Sophia Girls' College (Autonomous),
Ajmer

Department of Computer Science

Course Plan

Mr. Rishi Saxena

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

SESSION 2022-23

COURSEPLAN

Odd Sem

S.No.	Class	Semester	Paper
1	BCA	V	Mobile Application Development
2	MSc CS	I	Java Programming
3	MSc CS	III	Cloud Computing
4	IMSc	VII	Cloud Computing

SOPHIA GIRL'S COLLEGE, AJMER (*AUTONOMOUS*)
BCA Semester V (2022-23)
Mobile Application Development

Max. Marks :100 (70Ext; 30Int)

Credit: 04

SEM V Month	UNIT/TOPIC	Concepts/facts	Teaching Pedagogy	Learning Outcomes	Questions	Marks Weightage (%)
SEM V JULY	Unit I Android Introduction: Definition, History and Versions, Features, Applications, Categories, API Level. Android Architecture: Linux kernel, Native Libraries, Android Runtime, Android Framework, Applications	Android Basics	PPT	Define Android OS and its architecture.	*Knowledge Based* -Illustrate the different types of Application Categories. *Understanding Based* - -Classify the SDK on the basis of applications. *Higher Order Thinking Skills Based* -Develop a model for calculator app	Knowledge--60 Understanding-30 Higher Order-10
	Environment Setup: Set-up Java Development Kit (JDK), Android IDEs Core Building Blocks: Activity, View, Intent, Service, Content Provider, Fragment, AndroidManifest.xml, Android Virtual Device (AVD), Dalvik VM.	Android studio Installation & fundamentals	Download & installation			
AUGUST	Unit II Resource files: Strings, Colors, Dimensions. User Interface: Constraint Layout, Linear Layout, TextView, EditText, Button, CheckBox,	Resources	App creation Assignments	Outline the Application development in Android		

	ToggleButton, RadioButton, Toast, Spinner, ListView, RatingBar, DatePicker, TimePicker, ProgressBar					
	Activity Lifecycle: Activity Lifecycle methods - onCreate, onStart, onResume, onPause, onRestart, onDestroy.	Lifecycle	App creation Assignments			
SEPTEMBER-OCTOBER	Unit III Broadcast Receivers: Creating the Broadcast Receiver, Registering Broadcast Receiver, Event Constant & Description. Android Intent, Types of Android Intents - Implicit Intent, Explicit Intent, StartActivityForResult, Share App Data.	Broadcasting	App creation Assignments	Design and develop user Interfaces for the Android platform		
	Android Menu: Option Menu, Context Menu, Popup Menu. Android Fragments, Fragment Lifecycle, Methods.	Fragments	App creation Assignments			

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MSc CS Semester I (2022-23)

Java Programming

Max. Marks :70Min. Marks: 30 Credit: 06

SEM I Month	UNIT/TOPIC	Concepts/facts	Teaching Pedagogy	Learning Outcomes	Questions	Marks Weightage (%)
SEM I SEPETEMBER	Unit I JAVA: Introduction to Object Orientated Programming, Abstraction, Object Oriented Programming Principles, Features of JAVA, Introduction to JAVA byte code, Program elements; Primitive data types, variables, Input Output in Java, operators: arithmetic, assignment, logical, bit wise, relational , Boolean logical operators, operator precedence.	OOPs Basics	PPT	Describe the features of Java	*Knowledge Based* -Define OOP -Describe Data Types in Java *Understanding Based* -Apply branching constructs. - Organise operators on the basis of precedence. *Higher Order Thinking Skills Based* - Check passing objects as parameters - Plan an inheritance hierarchy	Knowledge--50 Understanding-35 Higher Order-15
	Control statements: Java's Selection Statements, if statement, switch statement, Iteration statements, while, do while, for-each, Nested loop, Jump Statement, using break, continue, return. Arrays, One & Two Dimensional Array	Programming Fundamentals	Programming Assignments			
OCTOBER	Unit II	OOPs Concepts	Programming			

	Object and classes: Objects, constructors, returning and passing objects as parameter. Inheritance: Definition & its Types, Extended class, usage of Super, Overloading and overriding methods, Abstract classes, using final with inheritance		Assignments	Develop programs with basic programming constructs.		
	STRING HANDLING: String constructors, special string operation, character extraction, searching and comparing string, string Buffer class. PACKAGE AND INTERFACES: Defining package, access modifiers, importing package, Defining and implementing interfaces.	Collections	Programming Assignments			
NOVEMBER	Unit III EXCEPTION HANDLING: Exception handling fundamentals, Exception types, try, catch and multiple catch statements. Usage of throw, throws and finally. THREADING: Multithreading, multiprocessing, life cycle of thread, Garbage collection.	Error handling	Programming Assignments	Experiment with branching & Looping and Arrange data in Arrays. Formalize the OOP concept and validate its real world implementation		
DECEMBER	File handling: input and output stream. Applet: applet Fundamentals, applet life cycle, using paint method and drawing polygon.	File handling	Programming Assignments			

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SOPHIA GIRL'S COLLEGE, AJMER (*AUTONOMOUS*)
MSc CS Semester III (2022-23)
Cloud Computing

Max. Marks :70Min. Marks: 30

Credit: 06

SEM I Month	UNIT/TOPIC	Concepts/facts	Teaching Pedagogy	Learning Outcomes	Questions	Marks Weightage (%)
SEM I JULY	Unit I Introduction, Layers and Types of Clouds, Desired Features of a Cloud, Cloud Infrastructure Management	Introduction to Cloud computing	PPT	Define cloud computing and identifying various service models.	*Knowledge Based* -What is Cloud in Cloud Computing? -Describe Service Models *Understanding Based* -Apply VM Systems in actual cloud implementation. - Outline Cluster as a service *Higher Order Thinking Skills Based* -Validate Hybrid cloud implementation -Plan a security model for cloud computing.	Knowledge--40 Understanding-35 Higher Order-25
	Infrastructure as a Service(IaaS), Platform as a Service Providers(PaaS), Software as a Service (SaaS), Challenges and Risks.	Service Models	PPT, Charts,			
AUGUST	Unit II Virtual Machines, Distributed Management of Virtual Infrastructures, Scheduling Techniques for Advance Reservation of Capacity	IaaS	PPT, Charts, Diagrams	Demonstrate various technologies related to IAAS. Manage virtual infrastructure in distributed environment.		
	Mobile Computing: Mobile Cluster as a Service, Cloud Storage, Technologies for Data Security in Cloud Computing.	CAAS	Assignments			

SEPTEMBER-OCTOBER	Unit III Technologies and Tools for Cloud Computing, Aneka Cloud Platform, Hybrid Cloud Implementation, Comet Cloud, Autonomic Behavior of Comet Cloud.	PaaS	PPT	Employ PAAS platforms like Aneka and Comet Cloud.		
	An Introduction to the Data Security, Cloud Computing and Data Security Risk, The Cloud, Digital Identity, and Data Security, Legal Issues in Cloud Computing.	Security issues	Practical Assignments			

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SOPHIA GIRL'S COLLEGE, AJMER (*AUTONOMOUS*)
IMSc Semester VII (2022-23)
Cloud Computing

Max. Marks :70Min. Marks: 30

Credit: 04

SEM I Month	UNIT/TOPIC	Concepts/facts	Teaching Pedagogy	Learning Outcomes	Questions	Marks Weightage (%)
SEM I JULY	Unit I Introduction, Layers and Types of Clouds, Desired Features of a Cloud, Cloud Infrastructure Management	Introduction to Cloud computing	PPT	Define cloud computing and identifying various service models.	*Knowledge Based* -What is Cloud in Cloud Computing? -Describe Service Models *Understanding Based* -Apply VM Systems in actual cloud implementation. - Outline Cluster as a service *Higher Order Thinking Skills Based* -Validate Hybrid cloud implementation -Plan a security model for cloud computing.	Knowledge--40 Understanding-35 Higher Order-25
	Infrastructure as a Service(IaaS), Platform as a Service Providers(PaaS), Software as a Service (SaaS), Challenges and Risks.	Service Models	PPT, Charts,			
AUGUST	Unit II Virtual Machines, Distributed Management of Virtual Infrastructures, Scheduling Techniques for Advance Reservation of Capacity	IaaS	PPT, Charts, Diagrams	Demonstrate various technologies related to IAAS. Manage virtual infrastructure in distributed environment.		
	Mobile Computing: Mobile Cluster as a Service, Cloud Storage, Technologies for Data Security in Cloud Computing.	CAAS	Assignments			

SEPTEMBER-OCTOBER	Unit III Technologies and Tools for Cloud Computing, Aneka Cloud Platform, Hybrid Cloud Implementation, Comet Cloud, Autonomic Behavior of Comet Cloud.	PaaS	PPT	Employ PAAS platforms like Aneka and Comet Cloud.		
	An Introduction to the Data Security, Cloud Computing and Data Security Risk, The Cloud, Digital Identity, and Data Security, Legal Issues in Cloud Computing.	Security issues	Practical Assignments			

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SESSION 2022-23

COURSEPLAN

S.No.	Class	Semester	Paper
1	VCA	II	Computer Fundamentals - II
2	BCA	IV	Operating System
3	BCA	VI	C # Programming
4	M.Sc.	II	Image Processing

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VCA Semester II (2022-23)

Computer Fundamentals – II

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

SEM II Month	UNIT/TOPIC	Concepts/facts	Teaching Pedagogy	Learning Outcomes	Questions	Marks Weightage (%)
SEM II Dec	Unit I Introduction to memory, classifications, random-access memory, volatile memory, non-volatile memory, flash memory, read-only memory, secondary memory, the cache memory, auxiliary storage memory	Computer Memory	PPT	Identify computer memory according to its accessibility and hardware	*Knowledge Based* Define computer memory *Understanding Based* Difference between volatile and non-volatile storage *Higher Order Thinking Skills Based* Design a data warehouse model	Knowledge--50 Understanding-35 Higher Order-15
Jan	memory hierarchy, storage device, magnetic tape, magnetic disk, floppy disk, hard disks, CD, DVD, magneto-optical.	Storage Devices	Hardware assignments			
	Unit II Number system: binary, octal, hexadecimal, addition, subtraction, multiplications. Computer code: BCD, ASCII, EBCDIC code, Excess-3 code, gray code, logic gates and Boolean algebra representation and simplifications by k Map	Number system & Codes	Numerical questions	Convert values in different number systems		
Feb	Introduction to Data warehouse, components of a data warehouse, different	Data warehouse	PPT			

	methods of storing data in a data warehouse, advantages of using data warehouse.					
March	Unit III Software: System software, application software, programming software. Computer Viruses: Introduction, history, types of computer viruses, classification of viruses, symptoms of a computer virus, & ways to catch a computer virus.	Software and its types	Installation Assignments	Generalize the software according to their uses		
	Introduction of Internet, history, TCP / IP & UDP, application protocol, world wide web, how the web works, web standards, website, overview, types of websites, electronic mail, e-mail header, saved message file extension, messages and mailboxes, introduction to intranet, uses, advantages, disadvantages.	Internet & web	Web based Assignments			

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BCA Semester IV (2022-23)

Operating System

Max. Marks :70 (70Ext; 30 Int) Min. Marks: 40(28 Ext;12 Int) Credit: 04

SEM IV Month	UNIT/TOPIC	Concepts/facts	Teaching Pedagogy	Learning Outcomes	Questions	Marks Weightage (%)
SEM IV Dec	Unit I Introduction to Operating Systems, goals of OS, Operations of OS, Classes of OS, batch processing, resident monitor, job control language, buffering, spooling	OS Basics	PPT	Understand the structure and functionalities of an OS	*Knowledge Based* Define OS structure *Understanding Based* Difference between various Operating Systems *Higher Order Thinking Skills Based* Design a Process management model	Knowledge--50 Understanding-35 Higher Order-15
Jan	multiprogramming.Multi-processing, time sharing, distributed, real time systems, system calls, structure of OS, layer design of DOS, Unix structure.	Classification	OS Simulator assignments			
	Unit II Process Management: Process concept, Process scheduling, Cooperating processes, Threads, Inter-process communication, Process scheduling, fundamental of scheduling, scheduling criteria, long medium short term scheduling	Process Management	OS Simulator assignments	Apply scheduling algorithms		
Feb	Priority, Round Robin	Deadlocks	Numerical			

	Process Synchronization and Deadlocks: The Critical-Section problem, Semaphores, Monitors		assignments			
March	Unit III Storage management: Memory Management-Logical versus physical address, swapping, contiguous allocation, fragmentation, Compactation, paging,segmentation, page replacement algorithm, virtual memory, virtual memory with paging, demand paging. Thrashing.	Storage management	PPT	Understand concept of memory management and to handle deadlock		
	Deadlocks-System model, Characterization, Deadlock prevention, Avoidance and Detection, Combinedapproach to deadlock handling.	Deadlock prevention	OS Simulator assignments			

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BCA Semester VI (2022-23)

C # Programming

Max. Marks :70 (70Ext; 30 Int) Min. Marks: 40(28 Ext;12 Int) Credit: 04

SEM VI Month	UNIT/TOPIC	Concepts/facts	Teaching Pedagogy	Learning Outcomes	Questions	Marks Weightage (%)
SEM VI Dec	Unit I C# : Evolution, History & Overview. Fundamentals of C#: Identifiers, Keywords, Literals, Punctuators, Operators. Data Types : Value Type & ReferenceType. Expressions: Implicit & Explicit Conversion (Boxing & Unboxing).	Data types	PPT	Understand and apply concept and features of C#	*Knowledge Based* Define C# operations *Understanding Based* Difference between branching and iteration *Higher Order Thinking Skills Based* Design an OOP model	Knowledge--50 Understanding-35 Higher Order-15
Jan	Program Flow Controls: Decision Control -(if, if – else, Nesting), Switch, Ternary. Loop – (while, do-while, for, foreach, Nesting). break, continue, goto statements. User Defined Data Types: Arrays (Single, Multi & Jagged), Structure &Enum	Branching & Looping	Programming assignments			
	Unit II Class: Structure of Class, Objects, Class Modifiers (private, public, protected, internal, protected internal, abstract, sealed) Constructors	OOP	Programming assignments	Know the concept of OOP Features		

	(default, parameterized, Copy), Destructor. This reference, Static, Constant and Readonly members					
Feb	Methods: Parameter Passing (Value, Reference, Params). Inheritance, Polymorphism, Interfaces: Concept, Types, Modifiers (Virtual, Override, New).	Inheritance	Programming assignments			
March	Unit III Method Overloading, Operator Overloading. Properties, Indexers, Delegates: Single Cast delegate, Multi Cast delegates, Passing delegate as parameter. Events: Concept &Declaration, Event Handlers.	Delegates	Programming assignments	Handle events and errors occurring in the system		
	Errors & Exceptions: Types of Errors, Try-Catch, Nested Try blocks, Throwing own exceptions, Multithreading: Creating & Starting a Thread, Scheduling, Synchronization.	Error handling	Programming assignments			

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MSc CS Semester II (2022-23)

Image Processing

Max. Marks :70 (70Ext; 30 Int) Min. Marks: 40(28 Ext;12Int) Credit: 06

SEM II Month	UNIT/TOPIC	Concepts/facts	Teaching Pedagogy	Learning Outcomes	Questions	Marks Weightage (%)
SEM II JAN	Unit I Introduction and Digital Image Fundamentals Digital Image Fundamentals, Human visual system, Image as a 2D data, Image representation – Gray scale and Color images, image sampling and quantization Image enhancement in Spatial domain: Basic gray level Transformations, Histogram Processing Techniques, Spatial Filtering, Low pass filtering, High pass filtering	Digital Images	PPT	Apply knowledge of mathematics for image understanding and analysis	*Knowledge Based* Define a digital image as 2D data *Understanding Based* Difference between various filtering techniques *Higher Order Thinking Skills Based* Design an image restoration model	Knowledge--50 Understanding-35 Higher Order-15
	Filtering in the Frequency Domain: Preliminary Concepts, Extension to functions of two variables, Image Smoothing, Image Sharpening, Homomorphic filtering	Filtering	Numerical assignments			
FEB	Unit II Image Restoration and Reconstruction: Noise Models, Noise Reduction, Inverse	Image Restoration	MATLAB assignments	Design and analysis of techniques /		

	Filtering, MMSE (Wiener) Filtering Color Image Processing: Color Fundamentals, Color Models, Pseudo color image processing			processes for image understanding		
	Image Compression: Fundamentals of redundancies, Basic Compression Methods: Huffman coding, Arithmetic coding, LZW coding, JPEG Compression standard	Image compression	MATLAB assignments			
MARCH-APRIL	Unit III Morphological Image Processing: Erosion, dilation, opening, closing, Basic Morphological Algorithms: 04 08 hole filling, connected components, thinning, skeletons	Morphological Image Processing	MATLAB assignments	Design, realize and troubleshoot various algorithms for image processing case studies		
	Object Recognition and Case studies Object Recognition-patterns and pattern classes, recognition based on decision – theoretic methods, structural methods, case studies – image analysis Application of Image processing in process industries	Object Recognition	MATLAB assignments			

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