

SCHEME & SYLLABUS
One Year Diploma Course
in
PC Hardware and Networking



Department of Computer Science & Engineering

UIET

Sant Baba Bhag Singh University

2020

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SEMESTER- I

I. Theory Subjects

S No.	Subject Code	Subject Name	Contact Hours (L:T:P)	Credits (L:T:P)	Total Contact Hours	Total Credit Hours
1	CHN101	Fundamental Of Computer Hardware	5:0:0	5:0:0	5	5
2	CHN103	Software and Hardware Installation	5:0:0	5:0:0	5	5
3	CHN105	Basics of Computer Networks	5:0:0	5:0:0	5	5
4	CHN107	Communication Skills-I	5:0:0	5:0:0	5	5
5	CHN109	Fundamentals of Computer Technology	5:0:0	5:0:0	5	5

I. Practical Subjects

S No.	Subject Code	Subject Name	Contact Hours (L:T:P)	Credits (L:T:P)	Total Contact Hours	Total Credit Hours
1	CHN111	Software and Hardware Installation Lab	0:0:10	0:0:5	10	5

Total Credits: 30

Total Contact Hours: 35

SEMESTER- II

I. Theory Subjects

S No.	Subject Code	Subject Name	Contact Hours (L:T:P)	Credits (L:T:P)	Total Contact Hours	Total Credit Hours
1	CHN102	Advanced Computer Networks	5:0:0	5:0:0	5	5
2	CHN104	Office Automation	5:0:0	5:0:0	5	5
3	CHN106	Basics of SQL Programming	5:0:0	5:0:0	5	5
4	CHN108	Communication Skills-II	5:0:0	5:0:0	5	5
5	CHN110	Basics of Operating System	5:0:0	5:0:0	5	5

I. Practical Subjects

S No.	Subject Code	Subject Name	Contact Hours (L:T:P)	Credits (L:T:P)	Total Contact Hours	Total Credit Hours
1	CHN112	Project in Hardware and Networking	0:0:10	0:0:5	10	5

Total Credits: 30

Total Contact Hours: 35



*First
Semester*

Course Code	CHN101
Course Title	Fundamental Of Computer Hardware
Type of Course	PC
L T P	5 0 0
Credits	5
Course Prerequisites	NA
Course Objectives (CO)	To learn basic concepts of Computer Hardware, Input, output devices

SYLLABUS

UNIT -I

Introduction to Computer Hardware, Objective, Anatomy of a Computer, Input Devices, Output Devices, Display Devices, Storage Devices, Types of Computer.

UNIT-II

Function of Speakers and Mice, brief principle, types, interfaces, connectors, cable; Function of serial port, parallel port, brief principle of communication through these ports, types of devices that can be connected, interface standards, connectors, cable; Precaution to be taken while connecting/removing connectors from PC ports. Method of ensuring firm connection.

UNIT-III

Types of Processors and their specifications (Intel: Celeron, P4 family, Xeon, dual core, quad core, core 2 duo, i3,i5,i7 and AMD); Memory devices, types, principle of storing. Data organization 4 bit, 8 bit, word; Semiconductor memories, RAM, ROM, PROM, EMPROM, EEPROM, Static and dynamic; Precaution and care to be taken while dismantling Drives; Drive bay, sizes, types of drives that can be fitted. Precautions to be taken while removing drive bay from PC.

UNIT-IV

HDD, advantages, Principle of working of Hard disk drive, cylinder and clustered, types, capacity, popular brands, standards, interface and jumper setting. Drive components- hard disk platters, and recording media, air filter, read write head, head actuator, spindle motor, circuit board, sensor, features like head parking, head positioning, reliability, performances, shock mounting capacity. HDD interface IDE, SCSI-1/2/3 comparative study. Latest trends in interface Technology in PC and server HDD interface.

RECOMMENDED BOOKS			
Sr. no.	Name	AUTHOR(S)	PUBLISHER
1	Fundamentals of Computers	R. S. Salaria	Salaria Publishing House
2	Computer Fundamentals	P.K. Sinha and P. Sinha	BPB Publication
3	Absolute Beginners Guide to Computer Basics	Miller M	Pearson Education
4	Computer Organization and Design	David A Patterson and John L. Hennessy	Morgan Kauffmann Series
5	Computer Organization and Architecture	William Stallings	Pearson



Course Code	CHN103
Course Title	Software and Hardware Installation
Type of Course	PC
L T P	5 0 0
Credits	5
Course Prerequisites	NA
Course Objectives (CO)	Students will learn how to install and update window OS and other software.

SYLLABUS

UNIT-I

Software, Types of software. System software-OS, Compiler. Application software-like MS office. Functions of an operating system. Disk operating system, Window Operating system and its installation

UNIT-II

Concept of GUI, Modes of starting on different occasions; Desktop, Icon, selecting, choosing, drag and drop; My computer, network neighborhood/ network places; Recycle bin, briefcase, task bar, start menu, tool bar, and menus; Windows Explorer; Properties of files and folders; Executing application programs; Properties of connected devices; Applications under windows accessories; Windows Help; Finding files, folders, computers; Control panel. Installed devices and properties.

UNIT-III

Windows Update & Device Driver

Version of software, Service pack, Updating OS, Different configurations of Computer system and its peripherals, Compatible with different hardware/software.

Software Installation: Pre-installation - Prerequisites, Install procedure, Rollback or Uninstall procedure, Tests. Post-installation – Backup procedure & specifications, Restore procedure, Periodical view check. Awareness of legal aspects of using computers such as copyright, patent etc.

UNIT-IV

Installing Hardware Drivers

Driver, What hardware device drivers should be updated, Device manager, Computer Maintenance Tips and Tricks to Backup, Scan and Clean Power on self test, Peripheral diagnostics, general purpose diagnostics, Operating system diagnostics. Hardware boot process, Windows boot process.

RECOMMENDED BOOKS			
Sr. no.	Name	AUTHOR(S)	PUBLISHER
1	Advanced Computer Architecture	Kai Hawang	Tata McGraw Hill
2	A+ Guide to PC Hardware Maintenance and Repair, Volume 1	Michael W. Graves	Cengage Learning
3	Practical TCP/IP and Ethernet Networking	Deon Reynders, Edwin Wright	Newnes
4	A Practical Guide to Advanced Networking	Jeffrey S. Beasley, Piyasat Nilkaew	Pearson



Course Code	CHN105
Course Title	Basics of Computer Networks
Type of Course	PC
L T P	5 0 0
Credits	5
Course Prerequisites	NA
Course Objectives (CO)	To be familiar with various computer network architectures and to identify the infrastructure components, design infrastructure including devices, topologies and protocols.

SYLLABUS

UNIT-I

Introduction to Computer Networks – Advantages of Networking, Type of Networks – Local Area Networks (LAN), Metropolitan Area Networks (MAN), Wide Area Networks (WAN) and Internet, Ethernet, Wi-Fi, Bluetooth, Mobile Networking, Wire and wireless Networking. Difference between Intranet and Internet.

UNIT-II

Crimping & Punching

Communication Media & Connectors – Unshielded twisted-pair (UTP), shielded twisted-pair (STP), Fiber Optic and coaxial cable: RJ-45, RJ-11.

UNIT-III

Configuration of Data Communication Equipments

Network Components – Modems, Firewall, Hubs, Bridges, Routers, Gateways, Switches, Access point, etc. – their types, functions, advantages and applications.

IP Addressing & TCP/IP

Protocols, TCP/IP, FTP, Theory on Setting IP Address (IP4/IP6) & Subnet Mask, Classes of IP Addressing.

UNIT-IV

Other Network Protocols

Simple Mail Transfer Protocol (SMTP), File Transfer Protocol (FTP), Hyper Text Transfer Protocol (HTTP), Simple Network Management Protocol (SNMP Introduction to Network Security, Concept of Dynamic Host Control Protocol

Sharing Resource & Internet connection

Concept of Internet, DNS Server, Internet Access Techniques, ISPs and examples (Broadband/Dialup/ Wi-Fi), Concept of VIRUS and its Protection using Anti Virus, UTM and Firewall.

RECOMMENDED BOOKS

Sr. no.	Name	AUTHOR(S)	PUBLISHER
1	Data Communication and Networking: A Practical Approach	Massoud Moussavi	Cengage Learning
2	A Practical Guide to Advanced Networking	Jeffrey S. Beasley, Piyasat Nilkaew	Pearson
3	Practical TCP/IP and Ethernet Networking	Deon Reynders, Edwin Wright	Newnes



Course Code	CHN107
Course Title	Communication Skills--I
Type of Course	HS
L T P	5 0 0
Credits	5
Course pre-requisite	NA
Course Objectives	The objective of this course is to provide the students sufficient practice for speaking and writing English efficiently.

SYLLABUS

UNIT-I

Basics of Communication Skills:

Communication, Process of Communication, Types of Communication-Verbal and Non verbal communication, Channels of Communication- Upward, Downward, Horizontal, Barriers to Communication, Role of Communication in society.

UNIT-II

Listening Skills:

Listening Process, Hearing and Listening, Types of Listening, Effective Listening, Barriers of Effective Listening, Note Taking

Reading Skills:

Purpose of reading, Process of reading, reading skills Models and strategies, scanning, skimming, SQ3R, Approaches of Reading, Comprehension passages for practice.

UNIT-III

Writing Skills:

Purpose of writing, Effective writing, Types of writing, Business Correspondence, Precise writing, Memo writing, minutes of meeting.

UNIT-IV

Speaking Skills:

Speech process, Skills of effective speaking, Role of audience, Feedback Skill, Oral Presentation.

Text and Reference Books:

Sr No	Author(s)	Title	Publisher
1.	Bhupender Kaur	Effective Communication Skills	S.K. Kataria and Sons
2.	R. Datta Roy and K.K. Dheer	Communications Skills	Vishal Publishing Company
3	The Essence of Effective Communication	Ludlow and Panthon	Prentice Hall of India
4	Essentials of Business Communication	Pal and Rorualling	S. Chand and Sons. New Delhi



Course Code	CHN109
Course Title	Fundamentals of Computer Technology
Type of Course	ES
L T P	5 0 0
Credits	5
Course Prerequisites	Basics of computer and any high level language
Course Objectives (CO)	To familiarize the students of all branches in engineering with computer organization, operating systems, problem solving and programming in C++.

SYLLABUS

UNIT-I

Introduction to Computers: Define a Computer System, Block diagram of a Computer System and its working, associated peripherals, memories, RAM, ROM, secondary storage devices, Computer Software and Hardware.

Working Knowledge of Computer System and Office automation: Introduction to the operating system, its functions and types, working knowledge of GUI based operating system, introduction to word processors and its features, creating, editing, printing and saving documents, spell check, mail merge, creating power point presentations, creating spreadsheets and simple graphs

Problem Solving & Program Planning: Need for problem solving and planning a program; program design tools – algorithms, flow charts, and pseudo code; illustrative examples.

UNIT-II

Overview of C++ Language: Introduction to C++ language, structure of a C++ program, concepts of compiling and linking, IDE and its features; Basic terminology - Character set, tokens, identifiers, keywords, fundamental data types, literal and symbolic constants, declaring variables, initializing variables, type modifiers.

Operators and expressions: Operators in C++, precedence and associativity of operators, expressions and their evaluation, type conversions.

Beginning with C++ program: Input/output using extraction (>>) and insertion (<<) operators, writing simple C++ programs, comments in C++, stages of program execution.

UNIT-III

Control Structures and Functions: Decision making statements: if, nested if, if – else. Else if ladder, switch, Loops and iteration: while loop, for loop, do – while loop, nesting of loops, break statement, continue statement, goto statement, Advantages of using functions, structure of a function, declaring and defining functions, return statement, formal and actual arguments, const argument, default arguments,

Arrays and Strings: Declaration of arrays, initialization of array, accessing elements of array, I/O of arrays, passing arrays as arguments to a function, multidimensional arrays. String as array

of characters, initializing string variables, I / O of strings, string manipulation functions (strlen, strcat, strcpy, strcmp), passing strings to a function. Use of arrays and strings through illustrative programming examples.

Classes and Objects: Concept of classes, Declaration of classes, Defining access specifier, Public, Private, Protected derivations, defining member functions in a class, use of scope resolution operator outside the class definition. Defining objects. Friend function.

UNIT-IV

CAD/CAM: Introduction to the basics of CAD and CAM, Study 2-D sketching entities like lines, rectangle, parallelogram polygon, circle etc., under SKETCH ENTITY MENU.

Evolution of Internet and its applications and services.

RECOMMENDED BOOKS

Sr. no.	Name	Author(s)	Publisher
1.	Object-Oriented Programming with C++	E. Balagurusamy	Tata McGraw Hill
2.	Object-Oriented Programming with C++	Lafore R	Waite Group
3.	The C++ Programming Language	Bjarne Stroustrup	Addison Wesley
4.	Fundamentals of Computers	R. S. Salaria	Salaria Publishing House

Course Code	CHN111
Course Title	Software and Hardware Installation Lab
Type of Course	PC
L T P	0 0 10
Credits	5
Course Prerequisites	NA
Course Objectives (CO)	To learn basic concepts of Computer Hardware

SYLLABUS

List of Practical's

1. Hardware Identification

- Identify the front and rear panel controls and ports on a PC
- Cases
- Cooling
- Cables & Connectors
- Power Supplies
- Power Supply Connections
- Motherboard Connections
- Motherboard Components
- CPU (Processor)
- RAM (Memory)
- Hard Drive Connections
- Mechanical vs. Solid State Drives
- ROM Drives
- Video Cards
- Sound Cards Use Of Debug Card Post Error & Code, SMPS Tester, PCI slot testing tool.

2. Hardware Remove-Test Replace/ Install

- Removing RAM
- Installing RAM
- Removing a ROM Drive
- Installing a ROM Drive
- Removing a Hard Drive
- Installing a Hard Drive
- Defects related to SMPS, its cable, connector and servicing procedure.
- Removing a Power Supply
- Installing a Power Supply
- Removing a Video Card
- Installing a Video Card

- Install Expansion Cards
- Removing Fans
- Installing Fans
- Removing the Motherboard
- Installing the Motherboard
- Removing the Processor
- Installing the Processor
- Installing a CPU Cooler
- Troubleshooting
- Checking the Power Switch
- Removing the CMOS Battery
- Seating Expansion Cards

3. Laptop PCs

- Identification of laptop sections and connectors.
- Assembling and disassembling a Laptop.
- Checking of various parts of a laptop.
- Checking of batteries and adaptors.
- Replacing different parts of laptops.
- Upgrading RAM, HDD and other parts.
- Testing, fault finding and troubleshooting techniques.
- POST codes and their meaning, fixing of problems based on codes.
- Enabling support for SATA technology. Installation of OS using SATA technology drivers.
- Laptop troubleshooting
- Latest Tools & Gadgets For Desktop/Laptop Repairs

RECOMMENDED BOOKS

Sr. no.	Name	AUTHOR(S)	PUBLISHER
1	A+ Guide to PC Hardware Maintenance and Repair, Volume 1	Michael W. Graves	Cengage Learning
2	Advanced Concepts in Operating Systems	Mukesh Singhal & Niranjana G Shivaratri	Tata McGraw Hill
3	Data & Computer Communication	William Stallings	PHI, 6ed.



*Second
Semester*

Course Code	CHN102
Course Title	Advanced Computer Networks
Type of Course	PC
L T P	5 0 0
Credits	5
Course Prerequisites	NA
Course Objectives (CO)	To be familiar with various computer network architectures and to identify the infrastructure components, design infrastructure including devices, topologies and protocols

SYLLABUS

UNIT-I

Introduction to computer networks

Data communication System and its components, Data Flow, Computer network and its goal, Types of Computer networks: LAN, MAN, WAN, Wireless and wired networks, broadcast and point to point networks, Network topologies.

UNIT-II

Physical Layer

Concept of Analog & Digital Signal, Bandwidth, Transmission Impairment, and Introduction to transmission media: Twisted pair, Coaxial Cable, Fiber Cable, and Fiber Optics.

Data Link Layer

Design issues, Framing, error detection and correction codes, Data Link Protocols: HDLC and PPP.

UNIT-III

Networks Layer

Introduction, Virtual and Datagram networks, study of router, IP protocol and addressing in the Internet, Routing algorithms, Broadcast and Multicast routing

Transport Layer

Introduction and transport layer services, Multiplexing and De multiplexing, Connection less transport (UDP), Principles of reliable data transfer, Connection oriented transport (TCP), Congestion control

UNIT-IV

Application Layer

Principles of computer applications, Web and HTTP, E-mail, DNS, Socket programming with TCP and UDP.

RECOMMENDED BOOKS

Sr. no.	Name	AUTHOR(S)	PUBLISHER
1	An Engineering approach to Computer Networking	S. Keshav	Addison Wesley
2	Computer Networks.	A.S. Tanenbaum	PHI
3	Introduction to Data Communication and Networks	Forouzan, Coombs and Fagan	TMH
4	Data and Communication	William Stallings	PHI



Course Code	CHN104
Course Title	Office Automation
Type of Course	PC
L T P	5 0 0
Credits	5
Course Prerequisites	Basics of computer and any high level language
Course Objectives (CO)	To familiarize the students of all branches in engineering with basic and advanced concepts of MS-Office.

SYLLABUS

UNIT-I

Word processing concepts: saving, closing, Opening an existing document, Selecting text, Editing text, Finding and replacing text, printing documents, Creating and Printing Merged Documents, Character and Paragraph Formatting, Page Design and Layout. Editing and Profiling Tools: Checking and correcting spellings. Handling Graphics, Creating Tables and Charts, Document Templates and Wizards.

UNIT-II

Spreadsheet Concepts, Creating, Saving and Editing a Workbook, Inserting, Deleting Work Sheets, entering data in a cell / formula Copying and Moving from selected cells, handling operators in Formulae, Functions: Mathematical, Logical, statistical, text, financial, Date and Time functions, Using Function Wizard.

UNIT-III

Formatting a Worksheet: Formatting Cells – changing data alignment, changing date, number, character or currency format, changing font, adding borders and colors, Printing worksheets, Charts and Graphs – Creating, Previewing, Modifying Charts.

UNIT-IV

Creating, Opening and Saving Presentations, Creating the Look of Your Presentation, Working in Different Views, Working with Slides, Adding and Formatting Text, Formatting Paragraphs, Checking Spelling and Correcting Typing Mistakes, Making Notes Pages and Handouts, Drawing and Working with Objects, Adding Clip Art and other pictures, Designing Slide Shows, Running and Controlling a Slide Show, Printing Presentations.

RECOMMENDED BOOKS			
Sr. no.	Name	AUTHOR(S)	PUBLISHER
1	MS Office for Windows XP	Sagman S	Pearson Education
2	MS Office 2007	Perry G	Pearson Education
3	Fundamentals of Computers	R. S. Salaria	Salaria Publishing House



Course Code	CHN106
Course Title	Basics of SQL Programming
Type of Course	PC
L T P	5 0 0
Credits	5
Course Prerequisites	NA
Course Objectives (CO)	To create links, tables, use graphics, validate and publish web pages.
SYLLABUS	

UNIT-I

Introduction to DBMS and its applications, Study Of SQL Statements (DDL, DML)

UNIT-II

Data types, creating tables, retrieval of rows using select statement, conditional retrieval of rows, alter and drop statements.

UNIT-III

Working with null values, matching a pattern from a table, ordering the result of a query, aggregate functions, grouping the result of a query, update and delete statements.

UNIT-IV

Operators: arithmetic operators- add, subtract, multiply, divide, rename field, logical operations- and, or, not ,aggregate function- average, minimum, maximum, sum, count, count(*)
 numeric functions- absolute, power, sqrt, round, string functions: lower, upper, initcap, length, ltrim, rtrim, substring, lpad, rpad

RECOMMENDED BOOKS			
Sr. no.	Name	Author(S)	Publisher
1	An introduction to Database Systems	Bipin C. Desai.	West Publishing
2	SQL,PL/SQL ,The programming language of oracle	Ivan Bayross	BPB Publication

Course Code	CHN108
Course Title	Communication Skills-II
Type of Course	PC
L T P	5 0 0
Credits	5
Course Prerequisites	Basic knowledge of English grammar and sentence making
Course Objectives (CO)	The course is career oriented which aims to develop and improve the English language and proficiency of students in order to gain confidence in public and professional life and strengthen the abilities and skills pertinent to success.
SYLLABUS	

UNIT-I

Language Skills: Parts of Speech, Vocabulary, Phrase, Clause, Sentence and its types, Punctuation.

UNIT-II

Business Correspondence: Meaning of Business correspondence – Importance of Business Correspondence, Essential qualities of a business letters, types of business letters – cover letter, thank you letters, message through email and Fax. Acceptance letters, rejection letters, and withdrawal letters.

UNIT- III

Principles of communication: LSRW in communication. What is meant by LSRW Skills – Why it is important – How it is useful – How to develop the skills? Non verbal communication: Body language-Kinesics, Proxemics, Para linguistic, Chronemics Signs and symbols, Territory/Zone Oral: Speaking words, articulation and pronunciation.

UNIT- IV

Enhancing self esteem and Personality development: Self theory and the Johari window: Characteristics of fully functioning individuals, manifestations of low and high self esteem, techniques for enhancing self esteem, nurturance techniques.

RECOMMENDED BOOKS			
Sr. no.	Name	Author(s)	Publisher
1	Communication Skills	Loveleen Kaur	Satya Prakashan
2	A course in Communication Skills and English Grammatr	Tanu Gupta, Titiksha Mittal	Ajay Publications Yamuna Nagar
3	Business Communication	Varinder Kumar, Bodh Raj	Kalyani Publishers

Course Code	CHN110
Course Title	Basics of Operating Systems
Type of Course	PC
L T P	5 0 0
Credits	5
Course Prerequisites	Overview of Computer Architecture
Course Objectives (CO)	This course provides the knowledge about the role of an operating system, issues in the management of resources like processor, memory and input-output, design of an operating system.

SYLLABUS

UNIT-I

Introduction: Operating Systems functions, Types of operating systems, Multiprogramming systems, Batch systems, Time-sharing systems, Operating system operations, Special purpose operating systems, distributed systems, Different computing environments.

UNIT-II

Operating System Organization: Processor and user modes, user operating system interface, Kernels, System calls and its types, System programs, Operating system structures, Virtual machines.

UNIT-III

Memory Management: Physical and virtual address space, Memory allocation strategies, Paging, Segmentation, Virtual memory and Demand paging, Page replacement algorithms.

UNIT-IV

Security: Security breaches, types of attacks, attack prevention methods, security policy and access control.

RECOMMENDED BOOKS			
Sr. no.	Name	Author(S)	Publisher
1	Operating Systems Concepts	A Silberschatz, P.B. Galvin, G. Gagne	John Wiley Publications
2	Operating Systems: A Modern Perspective	G. Nutt	Pearson Education
3	Modern Operating Systems	A.S. Tanenbaum	Pearson Education
4	Operating Systems, Internals & Design Principles	W. Stallings	Prentice Hall of India

Course Code	CHN112
Course Title	Project in Hardware and Networking
Type of Course	PC
L T P	0 0 10
Credits	5
Course Prerequisites	NA
Course Objectives (CO)	To pursue lifelong learning and continuous improvement of their knowledge and skills in the design, development, and application of computer systems in diverse industries with the highest professional and ethical standards.

SYLLABUS

The student will be able to use concepts of hardware and networking to develop projects. There are various applications areas that can be covered in this lab –

- Cisco automation framework
- Network Security Design for Backup Server
- Datacenter security design proposal
- Warehouse design using Collapsed core architecture
- Campus network design
- Web Server monitoring techniques
- Network Infrastructure upgrade for organization
- Rogue AP detection using scanning techniques
- Enterprise network design using IP subnetting
- Flooding attack detection using anomaly techniques with wireshark
- Securing router using multiple access control techniques
- Network design proposal for casino
- Server uptime monitoring tool
- Internet usage control using access control techniques
- Brute Force attack detection using wireshark
- WAN Optimization design for Enterprise
- Windows TCP Connection Monitor
- Study on network and application firewalls.
- Vulnerabilities of Spanning tree protocol and mitigation.
- Methodologies to prevent IP fragmentation attacks.
- Attacks based on a VLAN infrastructure.
- Preventing Rogue DHCP servers on the network.
- Defeating DDOS attacks with hosted solutions
- Perimeter router configuration to block IP spoofing attacks
- Comparative study of access control mechanisms
- Practical analysis of Access control lists.