NIMS UNIVERSITY

SYLLABUS

OF

BACHELOR IN COMPUTER APPLICATION – BCA

VERSION 1.2

DIRECTORATE OF DISTANCE EDUCATION

Shobha Nagar, Jaipur-Delhi Highway (NH-11C), Jaipur- 303121
Rajasthan, India

BACHELOR IN COMPUTER APPLICATION– BCA

Eligibility	:	Senior Secondary Level Examination
Programme Duration	:	3 Years
Programme Objectives	:	The aim of this programme is to develop knowledge about computers that can be effectively used in developing business and scientific applications.
Job Prospects	:	After completion of the BCA course, students can pursue master level programmes in India and abroad. The MCA programme is a logical progress for BCA students. Software products and service companies provide ample opportunities for students. Government institutions and Banks heavily recruit BCA candidates. Common job profiles for BCA candidates include : Software Engineer, Programmer, Internet Expert, Network Designer, Software Developer, System Analyst, Trouble-shooter

YEAR I

Course Code	Course Title	Theory/ Practical	Continuous Assessment (Internals)	Credits
ENG14101	Communication for Professionals	70	30	4
MTH14101	Mathematics	70	30	4
CSC14101	Programming in C	70	30	4
CSC14102	Digital Circuits & Systems	70	30	5
CSC14103	Relational Database Management Systems	70	30	5
CSC14104	Operating System	70	30	4
CSC14101P	Programming in C	35	15	2
CSC14103P	Relational Database Management Systems	35	15	2
CSC14104P	Operating System	35	15	2
			Total	32

YEAR II

Course Code	Course Title	Theory/ Practical	Continuous Assessment (Internals)	Credits
CSC14201	Object Oriented Programming with C++	70	30	5
CSC14202	Computer Architecture & Organizations	70	30	5
CSC14203	Data Structures & Algorithms	70	30	4
CSC14204	System Analysis & Design	70	30	4
CSC14205	Internet Technology & Applications	70	30	4
CSC14206	Data Mining & Warehousing	70	30	4
CSC14201P	Object Oriented Programming with C++	35	15	2
CSC14203P	Data Structures & Algorithms	35	15	2
CSC14205P	Internet Technology & Applications	35	15	2
			Total	32

YEAR III

Course Code	Course Title	Theory/ Practical	Continuous Assessment (Internals)	Credits
CSC14301	Data Communication & Computer Networks	70	30	4
CSC14302	Microsoft .NET Framework & C#	70	30	4
CSC14303	Management Information System	70	30	4
CSC14304	Web Programming with PHP	70	30	4
CSC14305	Information Security & Cyber Laws	70	30	4
CSC14306	Software Project Management	70	30	4
CSC14302P	Microsoft .NET Framework & C#	35	15	2
CSC14304P	Web Programming with PHP	35	15	2
PRJ14301	Project	200		4
			Total	32

DETAILED SYLLABUS

INSTRUCTIONAL METHOD: Personal contact programmes, Lectures (virtual and in-person), Assignments, Labs and Discussions, Learning projects, Industrial Training Programmes and Dissertation.

YEAR I

COMMUNICATION FOR PROFESSIONALS – ENG14101

UNIT	CONTENTS
1	**Role of Communication:** Defining Communication, Classification of Communication, Purpose of Communication, Process of Communication, Elements of Communications, Major Difficulties in Communication, Common Problems in Two Way Communications, Barriers to Communication, Conditions for Successful Communication, Characteristics of Successful Communication, and Universal Elements in communication.
2	**Non Verbal Communication:** Meaning, Characteristics, Classification, Advantages, Guidelines for Developing Non Verbal Communication.
3	**Important Functions of Managing:** Importance of Communication in Management, Important Functions of Managing, Managing and Communication, Need for Communication in Management, Corporate Communication, The Manager, The Human Needs, Communication Training for Managers, Communication Structure in an Organization, Communication and the Line and Staff Management, Formal Communication and Informal Communication.
4	**Written Business Communication:** The art of writing, importance of Skills in Written Communication, Purpose of Writing- The Audience, Clarity in Writing and Principles of Effective Writing.
5	**Business Letter Writing:** Business Letters and Memos: Introduction, Writing Routine Pleasant Letters, Writing a Persuasive Letter, Writing Memos, Case Study- A Reply Sent to Erring Customers.
6	**Report Writing:** Report-Difference Between Report and Other Forms of Writing, Purpose of a Report, Kinds of Report, Objectives of Report, Writing Report, Basic and Subsidiary Part of Report, Writing Elements of a Long Formal Report, Abstract and Executive Summary, Discussions of Findings and Analysis, Subject Wise Development, Concept Development, The Process on Investigation, Research Report, Difference of Summer Project Report from Business/Technical Report/Guidelines for Writing Summer Project Report, Summer Project Proposal, Synopsis, Summer Project Presentation, Summer Project Report on Hypothetical Topics in Human Resources & Marketing.
7	**Oral Communication Skills:** Effectiveness Application of Conversation Control, Negotiation Skills, Nature of Negotiation, Need to Negotiate, Stages of Negotiation Process, Negotiation Strategies, Presentation Skills, Elements of Presentation, Designing Presentation, Listening in Communication.
8	**CV's, Groups Discussion and Personal Interviews:** Preparing for job, summary, Drafting and application letter, interview, job interview, communication skills, focus of job interview, analysis and interpretation of respondents, Case Study Employment Interview for Cabin Crews & Five Other Case Studies on Interviews.

9	**Business Etiquette:** Meaning, Business Dining, Foreign Languages, Business Manners of Different Countries, Business to Business Etiquette, Managing Customer care, Case Study-Five Case Studies on Business Etiquette.
10	**Business Gossips in Communication:** Types of Business Gossips, Grape Vine Communication, Managing business Gossips, Prospects of business Gossips.

LEARNING SOURCE: Self Learning Materials

ADDITIONAL READINGS:

A. John Mattock – Cross Cultural Communication – Essential Guide to International Business – Kogan Page

B. Herbert W Hilderbrandt – Effective Business Communication, McGraw Hill, 7/e, 1997

C. Axel Satzger, Gina Poncini – International Perspective on Business Communication: From Past Approaches to Future Trends, Peter Lang Publications Inc., 2003

MATHEMATICS – MTH14101

UNIT	CONTENTS
1	**Sets and Propositions:** Introduction, Combinations of Sets, Finite and Infinite sets, Uncountably Infinite Sets, Mathematical Induction, Principle on Inclusion and Exclusion, Multisets, Propositions, Logical Connectives, Conditional and Bioconditional.
2	**Relation and Function:** Introduction, Cartesian product, Relations and their Types, Properties of Relations, Functions, Types of Functions, Operations on Functions.
3	**Arithmetic and Geometric Progressions:** Introduction to Arithmetic and Geometric Progressions, Sequences, Arithmetic Progressions, The Sum of an Arithmetic Series, Geometric Progressions, Sum of Infinite Geometric progression.
4	**Permutation and Combination:** Introduction to Permutation and Combinations, Objectives, Multiplication and Addition, Permutations, Combinations, Binomial Coefficients, Combinatorial Probability.
5	**Limit and Continuity:** Introduction to Limit and Continuity, Functions and Limits, Types of Functions, Limit of a Function, Properties of Limits, Some Standard Limits, Derivative as Tangent to a Curve, Continuity, Theorem on Continuous Functions, Discontinuous Functions.
6	**Differentiation:** Introduction to differentiation, Differential Coefficient, Differentiability, Differential Coefficients of Standard Functions, Theorem, Differentiation of Implicit Functions, Differentiation using Trigonometric Formulae, Logarithmic Differentiation, Differentiation for Special Functions, Differential Equation, General, Particular and Singular Solution, Successive Differentiation.
7	**Methods of Integration:** Introduction to Methods of Integration, The Method of Substitution, Integrals of Some Functions Containing a Quadratic Trinomial, Integrals of Some Expressions of the Different Form, Integrals of Certain Classes of Trigonometric Functions, Integration by Parts,

	Integration by Substitution.
8	**Integration:** Introduction to Integration, Historical Background, Inter-Connections Between Integration and Differentiation, Indefinite Integrals, Integral Defined as an Area, Integral Defined as the Limit of a Sum: Workers of the field, Analytic Definitions of the Integral, a Geometrical Interpretation of Indefinite Integration, Integrals of Certain Functions
9	**System of Linear Equation:** Introduction to Linear Equation, Basic Definitions, Solutions, Equivalent Systems, Elementary Operations, Small Square Systems of Linear Equations, System in Triangular and Echelon Form, Gaussian Elimination, Echelon Matrices, Row Canonical Form, Row Equivalence.
10	**Matrices:** Matrices to describe NETWORK, Order of a matrix, Types of matrices, Algebra of matrices, Transpose of a matrix, Addition and subtraction of matrices, Multiplication of matrices, Symmetric and skew-symmetric matrices, Orthogonal matrix, Nilpotent matrix, Periodic matrix, Idempotent matrix, Involuntary matrix, Determinant of a square matrix, Singular and non singular matrices, Minors and cofactors, Expansion of a determinants, Elementary properties of determinants, Application of determinants, Adjoint of a square matrix, Inverse of a matrix, Elementary operations on matrices, Echelon form of a matrix, Solution of system of linear equations by matrix method, Solution of system of linear equations by elementary transformation (operations).

LEARNING SOURCE: Self Learning Materials

ADDITIONAL READINGS:

A. K.B.Datta, Matrix and Linear Algebra, Prentice Hall of India Pvt.Ltd. New Delhi, 2000.

B. P.B.Bhattacharya, S.K.Jain and S.R.Nagpaul, First Course in Linear Algebra, Wiley Eastern, New Delhi, 1983.

C. Gorakh Prasad, Differential Calculus, Pothishala Private Ltd. Allahabad.

PROGRAMMING IN C – CSC14101

UNIT	CONTENTS
1	**Introduction to 'C':** Structure of a C program, 'C' Tokens, Keywords, Identifiers, 'C' Constants, Variables in C, Data Types, Derived Data Types: Operators, Precedence and Associativity of operators, Hierarchy of operators at a glance, Expression & its Evolution, Type conversion in expressions (Implicit and Explicit type conversion).
2	**Decision Making and Branching:** Introduction to Decision Making and Branching, Sequential Statements, Unformatted I/O Functions, Formatted Input using scanf() function, Formatted output using print(), Branching statements, The if-else statement, The nested if-statement, The switch statement, Additional Programs. Looping Statements- Introduction to Looping Statements, For-statement, While-Statement, Do-While Statement, Difference between while-loop and do-while loop, Nested loops, Jumps in loops, Programming examples.
3	**Arrays:** Introduction to Arrays, Single-dimensional arrays, Reading and writing single dimensional

	arrays, Examples of complex programs, Searching, Sorting, Two-dimensional arrays (Multi-dimensional arrays), Reading-writing two-dimensional arrays, Manipulation in two-dimensional arrays, Programming examples. Strings- Concepts of string, Strings in C language, String variable, Initializing strings, String input/output functions, Arrays of strings, String handling functions, Memory Formatting. User Defined Functions- Introduction to User Defined Functions, Elements of User-Defined Functions, Categories of Functions, Passing Parameters to Functions, Programming Examples, Arrays in Functions, Nesting of Functions, Recursion, Command Line Arguments, Storage Classes.
4	**Structure and Union:** Introduction to structures, Structures and its definition, Structure declaration, Tagged structure, Structure variables, Type-defined structure, Structure initialization, Accessing structures, Nested structures, Array of structures, Structures and functions, Sending individual members, Sending the whole structure, Passing structures through pointers, Uses of structures, Union and its definition.
5	**File Handling:** Introduction to file handling, File system basics, Standard Streams in C, File structure, File pointer, Opening and closing a file, File handling functions, File types, Text and Binary, Input/Output operations on file, Reading a character using getc(), Writing a character using putc(), Using feof(), Working with string using fputs() and fgets(), Using fprintf() and fscanf(), Using fread() and fwrite(), Direct Access File.

LEARNING SOURCE: Self Learning Materials

ADDITIONAL READINGS:

A. E. Balaguruswamy "Programming in C", Tata McGraw Hill

B. H. Schildt, "C The Complete Reference", Tata McGraw Hill

C. Y. Kanetkar, "Let us C", BPB Publications

DIGITAL CIRCUITS & SYSTEMS – CSC14102

UNIT	CONTENTS
1	**Introduction:** Digital Computers, Computer Architecture, Computer Organization, Difference Between Computer Architecture And Organization, Structure And Functions Basic arrangement of a Computer System- Computer, Basic Organization Of A Computer System, Types of Computers, Microprocessor(µp), Working Of Microprocessor, Microprocessor 8085 Architecture, Speed Of Microprocessors.
2	**Number System and its Representation:** Data Types Number System- Non Positional Number System Positional Number System

	Number System Conversion Binary Arithmetic Integer And Floating Point Representation- Integer Representation Fixed Point Representation Floating Point Representation Overflow, Underflow Computer Codes- Introduction To Computer Code, BCD (Binary Coded Decimal) Code, EBCDIC Code, ASCII Code, Excess-3 Code, Gray Code, Error Detection and Correction Code.
3	**Basic Building Blocks:** Logic Gates, Universal Gates, Exclusive Gates, Bubbled Gates, Universality Of NAND And NOR Gates.
4	**Boolean Algebra:** Boolean Variable, Boolean Algebra, Boolean Function And Truth Tables, Logic Diagram, Laws of Boolean Algebra, Rules of Boolean Algebra, Demerger's Theorems, Simplification Of Boolean Function, Implementation Using Basic Gates, To Obtain Expression From Logic Circuits. Karnaugh Map- Introduction to Karnaugh Map, Algebric Expressions by Karnaugh Map, Simplification of Boolean Expression Using K-Map and Don't Care Conditions.
5	**Digital Logic Circuits:** Introduction to Digital Logic Circuits, Combinational Logic Circuit, Sequential Logic Circuits.

LEARNING SOURCE: Self Learning Materials

ADDITIONAL READINGS:

A. Modern Digital Design – Sandiege– McGraw Hill

B. Switching theory & Logic Design – hill & Peterson - McGraw Hill

C. Digital Design– Morris Mano – Pearson

RELATIONAL DATABASE MANAGEMENT SYSTEMS – CSC14103

UNIT	CONTENTS
1	**Introduction to DBMS:** Operational Data, Introduction to Database, Views of Data, Three-Level Architecture Proposal, Instances And Schemas, Purpose of Database System, Advantages of DBMS, Disadvantages of DBMS, Structure of DBMS, Data Models, Database Languages. E-R Model- Entity-Relationship Model, Entity And Entity Set, Attributes And Keys, Relationship And Relationship Set, Mapping Constraints, Entity-Relationship Diagram, Strong And Weak Entities, Generalization, Specialization, Aggregation, Reducing ER diagram to Tables DBA- Role, Functionality And Importance, Failure Classification, The Strong Hierarchy, RAID, Transaction Model, File Structure And Storage Access, File Organization, Organization of Records In File, Data Dictionary Storage.
2	**RDBMS Concept and Terminology:** Set Theory-Concepts and Fundamentals, Extension and Intention, Attributes and Domains, Relations, Tuple, Concepts of Keys, Fundamental Integrity Rules. Relational Algebra- Select Operation, Project Operation, Join Operation, Division Operation, Cross Product Operation, Set Operation Relational Calculus- Introduction to Relation Calculus, Tuple Relational Calculus, Client-Server System, Parallel Database System, Distributed Database System, Overview of Database on Web, Concepts of ODBC, DSN.
3	**Functional Dependencies:** Universal Relation, Anomalies In Database, Decomposition, Normalization Database Language- Structured Query Language (SQL), Integrity Constraints, Implementing SQL Using MS Access, Function, Indexing, View Using MS Access Structured Query Language- Problems In SQL, Advantages Of PL/SQL, Block Structure Of PL/SQL, Common Data Types of PL/SQL, Declaration of Variables In PL/SQL, Assignment Statement In PL/SQL, User Input Statement In PL/SQL, User Output Statement In PL/SQL, Relational And Logical Operation In PL/SQL, Branching In PL/SQL, Looping In PL/SQL, Cursor, Exception, Procedure, Function. Operation Used In TRC, Example Queries Using TRC, Domain Relational Calculus, Operators Used In DRC, Example Queries Using DRC, Comparison Of TRC, DRC, RA.
4	**Database Storage & Querying:** Introduction to Database Storage & Querying, Basic Concepts of Indexing And Hashing, Query Processing, Measures of Query Cost, Basics of Query Optimization, Choice of Evaluation Plan, Structure of Relational Database.
5	**Advanced DBMS** Database System Architectures, Centralized System, Client-Server System, Parallel Database System, Distributed Database System, Overview of Database On Web, Concepts of ODBC, DSN

	Transaction & Concurrency Management- Introduction To Transaction & Concurrency Management, Transactions, Concurrent Transactions, Locking Protocol, An Interleaved Schedule, Locks, An Incorrect Locking Implementation, A Correct But Restrictive Locking Implementation, Two Phase Locking(2PL).

LEARNING SOURCE: Self Learning Materials

ADDITIONAL READINGS:

A. The complete reference-By Coach and loney

B. A Beginners guide- By Abbey and corney

C. Database System-Elmasri and Navathe

OPERATING SYSTEM – CSC14104

UNIT	CONTENTS
1	**Operating System: Overview:** Introduction of Operating System, Uses, Job Resources, Types Of Operating System, Functions of Operating System, System Components And It's Services, System Cell, System Programs, Structure, Design And Implementation, Operating System Generation.
2	**Process, Concept, Description:** Concepts Of Process, Process, State Model, Process Description-PCB, Process Control, Threads, Threads In Linux Process Scheduling- Types Of Scheduler, Scheduling Criteria, Uniprocessor Scheduling, Multiprocessor Scheduling, Algorithm Evaluation, Process Scheduling In Linux.
3	**Memory Management:** Memory Management Requirements, Address Space, Linking And Loading, Swapping, Partitioning, Paging, Segmentation Virtual Memory- Introduction To Virtual Memory, Demand Paging, Page Replacement, Thrashing, Demand Segmentation, Linux Memory Management.
4	**Concurrency:** Introduction To Concurrency, Critical Section Problem Mutual Exclusion Solutions- S/W Approach, H/W Support, Semaphore, Monitor Classical Problem Of Synchronization Deadlock- Deadlock Characterization, Deadlock Prevention, Deadlock Detection, Deadlock Avoidance, Combined Approach.
5	**Input Output Systems:** Input-Output Devices, Hardware Support For I/O, I/O Communication Techniques, I/O Software-Device Drivers, Performance Consideration File Management- File Concepts, Directory Concepts, File Sharing, Protection, File System In Linux. Shell

	Programming- Introduction To Shell Programming, What Is Unix, Unix Architecture, Unix- File Management, Basic Of Shell Programming-Building Blocks, Shell Script, Getting Started With Shell Programming, Wild Card(Filename Shorthand Or Meta Characters), Shell Variables, Shell Keywords, Various Types Of Shells, Conditional And Looping Statements, Examples Of General Shell Programming, Using "Bourne Shell".

LEARNING SOURCE: Self Learning Materials

ADDITIONAL READINGS:

A. Peterson and Silberschatz, Operating System Concepts, Addison Wesley.

B. P. B. Hansen, Operating System Principles, PHI.

C. K. Christian, The UNIX Operating System, John Wiley

PRACTICALS

1. **Programming in C- CSC14101P**
2. **Relational Database Management Systems- CSC14103P**
3. **Operating System- CSC14104P**

YEAR II

OBJECT ORIENTED PROGRAMMING WITH C++ – CSC14201

UNIT	CONTENTS
1	**Object Oriented Programming:** Overview of C++, Overview of Procedural Language, Comparison b/w Procedural Language and Object Oriented Language, Object Oriented Programming Paradigm, Basic Concepts of OOP, Advantages / Benefits of OOP, Usage / Applications of OOP C++ Environment- Program Development Environment, The Language And The C++ Language Standards, The C++ Standard Library, Prototype of Main() Function , I/O Operator, Manipulator, Comments Data Types, Introduction to Various C++ Compilers Creating and Compiling C++ Programs- Creating, Compiling And Running a C++ Program Using IDE and through Command Line Elements of C++ Language Structure of a C++ Program C++ Tokens.
2	**Classes and Objects:** Classes, Structures and Classes, Unions and Classes, Friend Function, Friend Classes, Inline Function, Scope Resolution Operator, Static Class Members, Static Data Members, Static Member Functions, Passing Object to Functions, Returning Objects

	Arrays and Functions- Arrays, The Meaning of an Array, Single-Dimensional Arrays, Two-Dimensional Arrays (Multi-Dimensional Arrays) User Defined Functions, Elements Of User-Defined Functions, Return Values And Their Types, Function Calls, Categories of Functions, Passing Parameters to Functions Array and Pointers- Array of Objects, Pointer to Object, Type Checking In C++, The This Pointer, Pointer to Derived Types, Pointer to Class Members.
3	**Constructors and Destructors:** Introduction, Constructors, Default Constructor, Parameterized Constructors, Copy Constructors, Constructors With Default Arguments, Default Arguments, Special Characteristics Of Constructor Functions, Destructors.
4	**Inheritance:** Introduction to Inheritance Features of Advantages of Inheritance, Type of Inheritance, Base Classes And Derived Classes, Base Class Access Control, Protected Members Inheriting Multiple Base Classes, Virtual Base Classes.
5	**Polymorphism:** Types of Polymorphism, Virtual Functions And Polymorphism, Pure Virtual Functions, Early Vs Late Binding Function and Operator Overloading- Function Overloading, Operator Overloading, Creating A Member Operator Function, Creating Prefix And Postfix Forms of The Increment (++) And Decrement (--) Operators (Overloading Unary Operator), Overloading The Shorthand Operators (I.E. +=, == etc.), Operator Overloading Restriction (Rules), Overloading Binary Arithmetic Operators, Overriding Methods.

LEARNING SOURCE: Self Learning Materials

ADDITIONAL READINGS:

A. E. Balaguruswami – Object Oriented programming with C++

B. Kris James – Success with C++

C. David Parsons – Object Oriented programming with C++

COMPUTER ARCHITECTURE & ORGANIZATIONS – CSC14202

UNIT	CONTENTS
1	**Introduction:** Digital Computers, Computer Architecture, Computer Organization, Difference between Computer Architecture and Organization, Structure and Functions Basic Arrangement of a Computer System- Computer, Basic Organization of a Computer System, Types of Computers, Microprocessor (µp), Working of Microprocessor, Microprocessor 8085 Architecture, Speed of Microprocessors Number System and its Representation- Data Types Number System- Non Positional Number System, Positional Number System

	Number System Conversion Binary Arithmetic Integer and Floating Point Representation- Integer Representation, Fixed Point Representation, Floating point representation Overflow, Underflow Computer Codes- Introduction to Computer Codes, BCD (Binary Coded Decimal) code, EBCDIC Code, ASCII Code, Excess-3 Code, Gray Code, Error Detection Code, and Error Correction Code.
2	**Basic Building Blocks:** Logic Gates, Universal Gates, Exclusive Gates, Bubbled Gates, Universality of NAND and NOR Gates Boolean Algebra- Boolean Variable, Boolean Algebra, Boolean Functions and Truth Tables, Logic Diagram, Laws of Boolean Algebra, Rules of Boolean Algebra, Demorgan's theorems, Simplification of Boolean Functions, Implementation Using Basic Gates, To Obtain expression from logic Circuits Karnaugh Map- Introduction to Karnaugh Map, Algebraic expression by Karnaugh Map, Simplification of Boolean Expression using K Map, Don't Care Conditions Digital Logic Circuits- Introduction to Digital Logic Circuits, Combinational Logic Circuit, Sequential Logic Circuits.
3	**Basic Computer Organization:** Register Transfer Language and Micro-operations, Instruction Codes, Instruction Set, Operations and Operands, Computer Registers, Instruction Format, Instruction Cycle, Addressing Modes, Real and Protected Programming, Input-Output and Interrupt. Central Processing Unit Design- Central Processing Unit (CPU), BUS Organization, Register Organization, Stack Organization, Data Path and Control Signals, Types of Processor (CPU), Micro Programmed Control and Hardwired Control, Pipelining. Software-Hardware Interaction Layers in Computer Architecture.
4	**Input-Output Organization:** Transfer of Information between I/O Devices, CPU & Memory, Data Transfer Format, Types of Data Transfer, I/O interface, Modes of Data Transfer, I/O Channels and Processors, Input-Output Identification (Peripheral or Memory Mapped, Conditions of Data Transfer.
5	**Memory Organization:** Computer Memory, Characteristics of Memory, Units of Memory, Data Accessing / Sorting Methods in Computer Memory, Memory Hierarchy, Classification of Memory, Associative Memory, Virtual Memory, Memory Management System.

LEARNING SOURCE: Self Learning Materials

ADDITIONAL READINGS:

A. Computer Organization – V. Carl Hamacher & Zvonko G. Vransic – McGraw Hill

B. Computer Architecture & Logic Design – Thomas C. Barty - McGraw Hill

C. Computer Organization – J. P. Heys

DATA STRUCTURES & ALGORITHMS – CSC14203

UNIT	CONTENTS
1	**Analysis of Algorithm:** Introduction To Analysis of Algorithm, Criteria of Algorithm, Time Complexity, Space Complexity, Asymptotic Notation, Big O (O) Notation, Big Omega (Ω) Notation, Big Theta (Θ) Notation Linked Lists- Concept Of List And Array, Introduction to Data Structures, Arrays, Linked List, Singly or Linear Linked List, Circular Singly Linked List, Doubly Linked Lists, Header Node, Applications of Linked Lists, Addition of Two Long Positive Numbers, Evaluation of A Polynomial.
2	**Stacks:** Introduction To Stacks, Push Operation, Pop Operation, Stack Implementation Using Arrays (Static Implementation of Stacks), STACK As A Linked List, Stack As An Abstract Data Structure, Applications Of Stack, Conversion Of Expressions, Precedence And Associativity Of The Operators, Evaluation Of Postfix Expression, Multiple Stacks Queue- Introduction to Queue, Different Types Of Queues, Queue (Linear Queue), Queue As An Abstract Data Structure, Circular Queue, Double Ended Queue (Dequeue), Priority Queue, QUEUE As A Linked List, Application Of Queue.
3	**Trees:** Introduction To Trees, Representation Of Tree, Binary Tree, Representation Of Binary Tree, Array Representation Of Binary Tree, Linked List Representation Of Binary Tree, Basic Operation On Binary Tree – Traversals, Binary Tree Traversal Algorithms (Recursive), Creation Of Binary Search Tree, Types Of Binary Trees, Operations Of Binary Search Tree (BST), Threaded Binary Trees, Application Of Binary Tree, B-Tree, Height Balanced Tree.
4	**Graph:** Introduction To Graphs, Undirected Graph, Directed Graph Or Digraph, Graph Representation, Adjacency Matrix Representation, Adjacency List Representation, Graph Traversals, Breadth First Traversal, Depth First Traversal, Searching In Graph, Minimal Spanning Tree, Kruskal's Algorithm, Prim's Algorithm, Shortest Path In Graph.
5	**Sorting and Searching:** Introduction To Sorting And Searching, Bubble Sort, Selection Sort, Merge Sort, Quick Sort, Insertion Sort, Shell Sort, Address Calculation Sort, Radix Sort, Comparison Of Sorting Methods, Hash Table, Collision Resolution Techniques, Linear Search (Sequential Search), Algorithms For Linear Search Forward Iteration, Binary Search, Algorithms For Binary Search. Searching an ordered table, Index sequential search, Interpolation search.

LEARNING SOURCE: Self Learning Materials

ADDITIONAL READINGS:

A. K. Christian, The UNIX Operating System, John Wiley.

B. A. N. Haberman, Introduction to Operating System Design, Galgotia.

C. Manuals of DOS, UNIX and Netware

SYSTEM ANALYSIS & DESIGN – CSC14204

UNIT	CONTENTS
1.	**System Concept and System Environment:** Introduction To System Concept And System Environment, Concept Of System, Characteristics Of A System, Elements Of A System, System Environment And Boundary, Types Of System, Management Information System, ERP System System Development Life Cycle- Introduction To System Development Life Cycle, System Development Life Cycle, Different Phases Of System Development Life Cycle, Consideration For Candidate Systems, Political Consideration, Prototyping Role of System Analyst- Introduction To Role Of System Analyst, Historical Perspective Of System Analyst, Who Are Called Systems Analyst? What Does A System Analyst Do?, Who Can Be A System Analyst?, System Analysis And Designing Skills, Personal Qualification, Educational Background And Work Experience, Career Prospects In System Analysis.
2.	**System Planning and Initial Investigation:** Introduction To System Planning And Initial Investigation, System Planning, Why System Planning?, Strategic MIS Planning, Managerial And Operational MIS Planning, Determining The User's Requirements, Strategies For Determining Information Requirements, Getting Information From The Existing Information System, Prototyping, Initial Investigation. Information Gathering- Introduction to Information Gathering, Nature Of Information, Sources Of Information, Information Gathering Technique, Samples Of Existing Documents, Forms And Database, Research And Sit Inspection, Site Observation, Questionnaires, Interviews, Types Of Interviews, Conducting an Interview.
3.	**Structured Analysis:** Introduction To Structured Analysis, What Is Structured Analysis, Why Structured Analysis, Charts, Bar Charts, Line Charts, Pie Charts, Data Flow Diagram, Guidelines For Drawing Data Flow Diagrams, Logical And Physical Data Flow Diagrams, Data Dictionary Definition And Entries, Decision Trees, Structured English.
4.	**Feasibility Study:** Introduction To Feasibility Study, Why Feasibility Study? Steps In Feasibility Study, Forming The System Team, Reviewing The System Data Flow Diagrams, Developing The System Candidates, Evaluating Preliminary Evaluation Of Candidates, Preparing Detailed Description Of Candidates, Identifying Meaningful System, Characteristics, Determining Performance And Cost For Each Candidate, Weighing The System Performance And Cost Characteristics, Feasibility Test, Feasibility Reports.
5.	**Cost/Benefit Analysis:** Introduction To Cost/Benefit Analysis, Data Analysis, Classifications Of Cost And Benefits, Tangible Of Intangible Costs And Benefits, Direct Or Indirect Costs And Benefits, Fixed Or Variable Costs And Benefits, Cost Categories, Determining Costs/Benefits, System Proposal.
6.	**System Design:** Introduction To System Design, Design Process, Phases Of Design, Methodologies Of Designing, Structured Design, Functional Decomposition, Module Coupling And Cohesion, Prototyping, Information Engineering, Joint Application Development, Rapid Application Development, Object Oriented Design, Development Activities, Audit Considerations, Processing Controls And Data Validation, Audit Trial and Documentation Control.

	Input, Output and Form Design- Introduction To Input, Output And From Design, Input Design, Input Design Considerations, Input Devices, Output Design, VDT Screen Output, Graphics, Desktop Publishing, Basic Part Of Form, Form Design, Types Of Forms, Layout Considerations, Print Forms In Reasonable Quantities, Automated Form Design and Forms Control.
7.	**File Organization And Database Design:** Introduction To File Organization And Database Design, File Structure, File Organization, Methods Of Organizing Files, Objectives Of Database, Data Structure, Types Of Relationship Amidst Data, Types Of Data Structure, Entities And Attributes, Normalization, Why Is Normalization Necessary, First Normal Form, Second Normal Form, Third Normal Form, Role Of Database Administrator, Managing Data Activities, Managing Database Structure, Managing Database Management System.
8.	**System Testing And Quality Assurance:** Introduction To System Testing And Quality Assurance, What Do We Test System For?, Test Plan, Types Of System Testing, Quality Assurance, Goal Of Quality Assurance, Levels Of Quality Assurance, Trends In Testing, Role Of Data Processing Auditor, Training, Elements Of Training, Importance And Needs Of Training, Types Of Training, Characteristics Of A Good Training Program, Documentation.
9.	**Implementation and Software Maintenance:** Introduction to Implementation And Software Maintenance, What Is System Implementation? What Is System Conversion? Types Of Implementation, Conversion Activities, User Training, Combating Resistance to Change, Post Implementation Review, Software Maintenance, Primary Activities of Maintenance Procedure, Reducing Maintenance Costs.
10.	**Hardware/Software Selection And The Computer Contract:** Introduction to Hardware/Software Selection And The Computer Contract, Supplier And Types, Software Industry, Procedure For Hardware/Software Selection, Role of Consultant, Post Installation Review, Software Selection, Ownership, Financial Consideration In Selection, Used Computer, Computer Contract, Art of Negotiation, Responsibilities And Remedies, Hardware, Software, Delivery And Acceptance, Warranties, Finance, Guarantee Of Reliability,
11.	**System Security and Disaster Recovery Planning:** Introduction to System Security and Disaster Recovery Planning, System Security, System Security is an Important Concern, Threats to System Security, Personal Computer and System Integrity, Risk Analysis, Control Measures, Recovery/Restart Requirements, System Failures and Recovery, Disaster/Recovery Planning, Plans, Team, Planning Task, Ethics in System Development, Ethics Code and Standards of Behavior.
12.	**Electronic Data Processing:** Introduction to Electronic Data Processing, Data, Data Vs Information, Characteristics of useful information, Data Processing, Need of Data Processing, Type of Data Processing, Data Management, Data Organization, Database Management Systems, Disadvantages of Database Approach, Data Warehousing, Future Trends, Data Verification, Data Validation, EDP Organization, Data Center, Evolution of Data Center, Requirements for Modern Data Centers, Application of Data Centers.

LEARNING SOURCE: Self Learning Materials

ADDITIONAL READINGS:

A. Award Elias M. – Systems Analysis & Design.

B. Sen James A. – Analysis & Design of Information Systems

C. Lee-Introductory Systems Analysis and Design

D. Wetherbe James C. Systems Analysis & Design

INTERNET TECHNOLOGY & APPLICATIONS – CSC14205

UNIT	CONTENTS
1	**World Wide Web:** Introduction to World Wide Web (WWW), Basic Features, Evolution of the WWW, Mechanism of the World Wide Web, WWW Browsers, URL (Web Address) Domain Name System (DNS), Search Engines, Searching The Web, Site Specific Search Tools. Electronic Mail- Introduction to Electronic Mail (E-Mail), What is an E-mail? Concept of E-mail, How does E-mail Work? Structure of an E-mail, Starting Outlook Express, Setting up a Mail Account, Web Based Email, Creating signature in Outlook Express, Creating Signature in Yahoo, E-Mail Protocols and Mailing List.
2	**Hyper Text Markup language (HTML):** Introduction to Hyper Text Markup language (HTML), Concept of Hyper Text Markup Language, Versions of HTML, HTML Editors, Elements of HTML, Document Layout, Cascading Style Sheet, Advanced HTML, Setting up a Form and Creating a Menu. Introduction to Web Designing Tools, WYSIWYG Design tools. HTML Editors- Adobe PageMill, AOLPress, BBEdit, Crakerjack, PSPad, Webniac, EZPad Site Management Tools- Netscape Composer, Adobe SiteMill, GoLive CyberStudio, Macromedia Dreamweaver, Microsoft FrontPage, NetObjects Fusion. Web Designing with FrontPage 2002- Introduction to Web Designing with FrontPage 2002, What is FrontPage? Starting FrontPage, Front Page Window and Its Elements, Creating A Website, Creating Tables In FrontPage, Formatting A table, Using Graphics in a Web Page, Creating Thumbnails.
3	**Introduction to JavaScript:** What is JavaScript? Role of Scripting, JavaScript Versus Java, JavaScript Versus VBScript, JavaScript Versions, Error Handling in JavaScript Program, Creating a Simple External JavaScript Program, Creating a simple HTML Page, Adding an alert box with External JavaScript. Elements of JavaScript- Introduction to Elements of JavaScript, Elements of JavaScript, Data Type Conversion in Strings, Using Special Characters in Strings, Escaping Characters, Unicode Support in JavaScript, Comments, Alert Boxes, Confirm Alert Box, Prompt Boxes.
4	**Variables & Functions:** Introduction to Variables & Functions, Variables in JavaScript, Declaring Variables, Using Variables, Variable Scope, Constants, Function, Working with Objects, Object Properties, object Methods. Expressions and Operations in JavaScript- Introduction to Expressions and Operations in JavaScript, Expressions in JavaScript, Operators in JavaScript, Assignment Operators, Comparison Operators, Arithmetic Operators, Bitwise Operators, Logical Operators, Short-Circuit Evaluation, String Operators, Special Operators and Operator Precedence.
5	**Statements in JavaScript:** Introduction to Statements in JavaScript, Statements, Block Statements, Conditional Statements, The if….else Statement, The Switch Statement, Loop Statement, The FOR

	Statement, The DO…While Statement, The While Statement, The Infinite Loop, The label Statement, The Break Statement, The Continue Statement.

LEARNING SOURCE: Self Learning Materials

ADDITIONAL READINGS:

A. M. L. Yount-Internet: The Complete Reference, Tata McGraw-Hill Company.

B. Harley Hanh-The internet Complete Reference, Tata McGraw-Hill Company.

C. Daniel Minoli-Internet & Intranet Engineering, Tata McGraw-Hill Company

DATA MINING & WAREHOUSING – CSC14206

UNIT	CONTENTS
1	**Strategic Information Management:** Need For Strategic Information, Decision Support System, Knowledge Discovery & Decision Making, Need For Data Warehouse, Definition of Data Warehousing And Data Mining, Common Characteristics Of Data Warehouse, Data Marts, Metadata, Operation Versus Analytical Databases, Trends And Planning Of Data Warehousing.
2	**Data Modeling Strategy:** Defining Business Requirements, Data Modeling Strategy, Fact Tables, Dimensions, Star Schema And Other Schemas, Multi Dimensional Data Models, Data Cube Presentation Of Fact Tables, Using The Data Warehouse, Designing Tools For Data Warehouse, OLAP Models And Operations.
3	**Data Warehouse Architectural Components and Implementation Options:** Architectural Components Infrastructure- Operational & Physical Extraction, Transformation And Loading, Components Of An Oracle Data Warehouse, Data Transformation Functions, DBA Responsibilities, Capacity Planning.
4	**Data Warehouse Implementation:** Implementation Of Data Warehouse Physical Design- Steps, Considerations, Physical Storage, Indexing, Performance Optimization, Data Warehouse Deployment Activities, Data Security, Backup And Recovery Concepts, Data Warehouse Maintenance.
5	**Data Mining:** Basics Of Data Mining, Related Concepts, Data Mining Techniques, Data Mining Algorithms, Classification, Clustering And Association Rules, Knowledge Discovery In Database (KDD) Process, Introduction To Web Mining.

LEARNING SOURCE: Self Learning Materials

ADDITIONAL READINGS:

A. Harley Hanh- Complete Reference, Tata McGraw-Hill Company.

B. Daniel Minoli-, Tata McGraw-Hill Company

PRACTICALS

1. **OBJECT ORIENTED PROGRAMMING WITH C++-CSC14201P**
2. **DATA STRUCTURES & ALGORITHMS-CSC14203P**
3. **INTERNET TECHNOLOGY & APPLICATIONS-CSC14205P**

YEAR III

DATA COMMUNICATION & COMPUTER NETWORKS – CSC14301

UNIT	CONTENTS
1	**The Theoretical Network Model-OSI:** OSI Model, Open System Interconnections model (OSI), Layered Architecture of the OSI Reference Model, Functions of the ISO/OSI layers, Summary of OSI layer functions TCP/IP Reference Model- Overview of TCP/IP Reference Model, Introduction to TCP/IP, TCP/IP protocols, User Datagram Protocol, the Internet Control Message Protocol (ICMP), The Address Resolution Protocol (ARP), Reverse Address Resolution Protocol (RARP), Simple Mail Transfer Protocol (SMTP), File Transfer Protocol, Dynamic Host Configuration Protocol(DHCP), Remote Login (rlogin), The Network File System(NFS)
2	**Introduction to Networking:** Introduction to Network, Network, Computer networks, Need of network, Uses of computer networks, Network criteria, Network hardware and software, Network types: Client, Server & Peers, Server, Various types of servers. Transmission Technology- Transmission technology, Data can be Analog or Digital, Analog and Digital Transmission, Asynchronous & Synchronous Transmission, Types of Communication Modes, Baseband and Broadband Transmission, Comparison of Baseband and Broadband Signalling. Transmission Media- Transmission media, Classification of Guided and Unguided Media, Twisted Pair (TP) cable, Coaxial Cable, Fiber Optic Cable (FOC) unguided media, Radio Frequency Characteristics, Microwave Transmission, Applications of Infrared Transmission.
3	**Network Topology:** Types of Network, Local Area Network (LAN), Metropolitan Area Network (MAN), Wide Area Network (WAN), Satellite Networks, Wireless LAN. Network Adapters- Network Adapters, Networks Interface Cards (NIC), Multiple Access Protocol, ALOHA, Carrier Sense Multiple Access (CSMA), CSMA/CD [Carrier Sense Multiple Access/collision Detection], Collision free protocols, Limited contention protocol, Controlled Access, Channelization, Code division multiple access (CDMA), GSM. Real World Networks- Real World Networks: Ethernet, Fast Ethernet, FDDI (Fiber Distributed Data Interface) Networks Operation, ATM (Asynchronous Transfer Mode), ATM Service Categories, ARCNET, Apple Talk IEEE 802 Standards- IEEE 802 Standards, IEEE 802.3 (CSMA/CD), IEEE 802.4 (TOKEN BUS), IEEE 802.5 (TOKEN RING), IEEE 802.5 Cable Standards, Comparison between IEEE 802.3, 802.4 and 802.5, Compare token passing with CSMA/CD.

4	**Connectivity Devices:** Networking Scaling, Connectivity devices, Modems, Transceiver, Repeaters, Hubs, Bridges, Routers and Switches. IP Addressing and Subnet- Introduction to IP, Domain Name System (DNS), URL (Uniform Resource Locator), Electronic Mail, E-mail Address, Subnet & Subnet Masks Network Building Blocks required for setting up a small LAN using Windows in an office, Hyper Terminal, Network Setup Wizard, Setting Up Internet Connection Sharing in Windows Network Security- Network Security, The Need for Security, Common Threats, Security Barriers in Network Pathways, Attacks, Classification of Attacks, Specific Attacks Approaches to Network Security- Levels of Security, Approaches to Network Security, Security Services Viruses and Security Threats- Virus & Threats, Malicious Programs, Types of Viruses, Virus Countermeasures, Antivirus Approach, Advanced Antivirus Techniques, Distributed Denial of Service Attacks, DDoS Attack Description.
5	**Firewalls:** Firewalls, Firewalls Design Principles, Types of Firewalls, Firewall configurations, Demilitarized zone (DMZ) networks, VLAN. Encryption, Decryption & Digital Signature- Encryption & Decryption- Cryptography, Terminology, Classification of Cryptography, Substitution Ciphers, Security of Algorithms, Steganography, Steganography vs Cryptography, Public Key Encryption, Comparison of Symmetric and Asymmetric Key Cryptography, Public Key Cryptanalysis, Digital Signature, Requirements of Digital Signature, Direct Digital Signature, Arbitrated Digital Signature, Authentication Protocols, Symmetric Encryption Approach, Public Key Encryption Approach, Digital Signature Standard, RSA and Digital signature, DSS approach, The Digital Signature Algorithm.

LEARNING SOURCE: Self Learning Materials

ADDITIONAL READINGS:

A. Data Communication & Networking – Behuouz A. Forouzan, TMH

B. Computer Network – A. S Tanenbaum, Pearson Education

C. Computer Networks- kundu – PHI

MICROSOFT .NET FRAMEWORK & C# – CSC14302

UNIT	CONTENTS
1	**Overview of ASP .Net Framework:** ASP.NET and the .NET Framework- Understanding the framework class library Understanding the Common language Runtime Installing the ASP.NET Framework Introduction of ASP.NET Creating your First ASP.NET Web– Understanding ASP.NET Pages Understanding ASP.NET Controls- Overview of ASP.NET Controls, Understanding HTML Controls, Understanding and Handling Control Events, Understanding Control Trees, Using Code-Behind Pages, Deciding Between Single-File and Code-Behind Pages, Handling Page Events, Using the Page.IsPostBack Property. Debugging and Tracing ASP.NET Pages, Debugging Pages with Visual Web Developer ASP.NET Applications Web Server Installation of IIS Server in Windows XP/2000/2003.
2	**Web Forms & Web Forms Control:** Introduction, Web Forms Web Form Control- Server Control, Client Control Web Forms & HTML Adding Control to a web form- Submitting Form Data, Accepting User Input, Using the Label Control, Using the Checkbox Control, Using the Radio Button Control, Performing Cross-page Posts, Specifying a default button, Displaying Images, Using the Image Map Control, Using the Panel control, Using the Hyperlink Control Running a Web Applications Multi Forms- Creating a Multiform.
3	**Form Validation:** Introduction Client Side and Server Validation- Client Side Validation Server Side Validation Overview of the Validation Controls Validation Control and JavaScript- Using Page. IsValid Validation Controls- Using the Required FieldValidator control Using the CompareValidator control, Using the RangeValidator control, Calendar Control, Ad-rotator Control (Displaying Advertisements), Internet Explorer Controls, Using the RegularExpressionValidator control, Using the CustomValidator control, Using the ValidationSummary control, Creating Custom Validation Controls, Creating a

	LengthValidator Control, Creating an Ajax validator control.
4	**State Management & Rich Control:** Introduction State Management- Client-Side State Management, Server-Side State Management, Advantage of State Management Accepting File UPLOADS Saving Files to the File System Displaying Different Page Views- Displaying a Tabbed Page View Displaying a Multi-Part form, Displaying a Wizard.
5	**Introduction of ADO.Net:** Introduction The ADO.NET Date Architecture- Component classes that make up the Data providers Connected and Disconnected Database- Create an XML Web Service using ASP.NET, Create a disconnected ADO.NET Windows application Create connection using ADO.NET object model- Building a Connection String, Connection Classes, Executing Commands DataSet Classes- Using an XSD Schema to create a Typed DataSet, Using the Designer to Build a Typed DataSet, Programming with a Typed DataSet Data Adapter Classes- Filing Typed DataSets Using Table Adapter Adding Additional Queries to a Typed DataSet Display Data on Data Bound Control- Working with List controls Working with Tabular Databound Controls Using ASP.Net Parameters with Data Source Controls Overview of SQL Server 2005 Express- Features of SQL Server Express SQL Server 2005 Express Management Tools Server Database Versus Local Databases.
6	**Database Accessing on Web Application:** Data Binding Concept with Web- Understanding Templates and Data Binding Expressions, Using Templates Data Grid Control- Creating Data Grid Binding Standard Web Server Control- Working with tabular Data Bound controls Display data on web form using Data Bound Control.
7	**Overview of C#:** Introduction, C# and .net, Similarities & Differences from Java, Structures of C# program, System Requirement for C#, Installing Visual C# 2005 Express Edition, Starting Visual C# 2005 Express and Reading a console application, Creating and Running C# program,

	language features, Variable, C# Data type, Properties, Type Casting, Reading and Writing Through Console [Console Class], Control Flow Statement, Function/Methods in C#, Method Overloading, Arrays, Classes & Objects, Constructors, Destructors, Inheritance, Interfaces, Abstract classes, polymorphism, Operator Overloading, Delegates, Events, Exception Handling, Attributes, Boxing and Unboxing, Serialization in C#, Reflection in C#.

LEARNING SOURCE: Self Learning Materials

ADDITIONAL READINGS:

A. The complete reference-By Coach and loney

B. A Beginners guide- By Abbey and corney

MANAGEMENT INFORMATION SYSTEM – CSC14303

UNIT	CONTENTS
1	**Fundamentals of Information Systems:** Introduction, Data, Information and Knowledge, Concept of System, Characteristics of A System, Elements of A System, System environment and boundary, Types of a System, Components of information System, Level of Management decision-making, Information System in Business Information- Introduction to Information, What is Information, Nature of Information, Need of Information, Information and Communication, Information Process, quality of information, Sources of Information, information Gathering Technique, levels of Information Management and Need for Information Systems, Marketing Management, Material Management, Finance Management and Human Resource Management. Management Information System- Introduction to MIS, Management Information System (MIS), Fields of Information System, Elements of MIS, Objectives of MIS, Characteristics of MIS, Impact of MIS, Designing an MIS, Placement of MIS, Views of MIS, Management Information Systems for Competitive Advantage, MIS Function in an Organisation, Role of MIS in Management.
2	**IS Related Concepts:** MIS versus Data processing, MIS & Decision support system, MIS & Information Resources Management, End-user computing, Uses of Management Information System in Finance, Uses of Management Information System in Marketing and Functions of MKIS. System Approach to Problem Solving- Definition of problem, Terminology of Problem Solving, Thinking Patterns, System Approach to Problem Solving, Introduction to System Development Life Cycle, The Problems of a System Mean, Different Phases of System Development Life Cycle, Considerations for Candidate Systems, Political Consideration and Prototyping.
3	**Planning:** Introduction to Planning, Meaning and Definition of Planning, Nature / Features of planning, Objective of planning, Importance of planning, Levels of planning, Planning process, Six P's of planning, Types of Plans, Types of planning, Advantages of Planning, Limitations of Planning. Control-Meaning & Definitions of controlling, Control Process, Nature of Control /

	Characteristics of Control, Importance of Controlling, Limitation of Controlling Principles of effective control systems, Necessity of Control, Objective of Control, Elements of Control, Types of Controls, Qualities of Effective Control System. System Planning and Initial Investigation- Introduction to System Planning and Initial Investigation, System Planning, Why system planning? Strategic MIS planning, Managerial and operational MIS planning, Strategies for determining information requirements, Getting information from the existing information system, Protyping, Initial investigation, Information service request, Data collection, Correspondence and questionnaires, Personal interview, Observation, Research.
4	**Structured Analysis and Feasibility Study:** Introduction to Structured Analysis and Feasibility Study, What is Structured Analysis? Why Structured Analysis? Charts, Guidelines for Drawing Data Flow Diagrams, Data Dictionary, Data Dictionary Definition and Entries, Decision Trees, Structured English, Why Feasibility Study? Steps in Feasibility study, Preparing detailed description of candidates, Identifying meaningful system characteristics, Determining performance and cost for each candidate, Weighing the System Performance and Cost Characteristics. System Design- Introduction to System Design, Design Process, Phases of Design, Methodologies of Designing, Structured Design, Functional Decomposition, Module Coupling and Cohesion, Prototyping, Information Engineering, Joint Application Development, Rapid Application Development, Object Oriented Design, Development Activities, Audit Considerations, Processing controls and data validation, Audit Trial and Documentation Control.
5	**File Organisation and Database Design:** Introduction to File Organisation and Database Design, File Structure, File Organisation, Methods of organizing files, Objectives of database, Data Structure, Types of relationship amidst data, Types of data structure, Entities and attributes, Normalization, Why is normalization necessary? Role of Database Administrator, Managing Data Activities, Managing Database Structure, Managing Database Management System. System Security and Disaster Recovery Planning- Introduction to System Security and Disaster Recovery Planning, System Security, System Security is an Important concern, Threats to System Security, Team, Planning Task, Ethics in System Development, Ethics Codes and Standards of Behavior, Information Systems Misuse– Threats & Countermeasures. Business Applications of Information Technology- Introduction to Business Applications of Information Technology, What is Internet Actually? Growth of Internet, Owner of Internet, Components of E-Commerce, Internet and E-Commerce, IT ACT 2000, Intranet and Extranet & Enterprise Solutions. Information System for Business Operations- E-Business, Components of E-Business Model, E-Business Trends, Information System for strategic advantage, Information System for Managerial Decision Support, Management Information Systems, Decision Support System (DSS) and Other Information Systems. Advance Concepts in Information Systems- Enterprise Resource Planning, Components of ERP, Supply Chain Management, E-SCM Process Integration, Customer Relationship Management Concepts, Electronic Customer Relationship Management, E-CRM Goals, E-CRM Business Models, Technologies for E-CRM, How technology can help in CRM? E-CRM solutions, Contact Management Software, Advantages of E-CRM, E-CRM capabilities, Implementing an E-CRM System.

LEARNING SOURCE: Self Learning Materials

ADDITIONAL READINGS:

A. Javadekar, W. S.; *Management Information System,* Tata MacGraw Hill Publication, 2003.

B. Information Systems for Managers: Arora, Ashok and Akshaya Bhatia, Excel Books, New Delhi.

C. Management Information Systems, Basandra, Suresh K. Wheeler Publishing, New Delhi.

WEB PROGRAMMING WITH PHP – CSC14304

UNIT	CONTENTS
1	**Introduction to PHP:** Introduction, Considering the Various Uses for PHP, Using PHP for web application, Using PHP for database applications, Using PHP with your file system, Using PHP for system commands, Understanding How PHP works, PHP as a general purpose language, PHP for the web, Keeping Up with changes in PHP, PHP 5, Previous versions of PHP Creating your first PHP Script- Introduction, Writing PHP statements, Adding PHP sections to HTML files, Writing PHP output statements, Documenting your scripts.
2	**Working with Data:** Understanding data types, performing arithmetic, Manipulating characters strings, Using dates and times. Using Variables in PHP Scripts- Introduction Naming variables, Assigning values to variables, Removing variables, Using constants, Handling errors.
3	**Storing Data in Groups by Using Arrays:** Introduction, Building arrays, Assigning values to arrays, Sorting arrays, Using Values in arrays, Building multidimensional arrays.
4	**Controlling the Flow of the Script:** Introduction, Changing the order in which statements are executed, Setting up condition, Joining simple conditions to make complex conditions, Using conditions in conditional statements and loops, Writing if statements, Building and using loops for repeated statements, Breaking out of loops. Reusing PHP code- Introduction, Including files in scripts, Understanding store for included files, Writing functions, Using functions.
5	**Object-Oriented Programming Meets PHP:** Introduction, Understanding object- oriented programming, Identifying objects, Writing Classes, Using Classes.
6	**The Basics of Web Application:** Introduction, Understanding web site security, Displaying static pages, Collecting information form user with HTML forms, processing information received from users. Other Web Application- Introduction, Passing information from page to page, Using cookies, Using hidden fields in HTML forms, Using HPP session functions, Adding java script to PHP scripts.
7	**Storing Data with PHP:** Introduction, Writing, and reading flat files, Exchanging data between PHP and other programs, Understanding database supports in PHP, Using PHP to interact with a database,

	Handling database-connection errors.

LEARNING SOURCE: Self Learning Materials

ADDITIONAL READINGS:

A. Harley Hanh- Complete Reference, Tata McGraw-Hill Company.

B. Daniel Minoli-, Tata McGraw-Hill Company

INFORMATION SECURITY & CYBER LAWS – CSC14305

UNIT	CONTENTS
1	**Historical Background of Information Systems:** Introduction, Need of Information Systems, Fundamental of Information System, Variations in Information Systems, Distributed information Systems, Benefits of Internet and web Services, Security of Information system, Types of Threats.
2	**Security in Mobil Communication:** Introduction, Challenges in Security of Mobile devices, Authentications security, Authentications methods, Security of organization, Security of personal computing Devices, Physical Security of Device, Data Security of Devices, Information security management, Objective of Information Security Management.
3	**Electronic Commerce:** Introduction, Security Threats to ecommerce, Defenses against ecommerce Threats, Virtual organization, Bus-Ess- Transactions on the web, Electronic data interchange, Electronic Payment system, E-Banking, E-cash, Credit Card, Debit Cards.
4	**Introduction to Information Security and Biometrics:** Introduction, Physical Security needs, Disaster and Controls, Access Control, Biometrics, Economic and social aspects legal challenges, Physical Security Checklist for a data center.
5	**Cryptography:** Introduction, Model of Cryptography, Documents Security Issues, System of Keys, Public Key Cryptography, Digital Signature, Finger Prints, Firewall, Security metrics in Information Technology.
6	**Network Security:** Introduction, Network Security, Intrusion Detection, Virtual Private networks (VPN), Types of VPNS and their Usage.
7	**Security Metrics and Cyber Security:** Introduction, Security Metrics, Intellectual Property (IP), Patent, Copyright, Building Security into Software Life Cycle, Ethical Issues, Issues in Data Software privacy, Cyber crime types & overview of cyber crimes, Myths about information security metrics.

LEARNING SOURCE: Self Learning Materials

ADDITIONAL READINGS:

A. Computers : Technology, Applications and Social Implications

B. A First Course in Data Processing, J. Daniel Couger & Fred R McFadden, Whiley David, Van Over, Foundations of Business System, Forth Worth, Dryden 1992

SOFTWARE PROJECT MANAGEMENT – CSC14306

UNIT	CONTENTS
1	**Software Testing Fundamentals:** Introduction, Software is different from Hardware, The History of Software Testing, Quality, Quality Control and SQA, Software Quality Attributes, Testing Verification and Validation, Testing Versus Debugging, Software testing Principles, phases of Software Development, When to test software, Software Process Models, Comparison of the process models.
2	**White Box Testing:** Introduction to White box testing, White box Testing, What's a test case?, type for testing-white box & black box, White Box testing, Static Testing, Desk Checking, Source Code Walkthroughs, Formal Code Inspection, Dynamic Testing, Unit Testing, Code Coverage Testing, Code complexity. Black Box Testing- Introduction to Black Box Testing, Requirement points regarding Requirement Based Testing, Important points Regards Requirement Based Testing, Boundary Value analysis, Positive and Negative Testing, Decision tables, Compatibility testing, Documentation Testing, Domain Testing, Black BoxV/s White Box Testing. Integration Testing- Introduction to Integration testing , Integration testing introduction, Scrubs and drivers, Top-Down integration, Bottom-Up integration, BI-Directional or Sandwich Approach, Big Bang method, Scenario test, Use Case Scenarios, Defect Bash. System and Acceptance Testing- Introduction to system and acceptance testing, System testing, Functional Versus Non Functional Testing, Performance Testing, Scalability Testing, Reliability testing, stress testing, compatibility testing, Recovery testing, Security Testing, Load Testing, Alpha testing, User Acceptance testing, Beta testing, Interoperability testing. Performance and Object Oriented Testing- Introduction to Performance and object oriented testing, Systems testing, Performance testing, Reasons for conducting performance testing, types of performance testing, Baselines, Benchmarking, Inputs required in performance testing, Output from the performance testing, Steps in conducting performance testing, Benefits and challenges related to various performance test, Regression testing, Benefits of regression testing. Ad-Hoc Testing & Object Oriented Testing- Introduction to Ad-Hoc Testing & Object Oriented testing, Ad-Hoc-Testing & Object Oriented Testing, Ad-Hoc testing, Buddy testing, Pair Testing, Exploratory Testing, Situations where ExploratoryTesting Is more suitable, Iterative testing, Agile Testing, testing in Extreme programming (XP), How XP testing is different, XP tester Activities, Defect Seeding, Object Oriented Testing, Differences in Object Oriented and Traditional Testing.
3	**Software Testing Tools:** Introduction, Automation of software testing, Benefits of Automated Testing, Disadvantages of Automation testing, WinRunner, WinRunner Testing Modes, The WinRunner Testing Process, (Mercury Quality Center)Test Director, The Test Director testing Process, LoadRunner, The Load resting process, Important Concepts used in load runner, Testing Process with Load Runner.
4	**Software Project Management:** Introduction to software project management, Project Management, Software Project

	Management Framework, The project Team, Their Roles & Responsibilities, The Stakeholders & its importance, , Problems in Project, Software project management myths and their Clarification. Software Project Scope Management- Introduction, The Need of scope Management, Scope Process Initiation, Scope Planning, Scope Definition, Scope Verification, Scope Change Control, Communication tools and techniques, Communication methodologies used to Elicit client Requirements.
5	**Software Requirement Gathering and Resource Allocation:** Basic System Design &, Introduction to System Design, Software Requirements Basic, Software Requirement Specifications (SRS), Benefits from A Good SRS, Nature of the SRS, Environment of the SRS, Characteristics of a good SRS, Resources Allocation to the project. Software Project Estimation- Introduction, Software project Estimation, Work breakdown structure (WBS) Measuring Efforts for a project, SLOC Technique, Function point Approach, COCOMO Cost Estimation Model, Delphi technique Project Scheduling- Introduction, Project scheduling Activities, Need of the project scheduling, Grant chart, PERT, CPM.
6	**Using Project Management Tool : MS Project 2000:** MS project 2000 introduction, project activities and what ms project provides, Specifying task, milestones, Constraints, Deadlines, Task Dependencies, Adding resources and costs, Scheduling in Microsoft project 2000, Viewing your information, Printing and publishing Basic, Views versus reports, print view & report, Publishing projects on the web or Internet.

LEARNING SOURCE: Self Learning Materials

ADDITIONAL READINGS:

A. Computers : Technology, Applications and Social Implications

B. A First Course in Software management, J. Daniel Couger & Fred R McFadden, Whiley David, Van Over, Foundations of Business System, Forth Worth, Dryden 1992

PRACTICALS

1. **MICROSOFT .NET FRAMEWORK & C# - CSC14302P**
2. **WEB PROGRAMMING WITH PHP - CSC14304P**