SAVITRIBAI PHULE PUNE UNIVERSITY

SYLLABUS

B.Sc. Computer Hardware and Network Administration (CHNA)
(FOR AFFILIATED COLLEGES)

FACULTY OF SCIENCE AND TECHNOLOGY

UNDER NATIONAL EDUCATION POLICY
(NEP 2020)

TO BE IMPLEMENTED FROM
ACADEMIC YEAR 2024-25

Computer Hardware and Network Administration

Preamble:

The systematic and planned curricula from first year to the third year shall motivate and encourage the students for gaining expertise in computer maintenance and Network administration and for becoming an entrepreneur.

Titles of Papers and Scheme of Study Evaluation

F.Y.B.Sc. Computer Hardware and Network Administration (CHNA)

Sem	Paper Code	Paper	Paper Title	Credits	Lectures/Week		Evaluation		
					Theory	Pract.	CA	UE	Total
I	CHNA-101	I	Essentials of Computers-I	2	2	-	15	35	50
	CHNAP-102	II	CHNA Lab-IA	2	-	4	15	35	50
II	CHNA-151	I	Basics of C programming-I	2	2	-	15	35	50
	CHNAP-152	II	CHNA Lab-IB	2	-	4	15	35	50

S.Y.B.Sc. Computer Hardware and Network Administration (CHNA)

Sem	Paper Code	Paper	Paper Title	Credits	Lectures/Week		Evaluation		
					Theory	Pract.	CA	UE	Total
III	CHNA-201	I	Essentials of Computers-II	2	2	-	15	35	50
	CHNAP-202	II	CHNA Lab-IIA	2	-	4	15	35	50
IV	CHNA-251	I	Basics of C programming-II	2	2	-	15	35	50
	CHNAP-252	II	CHNA Lab-IIB	2	-	4	15	35	50

Semester I, Paper I:
CHNA- 101: Essentials of Computers

(2 Credits, 30 lectures)

Semester I   **Theory Lectures: 30**

Learning Objective:

1. *To understand importance of CPU.*
2. *To understand working of different parts in computer system*
3. *To understand different aspect the hardware of computer system*

Learning outcomes:
After completion of this course student will be able:

1. *To understand evolution of computers.*
2. *To understand the working of different Hardware parts of Computer*
3. *To understand the working of input and output devices of Computer*
4. *To understand working of CPU.*

Unit 1: Introduction and Overview of System

Functional Block Diagram, History, Generations of computer, CPU Cabinet: Power supply, SMPS, Motherboard, CPU, Cables and connectors, Main and auxiliary memory, Front and rear panel study.

Unit 2: Input Output Devices

Input devices: wired /wireless Keyboard, Mouse, Joystick, Scanner, Digitizers, Light pen, Touch screen, Barcode Scanner Camcorder. Output devices: Monitor (CRT, LCD/ LED Panel,) Printer: Dot Matrix, Inkjet, LASER, Thermal, Plotter, Barcode Printers, Sound devices (Speaker, Bluetooth, dongle)

Unit 3: Central Processing Unit

Microprocessor as CPU, General block diagram of CPU, CPU bus system, Packing, Cooling, Sockets and slots, Comparative study of Microprocessor's features with evolutions, Microprocessor Operations: Instruction Cycle, Data fetch, Address Decoding, Classification of Interrupts, Input Output Techniques, Introduction to multi-core processors, Device Controllers: Concept of DMA, DMA Transfer, DMA controller

Text books and reference books:

1. Computer Fundamentals, P. K. Sinha
2. Upgrading and Repairing of PCs, Scott Muller
3. IBM PC and Clones, B. Govindrajalu
4. Microprocessor and Interfacing, D. V. Hall
5. Microprocessor X 86 Programming, Venugopal
6. Computer Motherboard Testing and Fault finding, S. K. Gupta
7. PC Hardware (A+ Certificate guide), Mike Mayer
8. PC Hardware interfaces, Michael Gook

Semester I, Paper II:
CHNAP- 102: CHNA Lab-IA

(2 Credits)

Semester I   **Practicals: 15**

The practical course consists of **15 experiments** out of which two will be preparatory experiments. These will be evaluated in an oral examination for 15% marks at internal and external semester examination. **Each Practical batch will have maximum 15 students.**

Preparatory Experiments: (Minimum 2)

1. *Site Preparation, Electrical Connections and use of Maintenance kit.*
2. *Connecting Keyboard, Mouse, Printer, Scanner, Multimedia components and make it working.*
3. *Study of Various computer operating systems (Min-2).*

List of Practical's (Minimum 13):

1) Identifying the peripherals of a computer.
2) To identify the front panel indicators and switches and rear side connector in computer System.
3) Study of SMPS.
4) Identification of cables, connectors and tools.
5) Assembly and disassembly of computer.
6) Creation bootable USB flash drive.
7) Preparation of CMOS setup for Windows installation using USB flash drive.
8) Installation of Windows 8/10.
9) Installation of device drivers for External devices.
10) Network troubleshooting & PING test, ipconfig etc
11) Printer installation, servicing and troubleshooting.
12) Installation of office 2010/2013/2016.
13) Practical based on MS Word.
14) Practical based on MS Excel.
15) Practical based on Power Point.
16) DOS based practical Internal External commands (Only Demo).
17) Study of BIOS and POST Sequence (Only Demo) and Standard CMOS setup for different configuration.

Semester II, Paper I:
CHNA- 151: Basics of C programming-I

(2 Credits, 30 lectures)

Semester II   **Theory Lectures: 30**

Learning Objective:

1. *To understand fundamentals of C language.*
2. *To develop algorithm for problem solving and writing programs.*
3. *To learn to use functions, arrays, and pointers in C language.*
4. *To study different types of algorithm.*

Learning outcomes:
After completion of this course student will be able:

1. *To develop a C program*
2. *To control the sequence of the program and give logical outputs*
3. *To apply code reusability with functions and pointers.*
4. *To manage I/O operations in your C program.*

Unit 1: Algorithms   [8]

Algorithm definition, properties of algorithm, sorting algorithm, Bubble sort algorithm, selection sort algorithm, Insertion sort algorithm, quick sort algorithm, linear search algorithm and Binary search algorithm.

Unit 2: C- Fundamentals   [10]

Introduction, character set, constants and variables, Key words, Symbolic constant, statements, entering and executing C program, input and output simple and formatted functions, operators and expressions, control structures and loops and programming examples.

Unit 3: Functions, Arrays and Pointers   [12]

Defining a function, Accessing a function, function prototype, passing argument, recursion e.g. Defining and processing of an array, passing array to a function, Pointers declarations, passing pointers to a function, operations of Pointers, pointers as function parameters and programming examples.

Recommended Books:

1. J. Jayasri, The 'C Language Trainer with C Graphics and C++ WILEY
2. Byron. S. Gottfried, Schaum's Outline of Programming with C TMH
3. E Balaguruswamy, Programming in –C BPB
4. Stephens Cochan, Programming in C Prentice hall of India Ltd
5. V. Rajaraman, Computer Programming in C Prentice hall of India Ltd.
6. Madhusudan Mothe, C for Beginner shroff / the x team reprints

CHNAP- 152: CHNA Lab-IB

(2 Credits)

Semester II   **Practicals: 15**

The practical course consists of **15 experiments** out of which two will be preparatory experiments. These will be evaluated in an oral examination for 15% marks at internal and external semester examination. **Each Practical batch will have maximum 15 students.**

List of Practical's (Minimum 15):

1) Write a C program to study *printf* and *scanf* functions.
2) Write a C program to print pyramid.
3) Write a C program to calculate the percentage of 5 subjects.
4) Write a C program to perform logical operations.
5) Write a C program to define read number odd/even.
6) Write a C program to study nested if-else.
7) Write a C program to convert Celsius to Fahrenheit.
8) Write a C program to add two arrays and store result in another array.
9) Write a C program to convert binary number to decimal number.
10) Write a C program to convert decimal number to binary number.
11) Write a C program to sort array in ascending/descending order.
12) Write a C program to find smallest / largest number from array.
13) Write a C program to find n prime numbers.
14) Write a C program to find Fibonacci series of length n.
15) Write a C program to find Factorial of n using recursive function.
16) Write a C program to study call by reference using pointer.
17) Write a C program to check palindrome number.