Department of Computer Science & Information technology

Guru Ghasidas Vishwavidyalaya, Bilaspur, C.G.

SYLLABUS FOR UG/PG INTEGRATED (CS) COURSE UNDER *CHOICE BASED CREDIT SYSTEM* (CBCS)

Semester 1

Sno	Subject Code	Title	Credit		Marks		Total Credits
			L	P	Internal	External	
1	PCSC-101	Computer Science - I	2		20	30	2
2	PCSC-102	Computer Science - II	2		20	30	2
3		Maths-I	3		30	45	3
4		Maths-II	3		30	45	3
5		Physics/Electronics - I	2		20	30	2
6		Physics/Electronics - II	2		20	30	2
7		Hindi	2		40	60	2
8		English	2		40	60	2
9	PCSC-103	Lab based on Computer Science		2	20	30	2
10		Lab based on Physics/Electronics		2	20	30	2
			18	4	260	390	22

Semester 2

Sno	Subject Code	Title	Credit		Marks		Total Credits
			L	P	Internal	External	
1	PCSC-201	Computer Science - I	2		20	30	2
2	PCSC-202	Computer Science - II	2		20	30	2
3		Maths-I	3		30	45	3
4		Maths-II	3		30	45	3
5		Physics/Electronics - I	2		20	30	2
6		Physics/Electronics - II	2		20	30	2
7		Hindi	2		40	60	2
8		English	2		40	60	2
9	PCSC-203	Lab based on Computer Science		2	20	30	2
10		Lab based on Physics/Electronics		2	20	30	2
			18	4	260	390	22

Semester 3

Sno	Subject Code	Title	Credit		Marks		Total Credits
			L	P	Internal	External	
1	PCSC-301	Computer Science - I	2		20	30	2
2	PCSC-302	Computer Science - II	2		20	30	2
3		Maths-I	3		30	45	3
4		Maths-II	3		30	45	3
5		Physics/Electronics - I	2		20	30	2
6		Physics/Electronics - II	2		20	30	2
7		Environment - I	3		40	60	3
8	PCSC-303	Lab based on Computer Science		2	20	30	2
9		Lab based on Physics/Electronics		2	20	30	2
			17	4	220	330	21

Semester 4

Sno	Subject Code	Title	Credit		Marks		Total Credits
			L	P	Internal	External	
1	PCSC-401	Computer Science - I	2		20	30	2
2	PCSC-402	Computer Science - II	2		20	30	2
3		Maths-I	3		30	45	3
4		Maths-II	3		30	45	3
5		Physics/Electronics - I	2		20	30	2
6		Physics/Electronics - II	2		20	30	2
7		Environment - I	3		40	60	3
9	PCSC-403	Lab based on Computer Science		2	20	30	2
10		Lab based on Physics/Electronics		2	20	30	2
			17	4	220	330	21

Semester 5

Sno	Subject Code	Title	Credit		Marks		Remarks
			L	P	Internal	External	
1	PCSC -501	Programming with Visual Basic	4		20	30	4
2	PCSC-502	Object Oriented Concepts	4		20	30	4
3	PCSC-503	Linux Operating System and Shell Programming	4		20	30	4
4	PCSC-504	Introduction to Artificial Neural Network	4		20	30	4
5	PCSC-505	Web Based Mini Project		4		100	4
		Total	16	4	80	220	20

Semester 6

Sno	Subject Code	Title	Credit		Marks		Remarks
			L	P	Internal	External	
1	PCSC -601	Introduction to JAVA	4		20	30	4
2	PCSC-602	Software Testing	4		20	30	4
3	PCSC-603	Introduction to Data Structure	4		20	30	4
4	PCSC-604	Management Information System	4		20	30	4
5	PCSC-605	Major Project		4		100	4
		Total	16	4	80	220	20

Total Course Credits – 126

Subject – Fundamentals of Computer
Paper Code – PCSC-101

Basics of Computer – Development of computer ,Computer system concepts, Characteristics, capabilities and limitations of computer, Types and generation of computers, Computer architecture.

Input /Output and Storage device – Basic input devices: keyboard, mouse , joyst ick ,MICR, OCR. light pen ,Bar Code Reader, Touch screen ,Basic output devices: Pr inter –Types o f pr inter, Plotter, Monitor VGA, SVGA ,XGA etc.
Storage device : Different types o f storage device ,Primary Vs Secondary data storage .

Computer software – Definition ,Software and its need ,types o f software :Application software, System software, Firmware, Evolution o f programming language ,Different types o f programming language :High level ,Assembly level ,Low level and 4GL,their advantages and disadvantages , language translator: Compiler, Interpreter, Assembler, Booting process.

Data Representation – Number system :Binary, Octal, and Hexadecimal ,convert ing fro m one number system to another ,Computer code:BCD,EBCDIC and ASCII ,Binar y ar it hmet ic :Addit io n ,subtraction, mult iplicat ion and divis io n ,

Operating System and other Software – Definition and object ive o f operating system ,T ypes o f operating system, DOS and Windows ,Characterist ics of DOS ,some basic co mmands of DOS ,Virus : T ypes of virus ,virus detection and prevent ion .

Readings:

1. Alexis Leon and Mathews Leon ,Fundamental o f Infor mat ion Techno logy ,Vikas Publicat ion .
2. V.Rajaraman .Computer fundamental ,PHI publicat ion .

Subject - Introduction to Programming Methodology
Paper Code – PCSC-102

Programming Concepts, Characteristics of Programming, Stored Program Concepts,
Procedure Oriented Programming, Object Oriented Programming- characteristics & its advantages, Types o f Computer Languages (Low Level, High Level, 4GL and Object Oriented Languages).

Programming Tools: Algor ithms, characteristics of Algor ithm, Program Flo w Charts, Pseudo code, Decision Tables, Structured Programming Techniques.

File Concepts, t y p e s , Data Terminology and File Operations, attributes and access permissions, Directory.

Basic concepts of any programming language: Character set, keywords, identifiers, assigning values of variables, types of operators in C Language, JAVA(Basic Principles, class, object), C++ etc.

Decision making and looping: recursion, switch ....break, repeat, labels and goto statements.

Readings:

1. Computer fundamentals: By V.Rajaram; PHI Publicat ion
2. Data Structure : By Schaum Ser ies

Subject – Introduction to logics of computer

Paper Code – PCSC-201

Number Systems and codes: Decimal nu mbers, binar y numbers, binar y ar it hmet ic, 1's and 2's co mplements, Octal numbers, hexadecimal numbers, inter-conversio n o f number system, Digital codes: Binar y coded decimal (BCD) , Gray code, Excess-3 code, Format of ASCII code.

Logic Gates: Posit ive and negat ive lo gics, NOT gate, OR gate, AND gate, NAND gate, NOR gate, EX-OR and EX-NOR gates , S ymbo l , truth table, Circuit diagram using basic gates , universal property of NAND and NOR gates.

Boolean Algebra: Boolean operation, logic expressing, rules and laws of Boolean algebra, Demorgan's theorems, simplificat ion of Boolean expressio n using Boolean algebra techniques.

SOP and POS fro m o f Boolean expressio ns, mint ers, maxterms, and simplificat ion of Boolean expressio n using Kar naugh map techniques (Up to 4 Variable s), half adder, Full adder, Mult iplexer.

Flip-Flops, Registers, Shift registers, Counters.

Readings:

1. Computer Fundamentals , Architecture & Organizat ion By B.Ram, New Age International Publisher limited.
2. Computer Architecture & Organizat ion by Moriss Manno, 3rd edit ion, Print ice Hall o f India Pvt Ltd.
3. Digital Computer electronics: An Introduction to micro computers by Albert Malvino and Jerald Brown, Tata Mcgraw Hill.
4. Modern Digital Electronics, by R.P Jain, Tata Mcgraw Hill Publicat ion, 3rd Edit ion.

Subject –System Analysis and Design
Paper code – PCSC-202

System Concepts : What is system, Characteristics of system, Elements o f a System, Computer Based system and it s Components, Types o f Systems: Open and Closed System, Transact ion Processing System, MIS, DSS etc.

System Analysis & Requirement Analysis: what is System Analysis, Ro le and Qualities o f System Analyst, System Development Life Cycle- Phases o f S DLC, Prototyping- Steps in Prototyping, Advantages and Disadvantages of prototyping.

Requirement Investigation, Feasibility Study, Fact Finding Techniques.

Analysis and Design Tools: Flowcharts, Decision Trees, Decision Tables, Database/File Design, Data Flow Diagrams, E-R Diagrams.

System testing and Implementation : System testing – Black Box Testing, White Box Testing, Unit Testing , Integration Testing, Modular Testing.

What is implementation, Type of Implementation- Fresh, Replacement and Modified, Implementation Methods.

Readings:

1. Analys is and Design of Infor mat ion System: James A Senn
2. System Analysis and Design: Awad

Subject – Introduction to Operating System

Paper code – PCSC-301

Introduction to O.S: Over view of OS , funct ion and goal, characteristics of OS, Hardware C oncept related t o OS , CPU States, I/O channels , Memor y Hierarchy, T ypes of OS – Multiprogra mming, T imes haring, Batch Processing , Multitasking, Real-t ime.

Concepts of Process: Operation on Process, Process states, Concurrent Processes, Process Control Block(PCB) and signals, Process schedu ling, Process Hierarchy.

Process synch ronization and Communication: Problem of concurrent processes, Critical sect ion, Mutual Exclusion, Deadlock, Process of Deadlock, Interpocess synchronization, need for interprocess synchronization.

Memory Organization and management: Address Binding, Logical and Physical address, Fragmentation, Concept of Virtual memor y, Swapping and Relocation.

Preliminary Study of WINDOWS/ Unix.

Readings:

1. Silberschatz and Galvin, Operat ing S ystem Concepts 6/ed, Addisio n Wesley.
2. William Stalling, Operat ing S ystems: Internals and Design Pr inciples 5/ed, PHI.
3. Tanenbaum, Modern Operat ing S ystems, PHI.
4. Peterson and S ilberschatz, Operating S ystem Concepts, Addison Wesley.

Subject -Introduction to C Language
Paper code – PCSC-302

Origin & Introduction to C : About C, Evolution of C, Programming languages, Structure of a C program, Compiling a C program, Simple C program, Character set in C, Keywords in C, Basic data types, Qualifiers used with basic data types, Variables in C, Type declaration, Input function, Output function and format specifiers, arithmetic operators, Unary operators, Relational and logical operators, address operator, conditional operator, Hierarchy o f operators.

Decision Making, looping & Branching: Control statements, if statement, if else statement, for statement, while loop, do while loop, switch statement, break statement, continue statement, goto statement.

Arrays & String Handling : Introduction to arrays, advantages of arrays, single dimensional arrays, multidimensional arrays, array declaration, array initialization, accessing data from array, Character arrays, String Variables, Reading & writing strings, string handling functions.

Pointers & User Defined Functions : Introduction to pointers, pointer variables, pointers and arrays, pointers to pointers, array of pointers, 2 dimensional arrays and pointers, Introduction to functions, advantages of functions, declaring a function, calling a function, passing arguments to a function.

Structure, Union & Enum : Structure: Array of structure, array within structure, Nested structure, passing arguments and returning structure for functions. **Union**: declaring union and its usage. **Dynamic memory allocation functions** – malloc, calloc, realloc and free.

File Management in C : Defining & opening a file, closing a file, I/O operations on file, error handling during I/O operations.

Readings:

1. A. K. Saxena, Programming Language C : Anamaya Publishers, New Delhi.
2. Y. Kanetkar, Let Us C, BPB Publicat ion.
3. B.S. Gottfried, Schaum's outline of Theory and Problems o f Programming with C, McGraw-Hill.

Subject – Database Management System

Paper code – PCSC-401

Introduction : Purpose of Database System, Concept of database & its evaluation, Views of Data, Types of DBMS, DBMS architecture, Data Independency, Data Models, Data Dictionary.

E-R Model : Basic Concept, Design Issues, Entity Sets, Attributes & its Types, E-R Diagram, Design of an E-R Database Schema , Keys.

Normalization : Purpose of Normalization , Functional Dependencies, 1 NF, 2 NF and 3 NF.

SQL : Introduction to SQL, DDL, DML & DCL statements, Basic Operations, Aggregate function, Modification of Database, other SQL features.

Relational Model : Structure of Relational Model, The Relational algebra (Selection, Projection, Union, Intersection, Cartesian product, Join), Tuple relational calculus.

Readings:

1. Database system concepts By H.Korth and A. Silberschatz ,S.Sudarshan, TMH Publication , 2010.
2. An introduction to Database Systems by Bipin Desai, Galgotia Publications, 2003 edition.
3. An Introduction to Database Systems, C.J.Date, A.Kannan, S. Swamynathan, Pearson Publication, Eight edition, Database Management System C.J.Data

Subject – Computer Based Numerical Method

Paper code – PCSC-402

Algebraic Equation : Bisection Method, Newton – Raphson Method, Regula Falsi Method.

Simultaneous Algebraic Equation: Gauss Elimination Method, Gauss-Jordan Method, Factorization Method, Jacobi's Iteration Method, Gauss- seidal Iteration Method.

Matrix Inversion & Eigen Value : Gauss Jordan Method, Factorization Method , Eigen values and Eigen Vectors .

Interpolation: Newton's backward and forward Interpolation Formula, Lagrange's Interpolation Formula.

Numerical Differentiation & Integration: Trapezoidal Rule, Simpson's one- third rule Simpson's three-eight rule.

Readings:

1. Numerical Methods in Engineering & Science By Dr. B.S.Grewal, Khanna Publishers, Seventh edition, 2005.
2. Introductory methods of numerical Analysis By S.S.Sastry, Phi Learning publication, Edition Fourth , 2009

Subject – Programming with Visual Basic

Paper code – PCSC-501

Introduction to visual Basic: Hardware requirements, features of VB, Editions of Visual Basic, and Event Driven Programming vs procedure oriented programming. Introduction to Integrated Development Environment. Basic concepts of Visual Basic programming: Controls, properties, methods, events, forms, projects. Creating Executable files. Variables, constants, data types, data conversion function.Scope of variables Operators Control Structure: Conditional / branching statements: If...else..endif, Select case Looping statements: do.. while, for.. next, for each, exiting a loop, goto statement, msgbox and input box functions.

Arrays & Functions: types of arrays, array manipulation, working with standard controls. Working with control array, various key and mouse events, using drag and drop concepts. Procedure and Functions: types of function, library function, date and time function, format function, and string related function, validation function. Creating user defined function & procedure, call by value and call by reference, concept of recursion.

Working with Advanced Controls: toolbar, status bar, tabbed dialog controls, progress bar, animation controls, dtpicker, calendar, common dialog control. SDI & MDI Application: creating MDI application, menu editor: defining menu & popup menu, sub main, startup objects.

Error Handling: Types of errors, error trapping tools: watch window, local window, immediate window, debug menu, tracing program flow with call stack, the err object, error function, error handling routines: on error goto statements. File Handling: type of file handling, Sequential file handling: reading, writing and appending in file, understanding user defined data type, Random access file: reading, writing and appending in file.

Data Access Using the ADO Data Control: Basic concepts of relational database, visual data manager, introduction to SQL, concept of ODBC, Overview of DAO and RDO, Using DAO and RDO to access data. Data Environment: accessing data using data environment, Report Generation: Overview of Data Report, creating Data report, adding groups, using data report functions.

Readings:

1. Mastering Visual Basic 6 Fundamentals - By Microsoft
2. Mastering in Visual Basic - Bv BPB Publications.
3. Introduction to VB Programming – By V. K Jain
4. Visual Basic 6 Programming Black Book ByHolznerDreamtech

Subject – Object Oriented Concepts

Paper code – PCSC- 502

Overview of Object Oriented: Need of Object Oriented, Procedural Vs Object Oriented approach, Benefits, C++ and other languages.

Features of Object Oriented: Class, Objects, Polymorphism, Inheritance, Message Passing, Abstraction, Encapsulation.

Class and Object: Definition, Construction of class, Creation of objects, Pointer to Object, Array of Object, Comparison of Class with Union & Structure.

Polymorphism : Type of Polymorphism, Methods Overloading, Operator overloading.

Inheritance : Types of Inheritance, Single Level, Multi Level, Multiple & Hybrid Inheritance, Advantage of Inheritance, Base Class & Derived Class, C++ & VB: Introduction, Basic Data Type, Writing Simple Program.

Readings:

1 Object Oriented Programming: E. Balaguru Swamy, Tata Mc. Graw Hill
2 Object Oriented Programming & C++: By R. Raja Raman
3 Visual C++ Programming: Yeshwant P. Kanitkar

Subject – Linux Operating System and Shell Programming

Paper code – PCSC-503

Introduction to Linux: Introduction to Linux system, History and Emergence, Features of Linux system, Different Linux distributions, Hardware Requirements for the different versions of Linux, Architecture of the Linux, Features of the Kernel and Kernel Shell relationship. Linux File System Features of Linux file system, File types and permissions, Getting started, Logging in /out with the concept of home directory. File operations and links, Commonly used commands like GREP, Find, who, ls, pwd, mv, ls, cd, df, cat, head, tail, rm, sort, grip, ps, whoami, chmod, chonn, gunzip, date, bc, tar.

Text Processing: Introduction to Text Processing, Vi editor, Vi Features, Vi Commands, Yanking, Running shell commands, from within Vi, Command macros, Set showmode, Set Auto Indent, Set number, Introduction to Exrcfile.Emacs editor, Emacs feature, Emacs commands, Using cut, paste and copy in Emacs, Saving buffer in Emacs.

Introduction to Shell & Shell Programming: Features of a Shell, Different types of a Shell, Why use more shell, Shell treatment to the command line, the environment, set, set env, path, home, ifs, mail, ps1, ps2, term, log name, profile, sty, profile file, login/ logout file, setting environment, simple shell programs, for... do, case, do while construct

X-windows : what is X-windows, Microsoft windows verses x-windows, windows manager, FVWM and FVWM95, twn, the client server model of x-windows, starting and stopping an X-window session. GNOME & KDE Using the GNOME & KDE desktop environment : starting the GNOME desktop environment, the GNOME panel, using the main system menu, the Gnome file manager, getting help in GNOME, using the Gnome control. A history of KDE project, starting the KDE desktop environment, exploring the Kde desktop, KDE main system menu, using file manager window, setting wallpaper, screen savers in KDE

System Administration of Linux: Installation & system Administration of Linux: responsibilities of a system administrator, startup and shutdown process, inittub and profile file importance, security file access permission, user and group related jobs, managing disk space, managing file system, backup and restart process.

Readings:

1. Mastering Linux by Paul S. Wang
2. BPB publication Complete Reference Linux by Richard Petersen.

Subject - Introduction to Artificial Neural Networks

Paper Code – PCSC – 504

Introduction: Definition and meaning, Different areas of A.I. Applications

Preliminaries of Neural Networks: Essence and benefits of neural networks

Introduction to Artificial Neuron: Model of biological neuron, meaning of learning and training, Model of an artificial Neuron, different units of an artificial neuron.

Introduction to Artificial Neural Network: Connectionist Networks, types of neural networks, single layer and multilayer perceptrons, Weights, bias, transfer functions

Training of a simple perceptron: Training of a single layer neural network with simple example like AND, OR logic gates.

Readings:

1. Neural Networks: A comprehensive Foundation (2e preferred): Simon Haykins, Prentice Hall of India.
2. Neural Networks for Pattern Recognition: Christopher M Bishop: Oxford Press
3. Introduction to Artificial Neural Systems:J.M.Zurada, West Publishing Company, St. Paul, Minnesota, 1992 / Jaico Publishing House, Bombay, 1994
4. Artificial Intelligence, E. Rich and K. Knight, Tata McGraw Hill.
5. Artificial Intelligence: A New Synthesis, Nilsson , Morgan Kaufmann.

Subject- Introduction to JAVA

PCSC – 601

Introduction: Genesis of java, importance to the Internet, overview and features. **Language Basics**: Constants, Variables and Primitive Data types, Operators and Expression, Decision Making and Branching statement, Decision Making and Looping, Classes, Objects and Methods, Arrays, Strings and Vectors.

Inheritance: Definition, Types, Method overloading and Method Overriding, super and this keywords. **Interfaces**: Defining Interface, Extending Interfaces Implementing Interface.

Packages: Defining Packages, Java API Packages, Naming Conventions, Creating Packages, Accessing Packages, Adding class to Package, CLASS PATH. **Exception handling**: Exception Types, Try, Catch & finally Blocks, Throw and Throws keywords. Creating user defined Exception.

Multithreaded Programming: Thread Model, Creating Threads, Thread Priority, Thread Exception, Synchronization. **Input/output:** Basic Streams, Byte and Character Stream, predefined streams, reading and writing from console and files.

Java Collection: Introduction, Overview of Interfaces, Overview of Classes. **Introduction to AWT:** Window fundamentals, creating windowed programs working with graphics, Using AWT controls, Delegation event model, handling mouse and keyboard event

Readings:

1. Naughton P and schildt H. Java: The complete reference, Osborne Mcgra-Hill, Berkeley, USA, 1997.
2. Rodgers Cadenhead, Laura Lemay, Sams Teach Yourself Java 2 in 21 Days, Sams Publishing.
3. E. Balagurusamy, Programming with Java, Tata McGraw Hill.
4. Bruce Eckel, Thinking in Java, Pearson Education.
5. Peter Van Der Linden, Just Java 2, Sun Microsystems/Prentice Hall.
6. Simply JAVA :An Introduction to JAVA programming By James R. Levenick ,Firewall Media New,Delhi
7. Java Programming - Khalid Mughal.
8. Core JAVA An Integrated Approach By Dr. R. Nageswara Rao dremtech Publication.

Subject- Software Testing

PCSC – 602

Fundamentals of Testing

Human and errors, Testing and Debugging, Software Quality, Requirement Behavior and Correctness, Fundamentals of Test Process, Psychology of Testing, General Principles of Testing, Test Metrics.

Role of Testing in SDLC

Review of software development models (Waterfall Models, Spiral Model, W Model, V Model) Agile Methodology and Its Impact on testing, Test Levels (Unit, Component, Module, Integration, System, Acceptance, Generic)

Approaches to Testing - I

Static Testing ,Structured Group Examinations ,Static Analysis ,Control flow & Data flow, Determining Metrics

Approaches to Testing - II

Dynamic Testing ,Black Box Testing ,Equivalence Class Partitioning, Boundary Value Analysis, State Transition Test, Cause Effect Graphing and Decision Table Technique and Used Case Testing.
White Box Testing ,Statement Coverage, Branch Coverage, Test of Conditions, Path Coverage.

Test Management

Test Organization ,Test teams, tasks and Qualifications ,Test Planning ,Quality Assurance Plan, Test Plan, Prioritization Plan, Test Exit Criteria ,Cost and economy Aspects ,Test Strategies, Test Activity Management, Incident Management.

Readings:

1. Software Testing Foundations, Andreas Spillner, Tilo Linz, Hans Schaefer, Shoff Publishers and Distributors
2. Software Testing: Ron Patton , Techmedia
3. Foundations of Software Testing by Aditya P. Mathur – Pearson Education custom edition 2000
4. Testing Object Oriented Systems: models, patterns and tools, Robert V Binder, Addison Wesley, 1996
5. Software Engineering – A practitioner's approach by Roger S. Pressman, 5th Edition, McGraw Hill

Subject- Introduction to Data Structure
PCSC – 603

Introduction: Basic terminology, Elementary data organization, Data structure, Data structure Operation and Types, Order of an algorithm, Complexity of Algorithms.

Array: Basic Terminology, Linear and multi dimensional Array.
Pointers: Array of pointers.
Records: Record Structures.

Linked list: traversing a linked list, searching a linked list, Insertion into a linked List, Deletion from a Linked List.
Stacks: operation on stack, Array Representation of Stack.
Queues: Linear Queue, Circular Queue, operation on Queue,.

Trees : Definition of Trees: Types of Trees, Linear Tree, Binary Tree and Their Representation, Implementation and Searching (inorder, Preorder, Postorder)
Operations on binary search tree: Traversing, Searching, Insertion, Deletion.

Sorting: Sorting, bubble sort, quick sort, Insertion Sort, Selection Sort, Merge sort, heap sort. **Searching**: Binary Search, hashing.

Readings:

1. Data Structure - Seymour Lipschutz (Schaum's Series).
2. Data Structure & Program Design - Robert L. Kruse, 3rd Ed., Prentice Hall.
3. Standish, Data Structure, Addison-Wesley.
4. A. M. Tennenbaum, Y. Langsam and M. J. Augenstein, Data Structures using C, PHI, 1996.
5. N. Wirth, Algorithms+Data Structures= Program, Prentice Hall.
6. Robert Lafore, Data Structures and Algorithms in Java, Sams.
7. Sahni S, data Structures, Algorithms and Applications in C++ , Mc Graw- Hill, 2002.
8. R. B. Patel and M.M.S. Rauthan, Expert Data Structures With C++, Khanna Publications, Delhi, India.
9. G. S. Baluja Data Structures Using C

Subject- Management Information System
PCSC -604

Management Information System: Definition, MIS as an evolving concept, MIS and other Academic Disciplines, Subsystems of an MIS.

Structure of MIS: Elements of an Information System, MIS support for Decision making, MIS Structure.

Hardware, Software, and communications Technology for Information Systems.

System & Design: Systems Development Initiative, Different Methodologies - Life Cycle & Prototype approach, detailed study on Life Cycle Design & Implementation. Case Study.

Managerial Decision Making: Decision Making Process, Group Decision Support Systems, Architecture of GDSS, Categories of GDSS.

Decision Support System: Definition, Components of DSS (Data Base Management System, Model Base Management
System, Support Tools), Applications of DSS, Functions of DSS.

Study of Computerization: Computerization in different functional areas of a typical manufacturing/business organization i.e. Marketing, production, material, financial, personal.

Readings:

1 Management Information Systems, Gordon B. Davis & Margerethe H. Olson Mc-Graw-Hill
2 Management Information Systems, Kenneth, Prentice Hall Publication
3 Management Information Systems, T. Lucey , Thomson Learning

MAJOR PROJECT

PCSC-605