Sophia Girls' College (Autonomous), Ajmer

Department of Computer Science

Course Plan

Ms. Bhawana Kumawat

Course Plan
Session 2022-23
(Odd Semester)

S.No.	Class	Semester	Paper
1	BCA	I	BCA-101: Computer Fundamentals
2	IMSC	VII	IMSC-704(A): Internet Of Things
3	M.Sc.	III	M.Sc.- 304 (A) Artificial Intelligence
4	VCA	I	VCA-101: Computer Fundamentals-I

2022-23

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BCA (SEMESTER - I) 2022-23

BCA – 101 Computer Fundamentals

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

Min. Marks: 40 (28 Ext;12 Int) Credits : 4

COURSE PLAN

SEM I Month	UNIT/TOPIC	Concepts/facts	Teaching Pedagogy	Learning Outcomes	Questions	Marks Weightage (%)
AUGUST	Introduction to Computer: Definition, Characteristics, Classifications of computer on the basis of size and speed, Generation of computers, Applications of Computer	Introduction to Computer	PPT,practice exercise, assignments,blended learning	Describe the computer system and identify its types.	*Knowledge Based* -Define Computer System. -Illustrate the different types of Computer.	Knowledge—60 Understanding-30 Higher Order-10
SEPTEMBER	Input Devices: keyboard, mouse, track ball, touch pad, joystick, touch sensitive screens, pen based systems, digitizer, data scanning devices, bar code readers, optical mark readers, flatbed scanner	Input Devices	PPT, Charts, assignments, group discussions			

OCTOBER	Output Devices: Hard copy devices: Printer (impact printers) dot matrix printer, (non-impact printers) inkjet, laser printer, Computer Display:Introduction to CRT Monitor, Plasma display, Projection display. Introduction to memory:memory hierarchy volatile memory, non-volatile memory, random-access memory, read-only memory, secondary memory, the cache memory, registers, flash memory. Storage device: magnetic tape, magnetic disk, hard disks, CD, DVD	Hard Copy Devices and Computer Storage	PPT, Device Presentation, Group discussions PPT, Videos, Problem solving activities	Illustrate the use of different I/O devices.	*Understanding Based* -Compare the Analog and digital computing technology. -Classify the computers on the basis of applications.	
NOVEMBER	Computer Viruses: Introduction, types of computer viruses Introduction to Internet: Network, Client and Server, Introduction of World Wide Web (www), Hypertext transfer protocol (http), Uniform Resource Locater (URL), Domain Name System (DNS), Internet Service Provider (ISP), web Browsers and email. E-learning: Online learning, Massively Open Online Courses (MOOCs), Asynchronous learning, Synchronous learning, Learning management systems, Online credentials.	Output devices and Introduction to E learning	PPT, Device Demonstration,group discussuions, Practical Implementation,Presentation by students	Categorize different computer viruses on the basis on operation and establishes basic understanding of the internet.	*Higher Order Thinking Skills Based* -Justify the keyboard as primary input device. -Critically Evaluate the touch screen technology	

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IMSC (SEMESTER VII) 2022-23

IMSC–704(A) : Internet of Things

Max. Marks :100 (70Ext; 30 Int) Min. Marks: 40 (28 Ext;12 Int) Credits : 4

COURSE PLAN

SEM VII Month	UNIT / TOPIC	Concepts / Facts	Teaching Pedagogy	Learning Outcomes	Questions	Marks Weightage (%)
JULY	Introduction to IoT: Definition, and characteristics of IoT, Genesis of IoT, IoT and Digitization, Design ofIOT: Physical design of IOT, Logical Design of IOT- Functional Blocks, communication models, communication APIs, IOT enabling Technologies- Wireless Sensor Networks, Cloud computing, big data analytics, embedded systems. IOT Levels and deployment templates.	Ecosystem of IoT, Design of IoT, Technologies in IoT	PPT, Worksheet, MCQ'S, Group discussion	Compare and contrast the deployment of smart objects and the technologies to connect them to network.	Knowledge Based Define IoT . Explain Levels of IoT and its deployment Template.	
AUGUST	IoT Hardware and Software: Sensor and actuator, Humidity sensors, Ultrasonic sensor, Temperature Sensor, Arduino, Raspberry Pi, LiteOS, RIoTOS, Contiki OS, Tiny OS Architecture and Reference Model: Introduction, Reference Model and architecture, Representational State Transfer (REST), architectural style, Uniform Resource Identifiers (URIs).	IoT Devices, Architecture of IoT	PPT, Practical Implementation MCQ's, assignments, group discussion	Appraise the role of IoT protocols for efficient network communication.	Understanding Based	Knowledge—40 Understanding-35 Higher Order-25

SEPTEMBER	IP as the IoT Network Layer, The Business Case for IP, the need for Optimization, Optimizing IP for IoT, Profiles and Compliances, Application Protocols for IoT, The Transport Layer, IoT Application Transport Methods Data and Analytics for IoT, An Introduction to Data Analytics for IoT, Machine Learning, Big Data Analytics Tools and Technology, Edge Streaming Analytics, Network Analytics, Securing IoT	Networking in IoT, Data Analytics of IoT, Analytics Tools	PPT, Quiz, practical implementation	Elaborate the need for Data Analytics and Security in IoT.	Explain Architecture of IoT. Describe various protocols used in different Layers of IoT.	
OCTOBER	A Brief History of OT Security, Common Challenges in OT Security, How IT and OT Security Practices and Systems Vary, Formal Risk Analysis Structures: OCTAVE and FAIR, The Phased Application of Security in an Operational Environment IoT Physical Devices and Endpoints - Arduino UNO: Introduction to Arduino, Arduino UNO, Installing The Software, Fundamentals of Arduino ProgrammingIoT Physical Devices and Endpoints - IoT Physical Devices and Endpoints - RaspberryPi: Introduction to RaspberryPi, About the RaspberryPi Board: Hardware Layout, Operating Systems on RaspberryPi, Configuring RaspberryPi, Programming	Security in IoT, Implementation of various IoT devices with Arduino software.	Practical Implementation	Illustrate different sensor technologies for sensing real world entities	Higher Order Thinking Skills Based Optimize IP for IoT Implementation of	

	RaspberryPi with Python, Wireless Temperature Monitoring System Using Pi, Temperature Sensor, Connecting Raspberry Pi via SSH, Accessing Temperature from DS18B20 sensors, Remote access to RaspberryPi, Smart and Connected Cities, An IoT Strategy for Smarter Cities, Smart City IoT Architecture.			and identify the applications of IoT in the Industry.	different sensors.	

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M.Sc. (SEMESTER III) 2022-23

M.Sc. – 304(A): Artificial Intelligence

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

Min. Marks: 40 (28 Ext;12 Int) Credits : 4

COURSE PLAN

SEM III Month	UNIT / TOPIC	Concepts / facts	Teaching Pedagogy	Learning Outcomes	Questions	Marks Weightage (%)
SEPTEMBER	Definition of AI, Applications of AI, knowledge-based systems, representation of knowledge, Organization and acquisition of knowledge. State space, Production system and its components, problem characteristics, production system characteristic.	Concepts of artificial intelligence, machine learning and deep learning, Techniques to represent knowledge in knowledge base.	PPT, Practical Implementation, Hands- on Exercise, group discussion	Understand basic principles and application of AI	Knowledge Based Define Artificial Intelligence. What are search problems in AI?	Knowledge—50 Understanding-35 Higher Order-15
OCTOBER	Problems (8-Puzzle problem, Tower of Hanoi, Cannibals and Missionaries and Travelling Salesman Problem) Search problems: DFS, BFS, Heuristics Search (Generate and test, Greedy or Best First search).	Problems in Artificial Intelligence, Search Problems in Artificial Intelligence	PPT, Practical Implementation, Hands - on Exercise, problem solving activities	Solve various problems by applying a suitable search method	Understanding Based What are syntax and semantics of propositional logic? Comparison of Artificial Intelligence, Machine Learning,	

NOVEMBER	Syntax, semantics of propositional logic, syntax and semantics of FOPL, conversion to clausal form. Inference rule, resolution principles. Non-deductive inference methods, truth maintenance system, fuzzy logic, Bayesian probabilistic inference, associative networks, frame networks	Propositional logic, Fuzzy logic, Associative networks, Frame networks	PPT, Practical Implementation, practice Exercise, problem solving activities	Understand key concept of learning	Deep Learning. Explain the concept of Leaning in Artificial Intelligence.	
DECEMBER	Concept of learning: Inductive and deductive, rote learning, Components of Learning Model, Performance Measures, Types of Learning (Supervised, Unsupervised, Active & Reinforcement). Concept of expert system, need for an expert system, Characteristics & features of an expert system, Components of an expert system, Stages in the development of an expert system, Application areas of Expert System.	Concept of Learning in AI, Concept of Expert System	PPT, Practice on Exercise, problem solving activities	Develop Skills to Plan an expert system for specific domain	Higher Order Thinking Skills Based Explain all the Problems(8-puzzel problem, missionaries and ccannibles problem, Explain Best First search and A* algorithm with real life example.	

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

V.C.A. – 101: Computer Fundamentals- I

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

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

COURSE PLAN

SEM I Month	Unit / Topic	Concepts / facts	Teaching Pedagogy	Learning Outcomes	Questions	Marks Weightage (%)
AUGUST	Introduction to Computer: Definition, Block Diagram, Characteristics, Classifications of computer on the basis of size and speed, Generation of computers, Applications of Computer	Introduction to Computer	PPT, practice exercise, assignments, blended learning	Describe the computer system and identify its types.	*Knowledge Based* Define Computer System. -Illustrate the different types of Computer. *Understanding Based* -Compare the Analog and digital computing technology. -Classify the computers on the basis of applications.	Knowledge--60 Understanding-30 Higher Order-10
SEPTEMBER	Input Devices: keyboard, mouse, track ball, touch pad, joystick, touch sensitive screens, pen based systems, digitizer, data scanning devices, bar code readers, optical mark readers.	Input Devices	PPT, Charts, assignments, group discussions	Illustrate the use of different Input devices.		
OCTOBER	Flatbed scanner , Drum Scanner, Handheld Scanner.Optical recognition System, Optical Character Reader. Output Devices: Hard copy devices: Printer (impact printers) dot matrix printer	Scanner, Hard Copy Devices	PPT, Device Presentation, Group Discussions			

NOVEMBER	Non-impact printers- inkjet, laser printer, Computer Display: Introduction to CRT Monitor, Plasma display, Projection display.	Non- Impact Printers, Soft Copy Devices	PPT, Videos, problem solving activities	Illustrate the use of different Output devices.	*Higher Order Thinking Skills Based* -Justify the keyboard as primary input device. -Critically Evaluate the touch screen technology	

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Course Plan

Session 2022-23

(Even Semester)

S.No.	Class	Semester	Paper
1.	BCA	IV	BCA - 401: E Commerce
2.	VCA	II	VCA - 201: Computer Fundamentals – II
3.	M.Sc. Chemistry	II	MSCHEM – 204 Programming in Chemistry

2022-23

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

B.C.A (SEMESTER IV) 2022-23

BCA-401 – E Commerce

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

Min. Marks: 40 (28 Ext;12 Int)

COURSE PLAN

SEM IV Month	UNIT/TOPIC	Concepts/facts	Teaching Pedagogy	Learning Outcomes	Questions	Marks Weightage (%)
DECEMBER	• Introduction to E Commerce • Different terminologies related to E Commerce • Different platforms available on E Commerce for Business	• Understanding the basic terminologies. • Understanding the need and importance of E Commerce platform for business	PPT	Understand the impact of Ecommerce platform.The growth and need of ECommerce	*Knowledge Based* What is E Commerce? *Understanding Based* Define E Ecommerce Explain difference between traditional and Non Traditional Business.	Knowledge--60 Understanding-30 Higher Order-30
JANUARY	• Impact • Advantages • Disadvantages	• Understanding the impact of Ecommerce on our daily life and business • Understanding the advantages and disadvantages of E Commerce	PPT	Able to code differentiate between the advantages and disadvantages of E Commerce		

FEBRUARY	• Anatomy of E Commerce • Different Business Models	Understand the anatomy of E Commerce. Understand the basic Business Models of E Commerce and their working style. The advantages and disadvantages of various Ecommerce business models	PPT, Quiz	Understand the various models working on ecommerce models and their working. Understanding the basics of E Commerce Anatomy	*Higher Order Thinking Skills Based* Difference Advertising and Information Model. Difference between B2B and B2C Model. Explain how EDI systems work and their importance in modern business.	
MARCH	• E Payment Systems • Threat to different E Payment Systems • EDI	Understanding the various E Payment systems available to customers. Advantages and disadvantages of various E Commerce platforms.	PPT	Understand what is EDI and various Payment systems. Their advantages and disadvantages.		

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VCA SEM II (2022-23)

Computer Fundamental-II

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

COURSE PLAN

SEM II Month	UNIT/TOPIC	Concepts / Facts	Teaching Pedagogy	Learning Outcomes	Questions	Marks Weightage (%)
DECEMBER	Introduction to memory, classifications, random-access memory, volatile memory, non-volatile memory, flash memory, read-only memory, secondary memory, the cache memory,	Understand various types of memory	PPT, assignments	Identify computer memory according to its accessibility and hardware	*Knowledge Based* What is memory? Define flash memory? *Understanding Based* Explain logic gates? *Higher Order Thinking Skills Based* Give the classification of virus?	Knowledge--40 Understanding-35 Higher Order-25
JANUARY	auxiliary storage memory, memory hierarchy, storage device, magnetic tape, magnetic disk, floppy disk, hard disks, CD, DVD, magneto-optical		Programming Assignments, assignments, group discussion			
FEBRUARY	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 .	Concept of number system, logic gate	Programming Assignments. assignments, group discussions, quizzes	Convert values in different number systems		

MARCH	Introduction to Data warehouse, components of a data warehouse, different methods of storing data in a data warehouse, advantages of using data warehouse.	Methods to store data in data warehouse	Programming Assignments, quiz, blended learning			

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SOPHIA GIRL'S COLLEGE, AJMER (AUTONOMOUS)

M.Sc. Chemistry (Previous) 2022-23

SEMESTER - II

MSCCHE – 204 Programming in Chemistry

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

COURSE PLAN

SEM - II Month	UNIT / TOPIC	Concepts/facts	Teaching Pedagogy	Learning Outcomes	Questions	Marks Weightage (%)
JANURARY	Introduction to Computer: Definition, Block Diagram, Hardware. Software & its types. Introduction to Language & its Types, Compilation and Execution.'C' Language: Character Set, Tokens- Keywords, Variables, Constants, Operators, Expressions. DataTypes, Type Conversion (implicit & explicit),	Understand the concepts of Programming Logics & Techniques its source and usage & characteristics of 'C' Language	PPT, Match the following, Demonstration, group discussion,	Identify terminology associated with the concepts, techniques, and processes used throughout the 'C' Programming Language	*Knowledge Based* Define Compiler & Interpreter List operators used in 'C' Language *Understanding Based* Which function is best suitable to take input from the user and why? Give comparison between Decision Control & Loop Control statements	Knowledge--60 Understanding -30 Higher Order-10
FEBURARY	Input Output Instructions (printf, scanf, getch, getchar, gets, putch, putchar, puts). Arithmetic Instructions: Hierarchy, Priority and Associativity of Operators. Control Instructions: Decision Control (Statements and blocks- if, if-else, conditional operator) nesting.	List the ways of data printing on the screen & Taking input from the user, different operators of 'C' Language	PPT, Practical Implementation, E content	Get familiar with basics input output & Operators of 'C' Language.		

MARCH	Loop Control (Statements and blocks- while, for, do-while, Nesting Loops), Case Control- (Statements and blocks- switch-case,), break, continue, goto statements. Arrays:- Concept of Arrays, One dimensional array &Two dimensional array, Storage strategy, Array Initialization, Memory Map of One Dimensional &Two dimensional Array, Operations on Arrays, Sorting – Selection Sort, Bubble Sort	Lists utility and implementation of Control Instructions Understanding different types of arrays, how arrays can save memory and different operations of array	PPT, Practical Implementation, group discussion	Able to create / write various control instructions & Arrays	*Higher Order Thinking Skills Based* Can creation of multi dimensional arrays help in managing the large amount of data systematically? Justify with example. Write a 'C' program to print a pyramid on the screen	
APRIL	Functions (Structure and Block):- Declaration, Calling (Call by value, Call by reference), Definition of functions, Recursion, Storage Class (auto, static, register, extern), Scope rules (Local, Global). Pointers:- Pointers and addresses, Pointers as Function arguments, Address Arithmetic. Structures: Basics, Structures Variables, Arrays of Structures Variables, Pointers Structure Variable.	Types of functions & their use Utility of Storage Classes & Pointers	PPT, Practical Implementation quiz, group discussion	Acquire knowledge and skills for creation of Functions & Structures		

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