Sophia Girls' College (Autonomous),
Ajmer

Department of Computer Science

Course Plan

Ms. Chandni Sharma

Course Plan
Session 2022-23

S.No.	Class	Semester	Paper
1	BCA	V	BCA/IMSC – 504 VB. Net Programming
2	MSC	I	MSC – 101 Computer Architecture
3	MSC	III	MSC – 203 VB. Net Programming
4	VCA	III	VCA – 302 Data Communication and Networking

SOPHIA GIRL'S COLLEGE, AJMER (*AUTONOMOUS*)
B.C.A/IMSC (SEMESTERV)2022-23

BCA/IMSC – 504 VB. Net Programming

MAX MARKS: 100(70EXT; 30 INT) MIN. MARKS: 40(28 EXT:12 INT) **Credit : 4**

COURSE PLAN

SEM V Month	Unit/Topic	Concepts/facts	Teaching Pedagogy	Learning Outcomes	Questions	Marks Weightage (%)
JULY	**Overview of .NET Framework** What is .NET framework, Origins of .NET, Architecture & Components, Common Language Runtime, Common Type System, Common Language Specification, MSIL, Framework Base Classes & Namespaces, IDE, .NET Languages.	Understand Dot Net Frame work with all its components and their usage	PPT, Quiz,assignments,group discussion	Compare and Contrast between different Run Time & Design Time Programming	*Knowledge Based* What is .Net Framework? Define .Net Framework Architecture and Functionalities	Knowledge--40 Understanding-40 Higher Order-20
AUGUST	**Visual Basic Language Features:** Introduction to VB.NET, Program Structure and Code Conventions, Data Types & Variables, Constants & Enumerations, Operators, Decision making & Looping, Arrays & Strings, Date & Time, Procedures in VB.	Understand the Program Structure, Code Conventions and Data types of VB.Net	PPT, Quiz, practicalimplementation, problem solving activities	Implement basic instructions ofVB.Net language	*Understanding Based* Explain Different Control structures in detail. Give a brief explanation of	

SEPTEMBER	**Building a User Interface:** The Visual Basic Environment, Event-Driven Programming. **Building Forms:** The Basics & Advanced Techniques, Working with Traditional Controls: Label Control, Text Box, Creating Buttons, Option Buttons, List Box,Combo Box.	Importance of Event Driven Programming and Making GUI Interface	PPT, Practical Implementation, group discussion	Handle the event driven programming & controls of VB.Net	different procedures used in .Net. *Higher Order Thinking Skills Based* Compare between List Box & Combo Box.	
OCTOBER	**Using Advanced Controls:** Creating Timers, Dialog Boxes, Picture Box, List View Control, Tree View Control, Menus and Toolbars. **Working with Database:** Introduction to ADO.NET, Connecting to a database, DataTables, DataRow, Navigating records, Adding, editing, and deleting records.	Handling different Interface Tools & Dialog Boxes. Importance and various techniques of connecting the databases.	PPT, Practical Implementation, assignments	Handle advance controls & connectivity with the Database	Fetching different pin codes of cities using Combo box Control. Creating a form using timer control and button control to change the background image accordingly.	

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SOPHIA GIRL'S COLLEGE, AJMER (*AUTONOMOUS*)
MSC (SEMESTERI) 2022-23

MSC – 101Computer Architecture

Max. Marks : 75 (50Ext; 25 Int) Min. Marks: 30(20 Ext;10 Int) Credits:06

SEM/Month	UNIT/TOPIC	Concepts/facts	Teaching Pedagogy	Learning Outcomes	Questions	Marks Weightage (%)
SEM I **SEPTEMBER**	Fundamentals of Computer Architecture: Major components of Digital Computer, Flynn's classification of Computer. Computer Arithmetic: Number systems: Decimal numbers, Binary numbers, Octal numbers, hexadecimal numbers and their mutual conversions, Binary arithmetic: Addition, subtraction, multiplication, and division of binary numbers, 1's and 2's complements, 9's and 10's complement BCD codes: addition and subtraction, BCD to binary convertor, binary to gray and gray to binary.	Digital Computers and Classification Number System and conversion	PPT, Practical exercises Solving Boolean functions, presentations by students, E-content	How the number system works	*Knowledge Based* Convert Decimal number to Binary Shortcut methods of base conversion	Knowledge--25 Understanding-45 Higher Order-30

OCTOBER	Boolean algebra and minimization techniques: Boolean logic operations, basic laws of Boolean algebra, De-Morgan's theorem, Karnaugh map: sum of product and product of sum, do not care condition. Logic Gates: AND gate, OR gate, NOT gate, NAND gate, NOR gate, X-OR gate, X-NOR gate, The universal property of NAND gate and NOR gate, Realization of basic gates.	Concepts of Boolean Algebra Minimization and simplification of Boolean functions understanding SOP and POS Concepts of Boolean Algebra understanding SOP and POS	PPT, group discussions, assignments	Understand the design of circuits How to perform different operations of binary arithmetic and their rules	*Understanding Based* Find out complements of binary digits Minimization and simplification of Boolean functions	
NOVEMBER	Combinational circuits: Half adder, Full adder, 4-bit Parallel adders, Subtractor: Half subtractor, Full subtractor Implementation using logic gates, Decoders: 4-bit decoder, BCD to decimal decoder, Encoder: Decimal to BCD encoder, Multiplexer: 4 to 1 multiplexer, Demultiplexer: 1 to 4 demultiplexer. Sequential Circuits: Latches: SR latch, Clocked flip-flops: SR flip-flop, D flip-flop, JK flip-flop, Positive edge-triggered	Designing Different Gates Combinational Circuits , Sequential Circuits and Registers	PPT, practice exercise, quiz Practice exercise, assignments	Design of Digital Circuits	*Higher Order Thinking Skills Based* Design Circuits using NAND gate	

DECEMBER	flip flops, Master-slave JK flip-flop. Registers: Modes of operation of registers: SISO, SIPO, PISO, and PIPO Register transfer language, inter-register transfer, arithmetic micro - operation, logic and shift micro operation Instruction codes, instruction format, timing and control, input/output and interrupts. Arithmetic logic unit, stack organization, addressing modes, associative memory, virtual memory, cache memory, cache coherence.	RTL Concepts Microinstruction formats Addressing Modes Compare different memories	PPT, group discussion, assignments	Handle interrupts and instruction codes	Explain different types of registers Performing Micro operations	

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MSC (SEMESTER III) 2022-23

MSC – 303 VB. Net Programming

Max. Marks :75 (50Ext; 25 Int) Min. Marks: 30(20 Ext;10 Int) **Credit : 6**

COURSE PLAN

SEM V Month	Unit/Topic	Concepts/facts	Teaching Pedagogy	Learning Outcomes	Questions	Marks Weightage (%)
SEPTEMBER	**Overview of .NET Framework** What is .NET framework, Origins of .NET, Architecture & Components, Common Language Runtime, Common Type System, Common Language Specification, MSIL, Framework Base Classes & Namespaces, IDE, .NET Languages.	Understand Dot Net Frame work with all its components and their usage	PPT, Quiz,assignments,group discussion	Compare and Contrast between different Run Time & Design Time Programming	*Knowledge Based* What is .Net Framework? Define Common Language Runtime Explain .Net IDE.	Knowledge-- 40 Understanding- 40 Higher Order- 20
OCTOBER	**Visual Basic Language Features:** Introduction to VB.NET, Program Structure and Code Conventions, Data Types & Variables, Constants & Enumerations, Operators, Decision making & Looping, Arrays & Strings, Date & Time, Procedures in VB.	Understand the Program Structure, Code Conventions and Data types of VB.Net	PPT, Quiz, practical implementation, problem solving activities	Implement basic instructions ofVB.Net language	*Understanding Based* Explain Different Control structures in detail. Give a brief explanation of	

NOVEMBER	**Building a User Interface:** The Visual Basic Environment, Event-Driven Programming. **Building Forms:** The Basics & Advanced Techniques, Working with Traditional Controls: Label Control, Text Box, Creating Buttons, Option Buttons, List Box, Combo Box.	Importance of Event Driven Programming and Making GUI Interface	PPT, Practical Implementation,group discussion	Handle the event driven programming & controls of VB.Net	String class and its properties & functions and string methods available in .Net Framework. *Higher Order Thinking Skills Based*	
DECEMBER	**Using Advanced Controls:** Creating Timers, Dialog Boxes, Picture Box, List View Control, Tree View Control, Menus and Toolbars. **Working with Database:** Introduction to ADO.NET, Connecting to a database, DataTables, DataRow, Navigating records, Adding, editing, and deleting records.	Handling different Interface Tools & Dialog Boxes. Importance and various techniques of connecting the databases.	PPT, Practical Implementation,assignments	Handle advance controls & connectivity with the Database	Creating the Quiz program using different controls and printing result. Adding, Removingitems of user's choice in the List box control and performing various operations on list box. Creating a form using timer control and button control to change the background image accordingly.	

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V.C.A. (SEMESTER - III)2022-23

VCA – 302 Data Communication and Networking

Max. Marks :75 (50Ext; 25 Int) Min. Marks: 30 (20 Ext;10 Int) Credits : 03

LESSON PLAN

SEM - III Month	UNIT / TOPIC	Concepts/facts	Teaching Pedagogy	Learning Outcomes	Questions	Marks Weightage (%)
JULY	• Introduction to digital communication. • Introduction to different types of networks :LAN, WAN MAN • Intro to Server, Client, their role in networking. • Intro to Topology, its types, advantages and disadvantages of different types of Topologies.	Understanding the history, importance and evolution of networking. Understanding the types of Networks, Their needs, uses and importance. Understanding the different topologies	PPT, Match the following, Demonstration	Identify terminology associated with the concepts, techniques, and processes used in Networking.	*Knowledge Based* Define Network. Give difference between LAN and WAN *Understanding Based* How is star topology better than Bus Topology? Compare the different types of Topologies and state their advantages and disadvantages.	Knowledge--45 Understanding -15 Higher Order-15
AUGUST	• Introduction to signals. Analog and Digital. • Introduction to different terminologies related to signals : Amplitude, Frequency, Phase, Bit Rate, Baud Rate • Introduction to Transmission Media ; Guided and Unguided Media	Understanding the types of signals and their usage. Importance of different characteristics of Signals. Importance of the transmission Media.	PPT, Practical Implementation	Getting familiar with the different types of signals, their terminologies, and transmission media.		

SEPTEMBER	Multiplexing • Introduction to different networking terminologies like Noise, distortion, Attenuation, Delay etc. • Types, need and importance of Multiplexing.	Lists types and uses of different types of Multiplexing.	PPT, Practical Implementation	Should understand the need of different types of Multiplexing.	*Knowledge Based* Explain FM. What is Multiplexing? *Understanding Based* Give differences between FM and AM. Difference between router and switch	
OCTOBER	• OSI MODEL • TCP/IP • FTP • TELNET • Networking Devices	Understanding the concept of OSI model, protocols and different networking devices	PPT , Quiz, You tube videos	Understand the different networking devicces		

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Course Plan
Session 2022-23
(Even Semester)

S.No.	Class	Semester	Paper
1	BCA	II	BCA – 201: Digital Computer Fundamentals
2	BCA / IMSC	IV	BCA/IMSC – 404: Operating System
3	VCA	IV	VCA – 402 Data Structure & Algorithm

SOPHIA GIRL'S COLLEGE, AJMER (*AUTONOMOUS*)

BCA (SEMESTER II) 2022-23

BCA – 201: Digital Computer Fundamentals

Max. Marks :70 (50 Ext: 25 Int) Min. Marks: 30 (20 Ext:10 Int) Credits:04

SEM/Month	UNIT/TOPIC	Concepts/facts	Teaching Pedagogy	Learning Outcomes	Questions	Marks Weightage (%)
DECEMBER	Fundamentals of Computer Architecture: Major components of Digital Computer, Flynn's classification of Computer. Computer Arithmetic: Number systems: Decimal numbers, Binary numbers, Octal numbers, hexadecimal numbers and their mutual conversions, Binary arithmetic: Addition, subtraction, multiplication, and division of binary numbers, 1's and 2's complements, 9's and 10's complement BCD codes: addition and subtraction, BCD to binary convertor, binary to gray and gray to binary.	Digital Computers and Classification Number System and conversion	PPT, Practical exercises Solving Boolean functions, presentations by students, E-content	How the number system works	*Knowledge Based* Convert Decimal number to Binary Shortcut methods of base conversion	Knowledge--25 Understanding-45 Higher Order-30
	Boolean algebra and minimization techniques:	Concepts of Boolean Algebra		Understand the design of circuits	*Understanding Based*	

JANUARY	Boolean logic operations, basic laws of Boolean algebra, De-Morgan's theorem, Karnaugh map: sum of product and product of sum, do not care condition. Logic Gates: AND gate, OR gate, NOT gate, NAND gate, NOR gate, X-OR gate, X-NOR gate, The universal property of NAND gate and NOR gate, Realization of basic gates.	Minimization and simplification of Boolean functions understanding SOP and POS Concepts of Boolean Algebra understanding SOP and POS	PPT, group discussions, assignments	How to perform different operations of binary arithmetic and their rules	Find out complements of binary digits Minimization and simplification of Boolean functions	
FEBRUARY	Combinational circuits: Half adder, Full adder, 4-bit Parallel adders, Subtractor: Half subtractor, Full subtractor Implementation using logic gates, Decoders: 4-bit decoder, BCD to decimal decoder, Encoder: Decimal to BCD encoder, Multiplexer: 4 to 1 multiplexer, Demultiplexer: 1 to 4 demultiplexer.	Designing Different Gates Combinational Circuits , Sequential Circuits and Registers	PPT, practice exercise, quiz Practice exercise, assignments	Design of Digital Circuits	*Higher Order Thinking Skills Based* Design Circuits using NAND gate	
MARCH	Sequential Circuits: Latches: SR latch, Clocked flip-flops: SR flip-flop, D flip-flop, JK flip-flop, Positive edge-triggered flip flops, Master-slave JK flip-flop. Registers: Modes of operation of registers: SISO, SIPO, PISO and PIPO	Shift Operation Concepts	PPT, group discussion, assignments		Explain different types of registers Performing Micro operations	

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SOPHIA GIRL'S COLLEGE, AJMER (*AUTONOMOUS*)
BCA/IMSC (SEMESTER IV) 2022-23

BCA/IMSC – 404: Operating System

Max. Marks:75 (50 Ext: 25 Int) Min. Marks: 30(20 Ext;10 Int) **Credit : 04**

COURSE PLAN

SEM V Month	Unit/Topic	Concepts/facts	Teaching Pedagogy	Learning Outcomes	Questions	Marks Weightage (%)
DECEMBER	Introduction to Operating Systems, goals of OS, Operations of OS, Classes of OS, batch processing, resident monitor, job control language, buffering, spooling, multiprogramming, Multi-processing, time sharing, distributed, real time systems, system calls, structure of OS, layer design of DOS, Unix structure. .	Understanding different types of OS Understanding DOS and Unix Structure	PPT, Quiz, assignments, group discussion	Understanding the structure and functionalities of OS	*Knowledge Based* What is Operating System? Define Classes of OS Explain system calls and why they are used.	Knowledge--40 Understanding-40 Higher Order-20
JANUARY	Process Management: Process concept, Process scheduling, Cooperating processes, Threads, Inter-process communication, Process scheduling, fundamental of scheduling, scheduling criteria, long medium short term scheduling, Preemptive and non-preemptive scheduling	Understand process life cycle and how they communicate.	PPT, Quiz, practical implementation, problem solving activities	Differentiate between Pre-emptive and non pre-emptive scheduling Algorithms	*Understanding Based* Explain Different Operating System structures in detail.	

FEBRUARY	**Scheduling algorithms:** FCFS, SJF, Priority, Round Robin . Process Synchronization and Deadlocks: The Critical-Section problem, Semaphores, Monitors. Storage management: Memory Management-Logical versus physical address, swapping, contiguous allocation, fragmentation, Compactation, paging, segmentation,.	Importance of Memory Management and various techniques of doing it.	PPT, Practical Implementation, group discussion	Applying Scheduling Algorithms Understanding memory management and Deadlock	Give a brief explanation of Cooperating processes, Threads, Inter-process communication. *Higher Order Thinking Skills Based*	
MARCH	**Page replacement algorithm,** virtual memory, virtual memory with paging, demand paging. Thrashing. Deadlocks-System model, Characterization, Deadlock prevention, Avoidance and Detection, Combined approach to deadlock handling.	Handling different types of Page Faults. Importance and various techniques to avoid and prevent Deadlock	PPT, Practical Implementation, assignments	Handling and removing Deadlock	Removing a system from Deadlock. Preventing a system from entering into deadlock situation. Applying different scheduling algorithms and comparing their waiting, turnaround and completion time.	

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SOPHIA GIRLS' COLLEGE, AJMER (*AUTONOMOUS*)
V.C.A (SEMESTER IV) 2020-21

VCA – 402 Data Structure and Algorithms

Max. Marks:75 (50Ext; 25 Int) Min. Marks: 30(20 Ext:10 Int)

COURSE PLAN

SEM IV Month	UNIT/TOPIC	Concepts/facts	Teaching Pedagogy	Learning Outcomes	Questions	Marks Weightage (%)
DECEMBER	• Introduction to algorithms • Introduction to data types • Arrays, two and three dimensional and their storage policy • Characteristics of an algorithm	• Understanding the need and importance of an algorithm. • Understand the different data types and their importance. • Understanding the concept of arrays	PPT, Practical Implementation, Practice questions, worksheet	Write meaningful algorithms with best characteristics. Understanding the storage mechanism of arrays.	*Knowledge Based* What is algorithm? What are primitive data types and composite data types? *Understanding Based* Explain a good algorithm. WAP to implement Binary Search algorithm in C++.	Knowledge--45 Understanding-15 Higher Order-15
JANUARY	• Sorting and Searching. • Binary and Linear Search algorithm • Sorting – External and Internal Sorting algorithms. • Merge Sort, Selection Sort	• Understanding the need and importance of searching and sorting. • Understating different algorithms used for searching and sorting	PPT, Practical Implementation MCQ's	Able to code the searching and sorting algorithms. Implement different searching and sorting techniques		

FEBRUARY	• Linked List : Introduction • Representation of linked list in memory • Traversing a linked list • Searching a linked list • Sorting a linked list • Types of linked list	Understanding the need and importance of a linked list. Understanding different types of linked list. Using programming techniques to search, traverse and sort a linked ist	PPT, Quiz	Understand the linked list data structure and implement it through coding.	*Higher Order Thinking Skills Based* Write a program to implement a stack in c++ using class. What is the difference between Stack and Queue working methodology?	
MARCH	• Introduction to various data structures like Stacks , Queues, Graph, Tree • Traversing a tree – Pre order, post order, in order • Breadth First Search • Depth First Search	Understanding data structures like stacks, queue and tree. Understanding their working mechanism. Understanding the traversing and searching mechanism in these data structures.	PPT, Practical, Live Examples	Understand the basic concept of data structure. Understand the need, importance and meaning of various data structures. Understanding the different traversing mechanisms used in different data structures.		

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