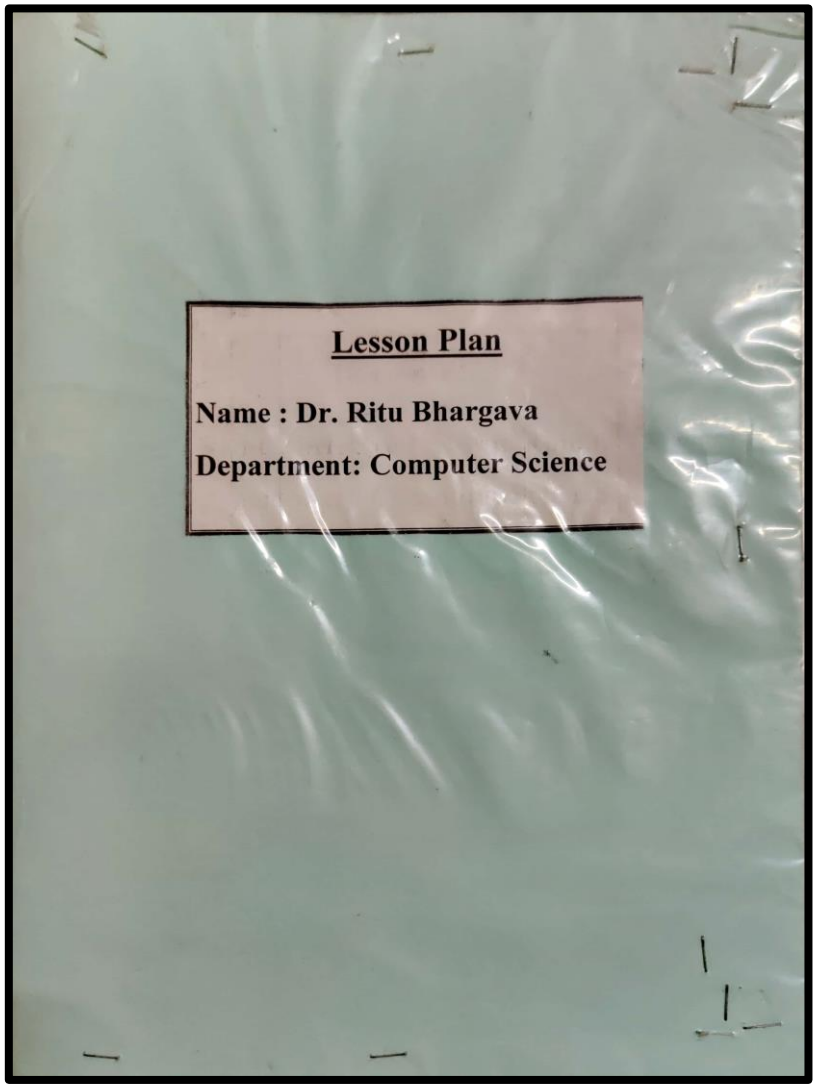
SOPHIA GIRLS' COLLEGE(AUTONOMOUS), AJMER



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

SEMESTER V BCA
Max. Marks: 50(40Ext; 10 Int)

Open Source Operating System BCA – 501
Min Marks: 20(16 Ext;4 Int)
Credit: 02

COURSE PLAN

SEM V Month	UNIT/TOPIC	Concepts/facts	Teaching Pedagogy	Learning Outcomes	Questions	Marks Weightage (%)
SEMV JULY	Introduction of Open Source Software, Need of Open Source, comparison with Closed source / Proprietary software.	Understand open source Operating System	PPT	Understand the structure and functionalities of an OS Understand concept of Linux File System	***Highorder-*** Write a shell script to find out the given number is palindrome or not ***Understanding-*** Explain Different File System of OS ***Knowledge-*** Compare the MV and CP command	Knowledge 25 Understanding-45 Higher Order-30
	Linux Architecture, Linux file system (inode, Super block, Mounting and Un-mounting)	Analysing structure of OS	PPT			
	Types of File system, Kernel, Process Management in Linux.	Compare EXT2,FAT,NTFS	PPT			
AUGUST	Shell Commands: user access commands, directory commands, file manipulation commands, security and protection commands, inter user and inter-machine communication,	Illustrate Shell Commands	PPT	Apply shell commands in linux programming		
	information commands, process management commands, program development and debugging commands, system administration commands, I/O		PPT & Quiz			
	Redirection and Piping, Relation and Absolute path, hard link and soft link, Linux Directory types, User and its Home Directory Vi editor					

OCT	Shell Programming – Introduction to Shell, Various Shell of Linux, Shell Variables, Shell keywords, Positional Parameters	Role of Positional Parameter	PPT and Lab exercies			
	control statements- if-then-else, case-switch, While, Until, Find, Shell Metacharacters	Searching files using metacharacters and execute shell scripts				
	. Booting and Shutting down Boot Loaders: LILO, GRUB, Bootstrapping, init Process.	Compare different Loaders.				

Sr Pearl

PRINCIPAL
SOPHIA GIRLS' COLLEGE
(AUTONOMOUS)
AJMER

RBhargava

Head
Department of Computer Science
Sophia Girls' College
(Autonomous), Ajmer

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

V.C.A III (SEMESTER V)

Database Technologies – I VCA - 501

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

COURSE PLAN

SEM V Month	UNIT/TOPIC	Concepts/facts	Teaching Pedagogy	Learning Outcomes	Questions	Marks Weightage (%)
SEM V JULY	UNIT-I Overview and History of DBMS. Basic DBMS terminology, File Processing System v/s DBMS. Advantages and disadvantages of DBMS, DBA and his responsibilities, ,	Importance of database and role of DBA	PPT, Quiz	Identify the concepts of database its types .Database and its concepts Architecture And data model implementation	*Knowledge Based* -What is DBMS? -Illustrate the difference between file processing and dbms? *Understanding Based* -Compare the data abstraction layers? -Classify 2 and 3 tier architecturer? *Higher Order Thinking Skills Based* -Justify that a child can have only one parent with example? -Critically Evaluate constraints and its types? What benefits extended ER models have over ER models? What is the role of Normalizartion?	Knowledge--60 Understanding-30 Higher Order-10
	Data Abstraction, physical and logical data independence Architecture of DBMS: Client/server architecture, 2 Tier & 3 Tier.	Identifying different tier architecture of DBMS	Match the following, Quiz, Demonstration			
	Overview of hierarchical, network and relational models, comparison of network, hierarchical and relational models.	Comparison of Data Models	Models and demonstration			
AUGUST	UNIT-II Entity Relationship model: Overview of Data Design Entities, Attributes and Entity Sets, Relationship and Relationship Sets.	Construction of E-RModels using Real Life examples	Contruction of real life problems through ER models	Illustrate the different constraints and keys		
	Features of the ER Model- Key Constraints, Participation Constraints, Weak Entities, degree of relationship, Relationships, keys(types).	Concept of constraints and implementation	PPT			

	Generalization, Specialization, Aggregation, Implementation of sequential , random & indexed sequential file organization.	Distinguishing File Organization methods	PPT			
SEPTEMBER-OCTOBER	UNIT-III Relational Model: Storage organization for relations, Relational Algebra: Set Operators (Union ,Intersection, Set Features of the ER Model- Key Constraints, Participation Constraints, Weak Entities, degree of relationship, Relationships, keys(types),	Implementing constraints in database	Demonstration through rock samples	Compare and analyze the different relational operators and implementation. Implementation of Normalization and its forms		
	Relational Model: Storage organization for relations, **Relational Algebra:** Set Operators (Union ,Intersection, Set-Difference, Cartesian Product), **Relational Operators:** (Select, Project, Rename, Join), E.F.Codd's rules,	Implementing relational Algebra with queries	PPT, Demonstration			
	Schema refinement and Normal forms: Introductions to Schema Refinement, Functional Dependencies, Boyce-Codd Normal Forms, Third Normal Form,Normalization-Decomposition into BCNF Decomposition into 3-NF.	Normalization and its forms	PPT, Case Studies			

Sr Pearl

PRINCIPAL
SOPHIA GIRLS' COLLEGE
(AUTONOMOUS)
AJMER

RBhargava

Head
Department of Computer Science
Sophia Girls' College
(Autonomous), Ajmer

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

M.SC COMPUTER SCIENCE (PREVIOUS)

SEMESTER I (M. Sc (CS) PREV) Computer Architecture MCS-101

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

COURSE PLAN

SEM/ Month	UNIT/TOPIC	Concepts/facts	Teaching Pedagogy	Learning Outcomes	Questions	Marks Weightage (%)
SEM I JULY	Number system, Arithmetic operations,1's and 2's complements,9's and 10's complement, BCD (addition and subtraction), codes: BCD to binary convertor, binary to gray and gray to binary.Excess-3 code.	Understand Number System and conversions	PPT And Practical exercises	understand the design of circuits and the number system used Design Digital Circuits	Convert Decimal to base Find out complements of binary digits Minimize Boolean functions	Knowledge--25 Understanding -45 Higher Order-30
	Boolean algebra and minimization techniques: boolean logic operations, basic laws of Boolean algebra,	Concepts of Boolean Algebra Minimization and simplification of Boolean functions	Solving Boolean fuctions Solving K-Map	handle interrupts and instruction codes know basic pin		

	demorgan's theorem, sum of product and product of sum, karnaughmap. Logicgates, Arithmeticcircuits: halfadder, fulladder.	understanding SOP and POS		configuration of 8085 microprocessor	Explain the block diagram of 8088 micro processor	
	Combinational, circuits: multiplexors, demultiplexors, decoders, encoders, Sequential circuits:Latches ,flip-flops., Registers, shift registers.	Combinational Circuits and Registers	PPT			
AUGUST	Register transfer language, inter-register transfer, arithmetic micro operation, logic and shift micro operation	RTL Concepts	PPT			
	Processor bus organization, arithmetic logic unit, stack organization		Assembly Language Programs			
SEPTEMBER-	Block diagram of 8085	Processor Design				

OCTOBER	and pin configuration, data transfer Binstructions,		PPT			
	arithmetic, logical, shift, rotate, flag, compare, jump instruction, subroutine, loop,	Microinstruction formats	PPT			
	addressing modes, associative memory, virtual memory, cache memory, cache coherence.	Compare different processor memories	PPT			

Sr Pearl

PRINCIPAL
SOPHIA GIRLS' COLLEGE
(AUTONOMOUS)
AJMER

RBhargava

Head
Department of Computer Science
Sophia Girls' College
(Autonomous), Ajmer

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

M.SC COMPUTER SCIENCE (PREVIOUS)

SEMESTER III (M. Sc (CS) FINAL)

DATA WAREHOUSE & MINING MCS-303

MAX MARKS: 100(70EXT; 30 INT)

MIN. MARKS: 40(28 EXT;12 INT)

COURSE PLAN

SEM/ Month	UNIT/TOPIC	Concepts/facts	Teaching Pedagogy	Learning Outcomes	Questions	Marks Weightage (%)
SEM III JULY	Data Warehousing: Introduction to Data Warehouse, Data mart, Data warehouse architecture, Multidimensional Data Model (data cube)	Analyse data ware hose models	PPT	Understand the concepts of data warehouse and data mining	HIghorder Analyse weather dataset and retrieve resules using Apriori algorithm Understanding Compare OLAP and OLTP Knowledge Explain Warehouse schema.	Knowledge--25 Understanding -45 Higher Order-30
	OLAP Techniques : Roll-up, slicing and dicing, drilldown, pivot, Approaches to OLAP servers (MOLAP,ROLAP,HOLAP) OLTP, data transformation, loading).	Compare OLAP techniques				
	Warehouse schema(star schema, snowflake schema, fact constellation) metadata,. Data Warehouse ETL Process (data extraction, data cleaning,		PPT			
AUGUST	Data Mining: Introduction,	Compare different	PPT	Analyze		

	Definition, KDD vs. DM, DBMS vs. DM, DM Techniques: verification model, discovery model: discovery of association rule, discovery of classification rule, clustering, discovery of frequent episodes, deviation detection,	models		transaction databases for association rules		
	Issues and Challenges in DM, DM Applications (Business and E-commerce, Scientific, Engineering and Health care, Web data)					
SEPTEMBER-OCTOBER	Association Rules, Market basket analysis, Association Rules: Apriori Algorithm, Partition, Incremental, FP-tree growth algorithms, learning techniques(supervised and unsupervised) Classification: Hierarchical and non-hierarchical techniques, Partitioning,	Analyse Market Basket Analysis	PPT	Use classification methods and various clustering techniques for categorizing data		
	Clustering: K-MEDOID	Critically analyse different classification	PPT & Lab Exercise			

	Algorithm K-means clustering, hierarchical clustering. Decision Trees: decision tree, types of decision tree Decision tree induction, Tree pruning,	and clustering algorithms				
	Extracting classification rules from decision trees, Decision tree construction algorithms: CART, ID3, J48, Decision tree construction with presorting.		PPT			

Sr Pearl

PRINCIPAL
SOPHIA GIRLS' COLLEGE
(AUTONOMOUS)
AJMER

RBhargava

Head
Department of Computer Science
Sophia Girls' College
(Autonomous), Ajmer

COURSE PLAN

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

B.C.A-IMSC I (SEMESTER II)

Digital Computer Fundamentals BCA 201

Max Marks: 50(40Ext; 10 Int) Min Marks: 20(16 Ext;4 Int) Credit: 02

SEM II Month	UNIT/TOPIC	Concepts/facts	Teaching Pedagogy	Learning Outcomes	Questions	Marks Weightage (%)
SEM II DEC - JAN	UNIT-I **Number systems:** Decimal numbers , Binary numbers : Counting in binary, The weighted structure of binary numbers, Octal numbers, hexadecimal numbers and their mutual conversions	Perform Number Conversions from one System to another System	PPT, Comparison charts, Practice Problems	Understand the basic number system and their conversions	*Knowledge Based* Explain Universal Gates- *Understanding Based* - Convert Decimal Number 27 into Binary *Higher Order Thinking Skills Based* Proove that AB+BC+BC'=A B+C	Knowledge--60 Understanding-30 Higher Order-10
	Binary arithmetic : Addition, subtraction, multiplication and division of binary numbers, 1's and 2's complement, BCD numbers, BCD addition, BCD subtraction,	Perform different arithmetic operations	PPT, Practice Problems			
	Gray code: Binary to Gray code conversion, Gray to Binary conversion	Perform different arithmetic operations	Comparison Charts			
FEB	UNIT II **Boolean algebra:** Boolean operations and expressions, Laws and rules of Boolean algebra, Demorgan's Theorem, Boolean expressions, Simplification of Boolean expression.		PPT, Diagrams, Models	Identify the logic gates and their functionality		
	Logic Gates: AND gate, OR gate, NOT gate, NAND gate , NOR gate , X-OR gate , X-NOR gate, The universal property	Design various logic gates and Truth Tables	PPT, Truth Tables, Diagrams	Understand how logic circuits and		

	of NAND gate and NOR gate. Realization of basic gates.			Boolean algebra forms as the basics of digital computer.		
	Boolean expression for logic circuits, Karnaugh map SOP with examples.		PPT, Diagrams, Practice Examples			
MARCH-APRIL	UNIT III Combinational Circuits: Half adder, Full adder, Half subtractor, Full subtractor	Design basic electronic Circuits(combinational circuits)	Diagrams , PPT	Analyse and design different circuits Understand and design of various circuits		
	Decoders, Encoder , Multiplexer, Demultiplexer.	Demonstrate the Working of circuits	Diagrams, PPT			
	Sequential Circuits: Latches: SR latch, Clocked flip-flops: SR flip-flop, D flip-flop, JK flip-flop, Master slave JK flip-flop.	Demonstrate the building up of Sequential and combinational logic from basic gates.	PPT, Comparison chart, Diagrams			

Sr Pearl

PRINCIPAL
SOPHIA GIRLS' COLLEGE
(AUTONOMOUS)
AJMER

RBhargava

Head
Department of Computer Science
Sophia Girls' College
(Autonomous) , Ajmer

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

SEMESTER IV BCA
Max. Marks: 50(40Ext; 10 Int)

Min Marks: 20(16 Ext;4 Int)

Operating System BCA – 401

Credit: 02

COURSE PLAN

SEM IV Month	UNIT/TOPIC	Concepts/facts	Teaching Pedagogy	Learning Outcomes	Questions	Marks Weightage (%)
SEM IV DEC-JAN	Introduction to Operating Systems, goals of OS, Operations of OS,	Understand open source Operating System	PPT	Understand the structure and functionalities of an OS	***Highorder-*** Find out the optimized algorithm using reference string in page replacement algorithm ***Understanding-*** Explain architecture of OS ***Knowledge-*** Compare processing modes of OS	Knowledge-25 Understanding-45 Higher Order-30
	Classes of OS, batch processing, multi-processing, time sharing, distributed, real time systems,	Compare different processing modes of OS	PPT			
	system calls, structure of OS, layer design of DOS, Unix..	Analysing structure of OS	PPT			
FEB	Process concept, process scheduling, fundamental of scheduling, CPU scheduling algorithms: FCFS, SJF, Priority, RR, Threads.	Illustrate Process Life Cycle	PPT	Apply scheduling algorithms		
	scheduling criteria, long medium short term scheduling,	Critically analyse waiting time and turn around time with different algorithms	PPT & Quiz			
	CPU scheduling algorithms: FCFS, SJF, Priority, RR, Threads.					

March-April	Logical versus physical address, contiguous allocation, fragmentation	Concept of fragmentation and Compactation	PPT and Practice exercies	Apply different page replacement algorithms Understand concept of memory management		
	compactation, swapping, segmentation, paging, page replacement algorithm					
	virtual memory, virtual memory with paging, demand paging.	Differentiate memories				

Sr Pearl

PRINCIPAL
SOPHIA GIRLS' COLLEGE
(AUTONOMOUS)
AJMER

RBhargava

Head
Department of Computer Science
Sophia Girls' College
(Autonomous), Ajmer

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

SEMESTER VI BCA

Information Security & Protection **BCA – 603**

Max. Marks: 50(40Ext; 10 Int)

Min Marks: 20(16 Ext;4 Int)

Credit: 02

COURSE PLAN

SEM VI Month	UNIT/TOPIC	Concepts/facts	Teaching Pedagogy	Learning Outcomes	Questions	Marks Weightage (%)
SEM VI DEC-JAN	Introduction to the concepts of security: need for security, types of attacks	Understand concept of Security	PPT & Videos	Identify and classify computer and security threats and develop a security model to prevent, detect and recover from attacks	***Highorder-*** Encrypt Attack is tonight using Hill Cipher ***Understanding-*** Explain RSA algorithm ***Knowledge-*** Compare Active and Passive attacks	Knowledge-25 Understanding-45 Higher Order-30
	cryptographic techniques: plain text and cipher text substitution and transposition techniques	Analysing Transposition and substitution techniques	PPT			
	Caesar cipher, modified Caesar cipher, monoalphabetic cipher, Vigenere cipher, hill cipher, Vernam Cipher. stegnography, key range and key size.	Understanding security algorithms	PPT			
FEB	Computer based symmetric key cryptographic algorithm: Introduction, algorithm types: stream cipher and block cipher and mode	Illustrate Symmetric and Asymmetric key Cryptography	PPT	Understand the concept of encryption and analyze various symmetric & asymmetric encryption algorithm		
	ECB, CBC, CFB, OFB. An overview of symmetric key cryptography, basics of data encryption standard DES		PPT & Quiz			
	Computer based asymmetric cryptographic					

	algorithm: Introduction of asymmetric key cryptography, an overview of asymmetric key cryptographic, and the RSA algorithm.					
March-April	Internet security protocols: basic concepts, secure socket layer SSL	Compare different user authentication methods	PPT and Quiz	Familiarize with network security designs using available secure solutions such as SSL and IPSeC		
	Secure hyper text transfer protocol. User authentication mechanism: passwords					
	Certificate based authentication, biometrics authentication.					

Sr Pearl

PRINCIPAL
SOPHIA GIRLS' COLLEGE
(AUTONOMOUS)
AJMER

RBhargava

Head
Department of Computer Science
Sophia Girls' College
(Autonomous), Ajmer

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

V.C.A III (SEMESTER VI)

Database Technologies – II VCA - 601

Max. Marks : 75 (50Ext; 25 Int)

Min. Marks: 30(20 Ext;10-Int)

Credit: 03

COURSE PLAN

SEM VI Month	UNIT/TOPIC	Concepts/facts	Teaching Pedagogy	Learning Outcomes	Questions	Marks Weightage (%)
SEM VI DECEMBER	Transaction Processing: Introduction-Transaction State, ACID properties	Transaction life cycle	PPT, Quiz	Identify the concepts of Transaction and Concurrency	*Knowledge Based* -What is Transaction and its Life Cycle? -Illustrate the difference between concurrency types? *Understanding Based* -Compare different recovery techniques? *Higher Order Thinking Skills Based* -Create the database with constraints -Critically Evaluate constraints and its types?	Knowledge--60 Understanding-30 Higher Order-10
JAN	Concurrent Executions. Concurrency Control, Need of Serializability, Conflict vs. View Serializability security, authorization access matrixDatabase Failure and Recovery: Database Failures,	Identifying concurrency and serializabillity	Match the following, Quiz, Demonstration			
	Recovery Schemes: Shadow Paging and Log-based Recovery.	Database Recovery and failure	PPT& Quiz			
FEB	Relational query language: DDL, DML, DCL, database integrity: entity integrity, domain integrity, referential integrity, Introduction to SQL: Characteristics of SQL, Advantages of SQL, SQL data types and literals, Types of SQL commands, SQL operators, Tables	Comparison of Database Integrity Creation of Database	Contruction of Database Using Oracle Queries	Illustrate the different Database Integrity Application of SQL commands using sotware		

	Constraints: Null Constraint, Primary Key, Unique key constraint, Foreign Key constraint	Concept of constraints and implementation	PPT			
	domain key constraint, Check Constraints, & Not Null.	Implementation of Constraints	PPT			
MARCH & APRIL	Searching, Matching & Basic Oracle Functions: String, Numeric, and Aggregate Functions. Views and indexes, Queries based on group by clause, order by clause, having clause,	Implementing Oracle Functions	PPTand lab work	Application of Queries		
	Unions, Intersection, Minus SQL,	Implementing Set operators	PPTand lab work			
	Sub queries & joins.	Implementing Sub Queries	PPTand lab work			

Sr Pearl

PRINCIPAL
SOPHIA GIRLS' COLLEGE
(AUTONOMOUS)
AJMER

RBhargava

Head
Department of Computer Science
Sophia Girls' College
(Autonomous), Ajmer

SOPHIA GIRL'S COLLEGE, AJMER (*AUTONOMOUS*)
M.SC COMPUTER SCIENCE (PREVIOUS)

SEMESTER II (M. Sc (CS) PREV) — Operating System MCS – 202

MAX MARKS: 100(70EXT; 30 INT) — IN. MARKS: 40(28 EXT;12 INT)

COURSE PLAN

SEM II Month	UNIT/TOPIC	Concepts/facts	Teaching Pedagogy	Learning Outcomes	Questions	Marks Weightag (%)
SEM II DEC-JAN	Introduction to Operating Systems, goals of OS, operation of OS, classes of OS, batch processing, multi-processing, time sharing, distributed, real time systems,	Understand Operating System	PPT	Understand the structure and functionalities of an OS Understand concept of Process management	***Highorder-*** Find out the turn around time and waiting time for the given processes using FCFS,SJF,Priority,RR Write a shell script to find out the given number is palindrome or not? ***Understanding-*** Explain Different services of OS ***Knowledge-*** Compare the architecture of MS-DOS and UNIX	Knowledge-25 Understandi -45 Higher Orde 30
	, structure of OS, layer design of DO system calls ,Unix. Process concept, process	Analysing structure of OS Illustrate Processs life cycle	PPT			
	scheduling, scheduling criteria, long medium short term scheduling, CPU scheduling algorithms threads.	Solving different scheduling methods	PPT			
FEB	Logical versus physical address, swapping, contiguous allocation,Fragmentation ,compactation, segmentation, paging		PPT	Apply scheduling algorithms Apply different page replacement algorithms		
	segmentation with paging, page replacement algorithm, virtual memory, virtual memory with paging, demand paging,		PPT & Quiz			

6-April	Critical section, critical region, inter-process communication, monitor and semaphores.	What is IPC	PPT	Execute shell commands and Shell Scripts on Linux OS		
	History of Linux, Linux architecture, Linux File System, file naming, types of files, directory command, file command, vi editor, locating files in Linux, filter, pipe, shell variables,	Execute shell commands	PPT			
	positional parameters, local and global variables, command substitution, if, while, for, shift, tar, basic networking commands in Linux.	Execute shell scripts	PPT			

Sr Pearl

PRINCIPAL
SOPHIA GIRLS' COLLEGE
(AUTONOMOUS)
AJMER

RBhargava Sr Pearl

PRINCIPAL
SOPHIA GIRLS' COLLEGE
(AUTONOMOUS)
AJMER

Head
Department of Computer Science
Sophia Girls' College
(Autonomous), Ajmer