

B.VOC

In

HARDWARE AND NETWORKING
(UGC)

Program Learning Outcomes:

- PLO1: Learn the proper techniques of maintenance of hardware and networking devices
- PLO2: Study the science of hardware and networking
- PLO3: Diagnose and repair all major problems regarding hardware, PC peripheral devices
- PLO4: Build your own book of business
- PLO5: Demonstrate a comprehensive understanding of computer hardware components, their functions, and troubleshooting techniques.
- PLO6: Acquire in-depth knowledge of networking principles, protocols, and architectures.
- PLO7: Develop the ability to design, implement, and manage network infrastructure, including cabling, routers, and switches.
- PLO8: Gain proficiency in installing, configuring, and troubleshooting various operating systems.
- PLO9: Acquire skills in server administration, including hardware and software management.

TOTAL DURATION OF COURSE: 3 Years

- ✓ After completion of Year-1 Diploma is awarded.
- ✓ After completion of Year-2 Advance Diploma is awarded.
- ✓ After completion of Year-3 B.VOC Degree is awarded.

Maulana Abul Kalam Azad University of Technology, West Bengal
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B. Voc. in Hardware & Networking (UGC)
(Effective for Academic Session 2024-2025)

Year - 1 - Diploma (SEMESTER - I)
Corresponding NSQF Level 5

Course	Component	Theory / Practical / Sessional	Internal (Theory/Skill)	External (Theory/Skill)	Internal (Practical)	External (Practical / Sessional)	Credit		
							L	T	P
UGEN - 101 ENGLISH LANGUAGE AND COMMUNICATIVE SKILLS	Generic	Theory	30	70	-	-	3	1	-
UHWNV-101 BASIC ELECTRONICS	Skill	Theory	30	70	-	-	3	1	-
UHWNV-102 DIGITAL ELECTRONICS	Skill	Theory	30	70	-	-	3	1	-
UHWNV-191 BASIC ELECTRONICS LAB	Skill	Practical	-	-	40	60	-	-	3
UHWNV-192 DIGITAL ELECTRONICS LAB	Skill	Practical	-	-	40	60	-	-	3
UHWNV-193 PRACTICAL ON COMPUTER COMPONENTS IDENTIFICATION AND TESTING	Skill	Practical	-	-	40	60	-	-	4
UGEN – 181 ENGLISH LANGUAGE LAB	Generic	Sessional	-	-	-	100	-	-	2
UGEN - 182 COMPUTER FUNDAMENTALS & IT	Generic	Sessional	-	-	-	100	-	-	4

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Year - 1 - Diploma (SEMESTER - II)
Corresponding NSQF Level 5

Course	Component	Theory / Practical / Sessional	Internal (Theory/Skill)	External (Theory/Skill)	Internal (Practical)	External (Practical / Sessional)	Credit		
							L	T	P
UHWNV-201 PERSONAL COMPUTING SOFTWARE	Skill	Theory	30	70	-	-	3	1	-
UHWNV-202 COMPUTER HARDWARE, PC ASSEMBLING & TROUBLE SHOOTING	Skill	Theory	30	70	-	-	3	1	-
UHWNV-291 PERSONAL COMPUTING SOFTWARE LAB	Skill	Practical	-	-	40	60	-	-	3
UHWNV-292 COMPUTER HARDWARE, PC ASSEMBLING & TROUBLE SHOOTING LAB	Skill	Practical	-	-	40	60	-	-	3
UHWNV-293 PRACTICAL ON LAPTOP TROUBLE SHOOTING	Skill	Practical	-	-	40	60	-	-	4
UGEN - 281 SOFT SKILL & PERSONALITY DEVELOPMENT	Generic	Sessional	-	-	-	100	-	-	4
UGEN - 282 BUSINESS ANALYSIS: ENVIRONMENT, SALES & MARKETING	Generic	Sessional	-	-	-	100	-	-	4
UHWNV - 281 ON JOB TRAINING	Skill	Sessional	-	-	-	100	-	-	6

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Year - 2 - Advanced Diploma (SEMESTER - III)

Corresponding NSQF Level 6

Course	Component	Theory / Practical / Sessional	Internal (Theory/Skill)	External (Theory/Skill)	Internal (Practical)	External (Practical / Sessional)	Credit		
							L	T	P
UHWNV-301 COMPUTER PERIPHERAL AND DEVICES	Skill	Theory	30	70	-	-	3	1	-
UHWNV-302 NETWORK FUNDAMENTALS	Skill	Theory	30	70	-	-	3	1	-
UHWNV-391 COMPUTER PERIPHERAL AND DEVICES LAB	Skill	Practical	-	-	40	60	-	-	4
UHWNV-392 NETWORK FUNDAMENTALS LAB	Skill	Practical	-	-	40	60	-	-	4
UHWNV-393 PRACTICAL ON NETWORKING	Skill	Practical	-	-	40	60	-	-	4
UGEN - 381 VALUE EDUCATION & HUMAN RIGHTS	Generic	Sessional	-	-	-	100	-	-	4
UGEN - 382 BASIC ACCOUNTING	Generic	Sessional	-	-	-	100	-	-	4

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Year - 2 - Advanced Diploma (SEMESTER - IV)

Corresponding NSQF Level 6

Course	Component	Theory / Practical / Sessional	Internal (Theory/Skill)	External (Theory/Skill)	Internal (Practical)	External (Practical / Sessional)	Credit		
							L	T	P
UHWNV-401 WINDOWS SERVER ADMINISTRATION	Skill	Theory	30	70	-	-	3	1	-
UHWNV-402 SWITCHING AND ROUTING	Skill	Theory	30	70	-	-	3	1	-
UHWNV-491 WINDOWS SERVER ADMINISTRATION LAB	Skill	Practical	-	-	40	60	-	-	3
UHWNV-492 SWITCHING AND ROUTING LAB	Skill	Practical	-	-	40	60	-	-	3
UHWNV-493 PRACTICAL ON ROUTING CONFIGURATION & NETWORK CONNECTIVITY	Skill	Practical	-	-	40	60	-	-	4
UGEN - 481 ENVIRONMENTAL STUDIES	Generic	Sessional	-	-	-	100	-	-	4
UGEN - 482 QUALITY MANAGEMENT	Generic	Sessional	-	-	-	100	-	-	4
UHWNV – 481 ON JOB TRAINING	Skill	Sessional	-	-	-	100	-	-	6

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Year - 3 - Degree (SEMESTER - V)

Corresponding NSQF Level 7

Course	Component	Theory / Practical / Sessional	Internal (Theory/Skill)	External (Theory/Skill)	Internal (Practical)	External (Practical / Sessional)	Credit		
							L	T	P
UHWNV-501 LINUX OPERATING SYSTEM	Skill	Theory	30	70	-	-	3	1	-
UHWNV-502 NETWORK ADMINISTRATION & TROUBLE SHOOTING	Skill	Theory	30	70	-	-	3	1	-
UHWNV-591 LINUX OPERATING SYSTEM LAB	Skill	Practical	-	-	40	60	-	-	4
UHWNV-592 NETWORK ADMINISTRATION & TROUBLE SHOOTING LAB	Skill	Practical	-	-	40	60	-	-	4
UHWNV-593 PRACTICAL ON SWITCHING CONFIGURATION & NETWORK CONNECTIVITY	Skill	Practical	-	-	40	60	-	-	6
UGEN - 581 INDIAN ECONOMY & SOCIAL CHANGES	Generic	Sessional	-	-	-	100	-	-	4
UGEN - 582 RESEARCH METHODOLOGY	Generic	Sessional	-	-	-	100	-	-	4

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Year - 3 - Degree (SEMESTER - VI)

Corresponding NSQF Level 7

Course	Component	Theory / Practical / Sessional	Internal (Theory)	External (Theory)	Internal (Practical)	External (Practical / Sessional)	Credit		
							L	T	P
UGEN - 681 GENERAL HUMAN PSYCHOLOGY & HR MANAGEMENT	Generic	Sessional	-	-	-	100	-	-	4
UGEN - 682 ENTREPRENEURSHIP DEVELOPMENT PROGRAMME	Generic	Sessional	-	-	-	100	-	-	4
UHWNV - 681 INDUSTRIAL TRAINING	Skill	Sessional	-	-	-	100	-	-	14
UHWNV - 691 MAJOR PROJECT	Skill	Practical	-	-	40	60	-	-	8

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Year-1 Diploma (SEMESTER – I)

Paper Title: UGEN – 101: ENGLISH LANGUAGE AND COMMUNICATIVE SKILLS

Course Objectives:

- Enhance students' ability to express ideas clearly, concisely, and coherently in both oral and written forms.
- Expand students' vocabulary, grammar, and pronunciation to facilitate effective communication.
- Encourage students to analyze information, evaluate arguments, and form independent judgments.
- Develop students' awareness and appreciation of different cultures through language study.

Course Outcomes:

CO1: Demonstrate proficiency in oral and written communication across various contexts, including academic, professional, and interpersonal settings.

CO2: Utilize critical thinking and problem-solving skills to analyze and interpret information, and to construct clear and coherent arguments.

CO3: Exhibit a strong command of English grammar, vocabulary, and pronunciation, enabling accurate and appropriate language use.

CO4: Demonstrate understanding and appreciation of diverse cultures, and effectively interact with people from different backgrounds.

UNIT - I

The Sentence and Its Structure - How to Write Effective Sentences - Phrases - What Are They? - The Noun Clauses - The Adverb Clause - The Relative Clause - How the Clauses Are Conjoined - Word - Classes and Related Topics - Understanding the Verb - Understanding the Auxiliary Verb - Understanding the Adverbs - Understanding the Pronoun - Prepositions.

UNIT - II

Spelling and Pronunciation - Pronunciation, The Tense and Related Topics - Presentness and Present Tenses - The Presentness of a Past Action - Interrogatives and Negatives - Negatives - How to Frame Questions - What's What? - Polite Expressions - Some Time Expressions - In Conversation – Letter Writing - Academic Assignments.

UNIT - III

Self - Assessment; Identifying Strength & Limitations; Habits, Will - Power and Drives, Developing Self - Esteem and Building Self - Confidence, Significance of Self - Discipline, Understanding Perceptions, Attitudes, and Personality Types, Mind - Set: Growth and Fixed, Values and Beliefs, Motivation and Achieving Excellence; Self - Actualization Need; Goal Setting, Life and Career Planning , Constructive Thinking, Communicating Clearly: Understanding and Overcoming barriers.

UNIT - IV

Active Listening, Persuasive Speaking and Presentation Skills, Conducting Meetings, Writing Minutes, Sending Memos and Notices; etiquette: Effective E - mail Communication; Telephone Etiquette, Body Language in Group Discussion and Interview.

Books Recommended:

- Dorch, Patricia. What Are Soft Skills? New York: Execu Dress Publisher, 2013.
- Kulbhushan Kumar, Effective Business Communications, Khanna Publishing House (AICTE Recommended-2018)
- Kamin, Maxine. Soft Skills Revolution: A Guide for Connecting with Compassion for Trainers, Teams, and Leaders. Washington, DC: Pfeiffer & Company, 2013.
- Klaus, Peggy, Jane Rohman & Molly Hamaker. The Hard Truth about Soft Skills. London: HarperCollins E - books, 2007.
- Petes S. J. , Francis. Soft Skills and Professional Communication. New Delhi: Tata McGraw - Hill Education, 2011.
- Stein, Steven J. & Howard E. Book. The EQ Edge: Emotional Intelligence and Your Success. Canada: Wiley & Sons, 2006.

Paper Title: UGEN – 181 ENGLISH LANGUAGE LAB

Planning for Practical session: (Based on UGEN – 101)

- Conversation classes on contemporary issues
- Writing of corporate CVs
- PPT presentation on selected issues
- Group discussion
- Tips to face the interviews and mock sessions

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Paper Title: UHWNV - 101: BASIC ELECTRONICS

Job Role: Hardware and Network Support Technician

Course Objectives:

- Understand Basic Electronic Concepts: Provide students with a foundational understanding of essential electronic concepts, including voltage, current, resistance, power, and the fundamental laws governing electronic circuits (Ohm's Law, Kirchhoff's Laws).
- Explore Electronic Components and Their Functions: Introduce students to various electronic components such as resistors, capacitors, diodes, and transistors, focusing on their functions, characteristics, and roles in electronic circuits.
- Develop Skills in Circuit Analysis: Equip students with the skills needed to analyze basic electronic circuits, including series and parallel circuits, using both theoretical methods and practical tools.
- Apply Practical Circuit Construction Techniques: Teach students how to construct and test basic electronic circuits on breadboards or other prototyping platforms, emphasizing hands-on experience with assembling and troubleshooting circuits.

Course Outcomes:

CO1: Proficiency in Basic Electronic Concepts: Students will demonstrate a solid understanding of fundamental electronic concepts, including the ability to apply Ohm's Law and Kirchhoff's Laws to analyze and solve basic circuit problems.

CO2: Knowledge of Electronic Components: Students will be able to identify and describe the functions of various electronic components, understanding how they operate and their roles in different types of electronic circuits.

CO3: Competence in Circuit Analysis: Students will be capable of analyzing and solving basic electronic circuits, applying theoretical knowledge to determine circuit behavior and performance in both series and parallel configurations.

CO4: Skills in Circuit Construction and Testing: Students will effectively construct and test electronic circuits, using practical techniques to assemble, troubleshoot, and verify circuit functionality, ensuring reliable and accurate results.

UNIT-I

Current Electricity: Definition of Resistance, Voltage, Current, Power, Energy and their units, Relation between electrical and mechanical units, Temperature variation of resistance, Difference between AC and DC voltage and current.

D.C. Circuits: Ohm's Law, Series – parallel resistance circuits, calculation of equivalent resistance.

UNIT-II

Capacitors: Capacitor and its capacity, Concept of charging and Discharging of capacitors, Types of Capacitors and their use in circuits.

Overview of Atom, Sub-Atomic Particles and CRO: Brief History of Electronics. Atom and its elements, Electron, Force, Field intensity, Potential, Energy, current Electric field, Magnetic field, Motion of charged particles in electric and magnetic field. Overview of Multimeter and CRO.

UNIT-III

Voltage and Current: Resistance, Ohm's law, V-I Characteristics, Resistors, Inductors. Voltage and Current sources, Symbols and Graphical representation, Overview of AC, DC, Cells and Batteries, Energy and Power.

Basics of Semiconductor: Semiconductor materials, Metals and Semiconductors. N-type and P-type semiconductor, Effects of temperature on Conductivity of semiconductor. PN junction diode, depletion layer, Forward & Reverse bias, V-I Characteristic, Effects of temperature, Zener diode, Photo diode, LED, Types and applications of diode. Diode as a rectifier, Half wave and full wave rectification, Zener diode Regulator. Introduction to Filters.

UNIT-IV

Bipolar Junction Transistor: Operation of NPN and PNP transistors, Biasing of BJT. CB, CE and CC configuration. Introduction to FET, JFET, MOSFET, CMOS and VMOS

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Books Recommended:

- Fundamentals of Electrical and Electronics, B.L. Thereja
- Principles of Electronics, V.K Mehta
- Basic Electronics, S. Biswas, Khanna Publishing House (AICTE Recommended Textbook)

Paper Title: UHWNV-191 BASIC ELECTRONICS LAB

List of Experiments: (Based on UHWNV-101)

- Identification of different symbols and their components.
- Demonstration on the function of Digital Multimeter and voltage, current, resistance measurement by Multimeter.
- Demonstration of CRO and its use.
- Component checking methodology by Multimeter.
- Checking of phase, neutral and earthing of AC supply line.
- Equivalent resistance identification when they are in series, parallel and series / parallel combination
- Verification of Ohm's Law.
- Verification of KCL.
- Verification of KVL.
- Characteristics of PN junction Diode
- Experiment on Half wave rectifier by using Diode
- Experiment on Full wave rectifier by using Diode
- Basic concept of soldering, de soldering, demonstration on different soldering methods, practice of solder removal, replacement of components.
- Characteristics of BJT
- Characteristics of JFET

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Paper Title: UHWNV-102: DIGITAL ELECTRONICS

Job Role: Hardware and Network Support Technician

Course Objectives:

- **Understand Hardware Components and Architecture:** Provide students with a comprehensive understanding of computer hardware components, including CPUs, memory, storage devices, and peripherals, and their roles in system architecture.
- **Learn Network Fundamentals and Protocols:** Introduce students to fundamental networking concepts, including network topologies, protocols (such as TCP/IP), and devices (such as routers, switches, and modems), and how they interact within a network.
- **Develop Troubleshooting and Repair Skills:** Equip students with practical skills for diagnosing and repairing hardware and network issues, including hands-on experience with diagnostic tools and techniques for effective problem resolution.
- **Apply Best Practices for Network and Hardware Support:** Teach students to apply industry best practices for hardware and network support, including preventive maintenance, documentation, and user support, to ensure efficient and reliable system operation.

Course Outcomes:

CO1: Proficiency in Understanding Hardware Components: Students will demonstrate a thorough understanding of computer hardware components and system architecture, including the ability to identify, assemble, and troubleshoot various hardware components.

CO2: Knowledge of Network Fundamentals: Students will be capable of explaining and applying basic networking concepts, protocols, and device configurations, including setting up and managing small networks.

CO3: Competence in Troubleshooting and Repair: Students will effectively diagnose and resolve hardware and network issues using diagnostic tools and problem solving techniques, demonstrating practical skills in repair and maintenance.

CO4: Application of Best Practices in Support Roles: Students will be able to implement best practices for hardware and network support, including performing preventive maintenance, maintaining accurate documentation, and providing effective user support.

UNIT-I

Number Systems and Boolean Algebra: Basics of Analog and Digital. Boolean algebra, De-morgan's law, Truth tables. Logical Circuits Logic gates: AND, OR, NOT, NOR, NAND, XOR, XNOR.

UNIT-II

Combinational Circuits: Arithmetic Circuits: Half adders, Full adders, Half Subtractor, Full Subtractor, Data Processing Circuits: Encoders, Decoders, Multiplexers, De-Multiplexers.

UNIT-III

Latches and Flip-Flops: Concept of Latches, Types of Latches, SR latch. SR Flip Flop, JK Flip Flop, D Flip flop, T Flip Flop, Master Slave J-K Flip Flop. Introduction to counters, Types of counters, Asynchronous and Synchronous. Introduction to shift registers, types of shift registers.

UNIT-IV

Introduction to Display Devices: LED, LCD, 7 segment display
Integrated Circuits and Memories, Introduction to IC's, Importance and applications, Linear and Digital IC's. Introduction to SSI, MSI, LSI and VLSI (Terminology & Definitions). Memory Organisation and Operations, RAM, ROM, PROM, EPROM, EEPROM.

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Books Recommended:

- Digital Circuits and Logic Design, S.Salivahanan
- Digital Electronics, S.Salivahanan
- Digital computer electronics, Malvino and Brown
- Digital Electronics, R.Anand, Khanna Publishing House (AICTE Recommended Textbook)

Paper Title: UHWNV-192 DIGITAL ELECTRONICS LAB

List of Experiments: (Based on UHWNV-102)

- Practical on Logic Gates
- Practical on Universal Gate (NAND & NOR).
- Practical on Half adder.
- Practical on Full adder
- Practical on Half Subtractor.
- Practical on Full Subtractor
- Practical on Decoder
- Practical on Encoder
- Practical on MUX.
- Practical on DEMUX.
- Practical on Flip Flop
- Practical on Counter
- Practical on Register

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Paper Title: UHWNV-193: PRACTICAL ON COMPUTER COMPONENTS IDENTIFICATION AND TESTING

Job Role: Hardware and Network Support Technician

Course Objectives:

- Identify Computer Components: Equip students with the skills to accurately identify and describe various computer components, including CPUs, memory modules, hard drives, motherboards, power supplies, and peripherals.
- Perform Functional Testing: Teach students how to conduct functional tests on computer components to ensure they are operating correctly. This includes using diagnostic tools and software to assess performance and functionality.
- Understand Component Integration: Provide students with practical experience in assembling and disassembling computer systems, understanding how different components interact, and how to troubleshoot integration issues.
- Apply Diagnostic and Troubleshooting Techniques: Develop students' abilities to use diagnostic tools and techniques for identifying and resolving issues with computer components, including systematic troubleshooting methods to ensure reliable system performance.

Course Outcomes:

CO1: Proficiency in Identifying Computer Components: Students will be able to accurately identify and describe the functions of various computer components, including how they fit into the overall system architecture.

CO2: Competence in Performing Functional Testing: Students will demonstrate the ability to perform functional tests on computer components using diagnostic tools and software, interpreting test results to determine component health and performance.

CO3: Understanding of Component Integration: Students will be proficient in assembling and disassembling computer systems, understanding the interaction between components, and addressing any issues related to their integration.

CO4: Effective Diagnostic and Troubleshooting Skills: Students will apply diagnostic and troubleshooting techniques to identify and resolve issues with computer components, using practical methods to ensure proper functionality and system reliability.

UNIT-I

Introduction: History and Generations of the computer. Software and Firmware concept. Power Supply & UPS: Introduction to Power supply. SMPS. UPS, Offline & Online UPS. Introduction to computer hardware: Peripheral devices of a Computer system, Add On cards: network interface card, sound card and graphics card, functional description of various part of a PC.

UNIT-II

CPU & Memory: Different types of CPU & Socket Different type of memory & its slots. Various Components of a PC: Mother Board: Types of Motherboard AT, ATX, and BTX. Ports: Types of Ports, serial and parallel ports. Hard Disk: Types of Hard Disk: PATA, SATA, SCSI. RAM: Types of RAM: SRAM, DRAM, SDRAM, Power supply unit, cabinet, Processor.

UNIT-III

Peripheral Devices: Printer, Scanner, Mouse, Keyboard, Joystick, Web-Cam, Speaker. Monitor: CRT and LCD/TFT/LED Monitor. Cables: Types of Cables: USB, VGA, DVI, RJ11, RJ45, HDMI, SERIAL, and PARALLEL. Connecting Cables from SMPS to motherboard, hard disk etc. Establishing data connection for mother board, hard disk, and drivers. Fixing wires for power restart switches, fixing wires for power & HDD LED, External USB and Audio Connections. Drivers: Types of drivers: Device drivers, LAN drivers, sound drivers, graphics drivers.

UNIT-IV

Laptop: Introduction to laptop and its different parts identification. Component testing and Replacement from PCB: Resistor, Diode, Transistor, Coil, Capacitor, Fuse, Transformer, Switches, Sockets, Connectors, Cables etc. BIOS: Introduction, Connecting & disconnecting computer peripherals and components Mouse, Keyboard, Monitor, Hard Disk.

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Books Recommended:

- Mastering PC Hardware & Network, Dr. Ajit Mittal, Dr. Ajay Rana, Khanna Publishing House
- How Computers Work, Ron White
- Fundamental of Computer, V. Rajaraman
- Computer Fundamentals, R.S. Salaria, Khanna Publishing House (AICTE Recommended Textbook)

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Paper Title: UGEN – 182: COMPUTER FUNDAMENTALS & IT

Course Objectives:

- To introduce students to the fundamental concepts of computers and information technology. This includes understanding computer hardware, software, and their interconnections.
- To develop basic computer skills: Students will learn to operate computer systems, use productivity software, and access information resources effectively.
- To foster digital literacy: Students will be equipped with the knowledge and skills to use computers and information technology responsibly and ethically.
- To prepare students for further studies: This course will lay the foundation for advanced computer courses and IT-related fields.

Course Outcomes:

CO1: Demonstrate basic computer hardware knowledge: Students will be able to identify and describe the components of a computer system and their functions.

CO2: Utilize computer software effectively: Students will be proficient in using operating systems, word processors, spreadsheets, and presentation software.

CO3: Access and utilize information resources: Students will be able to search for, evaluate, and use information from various digital sources.

CO4: Apply digital literacy skills: Students will demonstrate responsible and ethical use of computers and information technology.

UNIT - I

KNOWING COMPUTER: Introduction, Objectives, Basic Applications of Computer, Components of Computer System: Central Processing Unit, Keyboard, mouse and VDU, Other Input devices, Other Output devices, Computer Memory. Concept of Hardware and Software: Hardware, Software: Application Software, Systems software. Concept of computing, data and information. Bringing computer to life: Connecting keyboard, mouse, monitor and printer to CPU, Checking power supply.

UNIT - II

OPERATING COMPUTER USING GUI BASED OPERATING SYSTEM: Introduction, Objectives, Basics of Operating System: Operating system, Basics of popular operating system (LINUX, WINDOWS). The User Interface: Task Bar, Icons, Menu, Running an Application. Operating System Simple Setting: Changing System Date And Time, Changing Display Properties, To Add Or Remove A Windows Component, Changing Mouse Properties, Adding and removing Printers. File and Directory Management: Creating and renaming of files and directories, Common utilities.

UNIT - III

INTRODUCTION TO INTERNET, WWW AND WEB BROWSERS: Introduction, Objectives. Basic of Computer Networks: Local Area Network (LAN), Wide Area Network (WAN). Internet: Concept of Internet, Applications of Internet, Connecting to the Internet, Troubleshooting, World Wide Web (WWW), Web Browsing Software, Popular Web Browsing Software. Search Engines: Popular Search Engines / Search for content, Accessing Web Browser, Using Favorites Folder, Downloading Web Pages, Printing Web Pages. Understanding URL, Surfing the web: Using e - governance website.

UNIT - IV

COMMUNICATIONS AND COLLABORATION: Introduction, Objectives, Basics of E - mail: What is an Electronic Mail, Email Addressing, Using E - mails: Opening Email account, Mailbox: Inbox and Outbox, Creating and Sending a new E - mail, Replying to an E - mail message, Forwarding an E - mail message, Sorting and Searching emails. Introduction to MS - Office: MS - Word, MS - Excel, MS - Power Point.

Books Recommended:

- Computer Fundamentals, R.S. Salaria, Khanna Publishing House (AICTE Recommended Textbook – 2018)
- Handbook of Computer Fundamentals, N.S. Gill, Khanna Publishing House (AICTE Recommended Textbook – 2018)
- Fundamentals of Computers, V. Rajaraman, PHI Publication
- Computer Fundamentals, P. K. Sinha, BPB Publication
- Introduction to Computers with MS - Office 2007, Leon, TMH Publication

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Year-1 Diploma (SEMESTER – II)

Paper Title: UHWNV-201: PERSONAL COMPUTING SOFTWARE

Job Role: Hardware and Network Support Technician

Course Objectives:

- Understand Software Fundamentals: Provide students with a foundational understanding of the essential functions and features of personal computing software, including operating systems, productivity suites, and utility programs.
- Develop Proficiency in Productivity Software: Equip students with the skills to effectively use productivity software, such as word processors, spreadsheets, and presentation tools, for various personal and professional tasks.
- Explore Software Installation and Configuration: Teach students how to install, configure, and update personal computing software, including troubleshooting common installation and configuration issues.
- Apply Best Practices for Software Use: Encourage students to apply best practices for efficient and effective use of personal computing software, including data management, security practices, and software integration.

Course Outcomes:

CO1: Proficiency in Software Fundamentals: Students will demonstrate a solid understanding of the core functions and features of personal computing software, including operating systems and common applications used in personal and professional settings.

CO2: Competence in Productivity Software: Students will be able to effectively use productivity software, including creating, formatting, and managing documents in word processors, spreadsheets, and presentation tools, for a variety of tasks.

CO3: Skills in Software Installation and Configuration: Students will successfully install, configure, and update personal computing software, demonstrating the ability to troubleshoot and resolve common issues related to software setup and functionality.

CO4: Application of Best Practices: Students will apply best practices in the use of personal computing software, including proper data management techniques, security practices to protect personal and professional data, and effective integration of different software applications.

UNIT-I

DOS : Versions of DOS: Booting sequence; Warm and Cold reboot; Concept of File and directory , Redirecting command input and output pipes, Wildcard characters, Types of DOS commands: Internal and External; Internal Commands: DIR, MD, CD , CLS, COPY, DATE, DEL, PATH, PROMPT, REN, RD, TIME, TYPE, VER, VOL; External Commands: XCOPY, ATTRIB, BACKUP, RESTORE, FIND, SYS , FORMAT, CHKDSK, DISKCOPY, LABEL, MOVE, TREE, DELTREE, DEFRAG, SCANDISK, UNDELETE. Batch Files: Introduction to simple batch files; Introduction to CONFIG.SYS and AUTOEXEC.BAT files. Graphical User Interface: Fundamentals of windows, types of windows, anatomy of windows, Icons, Recycle bin Operations on window: Opening a Window, Minimizing and Maximizing a window, Moving window, Resizing Window, Closing the window windows explorer Folders: Creating and deleting folders, copying, renaming folders, folder properties. Control panel: Customizing screens, Screen colors, Patterns, Spacing icons, selecting time/date, setting the Sound, Concept of menu Using Help, Creating Short cuts, Basics of Window Setup, Notepad, Window Accessories, System restore. Customizing printing, changing the print queue, configuring the printer, adding printers. Working with fonts: changing, removing, adding, customizing mouse and keyboard use. System properties and the device manager Management tools, DOS sessions, Explorer, Memory configuration, Safe mode Install and uninstall applications, Setup/troubleshooting issues. Maintaining and optimizing disks: Disk Cleanup, Disk defragmenter, Compressing and uncompressing folders and files. Encrypting and decrypting folders and files.

UNIT-II

Word Processing Package: Basics of Word Processing; Opening and Closing of documents; Text creation and Manipulation; Finding and replacing text, Printing of document, Formatting of text; Margin setting, Adding Borders and shading, Adding Headers and Footers, Setting up Multiple columns, Working with tables, Spell check, Grammar facility, Auto text, language setting and thesaurus; Mail merging. Installation of Word Processing Software.

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UNIT-III

Spreadsheet Package : Worksheet Basics, Data Entry in Cells : Entry of numbers, text and formulae, Moving data in a worksheet, Moving around in a worksheet, Selecting Data Range, Using the Interface (Toolbars, Menus), Editing Basics, Working with workbooks, Cell referencing; Formatting and Calculations: using Auto fill, Working with Formulae, Efficient Data Display with Data formatting (number formatting, date formatting etc.), Working with Ranges, Worksheet Printing; Working with Graphs and Charts : Creating Embedded Chart using chart wizard, sizing and moving parts, updating charts, Changing chart types, Chart wizard, Adding Titles, Legends and Gridlines, Printing Charts; Database Management. Finding records with Data form, Adding/Deleting Records, Filtering Records in a worksheet; Functions and Macros: Worksheet Creating Macros, Recording Macros, Running Macros, Assigning Macros to Buttons, Defining Macros from Scratch. Multiple Worksheets. Installation of Spreadsheet software.

UNIT-IV

Presentation Packages: Basics, General Features, Creating a presentation, formatting and enhancing text, Incorporation of Animation, adding charts, multimedia, page setup and printing slides. Installation of Presentation software. Internet and WWW: Evolution of Internet, services provided on Internet, Access Methods, application of Internet.

Books Recommended:

- A. Ravichandran, 2014, Computers Today, Khanna Publishing House
- Mathur Rajiv, 1996: Learning Word 6 for Windows Step-by-Step, Galgotia.
- Mathur Rajiv, 1996: Learning Excel 5 for Windows Step-by-Step, Galgotia.
- Jamsa, Kris A., 1993: Rescued by Windows 3.1, Galgotia.
- Basandra, S.K., 1995 Computers Today, Galgotia.
- Kasser, Barbara, 1998: Using the Internet, PHI, 4th ed., New Delhi.
- Wall, David A. & Others, 1996: Using the World Wide Web, PHI, 2nd ed., New Delhi.
- Darril Gibson, Microsoft Windows Networking Essentials 1st Edition.
- Ramesh Bangia, 2017, PC Software Made Easy, Khanna Publishing House
- Mastering Excel, Khanna Publishing House

Paper Title: UHWNV-291 PERSONAL COMPUTING SOFTWARE LAB

List of Experiments: (Based on UHWNV-201)

- Create Directory in DOS (MD Command)
- Create File in DOS (COPY CON Command)
- Apply internal DOS commands (DIR,CD,CLS,COPY,DATE,DEL,PATH,REN,RD,TYPE,VER)
- Apply External DOS Commands(XCOPY,ATTRIB,MOVE,TREE)
- Create Folders and Files in Windows Desktop
- Apply Commands such as COPY,CUT,PASTE,DELETE,RENAME on Files and Folders
- Create a Word document and type your own bio data, save and format the document
- Apply bold, italic, underline, font and other formats in a document
- Create a table with multiple rows/columns and enter tabular data
- Apply mail merge feature in MS Word
- Create excel database and save the worksheet
- Apply auto sum in a numeric range in a database
- Create different charts such as Line, Column, Bar, Pie from suitable example database
- Apply filter to extract records (Auto Filter/Advanced Filter)
- Create a presentation with multiple slides and save the presentation
- Apply different slide transitions
- Apply different animations on the slide objects

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Paper Title: UHWNV-202: COMPUTER HARDWARE, PC ASSEMBLING & TROUBLE SHOOTING

Job Role: Hardware and Network Support Technician

Course Objectives:

- Understand Computer Hardware Components: Provide students with comprehensive knowledge of the various components that make up a computer system, including the motherboard, CPU, RAM, storage devices, power supply, and peripherals.
- Develop Skills in PC Assembly: Equip students with practical skills for assembling a PC, including selecting compatible components, correctly installing hardware, and configuring BIOS/UEFI settings to ensure a functional system.
- Learn Troubleshooting Techniques: Teach students how to diagnose and troubleshoot common hardware issues, using diagnostic tools and systematic problem solving methods to identify and resolve problems.
- Apply Best Practices for Maintenance and Upgrades: Educate students on best practices for maintaining and upgrading computer hardware, including preventive maintenance, component upgrades, and ensuring optimal performance and longevity of the system.

Course Outcomes:

CO1: Proficiency in Understanding Computer Hardware: Students will demonstrate a thorough understanding of computer hardware components, their functions, and how they interact within a computer system.

CO2: Competence in PC Assembly: Students will be capable of assembling a computer system from scratch, including selecting compatible components, installing hardware correctly, and configuring the BIOS/UEFI for optimal operation.

CO3: Skillful Troubleshooting: Students will effectively diagnose and troubleshoot hardware issues, using appropriate diagnostic tools and techniques to identify and fix common problems in a computer system.

CO4: Application of Maintenance and Upgrade Practices: Students will apply best practices for computer hardware maintenance and upgrades, including performing preventive maintenance, upgrading components, and ensuring the overall performance and reliability of the system.

UNIT-I

PC Assembling: Gather and Inspect Components and Tools. Prepare System Case for Assembly. Checking SMPS and fit with system Case. Plan System Layout. Install Hard Disk Drive/DVD-RW Drive. Configure Motherboard. Install Processor. Install Memory Modules/Motherboard/I/O Port Connectors/PS/2 Mouse Port Connector Connect Motherboard and Case Connect Hard Disk Drive/ DVD-RW Drive to Motherboard. Install Video Card. Perform Post-Assembly Inspection. Connect External Peripherals. Perform Initial Boot/Initial BIOS Setup/Install System Tests/Additional Peripherals. Partition and Format Hard Disk. Complete Assembly. Installation of Windows (Client version). Installation and configuration of driver software. Installation of Linux (Client version).Updating Service Pack of O. S. Installation of Anti Virus Software(Well known).Updating Anti Virus Software.

UNIT-II

Trouble shoots for Hardware Problems: Monitor display problems: No signals, Resolution problem, strange display etc. Mouse Problems: Wired mouse and wireless mouse both. Desktop & Laptop that shut down without warning are often experiencing overheating issues. Troubleshooting for Desktop& Laptop Hard Drive Failure, Date and Time problem, No power etc. RAM failure.

UNIT-III

Trouble shoots for O.S. Corruptions: Slow Operating System, Start-up Errors and Freezing Machines, Operating System will not Start, Unable to Connect to the Wireless Network(for Laptop),System restarts without warning. Fix the Windows blue screen errors. Not a valid win32 application. How to fix a fatal exception error. How to fix a general protection fault Runtime errors. Trouble shoots for Virus affected systems: Suspicious computer _ehavior such as high CPU usage on unrecognized processes. Unable to access network resources such as shared drives. Internet Explorer home page is changed without permission. Exploring error for drives.

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UNIT-IV

Trouble shoots for Application software malfunctioning: Issue opening or running a software program. Unable to install a software program. Trouble shoots for Network problems. Bad network card drivers or software settings. Firewall preventing computers from seeing each other. Connection related issues. Bad network hardware. Connection IP conflict problem etc. Internet Configuration Different types of internet connection and their configuration method. Broad band connection (ADSL and Cable etc.). Webcam installation. Troubleshoot while configuring internet.

Books Recommended:

- Mastering PC Hardware & Network, Dr. Ajit Mittal, Dr. Ajay Rana, Khanna Publishing House
- How Computers Work, Ron White
- Modern TFT & LCD Monitor Introduction and Troubleshooting, BPB Publication
- Service Manual Mother Board & Laptop, GT Publication
- Fundamental of Computer, V. Rajaraman
- Computer Fundamentals, R.S. Salaria, Khanna Publishing House (AICTE Recommended Textbook – 2018)

Paper Title: UHWNV-292 COMPUTER HARDWARE, PC ASSEMBLING & TROUBLE SHOOTING LAB

List of Experiments: (Based on UHWNV-202)

- Prepare System Case for Assembly.
- Checking SMPS and fit with system Case.
- Plan System Layout.
- Install Hard Disk Drive/DVD-RW Drive.
- Configure Motherboard.
- Install Processor.
- Install Memory Modules/Motherboard/I/O Port Connectors/PS/2 Mouse Port Connector
- Connect Motherboard and Case
- Connect Hard Disk Drive/ DVD-RW Drive to Motherboard.
- Install Video Card.
- Perform Post-Assembly Inspection.
- Connect External Peripherals.
- Perform Initial Boot/Initial BIOS Setup/Initial System Tests/Additional Peripherals.
- Partition and Format Hard Disk.
- Complete Assembly.
- Installation of Windows (Client version)
- Installation and configuration of driver software
- Installation of Linux (Client version)
- Updating Service Pack of O.S.
- Installation of Anti Virus Software(Well known)
- Updating Anti Virus Software.
- Document System.

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Paper Title: UHWNV – 293: PRACTICAL ON LAPTOP TROUBLE SHOOTING

Job Role: Hardware and Network Support Technician

Course Objectives:

- **Identify Common Laptop Issues:** Equip students with the ability to identify common hardware and software issues that affect laptops, including power problems, display issues, connectivity problems, and performance issues.
- **Develop Diagnostic Skills:** Teach students how to use diagnostic tools and techniques to systematically analyze and diagnose problems in laptops, including the use of builtin diagnostics and external tools.
- **Apply Repair and Troubleshooting Techniques:** Provide practical experience in performing repairs and troubleshooting on laptops, including hardware repairs (e.g., replacing components) and software troubleshooting (e.g., resolving OS and driver issues).
- **Understand Laptop Maintenance and Best Practices:** Educate students on best practices for laptop maintenance, including preventive measures to avoid common issues, proper handling techniques, and effective methods for extending the lifespan of a laptop.

Course Outcomes:

CO1: Proficiency in Identifying Laptop Issues: Students will be able to accurately identify and categorize common laptop issues, including hardware malfunctions and software problems, based on symptoms and performance indicators.

CO2: Competence in Diagnostic Skills: Students will demonstrate the ability to use diagnostic tools and techniques effectively to analyze and diagnose laptop issues, including interpreting diagnostic results and identifying the root cause of problems.

CO3: Skill in Repair and Troubleshooting: Students will effectively perform repairs and troubleshooting tasks on laptops, including replacing faulty hardware components, resolving software conflicts, and restoring system functionality.

CO4: Application of Maintenance Best Practices: Students will apply best practices for laptop maintenance, including performing preventive maintenance, employing proper handling procedures, and implementing strategies to improve laptop performance and longevity

UNIT-I

Motherboard Tracing as per block diagram. Laptop assembling & Disassembling (Battery, HDD, DVD-RW Drive, Inverter, LCD/TFT Panel, camera module etc. Bios Setting, Bios password Break, Admin password Break.

UNIT-II

Laptop trouble shooting I: Problems in different input and output ports. Adaptor Problems, S.M.P.S Problems Display Problems. Finger Prints Problems. Webcam Problems. Bluetooth Problems. LAN Problems, Ethernet Port Not Working, Sound problem: Sound Not Working, Intermediate Sound, Low Sound Battery Problems, Not Booting, No charging, Less battery backup, No Output, Intermediate O/P, Low Output.

UNIT-III

Laptop trouble shooting II: Keypad Problems, Touch pad/Pointers Not Working, Mouse (Internal) Not Working Docking Station Not Working, On/Off Switch Problems. CD/DVD Related Problems, Over Heat problems, Lock Problems, Broken Problems Handling problems, Inner Noise problems, RAM Related Problems Hard Disk Related Problems, Not Booting/Dead Problems When Working, Immediately Off Charging Problems.

UNIT-IV

Laptop trouble shooting III: CMOS Related Problems Hard disk Not detect Problem. Direct Error Display, Password Related Problems Processor Related Problems Wireless (Wi-Fi) Not Working, Power On-Immediately Processor Fan Off, LCD Related Problems, No Display-Light Ok Intermediate Display, No Display-No Light Scrambled Display, Black & White Display LCD Changing Problems, OS Related Problems. Water Damage, Hanging Problems. Laptop Dead Problems, Motherboard Problems.

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Books Recommended:

- Service Manual Mother Board & Laptop, GT Publication
- Laptop Repair Complete Guide, Garry Romano
- The Laptop Repair Workbook, Morris Rosenthal

Year-1 Diploma (SEMESTER – II)

Paper Title: UGEN – 281: SOFT SKILL & PERSONALITY DEVELOPMENT

Course Objectives

- Enhance interpersonal communication: Develop students' ability to communicate effectively with diverse audiences, both verbally and non-verbally.
- Foster personal and professional development: Equip students with the necessary skills to build self-confidence, time management, and leadership qualities.
- Improve critical thinking and problem-solving: Enhance students' ability to analyze complex situations, make informed decisions, and find effective solutions.
- Develop teamwork and collaboration: Cultivate students' ability to work effectively in groups, share responsibilities, and achieve common goals.

Course Outcomes

CO1: Effective communication: Students will be able to communicate clearly, concisely, and persuasively in various settings.

CO2: Personal and professional growth: Students will demonstrate improved self-awareness, time management, and leadership skills.

CO3: Critical thinking and problem-solving: Students will be able to analyze problems, generate solutions, and make informed decisions.

CO4: Teamwork and collaboration: Students will effectively collaborate with others to achieve shared objectives.

UNIT - I

Listening Skills: Barriers to listening; effective listening skills; feedback skills. Attending telephone calls; note taking. Activities: Listening exercises - Listening to conversation, News and TV reports. Taking notes on a speech / lecture.

UNIT - II

Speaking and Conversational Skills: Components of a meaningful and easy conversation; understanding the cue and making appropriate responses; forms of polite speech; asking and providing information on general topics. The study of sounds of English, stress and intonation. Situation based Conversation in English.

UNIT - III

Essentials of Spoken English: Activities, Making conversation and taking turns, Oral description or explanation of a common object, situation or concept, Giving interviews.

UNIT - IV

Oral Presentation with / without audio visual aids. Group Discussion . Listening to any recorded or live material and asking oral questions for listening comprehension.

UNIT - V

Classroom technique to improve the soft skills, Surprise writing on current issues, General grooming sessions to face the interview, Group discussions, Motivational classes to improve communication and confidence power

Books Recommended:

- Soft skills Training - A workbook to develop skills for employment by Fredrick H. Wentz
- Personality Development and Soft skills , Oxford University Press by Barun K. Mitra

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Paper Title: UGEN – 282: BUSINESS ANALYSIS: ENVIRONMENT, SALES & MARKETING

Course Objectives:

- **Analyze the Business Environment:** Equip students with the tools and techniques to analyze the external and internal business environment, including market trends, economic conditions, regulatory frameworks, and competitive landscapes.
- **Understand Sales Strategies and Techniques:** Provide students with a deep understanding of various sales strategies and techniques, focusing on how to develop, implement, and assess sales plans that drive customer acquisition and revenue growth.
- **Explore Marketing Principles and Practices:** Introduce students to core marketing principles, including market research, segmentation, targeting, positioning, and the development of marketing strategies to effectively reach and engage target audiences.
- **Integrate Sales and Marketing Analysis:** Teach students how to integrate insights from sales and marketing analyses to create comprehensive business strategies that align with environmental factors and drive organizational success.

Course Outcomes:

CO1: Competence in Analyzing the Business Environment: Students will be able to analyze various aspects of the business environment, including market conditions, economic factors, and competitive dynamics, and understand their impact on business strategies.

CO2: Ability to Develop Sales Strategies: Students will demonstrate the ability to create and implement effective sales strategies, using data driven insights to optimize sales performance, customer acquisition, and retention.

CO3: Proficiency in Marketing Principles and Practices: Students will apply marketing principles to design and execute marketing strategies, including conducting market research, segmenting target markets, and positioning products or services effectively.

CO4: Integration of Sales and Marketing Insights: Students will be capable of integrating sales and marketing analyses to formulate cohesive business strategies that address environmental factors and contribute to overall business growth and success.

UNIT - I

Business Environment - Introduction, Concept of Business, Levels of the Business Environment, Understanding the Environment, Economic Environment of Business, The Global Economic Environment, Economic Policies, Business and Economic Policies, Socio Cultural Environment, Business and Society, Business and Culture , Indian Business Culture, Culture and Organizational Behavior. Introduction to Political Environment, Political Environment and the Economic system, Types of Political Systems, Indian Constitution and Business, Changing Profile of Indian Economy , Business Risks Posed by the Indian Political System, Economic Systems, Financial Environment: Introduction, An Overview of the Financial System, Components of Financial System, Financial Institutions and their Roles, Financial Institutions in India, Role of Foreign Direct Investment

UNIT - II

Introduction to Legal Environment, Laws Impacting Industry in India, Intellectual Property Rights, Major Regulations Pertaining to Business, Regulatory Role of Government, Promotional Role of Government, Participatory Role of Government, Conciliatory and Judicial Role of Government , Impact of India's Industrial Policy on Economic Reforms, New Economic Policy, Globalization. India, WTO and Trading Blocs, Levels of Economic Integration/Trading Blocs, Effects of Economic Integration, Major Regional Trading Blocs, Commodity Agreement, World Trade Organization, WTO and India, Corporate Social Responsibility: Introduction, Meaning and Definition, Need for social responsibility of business, Social responsibility of business towards different groups, Barriers to social responsibility, Social responsibility of business in India, Public, Private, Joint and Cooperative Sectors

UNIT – III

Traditional and Modern Concepts of Marketing; Selling vs. Marketing; Marketing mix; Marketing Environment. Market Segmentation & its implication. Concept of Product, Product Planning and Development; Packaging: Role and Functions; Brand name and Trade mark; Product Life Cycle Concept; Distributions Channels and Physical Distribution. Price: Importance of Price in the Marketing Mix; Factors affecting Price of a Product/Service; Discounts and Rebates. Methods of Promotion; Advertising Media; Characteristics of an effective Advertisement

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UNIT – IV

Salesmanship and Qualities of Salesman; Product knowledge; Customer knowledge: Buying Motives and Selling Points. Scientific Selling; Approach and Presentation: Methods of Approaching a Customer; Presentation Process and Styles; Presentation planning. Objection Handling: Types of objections; Handling customer objections. Closing Sales and Follow up: Methods of closing sale; Executing sales order; Follow-up; Sales Promotion Schemes: Sampling; Coupon; Price Off; Premium Plan; Consumer Contests and Sweeps Takes; POP Displays; Demonstration; Trade Fairs and Exhibitions; Sales Promotion Techniques and Sales Force.

UNIT – V

Study of international organization (WTO, WORLD BANK, IMF, AMA), Case studies on the recent Business Environment, Marketing, & Sales Promotion, PPT presentation on selected issues, Survey to collect the samples for project work

Books Recommended:

- Business Environment; By T. R. Jain, Mukesh Trehan, Ranju Trehan, VK Global Publications.
- Business Environment; By Vishwajeet Prasad, Gyan Publishing House.
- Business Environment; By Saleem, Pearson Education India.
- BUSINESS ENVIRONMENT; By VEENA KESHAV PAILWAR, PHI Learning Pvt. Ltd.
- Business Environment, by Suresh Bedi, Excel Books
- BUSINESS ENVIRONMENT: INDIAN AND GLOBAL PERSPECTIVE; FAISAL AHMED, M. ABSAR ALAMM, PHI Learning Pvt. Ltd.
- Principles of Management, Premvir Kapoor, Khanna Publishing House (AICTE Recommended Textbook)
- PRINCIPLES OF MARKETING; Kotlar Philip and Armstrong Gary, Pearson Education
- MARKETING MANAGEMENT; Ramaswamy, V.S. and S. Namakumari: Macmillian
- SALES MANAGEMENT; Condif, Still and Govani et.al: Prentice Hall of India
- SALES MANAGEMENT; Text; Cases & Readings: Vaccaro J.P: Prentice Hall of India
- ADVERTISING & SALES PROMOTION; Kazmi & Batra: Excel Books