Symmetric, Hermitian Skew Hermitian, Orthogonal, unitary matrices, Rank and consistency of equations. Eigen values, Eigen vectors – Cayley Hamilton theorem (no proof).

UNIT II **18Hrs**

Statistics: Introduction – Nature of statistics – Data collection – Changing definition of Statistics – Sample mean – Deviations – Sample median – Sample mode – Sample variance & Sample Standard Deviation– Sample correlation coefficient.

UNIT III **18Hrs**

Graph Theory: Introduction – Basic concepts – Subgraphs – Degree of vertices – Paths & connectedness – Automorphism of a simple graph – Directed graphs.

UNIT IV **18Hrs**

Trees: Definition, characteristics & simple properties – Eulerian graph – Hamilton graph – Planar - Non planar graph.

UNIT V **18Hrs**

Numerical Methods: The solution of numerical, algebraic and transcendental equations using Regula – Falsi , Newton – Raphson's methods – Numerical Differentiation – Numerical Integration using simpson's rule, Trapezoidal rule.

TEXT BOOKS:

1. Shanti Narayan,P.K.Mittal," A Textbook of Matrices", S Chand & Co Ltd ,2010
2. R. Balakrishnan, K.Ranganathan ,"Text book of Graph Theory", Second Edition Springer science + Business Media Newyork 2012 .
3. Sheldon M Ross,"IntroductoryStatistic"s, Third Edition, Elsevier Academic Press, 2010.

16UCS2MC01 PROGRAMMING IN C

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

Objectives:

1. To understand the basic concepts of programming using C language.
2. To learn the salient features of C programming and apply it for problem solving.
3. To understand the usage of files.

UNIT I **16 hrs**

Introduction to C Programming Techniques – Fundamentals: Algorithms, Flowcharts. C Character sets - Identifiers and keywords – Data types – Operators and Expressions - Basic Input-Output operations. Control structures : Conditional and unconditional statements- Loop statements – Nested control structure –Break and continue statements.

UNIT II **14hrs**

Arrays: One dimensional, two dimensional arrays and multi dimensional arrays - Initialization and Processing of arrays. Strings: Declaration - Initialization – Reading and Writing on Strings - Standard string functions

UNIT III **18hrs**

Pointers: Declaration - Pointer Arithmetic – Pointers to Pointers - Pointers and Arrays –Array of Pointers – Passing arrays to functions – Array of Pointers. Functions: Introduction – Function parameters – Return values – User defined and library functions– Recursion - Pointers and functions. Storage class - automatic, External, Static and Register variables.

UNIT IV **12hrs**

Structures: Declaring the structures – Initialization - Structure within a structure – Array of Structures – Pointer to Structures – Pointers within Structures - Union - Bit fields - Enumerated data types.

UNIT V **15hrs**

Files: Introduction – File handling functions – File types - Opening and closing a data file – Reading and writing Operations on files - Command Line Arguments.

TEXT BOOK:

1. K.R.Venugopal, S.R.Prasad, "Mastering C", Tata McGraw Hill, 2006.

REFERENCE BOOKS:

1. Ashok N. Kamthane, Programming with ANSI and Turbo C , Seventh Impression, 2009.
2. E. Balagurusamy, Programming in Ansi C, IV Edition - Tata McGraw-Hill, New Delhi 2010.
3. Deitel&Deitel - C How to Program, III Edition, Pearson Education, New Delhi, 2001.

16UCS2MC02 PROGRAMMING IN C LAB

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

Objectives:

1. To practice the Features of C programming.
2. To Solve problems through C language.
3. To solve problems using pointers and other data structures.

1. Arithmetic Expressions
2. Formatted Input/Output
3. Library functions (Mathematical, String)
4. Different types of Operators
5. Decision Making
6. Loop statements.
7. Enumerated data type.
8. Arrays (1-D, 2-D)
9. Operations on Strings
10. Pointers
11. User Defined Functions- Single and Multiple parameters.
12. Structures
13. Array of structures
14. Pointers to structures
15. Reading and writing with files

16UCA2AL01 MICROPROCESSOR 8085

Semester: II **Credits: 3**
Category: AR **No. of Hrs/Week: 6**

Objectives:
To make the students to :

1. Identify the basic element and functions of 8085 microprocessor.
2. Describe the architecture of 8085 microprocessor.
3. Apply the programming techniques in developing the assembly language program.

UNIT I **12Hrs**

Introduction, Advances in semiconductor technology, Organization of microprocessor based system, 8085 microprocessor and Architecture.

UNIT II **12Hrs**

8085 Bus organization, Demultiplexing the bus AD_7-AD_0, Generating control signals. ALU, Timing and control unit, Instruction register and decoder, Register array, Decoding and executing an instruction.

UNIT III **12Hrs**

Opcode fetch machine cycle, Memory read machine cycle, Memory write machine cycle, IO read machine cycle, IO Write machine cycle, Execution time of the instruction cycle.

UNIT IV **12Hrs**

Instructions, Data format and storage, Addressing modes, Instruction classification - Data transfer instructions, Arithmetic instructions, Logical instructions, Branching instructions, Machine control instructions, **Assembly language programs** Addition/Subtraction of 8 bit data, Interchanging a block of data, Largest of N numbers, Number of 1 's& 0's in a 8-bit data, Look-up table.

UNITV 12Hrs Counters and time delays, Time delay using single register and register pair, Stack and subroutines, Call and return instructions, Advanced subroutine concept. **Assembly language program**

Hexadecimal counter ,Sum of odd and even numbers , Hex to BCD conversion.

TEXT BOOK

Ramesh.S.Goankar "*Microprocessor Architecture, Programming & Applications With 8085"* 5th Edition - Penram International – 2011.

REFERENCE BOOKS

1 *Soumitra Kumar Mandal,* "Microprocessors and Microcontrollers Architecture, Programming and Interfacing using 8085, 8086 and 8051", *1st Edition. Tata McGraw-Hill, 2011.*

2. *Krishna Kant,* "Microprocessors And Microcontrollers: Architecture Programming And System Design 8085, 8086, 8051,8096", *PHI Learning Pvt. Ltd., 2010.*
3. M.Rafiquzzaman "Microprocessors-Theory and Applications", Edition PHI, 2009.
4. D.V.Hall"*Microprocessor and Digital System",* McGraw Hill Publishing Company, 2008.

MICROPROCESSOR PRACTICAL –LAB [30Hrs]

Write an ALP for the following.

Program to add two 8-bit numbers.

Program to subtract two 8-bit numbers.

Program to add two multi byte binary number.

Program to add N one byte numbers.

Program to add two BCD numbers.

1. Program to implement multiplication by successive addition method.
2. Program to find square of decimal number using Look-up table.
3. Program to move data block with and without overlap.
4. Program to find the smallest of N numbers.
5. Program to perform linear search over a set of N numbers. Display FF and its position if found otherwise 00.

6. Program to check the 4th bit a number is 0 or 1. Display FF if 1 otherwise display 00.
7. Program to find number of 1 's and 0's in 8-bit number.
8. Program to find sum of ODD and EVEN numbers.
9. Program to sort an array.
10. Program to implement BINARY to BCD conversion using subroutine.
11. Program to implement decimal up counter.
12. Program to implement real time clock.

16UCS3MC01 DATA STRUCTURES

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

Objectives:

1. To demonstrate a familiarity with major algorithms and data structures.
2. To apply important algorithmic design paradigms and methods.
3. To synthesize efficient algorithms in problem solving situations.
4.

UNIT I **10 Hrs**

Introduction & Overview : Concept of data Structures,Data structure operations, Control Structures, Variables, Data types, String Processing, Arrays-Linear arrays, Representation of Linear arrays in Memory, Traversing Linear Arrays, Inserting and Deleting, Multidimensional Arrays, Pointers, Pointer Arrays, Records- Record Structures

UNIT II **10 Hrs**

Stacks- Array Representation of Stacks, Operations on stack, Insert , Delete, update, Arithmetic Expressions: Polish

Notation- Reverse Polish notation, Evaluation of a postfix expression, Transforming infix expression into postfix, Recursion, Towers of Hanoi, Queues- Representation of Queues- operations on queues, Insert , Delete, update

UNIT III **14 Hrs**

Linked List- Representation of Linked list in memory, Traversing a linked list, Searching, Insertion into a linked list, Insertion Algorithm, Deletion from a Linked List, Deletion Algorithms- Doubly Linked List, Insertion, Deletion.

UNIT IV **14 Hrs**

Trees, Binary Trees, Representation of binary trees in memory, Traversing Binary Trees- Preorder, In order, Post order, Graphs, Multi graphs, Directed graphs, Sequential Representation of graphs, Adjacency matrix, path matrix, Traversing a graph, Breadth first search, Depth first search.

UNIT V **12 Hrs**

Sorting – sorting Techniques- Insertion sort, Selection sort, Bubble sort, merge sort

Searching- searching Techniques- Linear search, Binary search.

TEXT BOOK:

1. Seymour Lipschutz, “Theory and Problems of data structures” Schaum’s Outline Series,2009
2. NarasimhaKarumanchi, “Data Structures and Algorithms made easy”, CareerMonk Publications, 2016.

REFERENCE BOOKS:

1. Seymour Lipschutz, "Data Structures with C", Schaum's Outline Series,2009.
2. Thomas H Corman,Charles E leiserson,RonaldL.Rivest,Clifford Stein, "Introduction to algorithms",3rd Edition 2009.

16UCS3MC02 OBJECT ORIENTED PROGRAMMING USING C++

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

Objectives:

1. TointroducethefundamentalsofDataStructures, Abstractconceptsandhowtheseconceptsareusedinproblemsolving.
2. Tocreateanduse new, simple and complex data types within C++programs.
3. To write small/medium scale C++ programs with simple graphical user interface

UNIT I

Principles of Object Oriented Programming: Procedure Oriented Programming – OOP Paradigm- Basic conceptsofOOP-BenefitsofOOPObjectOrientedLanguageApplicationsofOOP. Beginningwith C++, Tokens, Expressions and Control Structure. Functions inC++: Introduction-Main function prototyping- call by, return by reference-inline functions-default, constant arguments.

UNIT II

Function overloading-friend andvirtualfunctions. ClassesandObjects. Specifying class, Defining member

functions, outside functions inside, Nesting of member functions, Private member functions, Arrays with in a class, static data members, static member functions, Arrays of objects, object as function arguments, Friendly functions, Returning objects, CONST member function, Pointers to members.

UNIT III

ConstructorsandDestructors. Constructors-Parameterized constructors,,Multiple Constructors-dynamic constructors-copy destructors, Dynamic constructors. OperatoroverloadingandType Conversions, Defining operator overloading, overloading Unary operators, overloading Binary operators, rules for overloading operators.

UNIT IV

Inheritance:Extendingclasses, single, multilevel, multiple, hierarchical and Hybrid inheritance- Pointers– pointers to objects, this pointer, pointers to derived classes, virtual functionsand polymorphism.

UNIT V

ManagingconsoleI/O Operations: C++ streams-C++ streamclasses-Unformatted I/O Operations-FormattedconsoleI/O Operations,Workingwithfiles:classesforfilestreamoperations-opening and closingafile-EOF-File modes-File pointers-sequentialI/OOperations.Templates, Exception Handling.

TEXT BOOKS:

1. E. Balagurusamy, Object-Oriented Programming with

C++,TataMcGraw-HillEducation,6th Edition ,2013.
2. BjarneStroustrup, The C++ Programming Language, 4th Edition Pearson Education Inc, 2013

REFERENCE BOOKS:

1. Scott Mayers, Effective Modern C++, O'Relly Media Inc, 2015
2. Stephan Prata, C++ Primer Plus, Sixth Edition, Pearson Education Inc, 2012.

16UCS3MC03 OBJECT ORIENTED PROGRAMMING USING C++-LAB

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

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. C++ Program to find an element in an array using function
2. C++ Program to arrange the given set of numbers in Ascending and Descending order using function
3. C++ Program to illustrate enumerated data type
4. C++ Program to illustrate reference variables
5. To implement call by reference and return by reference
6. To implement the concept Function overloading
7. To develop and use virtual and inline functions
8. C++ Program to perform nesting of member functions

9. C++ Program to implement private member functions
10. C++ Program to implement static member functions
11. To find the sum and average of n numbers using friend function.
12. To read two matrices of size m x n and perform addition/ subtraction.
13. To read two matrices and perform multiplication if the order satisfies the criteria.
14. To find the sum of two complex number using constructor.
15. To generate Fibonacci series using class.
16. To read and display the "Employee information" using class.
17. To prepare payroll for ‘n’ employees.
18. To create a String type class and implement the string operations
19. C++ Program to illustrate the parameterized constructor
20. C++ Program to overload an unary operator
21. C++ Program to implement Single Inheritance
22. C++ Program to implement Multiple Inheritance
23. C++ Program to implement Multilevel Inheritance
24. C++ Program to implement Hierarchical Inheritance
25. C++ Program to implement Hybrid Inheritance
26. C++ Program to implement I/O console functions
27. C ++ Program to perform file operations.

16UBU3AL02 HUMAN RESOURCE MANAGEMENT

SEMESTER: V **CREDITS: 6**
CATEGORY: MC **NO. OF HOURS/WEEK: 6**

COURSE OBJECTIVES:

1. To highlight the importance of HRM in an organization.
2. To familiarize the students with the processes and mechanism of managing human resources.
3. To develop a competitive advantage by using its human resource.

UNIT 1 : INTRODUCTION

Nature of HRM - Scope - Objectives - Importance - System Approach to HRM - Functions of HRM - HRM & Competitive Advantage - Skills & Roles of HR Manager - Meaning of Strategic HRM - - Personnel Management Definition

UNIT 2 : JOB ANALYSIS & HRP

Job Analysis - Uses - Process - Methods of Collecting Job Analysis Data - Job Description - Job Specification - Human Resource Planning (HRP) - Objectives of HRP - Importance of HRP - Process of HRP - Effective HRP - Attrition Management - Retention Management – Outsourcing

UNIT 3 : RECRUITMENT & SELECTION

Recruitment - Meaning & Definition - Constraints & Challenges - Sources of Recruitment - Methods of Recruitment - Selection - Definition - Purpose - Selection Process - Application Blank - Curriculum Vitae - Testing - Employment Interview - Interview Process - Medical Screening - Appointment Order

UNIT 4 : TRAINING & PERFORMANCE APPRAISAL

Training - Need for Training - Training Vs. Development - Areas of Training - Types of Training - Methods of Training - Succession Planning - Performance Appraisal - Objectives - Process of Performance Appraisal - Methods of Performance Appraisal - Traditional & Modern Methods - Essential Characteristics of an Effective Appraisal - Potential Appraisal

UNIT 5 : EMPLOYEE GRIEVANCES, DISCIPLINE & STRESS MANAGEMENT

Incentives - EAP - Employee Welfare Facilities - Teams - Team work - Team Building - Employee Grievances - Employee Grievance Procedure - Discipline - Kinds - Approaches to Discipline - Punishments - Essentials of Good Disciplinary System - Job Stress - Stress Management

COURSE TEXT:

1. V S P Rao, *Human Resource Management*, Excel Books, 2010

COURSE REFERENCES:

1. C B Gupta, *Human Resource Management*, Sultan Chand & Sons, New Delhi, 2012
2. Aswathappa K, *Human Resource Management*, Tata Mc-Graw Hill Education, 2010
3. Wayne Mondy Robert, *Human Resource Management*, Pearson Education, 12th Edition, New Delhi, 2010

16UCS4MC01RELATIONAL DATABASE MANAGEMENT SYSTEM

Semester: IV **Credits: 3**
Category: MC **No. of Hrs/week: 3**

Objectives:

1. To inculcate the basics of relational database systems.
2. To master the different query constructs and utilize the features of Oracle.
3. To gain knowledge in PLSQL Programming.

UNIT I **[8 Hrs]**

Introduction to databases- three levels of database architecture- Client Server Architecture - Relational algebra- Relational Calculus- Tuple Calculus – Domain Calculus – Integrity and views – Keys.

UNIT II **[8 Hrs]**

Functional dependencies- Basic definitions – First, Second and Third Normal forms - Boyce Codd normal form- E/R Model – E/R Diagrams – Database design with the E/R Model.

UNIT III **[8 Hrs]**

Transaction Management – Transactions -transaction recovery- system recovery -Two phase commit – Savepoint – Concurrency – Locking.

UNIT IV **[11 Hrs]**

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 - Adding and removing constraints to tables – Database objects – views – synonyms – sequences – indexes – clusters.

UNIT V **[10 Hrs]**

PL/SQL programming-Declaring variables-control statements-case statements- Cursors-Exception Handling. Procedures-functions - Triggers –types of triggers – trigger syntax-Enabling Disabling - replacing and dropping triggers.

TEXT BOOKS

1. C.J. Date, A. Kannan, S. Swamynathan, "An Introduction to Database Systems", Pearson Education, Eighth edition, 2009.
2. Shah Nilesh, "Database Systems Using Oracle A simplified Guide to SQL and PL/SQL", Prentice Hall of India, Second edition, 2005.

REFERENCE BOOKS

1. Raghu Ramakrishnan, "Database Management Systems", Tata McGraw Hill, Third Edition,2003.
2. Loney Kevin and Koch George, "Oracle 9i The complete reference ", Tata McGraw Hill, 2002.

16UCS4MC02 RELATIONAL DATABASE MANAGEMENT SYSTEM - LAB

Semester: IV **Credits: 3**
Category: MC **No. of Hrs/week: 3**

Objectives:

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

Exercises:

1. Creating, modifying and dropping Tables.
2. Inserting, modifying and deleting records of a table.

3. Creating tables with Adding, Dropping , disabling /enabling constraints.
4. Retrieving rows with Character functions.
5. Retrieving rows with Number and Date functions.
6. Retrieving rows with Group functions and HAVING.
7. Retrieving rows with Sub Queries.
8. PL/SQL programs with control structures.
9. PL/SQL programs with Cursors.
10. PL/SQL programs with Exception Handling.
11. Creating and Calling Procedures.
12. Creating and Calling Functions.
13. Working with Sequences, synonyms, views, index and clusters

16UCS4ES01 DATA COMMUNICATION AND NETWORKS

Semester: IV **Credits: 4**

Category: ES **No. of Hrs/week: 6Hrs**

Objectives:
1. To have a depth knowledge about data communication and networks.
2. To describe various transmissions and multiplexing methods.
3. To understand the utilities and security.

UNIT I **[11 Hrs]**

Introduction: Networks – Protocols and standards – Standards organizations – Line configurations – Topology – Transmission mode – Categories of networks – Inter networks.

UNIT II **[12 Hrs]**

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

UNIT III **[15 Hrs]**

Encoding – Digital -to- Digital – Analog-to- Analog- Transmission of Digital Data: Digital Data Transmission – DTE – DCE Interface.

UNIT IV **[18 Hrs]**

Modems: Transmission Rate- Modem Standards – Transmission Media: Guided Media – Unguided Media. Multiplexing: Many-to-One, One-to-Many – Types – Multiplexing - The Telephone System, Error Detection and Correction: types of Errors – Detection – Error Correction.

UNIT V **[15 Hrs]**

Networking and internetworking devices: Repeaters – Bridges – Gateways – Routing algorithms – Distance vector routing – Link state routing.TCP / IP protocol suite: Overview of TCP/IP. Application layer: Domain Name System (DNS) – Telnet – File Transfer Protocol (FTP) – Trivial File Transfer Protocol (TFTP) – Simple Mail Transfer Protocol (SMTP) – Simple Network Management Protocol (SNMP).

TEXT BOOK:

1.BehrouzForouzan, "Introduction to Data Communications and Networking", Sixth Edition, Tata McGraw Hill 2009.

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", AddisonWessley, 1995.

16UCS4ES02 CLOUD COMPUTING

Semester: IV **Credits: 4**
Category: ES **No. of Hrs/week: 6**

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.
3. To introduce the broad perceptive of cloud architecture and model.

UNIT I **[14 Hrs]**

Cloud Computing Overview: Applications – Intranets and the cloud – Why Cloud Computing Matters – Benefits – Limitations – Companies in the Cloud Today – Cloud Services.

UNIT II **[20 Hrs]**

Cloud Computing Technology: Hardware and Infrastructure – Clients – Security- Network – Services – Accessing the Cloud - Platforms – Web Applications – Web APIs –Web Browsers –Cloud Storage – Overview – Cloud Storage Providers –Standards – Application – Client – Infrastructure – Service.

UNIT III **[20 Hrs]**

Cloud Computing at Work: Software as a service – Overview– Driving Forces – Company offerings – Industries

– Software plus Services–Overview-Mobile Device Integration –Providers – Microsoft Online.

UNIT IV **[18 Hrs]**

Developing Applications: Google – Microsoft – Intuit Quick Base – Cast Iron Cloud – Bungee Connect - Local clouds and Thin Clients – Virtualization – Server Solutions – Thin Clients.

UNIT V **[18 Hrs]**

Migrating to the Cloud: Cloud Services for Individuals – Cloud services aimed at the mid-market – Enterprise-Class Cloud Offerings – Migration.

TEXT BOOKS:

1.AntonyT.Velte, Toby J.Velte, Robert Elsenpeter, Cloud Computing: A Practical Approach, Tata McGraw- Hill Pub, Edition 2010.

REFERENCE BOOKS:

1. Roger Jennings, Cloud Computing with Windows Azure Platform, Wiley India Pvt. Ltd, 2009.
2. Barrie Sosinsky, Cloud Computing Bible, Wiley India Pvt. Ltd., 2011.

WEB RESOURCES:

1.http://www.mb.net/resources/cloud-computingresources.aspx.

2. http://www.masterthebоss.com/cloud-computing/in-the-cloud-computing-a- beginners-tutorial

3.http://www.south.cattelecom.com/technologies/cloudcomputing/indes.aspx.

16UBU4AL01 ORGANIZATIONAL BEHAVIOUR

SEMESTER: IV **CREDIT: 6**

CATEGORY: MC **NO. OF HOURS / WEEK: 6**

OBJECTIVES:

1. To familiarize the students with the behavioral patterns of human beings at individual and group levels in the context of an Organization.

2. To enable the students to understand the prediction and control of human behavior in an Organization.

UNIT 1 : INTRODUCTION TO OB

Definition of Organization - Characteristics of Organization - Importance of Organization - Theories of Organization - Classical Theory - Neo Classical Theory - Elements & Criticism - Organizational Behaviour - Scope of OB - Elements of OB - Approaches to OB - Disciplines that contribute to OB Field - Challenges & Opportunities for OB - OB Model (Autocractic, Custodial) - Biographical Characteristics

UNIT 2 : ATTITUDES & VALUES

Attitude Definition - Characteristics of Attitude - Importance - Source of Attitude - Components of Attitude - Attitude Measurement - Developing Positive Attitude - Job Satisfaction - Values - Importance - Types of Values

UNIT 3 : PERSONALITY

Personality Definition - Factors Influencing Personality - Theories of Personality- Frudian Theory, Jungian Personality Type, Neo Frudian Personality Theory, Myers-Briggs Type Indicator - The Big Five Force Personality Model - Personality Traits

UNIT 4 : PERCEPTION & MOTIVATION

Perception Definition - Importance - Types of Perception - Uses of Perception - Factors that influence perception - Making Judgment about others - Perceptual Errors - Definition of Motivation - Importance of Motivation - Relevance of Motivation to OB

UNIT 5 : GROUP DYNAMICS

Defining Groups - Classifying Groups - Stages of Group Development - The Five Stage Model - Group Roles - Group Norms & Status - Group Size - Group Cohesiveness - Teams - Types of Teams - Difference between Groups & Teams

COURSE TEXTS:

1. Robbins P. Stephen, *Organizational Behavior*, PHI Learning / Pearson Education, 2011.
2.

COURSE REFERENCES :

1. Luthans Fred, *Organizational Behavior*, Tata McGraw Hill, 2010
2. Schermerhorn, Hunt & Osborn, *Organizational behavior*, John Wiley, 9th Edition, 2008.
3. Ivancevich, Konopaske&Maheson, *Organizational Behavior& Management*, Tata McGraw Hill, 2008.

16UCS5MC01 OPEN SOURCE TECHNOLOGY

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

Objectives:

1. To understand about the basics of open source technology
2. To understand and develop skills in open source programming language.

3. To understand and develop applications using open source technology.

UNITI :INTRODUCTION **Hrs:15**

Introductionto Opensources–Needof OpenSources– Advantagesof OpenSources– Application ofOpenSources. Opensourceoperatingsystems:LINUX:Introduction– GeneralOverview –KernelModeandusermode–Process– AdvancedConcepts– Scheduling–Personalities–Cloning– Signals–DevelopmentwithLinux..

UNITII: OPENSOURCEDATABASE **Hrs:15**

MySQL:Introduction– Settingupaccount– Starting,terminatingandwritingyour ownprograms– RecordselectionTechnology –Workingwithstrings–Dateand Time–Sorting QueryResults– GeneratingSummary– Workingwith metadata– Usingsequences–MySQLandWeb.

UNITIII OPENSOURCEPROGRAMMING LANGUGES **Hrs:15**

PHP:Introduction–Programming inwebenvironment– variables–constants – data types–operators–Statements – Functions–Arrays–OOP–StringManipulation andregularexpression–Filehandling anddatastorage– PHPandSQLdatabase– PHPandLDAP–PHPConnectivity– SendingandreceivingE-mails–Debuggingand errorhandling– Security–Templates.

UNITIV PYTHON **Hrs:15**

SyntaxandStyle–PythonObjects–Numbers–Sequences– Strings–Listsand Tuples–Dictionaries– ConditionalsandLoops–Files–InputandOutput–Errorsand

Exceptions–Functions–Modules–ClassesandOOP ExecutionEnvironment.

UNITV PERL Hrs:15

Perlbackgrounder–Perloverview –Perlparsingrules– VariablesandData– StatementsandControlstructures– Subroutines,Packages,andModules-Working with Files– DataManipulation.

TEXT BOOKS:

1.Remycard,Ericdumasandfrankmevel,"THELINUXKERNELBOOK",Wileypublications,2006

2.VikramVaswani, "HOW TO DO EVERYTHING WITH PHP AND MYSQL", Tata-McGraw-hillpublishingcompanylimited,2006.

3.Wesleyj.Chun,"COREPHYTHONPROGRAMMING",Prenticehall,2013

4.Martinc.Brown,"PERL:THECOMPLETEREFERENCE",2nd edition,TataMcGraw- Hillpublishingcompanylimited, Indian reprint2009.

REFERENCE BOOKS:

1.RasmusLerdorfAndLevinTatroe,"PROGRAMMINGPHP", O'Reilly,2012

2.StevenHolzner,"PHP:THECOMPLETEREFERENCE",2nd Edition,TataMcGraw- Hill PublishingCompanyLimited,IndianReprint2009.

3.VikramVaswani, "MYSQL:THECOMPLETEREFERENCE", 2nd Edition, TataMcGraw-HillPublishingCompanyLimited,IndianReprint2009.

4. PYTHON COOK BOOK O'Reilly media 2013

OPEN SOURCE TECHNLOGY - LAB

1. Installation of Linux
2. Generating random number using shell script.
3. Changing file permissions using shell script
4. Executing basing commands using Linux
5. Executing text editing commands in Linux.
6. Installation of WAMP Server.
7. Designing a web page using PHP
8. Designing application using session and cookies
9. Designing application using session and cookies
10. Working with different types of array using PHP
11. Working with PHP forms
12. Executing DML and DDL commands using MySQL
13. Retrieving data from table using PHP
14. Inserting data into table using PHP
15. Create a feedback form using PHP and MySQL
16. Create an application for ONLINE TEST using PHP and MySQL
17. Designing an application using PYTHON
18. Designing an application using PERL

16UCS5MC02 VISUAL PROGRAMMING

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

Objectives:

1. To understand the goals and objectives of the .NET framework.
2. A working knowledge of the VB.NET programming language.
3. To apply VB.NET programming techniques to various real world problems.

UNIT I **[7 Hrs]**

Introduction to .net framework -Features, Common Language Runtime (CLR), Framework Class Library (FCL).Visual Studio.NET- IDE-Languages supported-Components. VB.NET: Introduction-Features- Declaring Variables and Constants- Keywords-Data types-Operators.

UNIT II **[11 Hrs]**

Conditional statements-Looping statements – Option statements- Access modifiers – Creating Enumerations-Object Oriented Programming- Classes and Objects-Inheritance – Polymorphism – Creating Interfaces-Overloading-Overriding-Constructors-Destructors.

UNIT III [10 Hrs]

Arrays– Static and Dynamic -Exception Handling – Models-Statements-String Handling functions- File Handling – Using File Stream class- File Modes – File Share – Reading and Writing to files – Moving, Copying and Deleting files.

UNIT IV [7 Hrs]

ADO.NET – Overview – Database Connections – Commands – Data Reader – Data Adapter -Data Sets – Binding Controls to Databases.

UNIT V [10 Hrs]

Web Forms: Introduction to ASP.NET -Working with Web Forms – Web form controls –Web forms and HTML – Web form to manipulate XML files-Creating a Web application.

TEXT BOOKS:

1. Steven Holzner, "Visual Basic .NET Black Book", Dream Tech Press, 2009.

REFERENCE BOOKS:

1. Jeffery R.Shapiro, "The Complete Reference Visual Basic.NET", Tata McGraw Hills, 2009.
2. Matthew MacDonald, "Beginning ASP.NET in VB.NET", APress Media LLC, 2004.
3. DenielleOtey, Michael Otey, "ADO.NET: The Complete reference", McGraw Hill, 2008.

16UCS5MC03 VISUAL PROGRAMMING LAB

Semester: V **Credits: 4**

Category: MC **No. of Hrs/week: 4**

Objectives:

1. To provide basic programming constructs of VB.NET programming language.
2. To provide skills to create a Console and windows application.
3. To design Web application using ASP.NET

Exercises:

1. Console Application – Determine Simple interest.
2. Console Application – Solution to quadratic equation.
3. Console Application – Determine standard deviation for a set of numbers.
4. Console Application – Determine row sum and column sum of M x N matrix.
5. Console Application - Find factorial of a number using recursion.
6. Console Application - Simple Class for student data with Constructor & Destructor.
7. Console Application - Simple class for Complex data with function & operator overloading.
8. Console Application – Implementing inheritance and polymorphism concepts.
9. Console Application – Exception handling mechanism.
10. Console Application – String handling functions.
11. Windows Application –Program to display dates in different formats.
12. Windows Application – Creation of Login page.
13. Windows Application –Creation of simple menu driven application.
14. Windows Application – Simple Calculator with Addition, Subtraction, Multiplication and Division.
15. Windows Application –Working with File concepts.
16. Web Application – Developing simple applications.

16UCS5MC04 SOFTWARE ENGINEERING

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

Objectives:

1. To understand the fundamentals of software engineering
2. To understand the different phases of software development life cycle.
3. To express the flow of any Software Project.

UNIT I **13 Hrs**

Introduction: Definition of software and software engineering – Software myths – Software Engineering paradigms: Linear Sequential Model & Prototyping Model Software Project Management – Software Metrics – Software Cost Estimation – Software Project Planning.

UNIT II **12 Hrs**

Software Requirement Analysis: Software Risks – Software Configuration Management System Analysis – Modeling the System Architecture – System Specification – Fundamentals of Requirement Analysis – Software Prototyping – Prototyping method sand tools specification – Software requirements Specifications.

UNITIII **10 Hrs**

Structured Analysis: Introduction – the elements of the analysis model – data objects, attributes and relationships – Cardinality and Modality – ERD – DFD – Classical Analysis Methods : DSSD, JSD, SADT.

UNIT IV **13 Hrs**

Software Design: Software Design and Software Engineering – Design and Software Quality – Evolution of

Software Design – Design Principles. Design Concepts, Abstraction, Refinement, Modularity – Effective Modular Design, Functional Independence, Cohesion, Coupling.

UNITV 12 Hrs

Software Testing Methods: Software Testing Fundamentals – White Box Testing – Black Box Testing – Debugging – Software Quality: McCall's Quality Factors.

TEXT BOOKS:

1. Roger S. Pressman, Software Engineering – A Practioner's Approach, Tata McGraw Hill, 6th Edition

REFERENCE BOOKS:

1.Richard Fairley, Sommerville "Software Engineering – Design Reliability and Management" ,Pearson Education, 7th Edition

16UCS5ES01 DATA MINING

Semester: V **Credits: 4**

Category: ES2 **No. of Hrs/Week: 6**

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 (18 Hrs)

Introduction to 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 **(18 Hrs)**

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 **(18 Hrs)**

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 **(18 Hrs)**

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

UNIT V **(18 Hrs)**

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

1.HanJiawei Han and KamberMicheline , "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

16UCS5ES02 SOFT COMPUTING

Semester: V **Credits:4**

Category: ES2 **No. of Hrs/Week: 6**

Objectives:

1. To introduce the key aspects of soft computing
2. To get familiarity with Genetic algorithm
3. To understand the features of neural network
4. To introduce to fuzzy logic components

UNIT I **10Hrs**

Introduction: Neural Networks – Fuzzy Logic – Genetic Algorithm – Soft Computing

UNIT II **10Hrs**

Artificial Neural Network – Fundamental Concept – Evolution of Neural Networks - Basic Models – Terminologies – SupervisedLearning – Unsupervised Learning

UNIT III **10Hrs**

Classical Sets and Fuzzy Sets – Classical Relation and Fuzzy Relations – Membership Functions –Defuzzification – Fuzzy Decision Making - Fuzzy Logic Control System

UNIT IV **12Hrs**

Genetic Algorithm – Basic Operators and Terminologies – Traditional vs Genetic Algorithms- Classification of GA- Application of GA

UNIT V **18Hrs**

Applications of Soft Computing – Optimization of TSP using GA – GA based Internet Search Technique – Soft Computing Based Hybrid Fuzzy Controller - Soft Computing Based Rocket Engine Control

TEXT BOOK

1. S.N. Sivanandam, S. N. Deepa, "Principles of Soft Computing", Wiley India Pvt. Ltd., 2007.

REFERENCE BOOKS

1. George J. Klir and Bo Yuan, "Fuzzy Sets and Fuzzy Logic-Theory and Applications", Prentice Hall, 1995.
2. James A. Freeman and David M. Skapura, "Neural Networks Algorithms, Applications, and Programming Techniques", Pearson Edn., 2003.
3. David E. Goldberg, "Genetic Algorithms in Search, Optimization and Machine Learning", Addison Wesley, 2007.

16UCS5ES03 SYSTEMS PROGRAMMING Semester: V **Credits: 4**

Category: ES **No. of Hrs/Week: 6**

Objectives:

1. To provide basic knowledge of various system software to get deeper understanding of actual working of a computer system.
2. To know the advantages of using macros.
3. To know the functionalities of Loaders and Linkers.
4. To illustrate various phases of compilers.

UNIT I

Introduction: System Software. Evolution of Components of a Programming System, General Machine Structure - Memory, Registers, Data and Instructions. Machine Language - No Looping, Address modification using instruction as Data and Index registers, Looping. Assembly Language Program using Literals and pseudo -ops.

UNIT II **Hours- 16**

Assembler: General design procedure, Design of Assembler- Statement of Problems, Data structures, Format of Databases, Algorithm (2 –pass assembler) with flow chart.

UNIT III **Hours- 18**

Macro Language and the Macro Processor: Macro instructions, Features of Macro facility, Macro instruction argument, Conditional Macro expansions, Macro call within Macro, Implementation.

UNIT IV **Hours- 16**

Loaders and Linkers: - Loader Schemes - Compile and Go Loader, General Loader scheme, Absolute Loaders,

Subroutine Linkages, Relocating Loaders, Direct-Linking Loaders Binders, Linking loaders, Overlays, Dynamic Binders, Design of an Absolute Loader, Design of direct linking loader

UNIT V

Compilers:

Statement of problems- Recognizing basic elements- Recognizing syntactic units and interpreting meaning, Intermediate form- storage allocation - code generation, General model of compiler, General model of compiler. **Phases of Compilers** - Different phases- Lexical Phase, Syntax Phase, Interpretation Phase, Optimization Phase, Storage Assignment Phase, Code Generation Phase and Assembly phase- Passes of a Compiler with flow chart.

TEXT BOOK

1. John J Donovan,"Systems Programming"**,** Tata McGraw-Hill, Reprint, 2001.

REFERENCE BOOKS

1. D.M.Dhamdere,"Introduction to System Software" , McGraw-Hill Education, 2011.
2. Aho, Sethi, Ullman, "Compilers Principles, techniques and tools", Pearson Education, 2008.

WEB RESOURCES

1.http://www.cs.du.edu/~dconnors/courses/comp2355/notes/introduction.pdf

2. http://www.cse.psu.edu/~djp284/cmpsc311-s14/slides/01-systems-programming.pdf

3.https://drive.google.com/file/d/0B7doMTp4mbo3QWgzQzVSbnNCb1k/view?pref=2&pli=1

16UCS5ES04 COMPUTER GRAPHICS

Semester: V **Credits: 4**
Category: ES2 **No. of Hrs/week: 6 Hrs**

Objectives:

1. This subject deals with Graphics Concepts and Multimedia methodologies.
2. Mathematical Knowledge on Graphics and Technical background of Multimedia.
3. To inculcate knowledge on Graphics & Multimedia concepts.

UNIT I **15Hrs**

Survey of computer graphics, Overview of graphics systems – Video display devices, Raster scan systems, Random scan systems, Graphics monitors and Workstations, Input devices, Hard copy Devices, Graphics Software; Output primitives – points and lines, line drawing algorithms, loading the frame buffer, line function; circle and ellipse generating algorithms; Pixel addressing and object geometry, filled area primitives

UNIT II **15Hrs**

Two dimensional geometric transformations – Matrix representations and homogeneous coordinates, composite transformations; Two dimensional viewing –viewing pipeline, viewing coordinate reference frame; widow-to-viewport coordinate transformation, Two dimensional viewing functions; clipping operations – point, line, and polygon clipping algorithms.

UNIT III **15Hrs**

Three dimensional concepts; Three dimensional object representations – Polygon surfaces- Polygon tables- Plane equations – Polygon meshes; Curved Lines and surfaces, Quadratic surfaces; Blobby objects; Spline representations – Bezier curves and surfaces -B-Spline curves and surfaces. TRANSFORMATION AND VIEWING: Three dimensional geometric and modeling transformations – Translation, Rotation, Scaling, composite transformations; Three dimensional viewing – viewing pipeline, viewing coordinates, Projections, Clipping; Visible surface detection methods.

UNIT IV **12Hrs**

Audio: Introduction – Acoustics – Nature of Sound Waves – Types ND properties of Sound – Microphone – Amplifier – Loudspeaker – Audio Mixer – Digital Audio – Synthesizers – MIDI – Sound Card – Audio Transmission – Audio File formats and CODECs – Audio Processing Software. Video: Analog Video Camera – Analog video signal representation- Television system – Video Signal Formats – Video File Formats and CODECs – Video Editing Concepts– Video Processing Software.

UNIT V **15Hrs**

What is mean by Animation? – History of Animation– Uses of Animation – Types of Animation – Principles of Animation – Animation on the WEB – 3D Animation – Animation file formats -Creating Animation-Animation softwares.Compression: MPEG-1 Audio – MPEG-1 Video - MPEG-2Audio – MPEG-2 Video, MPEG -4.

TEXTBOOKS:

1.John F. Hughes, Andries Van Dam, Morgan McGuire ,David F. Sklar , James D. Foley, Steven K. Feiner and Kurt Akeley ,"Computer Graphics: Principles and Practice", 2013, 3rd Edition, Addison- Wesley Professional.

(UNIT I, II, III)

Ranjan Parekh "Principles Of Multimedia", TMH, **2012,**

(UNIT- III: UNIT- IV: 5.1-5.4, 5.6-5.9, 5.12-5.14, 5.17; 6.3-6.4, 6.10-6.12, UNIT-V: chapter 7 &8)

REFERENCE BOOKS:

1. Donald Hearn and M. Pauline Baker, Warren Carithers,"Computer Graphics With Open GL", 4th Edition, Pearson Education, 2010.
2. Jeffrey McConnell, "Computer Graphics: Theory into Practice", Jones and Bartlett Publishers, 2006 .
3. Peter Shirley, Michael Ashikhmin, Michael Gleicher, Stephen R Marschner, Erik Reinhard, Kelvin Sung, and AK Peters, "Fundamental of Computer Graphics", CRC Press, 2010.

16UCS5SK01 NETWORK ADMINISTRATION

Semester: V **Credits: 6**
Category: SK **No. of Hrs/week: 6**

Objectives:

1.To understand the different types of network and directory services.

2.To design a network , configure the networking resources.

3.To administrate and manage networks in an organization.

UNIT I **[6 Hrs]**

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.

UNIT II **[6 Hrs]**

Guided transmission media-magnetic media, coaxial cable, twisted pair, and fiber optics.Wireless Transmission-Radio Transmission, Infrared, light wave Transmission. Communication satellites.

UNIT III **[6 Hrs]**

Network connection hardware -Router, switch, Hub, NIC, Repeaters.Transmission Control Protocol (TCP) – Segment header, Connection Establishment, connection release- User Datagram Protocol (UDP) –Segment header

UNIT IV **[6 Hrs]**

Routing algorithm – Shortest path routing, DVR Routing, Flooding. DataCenters- Location, access, security, Racks, wiring, labels.

UNIT V **[6 Hrs]**

Designing Network – Accessing Network Needs, Applications, Users, Network Services, Security and Safety, Growth and Capacity Planning- 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

- 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
- Setting up simple LAN network.
- Practice installation of windows 2003 server

- Practice configuring server/client setting in windows 2003 server
- Assigning IP Address to remote user.
- Practice configuring windows 2003 server to use Domain Name System(DNS)
- Practice on configuring windows 2003 as a DHCP client
- Practice on configuring windows 2003 as a DHCP server
- Practice adding new user/new group in windows 2003 server.
- Practice sharing printer in network
- Configuring the system to connect internet.

16UCS5SK02 RUBY ON RAILS

Semester: V **Credits: 4**
Category: SK **No. of Hrs/Week: 6**

Objectives:

1. To provide the programming constructs available in Ruby.
2. To give object oriented programming in Ruby
3. Provide basics of Rail and implementing Ruby applications on Rail.

UNIT I **20Hrs**

Welcome to Ruby: Creating a First Web Application-Getting started with Ruby- Checking the Ruby Documentation-Working with Numbers in Ruby-Working with Strings in Ruby-Storing Data in Variables-Creating Constants-Interpolating Variables in Double Quoted Strings-Reading Text on the Command Line-Creating Symbols in Ruby-Working with Operators-Handling Operator Precedence.

UNIT II **16Hrs**

Conditionals, Loops, Methods and Blocks: Its All about Making choices: the if Statement-Using the case Statement-Using Loops-Creating and Calling a Method.

UNIT III **18Hrs**

Classes and Objects: All about Encapsulation-Creating a Class-Creating an Object- Basing one Class on Another-Understanding Ruby's Object Access- Overriding Methods-Creating Class Variables-Creating Class Methods.

UNITIV **18Hrs**

Welcome to Rails: Putting Ruby on Rails-Introducing Model View Controller Architecture-Giving the view Something to do-Mixing Ruby Code and HTML inside the View-Passing Data from an Action to a View-Escaping Sensitive Text-Adding a Second Action.

UNIT V **18Hrs**

Connecting to Databases: Creating a Data-Aware Rails Application-Creating a Database-Running the store Application-Adding Another Record-Beautifying a Display-Working with Databases: Displaying items to the customer-Creating a Shopping Cart.

TEXT BOOK

1. Holzner, Stephen, “Beginning Ruby on Rails”, Wiley India Publications, 2006.

REFERENCE BOOKS

1. Bruce A. Tate, Curt Hibbs “Ruby on Rails: Up and Running”, O'Reilly Media Publications, 2006.

2. Rappin, Noel, "Professional Ruby on Rails", Wrox publications, 2008.
3. Fisher, Timothy, "Ruby on Rails Bible", Wiley, 2008.

WEB RESOURCES

1. www.tutorialspoint.com/ruby/ruby_pdf_version.htm
2. www.railstutorial.org/book

16UCS6MC01 WIRELESS COMMUNICATION NETWORKS

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

Objectives:

1. To obtain the knowledge about the Wirelessnetworktopology.
2. To understand different wireless technologies.
3. To understand mobile IP and mobile TCP.

UNIT I **12 Hrs**

Principles of wireless networks, Network planning: Introduction - wireless network topologies – cellulartopology - cell fundamentals - capacity expansion techniques -wireless network operations: Introduction - mobility management – radio resources and power management.

UNIT II **12 Hrs**

GSM & TDMA technology: Introduction – GSM - Mechanisms to support a mobile environment - communication in the infrastructure. CDMA technology – What is CDMA?-The IS-95CDMA forward channel-The IS95 CDMA Reverse channel.

UNIT III **12 Hrs**

Mobile data networks: Introduction - the data oriented CDPD networks - GPRS and higher data rates -Short messaging service in GSM - Mobile application protocols.

UNIT IV **12 Hrs**

IEEE 802.11 WLANS : Introduction- IEEE 802.11 - The PHY LAYER - MAC Sublayer – MAC managementsublayer - Bluetooth.

UNIT V **12 Hrs**

Mobile IP : Goals — Entities – IP packet Delivery- Agent Advertisement and Discovery – Registration – Tunneling and Encapsulation – Optimization – Reverse Tunneling – IPv6– DHCP- Ad hoc Networks. Mobile Transport Layer: Traditional TCP- Indirect TCP- Snooping TCP- Mobile TCP- Fast retransmit/ Fast Recovery- Transmission/ Timeout Freezing –Selective Retransmission- Transaction Oriented TCP.

TEXT BOOKS:

1. PahlavanKaveh and Krishnamurthy Prashant, "Principles of wireless Networks",Pearson education, 2004.
2. Schiller Jochen, "Mobile Communications", Second Edition, Pearson Education

REFERENCE BOOKS:

1. Stallings William, "Wireless Communications and Networks", Second Edition, PHI,2003
2. PahlavanKaveh and Krishnamurthy Prashant, "Wireless information networks", second Edition,A John Wiley & Sons, Inc., Publication.
3. Upenadalal,"wireless Communications and Networks",Oxford university press,2015.

WEB RESOURCES:

http://ee.yazd.ac.ir/saadat/temporary/mobile/Wireless%20information%10Network.pdf

16UCS6MC02 PROGRAMMING IN JAVA-LAB

Semester: VI **Credits: 4**

Category: MC **No. of Hrs/week: 4**

Objectives

1. To implement the basic programming constructs of Java Language.
2. To acquire knowledge for developing windows application.
3. To implement the Java concept in developing the software.

Exercises:

1. Write a Java Program using classes and objects.
2. Write a Java Program with method over loading.
3. Write a java program to handle strings.
4. Write a Java Program with Abstract classes.
5. Write a Java Program with Interfaces.
6. Create and import a package in Java.
7. Write a Java Program to handle Built-in and user defined Exceptions.
8. Write a Java Program to implement the concept of Multithreading.
9. Write a Java Applet that creates some text fields and text areas to demonstrate features ofeach.
10. File Read/Write operation using java.
11. Write java program to perform Java database connectivity

16UCS6MC03 OPERATING SYSTEM

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

Objectives:

1.The goal of this paper is to provide an introduction to the internal operation of the modern Operating Systems
2.To have a basic knowledge of processes, Scheduling concepts ,DeadLock and the memory management of the operating system.
3.To have a better understanding in Input and Output device structures and File system of the operating system.

UNITI **12 Hrs**

Introduction: OS Structure - Components - Services – system calls -Virtual Machines. Process Management: Introduction - Process - Process Scheduling – Operations on processes - Cooperating Process - Inter-process Communication.

UNITII **12 Hrs**

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.

UNITIII **12 Hrs**

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

UNIT IV **12 Hrs**

Virtual Memory: Demand Paging - Page Replacement - Page Replacement Algorithms - Thrashing. File System:

Introduction - File Concepts - Access Methods - Directory Structures – Protection.

UNITV **12 Hrs**

File System Structures - Allocation Methods - Free Space Management. I/O System: Introduction - I/O Hardware - Kernel I/O Subsystem - Disk Structure – Disk Scheduling. Case study : The Linux System.

TEXT BOOK:

1. Silberschatz Abraham, Galvin Baer Peter and Gagne Greg, "Operating System Concepts", Sixth Edition, John Wiley & Sons Pvt. Ltd, Reprint 2011.

REFERENCE BOOKS:

1. Tanenbaum S. Andrew, "Modern Operating Systems", Third Edition, Prentice-Hall Inc, 2008
2. Stallings William, "Operating Systems", Seventh Edition, Pearson Education, 2011.

E-BOOK:

Tanenbaum S. Andrew, "Modern Operating Systems", Third Edition, Prentice-Hall Inc, 2007.

16UCS6MS01 MOBILE COMPUTING

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

Objectives:

To learn the basics of mobile computing and the types of communications used.
To know the protocols and the security mechanisms used in Mobile Computing.

UNIT I **Hours 18**

(Introduction-2, Content Handling-12,Revision-4)

Introduction: Mobile Computing – DialogControl – Networks – Middleware and Gateways – Application and Services – Developing Mobile Computing Applications – Security in Mobile Computing – Necessity of Standards – Standards Bodies – Mobile Computing Architecture: Architecture for Mobile Computing – Three-tier Architecture – Design Considerations for Mobile Computing – Mobile Computing through Internet – Making Existing Applications Mobile-enabled.

UNIT II **Hours 18**
(Introduction-2, Content Handling-12,Revision-4)

Emerging Technologies: Bluetooth – Radio Frequency Identification – Wireless Broadband - Mobile IP – Global System for Mobile Communications: Global System for Mobile Communications – GSM Architecture – GSM Entities – Call Routing in GSM – PLMN interfaces – GSM Addresses and Identifiers – Network Aspects in GSM – Mobility Management

UNIT III **Hours 18**
(Introduction-2, Content Handling-12,Revision-4)

General Packet Radio Service: Introduction – GPRS and Packet Data Network – GPRS Network Architecture – GPRS Network Operations – Data Services in GPRS – Applications for GPRS – Limitations for GPRS – Billing and Charging in GPRS – Enhanced Data Rates for GSM Evolution.

UNIT IV **Hours 18**
(Introduction-2, Content Handling-12,Revision-4)

Wireless Application Protocol: Introduction – WAP – MMS –MMS Architecture – MMS Transaction flows – CDMA and 3G: Spread-Spectrum Technology – CDMA versus GSM – Wireless LAN: Introduction – Advantages – Architecture –

Mobile Ad hoc Networks and Sensor Networks – Wireless Access in Vehicular Environment.

UNIT V **Hours18**
(Introduction-2, Content Handling-12,Revision-4)

Security Issues in Mobile Computing: Introduction – Information Security – Security Techniques and Algorithms – Security Protocols – Public Key Infrastructure – Trust – Security Models – Security Frameworks for Mobile Environment – Next Generation Networks: Narrowband to Broadband – Multi Protocol Label Switching – Wireless Asynchronous Transfer Mode – Multimedia Broadcast Services – Future Trends.

TEXT BOOK

1. Asoke K Talukder, Hasan Ahmed, Roopa R Yavagal, "Mobile Computing – Technology, Applications and Service Creation", Second Edition, Tata McGraw-Hill, 2010.

REFERENCE BOOKS

1. .Krzysztof Wesolowski , "Mobile Communication Systems" , Wiley, 2012.
2. UweHansmann, LotharMerk, Martin S. Nicklous, Thomas Stober, "Principles of Mobile Computing", Second Edition, Springer International Edition.2003

WEB REFERENCES

1. http://www.tutorialspoint.com/mobile_computing/index.htm
2. http://www.tutorialspoint.com/gsm/index.htm
3. http://www.tutorialspoint.com/gprs/index.htm

16UCS6MS02 SECURITY IN INFORMATION TECHNOLOGY

Semester: IV **Credits: 4**
Category: MS **No. of Hrs/week: 6**

Objectives

1. To explore the fundamental concepts information security
2. To learn various issues related to information security

UNIT I **18Hrs**

History, What is Information Security?, Components of an Information System, Balancing Information Security and Access, The Systems Development Life Cycle, The Security SystemsDevelopment Life Cycle, Security Professionals and Organization

UNIT II **18Hrs**

Business Needs, Threats, Attacks, Secure SoftwareDevelopment, Legal, Professional and Ethical Issues

UNIT III **18Hrs**

Risk Identification, RiskAssessment, Risk Control Strategies, Selecting Risk Control Strategies, Quantitative versus Qualitative Risk Control Strategies, Risk Management Discussion Points

UNIT IV **18Hrs**

Information Security Planning and Governance, Information SecurityPolicy, Standards and Practices, Information Security Blueprint, Security Education, Training and Awareness Program, Continuity Strategies

UNIT V **18Hrs**

Security Technology, Intrusion Detection and Prevention Systems, Scanning and Analysis Tools, Biometric Access

Control, Cryptographic Methods, Algorithms, Tools, Protocols for Secure Communications, Attacks on Cryptosystems

TEXT BOOK

1. Michael E Whitman and Herbert J Mattord, "Principles of Information Security", 4th Edition, Course Technology, Cengage Learning, 2012.

REFERENCE BOOKS

1. Micki Krause, Harold F. Tipton, "Handbook of Information Security Management",Vol 1-3 CRC Press LLC, 2004.
2. Stuart McClure, Joel Scrambray, George Kurtz, "Hacking Exposed", Tata McGraw-Hill, 2003.
3. Matt Bishop, "Computer Security Art and Science", Pearson/PHI, 2002

COMPUTER SCINCE ALLIED OFFERED TO OTHER DEPARTMENTS

16UCS2AL01 OPERATIONS RESEARCH

Semester: I **Credits: 3**
Category: AL **No. of Hrs/week: 6 Hrs**

Objectives:

1. To design and control complex systems and to solve hard problems.
2. To learn optimization in management problems.
3. To learn decision making in real time problems.

UNIT-I **18Hrs**

Introduction to Operations research: Basic definition, Scope, objectives, Phases, models and limitations of Operations research Linear Programming: Formulation of LPP – Graphical **solution** of LPP and simplex method.

UNIT-II **18Hrs**

Transportation problems-unbalanced Transportation problem-Finding basic feasible solution – North-west corner rule-least cost -Vogel's approximation method. Assignment Problems – Hungarian method for optimal solution-Traveling Salesman Problem.

UNIT-III **18Hr**

Sequencing and scheduling problems: Job sequencing-n-jobs through two machines, N- jobs through three machines, two jobs through m machines. Maintenance and replacement problems: Models for routine maintenance and preventive

maintenance decision – Replacement models that deteriorate with time and those fail completely.

UNIT-IV **18Hrs**

PERT and CPM techniques – Network-activity, node-dummy activity-Fulkerson rule-Constructing the network - Critical path analysis – Three time estimates for PERT.

UNIT-V **18Hrs**

Inventory problems: Deterministic model – costs – decision variables – Economic order quality – Instantaneous receipt of goods with and without shortage – Inventory systems – Safety stock – Reorder – Level (ROL), Reorder point (ROP)

TEXT BOOK:

1. Iyer,P.Sankara,"Operations Research",TataMcgGraw-Hill,2008.
2. Gupta, P.K. and Hira, D.S., Operations Research, S. chand& sons, 2000
3. http://www.math.epn.edu.ec/~sandra/TDE2015_A/libros/taha2007.pdf

REFERENCE BOOKS:

1.Kalavathy.S,"Operations Research",Vikaspublication,fourth edition.

2.Taha. H.A, "Operations research – an introduction".Pearson Prentice Hall, Eighth editions

16UCS2AL01 ENTERPRISE RESOURCE PLANNING

Semester: I **Credits: 3**
Category: AL **No. of Hrs/week: 6 Hrs**

Objectives:
In this course students shall learn various components of application software that helps to computerize functioning of an enterprise.

UNIT - I: **15hrs**
Introduction to ERP – Conceptual model of ERP – Evolution of ERP-Structure of ERP-Reasons for Growth-Advantages of ERP-Enterprise: An overview .ERP and related technologies: Business Process Re-engineering – Management Information System – Decision Support System – Executive Information system – Data Warehousing – Data Mining – OLAP – Supply Chain Management

UNIT- II: **18hrs**
Benefits of ERP: Reduction of Lead Time – Reduction of Cycle Time – Improved Resource Utilization – Reduced Quality Costs – Increased Flexibility – Improved Information accuracy and Decision making capability

UNIT- III: **15hrs**
ERP Implementation Lifecycle: Introduction – Per-evaluation screening – Project Planning – Gap Analysis – Reengineering – Configuration – Implementation – Testing – Training – Maintenance. Vendors, Consultants and Users: In-house Implementation-Pros and Cons – Vendors – Consultants – End-users.

UNIT- IV: **12hrs**
Supply chains as Systems - Modeling the Supply Chain – Supply Chain Software -Meeting Demand – Maintaining

Supply – Measuring Performance

UNIT - V: 12hrs

Forecasting Demand – Scheduling Supply – Improving performance – Mastering Demand – Designing the Chain – Maximizing Performance. Essentials of Customer relationship management – Designing CRM application - Various modules of CRM application - Advantages of CRM

TEXT BOOK:

1. Alexis Leon, "Enterprise Resource Planning "Tata McGraw – Hill Publishing Company Ltd,2004.
2. Taylor David,A supply chains(A manager guide),Pearson education,
   (Unit 3:Chapters 4, 5, 6, 7, 8, 9) (unit 4: Chapters 10, 11, 12, 13)
3. Tiwana, Essential guide to knowSledge management : The e-business and CRM applications, Pearson education (ISBN 81-780-8326-4)(unit 5)

REFERENCE BOOKS:

1. Rahul V. Altekar , "Enterprisewide Resource planning-Theory and practice", Prentice Hall of India Pvt Ltd
2. Vinodkumargarg and N.K.Venkitakrishnan , " Enterprisewide Resource Prentice Hall of India Pvt Ltd
3. Dr.SubodhKesharwani , " ERP systems – Application, Experiences &Upsurg " , Pragatiprakathanpublication – Meerut Balasubramanian, Enterprise Resource Planning

16UCA3AL01 FINANCIAL ACCOUNTING PACKAGE USING TALLY

Semester: III **Credits: 3**

Category: AL **No. of Hrs/week: 6 Hrs**

Objective:

1. To impart the students with the basic principles and concepts of accounting.
2. To provide Knowledge on the use and application of computer in accounting.
3. To implement all the concepts in using packages.

UNIT I

18HrsERP: Introduction – Need for ERP – Advantages – Major ERP Packages -Benefits of ERP – SAP: Introduction - Overview - SAP-History – Features - Organization – Technology

UNIT II **18Hrs**

SAP Implementation Tools (Asap and Solution Manager) - System Landscape - Roles And responsibilities of a Consultant - Types of Projects - Change Transport System – ABAP : Overview – Features - ABAP Dictionary – Advantages.

UNIT III **18Hrs**

SAP: Business Modules - SAP FI (Financial Accounting) Overview – GUI - Logon to SAP Environment – Screen Elements - Creating Favorites – Transaction – Configuration (IMG)

UNIT IV **18Hrs**

FINANCIAL ACCOUNTING : Basic Settings- Overview of Organizational Elements in Accounting - Organizational Units- Define and Assign Organizational Units for Finance - Variant Principle - Fiscal Year and Posting Periods - Field Status Variants - Document types and Number Ranges - Posting Keys - Define Tolerance for GL Accounts and Employees - Global Parameters

UNIT V **18Hrs**

FI Master Data Overview - Chart of Accounts - Types of Chart of Accounts - Define and Assign Chart of Accounts - Define Account

Groups and Screen Layout for GL Accounts,- Define Retained Earnings Account, - GL Accounts Master Records – Postings - Display GL Account Balances and Document.

TEXT BOOK:

1. Enterprise Resource planning (ERP): Text and case studies by Murthy, C S V, HPH Teach yourself SAP in 24 hours by George Anderson; Danielle Larocca - Pearson Education
2. SAP business 1.0 Software www.sap.com/confactsap 3.4 to 3.7

REFERENCE BOOKS:

1. SAP FICO BOOKS; 2.4 edition, CreateSpace Independent Publishing Platfor,, 2014.
2. Financial Accounting with SAP: Quick Reference Guide to SAP FI,1st Edition, SAP Press, 2010
3. Financial Planning and analysis with SAP, Malcilm J. Faulkner, William D.Newman, , SAP Press, 2014