# B.VOC

# In

# HARDWARE AND NETWORKING (UGC)

**Program Outcomes:**

- Learn the proper techniques of maintenance of hardware and networking devices
- Study the science of hardware and networking
- Diagnose and repair all major problems regarding hardware, PC peripheral devices
- Build your own book of business
- Work as a system administrator

**Course Relevance:**

A recent survey has uncovered that the electronics and hardware sector is anticipated to grow even more in the coming years. Computer hardware and networking is proposed to be one of the quickest growing occupations.

Aspirants can seek jobs in private and public sector banks, financial institutions, colleges etc as to perform their regular work they require the services of hardware and networking experts. The additional benefit of being a trained professional in this sector is that they can start a business of their own, providing various computer networking related services to various other sectors who are in need for the same. Teaching in technical institutes too can be considered as a good career option.

## 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
*(Formerly West Bengal University of Technology)*
**B. Voc. in** Hardware & Networking (UGC)
**(Effective for Academic Session 2018-2019)**

# Year - 1 - Diploma (SEMESTER - I)

| Course | Component | Theory / Practical / Sessional | Internal (Theory) | External (Theory) | Internal (Practical) | External (Practical / Sessional) | Credit | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | **L** | **T** | **P** |
| UGEN - 101￼ENGLISH LANGUAGE AND COMMUNICATIVE SKILLS | Generic | Theory | 10 | 40 | - | - | 1 | 1 | - |
| UGEN - 102￼COMPUTER FUNDAMENTALS & IT | Generic | Theory | 10 | 40 | - | - | 1 | 1 | - |
| UHWNV-103￼BASIC ELECTRONICS | Skill | Theory | 10 | 40 | - | - | 1 | 1 | - |
| UHWNV-104￼DIGITAL ELECTRONICS | Skill | Theory | 10 | 40 | - | - | 1 | 1 | - |
| UGEN – 191￼COMPUTER FUNDAMENTALS & IT LAB | Generic | Practical | - | - | 10 | 40 | - | - | 2 |
| UHWNV-192￼BASIC ELECTRONICS LAB | Skill | Practical | - | - | 10 | 40 | - | - | 2 |
| UHWNV-193￼DIGITAL ELECTRONICS LAB | Skill | Practical | - | - | 10 | 40 | - | - | 2 |
| UHWNV-194￼PRACTICAL ON COMPUTER COMPONENTS IDENTIFICATION AND TESTING | Skill | Practical | - | - | 40 | 60 | - | - | 4 |
| UGEN – 181￼ENGLISH LANGUAGE LAB | Generic | Sessional | - | - | - | 50 | - | - | 2 |

**All Generic Components common to all B. Voc. courses.**
**Industrial Training of 3 - 4 weeks of 6 credits in each year followed by report writing and Viva Voce.**
**These credits will be evaluated in semester 6**

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## Year - 1 - Diploma (SEMESTER - II)

| Course | Component | Theory / Practical / Sessional | Internal (Theory) | External (Theory) | Internal (Practical) | External (Practical / Sessional) | Credit | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | L | T | P |
| UGEN - 201 SOFT SKILL & PERSONALITY DEVELOPMENT | Generic | Theory | 10 | 40 | - | - | 1 | 1 | - |
| UGEN - 202 BUSINESS ANALYSIS: ENVIRONMENT, SALES & MARKETING | Generic | Theory | 10 | 40 | - | - | 1 | 1 | - |
| UHWNV-203 PERSONAL COMPUTING SOFTWARE | Skill | Theory | 10 | 40 | - | - | 1 | 1 | - |
| UHWNV-204 COMPUTER HARDWARE, PC ASSEMBLING & TROUBLE SHOOTING | Skill | Theory | 10 | 40 | - | - | 1 | 1 | - |
| UHWNV-291 PERSONAL COMPUTING SOFTWARE LAB | Skill | Practical | - | - | 10 | 40 | - | - | 2 |
| UHWNV-292 COMPUTER HARDWARE, PC ASSEMBLING & TROUBLE SHOOTING LAB | Skill | Practical | - | - | 10 | 40 | - | - | 2 |
| UHWNV-293 PRACTICAL ON LAPTOP TROUBLE SHOOTING | Skill | Practical | - | - | 40 | 60 | - | - | 4 |
| UGEN - 281 SOFT SKILL & PERSONALITY DEVELOPMENT LAB | Generic | Sessional | - | - | - | 50 | - | - | 2 |
| UGEN - 282 PRACTICE SESSION ON BUSINESS ANALYSIS: ENVIRONMENT, SALES & MARKETING | Generic | Sessional | - | - | - | 50 | - | - | 2 |
| **All Generic Components common to all B. Voc. courses.** **Industrial Training of 3 - 4 weeks of 6 credits in each year followed by report writing and Viva Voce.** **These credits will be evaluated in semester 6** | | | | | | | | | |

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## Year - 2 - Advanced Diploma (SEMESTER - III)

| Course | Component | Theory / Practical / Sessional | Internal (Theory) | External (Theory) | Internal (Practical) | External (Practical / Sessional) | Credit L | T | P |
|---|---|---|---|---|---|---|---|---|---|
| UGEN - 301 VALUE EDUCATION & HUMAN RIGHTS | Generic | Theory | 10 | 40 | - | - | 1 | 1 | - |
| UGEN - 302 BASIC ACCOUNTING | Generic | Theory | 10 | 40 | - | - | 1 | 1 | - |
| UHWNV-303 COMPUTER PERIPHERAL AND DEVICES | Skill | Theory | 10 | 40 | - | - | 1 | 1 | - |
| UHWNV-304 NETWORK FUNDAMENTALS | Skill | Theory | 10 | 40 | - | - | 1 | 1 | - |
| UHWNV-391 COMPUTER PERIPHERAL AND DEVICES LAB | Skill | Practical | - | - | 10 | 40 | - | - | 2 |
| UHWNV-392 NETWORK FUNDAMENTALS LAB | Skill | Practical | - | - | 10 | 40 | - | - | 2 |
| UHWNV-393 PRACTICAL ON NETWORKING | Skill | Practical | - | - | 40 | 60 | - | - | 4 |
| UGEN - 381 PRACTICE SESSION ON VALUE EDUCATION & HUMAN RIGHTS | Generic | Sessional | - | - | - | 50 | - | - | 2 |
| UGEN - 382 PRACTICE SESSION ON BASIC ACCOUNTING | Generic | Sessional | - | - | - | 50 | - | - | 2 |

**All Generic Components common to all B. Voc. courses.**
**Industrial Training of 3 - 4 weeks of 6 credits in each year followed by report writing and Viva Voce.**
**These credits will be evaluated in semester 6**

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## Year - 2 - Advanced Diploma (SEMESTER - IV)

| Course | Component | Theory / Practical / Sessional | Internal (Theory) | External (Theory) | Internal (Practical) | External (Practical / Sessional) | Credit | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | L | T | P |
| UGEN - 401 ENVIRONMENTAL STUDIES | Generic | Theory | 10 | 40 | - | - | 1 | 1 | - |
| UGEN - 402 QUALITY MANAGEMENT | Generic | Theory | 10 | 40 | - | - | 1 | 1 | - |
| UHWNV-403 WINDOWS SERVER ADMINISTRATION | Skill | Theory | 10 | 40 | - | - | 1 | 1 | - |
| UHWNV-404 SWITCHING AND ROUTING | Skill | Theory | 10 | 40 | - | - | 1 | 1 | - |
| UHWNV-491 WINDOWS SERVER ADMINISTRATION LAB | Skill | Practical | - | - | 10 | 40 | - | - | 2 |
| UHWNV-492 SWITCHING AND ROUTING LAB | Skill | Practical | - | - | 10 | 40 | - | - | 2 |
| UHWNV-493 PRACTICAL ON ROUTING CONFIGURATION & NETWORK CONNECTIVITY | Skill | Practical | - | - | 40 | 60 | - | - | 4 |
| UGEN - 481 PRACTICE SESSION ON ENVIRONMENTAL STUDIES | Generic | Sessional | - | - | - | 50 | - | - | 2 |
| UGEN - 482 PRACTICE SESSION ON QUALITY MANAGEMENT | Generic | Sessional | - | - | - | 50 | - | - | 2 |

**All Generic Components common to all B. Voc. courses.**
**Industrial Training of 3 - 4 weeks of 6 credits in each year followed by report writing and Viva Voce.**
**These credits will be evaluated in semester 6**

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# Year - 3 - Degree (SEMESTER - V)

| Course | Component | Theory / Practical / Sessional | Internal (Theory) | External (Theory) | Internal (Practical) | External (Practical / Sessional) | Credit | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | L | T | P |
| UGEN - 501￼INDIAN ECONOMY & SOCIAL CHANGES | Generic | Theory | 10 | 40 | - | - | 1 | 1 | - |
| UGEN - 502￼RESEARCH METHODOLOGY | Generic | Theory | 10 | 40 | - | - | 1 | 1 | - |
| UHWNV-503￼LINUX OPERATING SYSTEM | Skill | Theory | 10 | 40 | - | - | 1 | 1 | - |
| UHWNV-504￼NETWORK ADMINISTRATION & TROUBLE SHOOTING | Skill | Theory | 10 | 40 | - | - | 1 | 1 | - |
| UHWNV-591￼LINUX OPERATING SYSTEM LAB | Skill | Practical | - | - | 10 | 40 | - | - | 2 |
| UHWNV-592￼NETWORK ADMINISTRATION & TROUBLE SHOOTING LAB | Skill | Practical | - | - | 10 | 40 | - | - | 2 |
| UHWNV-593￼PRACTICAL ON SWITCHING CONFIGURATION & NETWORK CONNECTIVITY | Skill | Practical | - | - | 40 | 60 | - | - | 4 |
| UGEN - 581￼PRACTICE SESSION ON INDIAN ECONOMY & SOCIAL CHANGES | Generic | Sessional | - | - | - | 50 | - | - | 2 |
| UGEN – 582￼PRACTICE SESSION ON RESEARCH METHODOLOGY | Generic | Sessional | - | - | - | 50 | - | - | 2 |

**All Generic Components common to all B. Voc. courses.**
**Industrial Training of 3 - 4 weeks of 6 credits in each year followed by report writing and Viva Voce.**
**These credits will be evaluated in semester 6**

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# Year - 3 - Degree (SEMESTER - VI)

| Course | Component | Theory / Practical / Sessional | Internal (Theory) | External (Theory) | Internal (Practical) | External (Practical / Sessional) | Credit | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | L | T | P |
| UGEN - 601￼<br>GENERAL HUMAN PSYCHOLOGY & HR MANAGEMENT | Generic | Theory | 10 | 40 | - | - | 1 | 1 | - |
| UGEN - 602￼<br>ENTREPRENEURSHIP DEVELOPMENT PROGRAMME | Generic | Theory | 10 | 40 | - | - | 1 | 1 | - |
| UGEN - 681￼<br>PRACTICE SESSION ON GENERAL HUMAN PSYCHOLOGY & HR MANAGEMENT | Generic | Sessional | - | - | - | 50 | - | - | 2 |
| UGEN - 682￼<br>PRACTICE SESSION ON ENTREPRENEURSHIP DEVELOPMENT PROGRAMME | Generic | Sessional | - | - | - | 50 | - | - | 2 |
| UHWNV - 683￼<br>INDUSTRIAL TRAINING | Skill | Sessional | - | - | - | 300 | - | - | 12 |
| **All Generic Components common to all B. Voc. courses.**￼<br>**Industrial Training of 3 - 4 weeks of 6 credits in each year followed by report writing and Viva Voce.**￼<br>**These credits will be evaluated in semester 6** | | | | | | | | | |

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**Year-1 Diploma (SEMESTER – I)**

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

**Objective:** The objective of this paper is to familiarize the students with the importance of Communication and its associated components in the hard core corporate sector.

### 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

**Paper Title: UGEN – 102: COMPUTER FUNDAMENTALS & IT**

**Objectives:** The objective of this course is to familiarize students with Fundamentals of Computer and IT applications. It enables the student to get practical exposure towards MS - Office tools.

### 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

**Paper Title: UGEN – 191 COMPUTER FUNDAMENTALS & IT LAB**

**List of Experiments: (Based on UGEN – 102)**
- Different components of Taskbar
- Create Desktop icons
- Create Folder and Files on Desktop
- Run Application such as Notepad, MS Paint
- Change Mouse properties in Windows
- Connecting to the Internet
- Applying browsers software such as chrome, Internet Explorer
- Applying software download
- Create E-mail ID in a mail server
- Sending E-mail and working with Inbox
- Create Bio data in word
- Formatting text in Word
- Create excel database, apply auto sum
- Create presentation file with multiple slides
- Apply slide transition

**Paper Title: UHWNV - 103: BASIC ELECTRONICS**

**Job Role: Hardware and Network Support Technician**

**Objectives:** Basic electronics enable the students to learn about Analog electronics technologies, their implementation, uses, circuit tracing, troubleshooting and maintenance.

### 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

**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-192 BASIC ELECTRONICS LAB**

**List of Experiments: (Based on UHWNV-103)**
- 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.
- Characterestics 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.
- Characterestics of BJT
- Characterestics of JFET

**Paper Title: UHWNV-104: DIGITAL ELECTRONICS**

**Job Role: Hardware and Network Support Technician**

**Objectives:** Digital electronics enable the students to learn about Digital electronics technologies, their implementation, uses, circuit tracing, troubleshooting and maintenance.

## 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.

**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-193  DIGITAL ELECTRONICS LAB**

**List of Experiments: (Based on UHWNV-104)**
- 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

**Paper Title: UHWNV-194: PRACTICAL ON COMPUTER COMPONENTS IDENTIFICATION AND TESTING**

**Job Role: Hardware and Network Support Technician**

**Objectives:** The objective of this paper is to provide basic concept of computer components, its identification and testing.

### 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 partsof 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 connectionfor mother board, hard disk, and drivers.Fixing wires for power restart switches, fixing wiresfor 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 andcomponentsMouse, Keyboard, Monitor, Hard Disk.

**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)

**Year-1 Diploma (SEMESTER – II)**

**Paper Title: UGEN – 201: SOFT SKILL & PERSONALITY DEVELOPMENT**

**Objective:** On completion of the course, the students will be able to listen to lectures, public announcements, news on TV, radio and engage in telephonic conversation to communicate effectively and accurately in English used as spoken language for various purposes.

### 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.
**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

**Paper Title: UGEN - 281 SOFT SKILL & PERSONALITY DEVELOPMENT LAB**

**Planning for Practical session: (Based on UGEN – 201)**

- 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

**Paper Title: UGEN – 202: BUSINESS ANALYSIS: ENVIRONMENT, SALES & MARKETING**

**Objective:** The course will enable the students to understand, assimilate and apply the various dimensions of business and its associated affairs in the socio economic, socio cultural and socio political ambience.

## 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

## 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.

**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; Condiff, 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

**Paper Title: UGEN - 282  PRACTICE SESSION ON BUSINESS ANALYSIS: ENVIRONMENT, SALES & MARKETING**

**Planning for Practical session: (Based on UGEN – 202)**

- 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

**Paper Title: UHWNV-203: PERSONAL COMPUTING SOFTWARE**

**Job Role: Hardware and Network Support Technician**

**Objectives:** The objective of this course is to familiarize students with Fundamentals of Information Technology and its applications. It enables the student to get practical exposure towards MS- Office tools

## 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.

## 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 chat 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-203)**
- 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

# Maulana Abul Kalam Azad University of Technology, West Bengal
*(Formerly West Bengal University of Technology)*
**B. Voc. in** Hardware & Networking (UGC)
**(Effective for Academic Session 2018-2019)**

**Paper Title: UHWNV-204: COMPUTER HARDWARE, PC ASSEMBLING & TROUBLE SHOOTING**

**Job Role: Hardware and Network Support Technician**

**Objectives:** This paper enables the students to identify the hardware in-depth and helps them to learn about PC Assembling, hardware technologies, their implementation/installation, uses, troubleshooting and maintenance.

## 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.

## 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-204)**
- 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.

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

**Job Role: Hardware and Network Support Technician**

**Objectives:** The objective of this paper is to provide concept of laptop repairing and trouble shooting.

## UNIT-I

Motherboard Tracing as per block diagram. Laptop assembling & Dissembling (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 ProblemsDisplay Problems. Finger Prints Problems. Webcam Problems.Bluetooth Problems.LAN Problems, Ethernet Port Not Working, Sound problem: Sound Not Working, Intermediate Sound,Low SoundBattery 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 set 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.

**Books Recommended:**
- Service Manual Mother Board & Laptop, GT Publication
- Laptop Repair Complete Guide, Garry Romaneo
- The Laptop Repair Workbook, Morris Rosenthal

**Year-2- Advanced Diploma (SEMESTER – III)**

**Paper Title: UGEN – 301: VALUE EDUCATION & HUMAN RIGHTS**

**Objective:** The course aims to provide a sharp insight into the importance of human values, ethics, morality and above all the full growth of personality to ensure some total development of the human mind.

### UNIT – I
Concept of Human Values, Value Education Towards Personal Development, Aim of education and value education; Evolution of value oriented education; Concept of Human values; types of values; Components of value education. Personal Development, Character Formation Towards Positive Personality, Value Education Towards National and Global Development, National and International Values, Social Values, Professional Values , Religious Values, Aesthetic values.

### UNIT – II
Impact of Global Development on Ethics and Values, Conflict of cross – cultural influences, mass media, cross – border education, materialistic values, professional challenges and compromise, Modern Challenges of Adolescent Emotions and behavior; Sex and spirituality, Adolescent Emotions.

### UNIT – III
Theraupatic Measures – Control of the mind through: Simplified physical exercise, Meditation – Objectives, types, effect on body, mind and soul, Yoga – Objectives, Types, Asanas, Activities: Moralisation of Desires, Neutralisation of Anger, Eradication of Worries, Benefits of Blessings

### UNIT – IV
Human Rights – concepts & evolution, Definitions under Indian and International documents, Broad classification of Human Rights and Relevant Constitutional Provisions, Human Rights of Women and Children, Institutions for Implementation, Violations and Redressal.
**Books Recommended:**
- Value education and human rights, By R. P. Shukla, Sarup & Sons
- Professional Ethics and Human Values, By Dr. Premvir Kapoor, Khanna Publishing House (AICTE Recommended Textbook -2018)
- Value Education And Education For Human Rights, By V.C. Pandey, Gyan Publishing House.
- Education for Values, Environment and Human Rights, By Y. K. Sharma, Published by Deep and Deep Publications.
- Human Rights: Twenty First Century Challenges, edited by V.N. Viswanathan (ed. By), Gyan Publishing House.
- Education for Values, Environment and Human Rights, By J. C. Aggarwal, Shipra Publications, 2005
- Human Rights Education: A Global Perspective, edited by Hemlata Talesra, Nalini Pancholy, Mangi Lal Nagda, Published by Daya Books.

**Paper Title: UGEN - 381 PRACTICE SESSION ON VALUE EDUCATION & HUMAN RIGHTS**

**Planning for Practical session: (Based on UGEN – 301)**
- Motivational classes on values and ethics
- Case studies
- PPT presentation on selected areas

**Paper Title: UGEN – 302: BASIC ACCOUNTING**

**Objective:** The course will surely help the students to gain a comprehensive knowledge on the various areas of finance such as basic concepts, role of accounts, preparation of charts and an overview of the subject at the both domestic and international levels.

### UNIT – I
Define the accounting process, Describe the role of accountants, Explain accounting concepts and principles, Discuss the concept of the accounting equation, Use the accounting equation to analyze basic transactions in terms of increases and decreases, Reporting financial information on a balance sheet, Determine how transactions change owner's equity in an accounting equation, Reporting a changed accounting equation on a balance sheet, Analyze transactions using T – accounts and using debits and credits, Use debits and credits to record increase and decreases in accounts, Record journal entries in a 5 – column journal, Define accounting terms related to journalizing transactions, Prove and rule a five – column journal and prove cash

### UNIT – II
Prepare a chart of accounts and opening accounts, Post separate amounts from a journal to a general ledger, Post column totals from a journal to a general ledger, Make correcting entries, Reconcile a bank statement and record bank service charges, dishonored checks, and petty cash transactions, Describe and prepare the work sheet, Plan and adjust entries on a work sheet, Extend financial statement information on a work sheet, Find and correct errors on a work sheet, Describe the content and purpose of the three basic financial statements and how they are related.

### UNIT – III
Journalize and post adjusting entries, Journalize and post closing entries and prepare a post – closing trial balance. Reinforcement 1B, Describe the nature of merchandising business, Describe and be able to journalize purchases of merchandise for cash, Describe and be able to journalize purchases of merchandise on account and buying of supplies, Describe and be able to journalize cash payments and other transactions, Journalizing sales (compute sales tax) and cash receipts, Describe the concept of subsidiary ledgers, Journalize and post using accounts payable subsidiary ledgers, Journalize and post using accounts receivable subsidiary ledgers

### UNIT – IV
Prepare payroll records, Preparing payroll time cards, Calculating employee total earnings, Determining payroll tax withholding, Preparing payroll checks, Record, and journalize the payroll for a merchandising business, Record employer payroll taxes, Reporting, and paying withholding and payroll taxes, Prepare a worksheet for a merchandising business, Analyzing and adjusting the Merchandise Inventory account, Analyzing and adjusting the Supplies account, Analyzing and adjusting the Prepaid Insurance account, Prepare a multiple – step income statement for a merchandising business, Analyzing component percentages of income statements showing net income and net loss, Prepare a distribution of net income and owner's equity statements, Prepare a classified balance sheet

**Books Recommended:**
- Basic Accounting: The step-by-step course in elementary accountancy, By Nishat Azmat, Andy Lymer, Hachette UK.
- Basic Accounting, By Rajni Sofat, PHI Learning Pvt. Ltd.
- BASIC ACCOUNTING, By SOFAT, RAJNI , HIRO, PREETI, PHI Learning Pvt. Ltd.
- Accounting for Beginners, By Kokab Rahman, Createspace Independent Pub, 2013

**Paper Title: UGEN - 382 PRACTICE SESSION ON BASIC ACCOUNTING**

**Planning for Practical session: (Based on UGEN – 302)**
- Assignment on discussed topics
- Case studies analysis

**Paper Title: UHWNV-303: COMPUTER PERIPHERAL AND DEVICES**

**Job Role: Hardware and Network Support Engineer**

**Objectives:** This paper enables the students to repair different IO devices like keyboard, Mouse, Monitor, Printer, Joystick, Scanner etc.

### UNIT-I
Keyboard: Types of keyboard, correcting problems, vacuum cleaners and keyboards, keyboard maintenance, Mouse: Mouse basics, working with a mouse, performing mouse actions, inside the mouse, adjusting mouse properties, mouse keys, mouse maintenance, Optical mouse, breakdown and break through.

### UNIT-II
Monitors: basic, VGA, DVI, viewable area, maximum resolution and dot pitch, power consumption, flat panel, monitor resolution, colour depth, degaussing, power option for monitor, display option for monitor, monitor maintenance.

### UNIT-III
Printers: printer characteristics, type quality, print speed, impact vs nonimpact, and fonts. Inkjet printers: common features, operations, parts of inkjet printer, control panel, trays, cartridges, cleaning cartridges, replacing cartridges, clearing paper jams. Laser Printers: common features, operations, technology, control panel, trays, output bin, cartridges, redistributing toner, internal cleaning, paper jams, cancel printing jobs, setting preferences and defaults of printing, breakdown and break through.

### UNIT-IV
Other I/O Devices: Demo on Joy Stick, Web Cam, Pen drive and Digital pad. Scanner

**Books Recommended:**
- Modern All about Printer, Lotia
- Modern All about Keyboard and Mouse, Lotia
- Modern TFT & LCD Monitor Introduction and Troubleshooting, BPB Publication

**Paper Title: UHWNV-391 COMPUTER PERIPHERAL AND DEVICES LAB**

**List of Experiments: (Based on UHWNV-303)**
- Demo. on Keyboards and it's maintenance.
- Demo. on Mouse and it's maintenance.
- Demo. on CRT monitors and it's maintenance.
- Demo. on solid state  monitors and it's maintenance.
- Simple problems and their solutions of monitors.
- Demo. on inkjet Printer and it's maintenance.
- Demo. on Laser printer and it's maintenance.
- Printer (inkjet and laser): Common features, control panel, trays, cartridges, cleaning cartridges, replacing cartridges, clearing paper jams., redistributing toner, internal cleaning, paper jams, cancel printing jobs, setting preferences and defaults.
- Demo. on I/O devices (Joy Stick, Web Cam, Pen drive and Digital pad. Scanner)and it's maintenance

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## (Effective for Academic Session 2018-2019)

**Paper Title: UHWNV – 304: NETWORK FUNDAMENTALS**

**Job Role: Hardware and Network Support Engineer**

**Objectives:** Networking Fundamentals teaches the basic concepts and terminology of networking. The syllabus covers media types and standards. Students are also introduced to the terminology and basic concepts and Open Systems Interconnection (OSI) model.

### UNIT I
Network concepts: Introduction to Network, characteristics, need, types of networks on the basis of area coverage: LAN, WAN, MAN; Advantages and Disadvantages of networks; Network Topologies: bus topology, ring topology, star topology, tree topology, mesh topology and hybrid topology. Network Models: Peer-to-Peer, protocol, client / server network and hybrid type network. Servers: Different types of servers, Network protocols

### UNIT-II
Introduction to network standards: OSI reference model, TCP/IP Model. Difference between OSI reference model & TCP/IP model, Transmission Media: Types, Guided Media: twisted pair cable, coaxial cable, fibre optics, Unguided Media: radio wave, microwave, light wave, infrared and satellite.

### UNIT-III
Networking protocols: DNS, FTP, Telnet, DHCP, HTTP, TFTP, SSH, SFTP, SMTP, POP, IMAP, NTP Network devices: HUB, Switch, Repeater, Bridges, Routers, Gateway: IEEE Standards: IEEE Standards for LAN and WAN: IEEE Standard 802.3 and Ethernet, IEEE Standard 802.4 Token Bus, IEEE Standard 802.5 Token Ring, IEEE Standard 802.6 Distributed Queue Dual Bus, IEEE Standard 802.2 Logical Link Control.

### UNIT-IV
IP address: Introduction, IP address format, classes of IP Address, subnet address, Configuration of IP Address in PC, Configuration of IP address in Switch, configuration of Wireless Devices, Access Points Network Interface card (NIC): working principle of NIC, MAC Address, User Management: overview of user account, managing user account and password security: adding user, setting and changing password, changing picture of user, deleting the user, setting account restriction for the user, renaming a local account.

**Books Recommended:**
- Tannenbaum, A.S., 2003: Computer Networks, Prentice Hall.
- Networking: The Complete Reference 1st Edition, Mcgraw Hill Education
- Stallings, William, Local and Metropolitan Area Networks: Macmillan Publishing Co.
- Black: Data Network, Prentice Hall of India.
- CCNA Cisco Certified Network Associate Study Guide 3rd Edition, Mcgraw Hill Education
- Cisco a Beginner's Guide, Fifth Edition, McGraw-Hill/Osborne Media
- Bhavneet Sidhu, Computer Networks, Khanna Publishing House, New Delhi (AICTE Recommended Textbook)

**Paper Title: UHWNV-392 NETWORK FUNDAMENTALS LAB**

**List of Experiments: (Based on UHWNV-304)**
- Identification of Twisted Pair Cable, Fiber Optic Cable, Coaxial Cable and their respective connectors
- Identification of different types of NIC and Wi-Fi cards and their specifications
- Identification of Hub, Switch, Router, ADSL Gateway, Access Point
- Simple configuration of Cisco Switch, Cisco Router, ADSL Gateway, AP
- Securing Cisco Switch, Cisco Router, ADSL Gateway, AP by user account and passwords

**Paper Title: UHWNV-393: PRACTICAL ON NETWORKING**

**Job Role: Hardware and Network Support Engineer**

**Objectives:** The objective of this paper is to provide in-depth knowledge about the concepts of networking. It offers integrated and comprehensive coverage of networking tools and devices.

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**UNIT-I**
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**Networking Tools**: Crimping tool, punching tool: Impact and Punch down Tool, Multi Punch Tool, RJ45 Punch Down Tool, Impact Tool, Computer Punch Tool – deluxe, Cable cutter,I/O device, I/O Face Plate, I/O Box, LAN Cards, Connectors: RJ-11 (Registered Jack), RJ-45 (Registered Jack), F-Type, ST (Straight Tip) and SC (Subscriber Connector or Standard Connector), Fiber LC (Local Connector), MT-RJ (Mechanical Transfer Registered Jack),USB (Universal Serial Bus), LAN Patch Panel, Network Switch Rack.
**Testing and Networking Tools**: Introduction, Types of tools: LAN Testers, Application tools:IP scanner, Test Network Speed, Bandwidth Monitor 2 Lite Edition, Netbrute Scanner, piecework's IT Desktop, Ping, ipconfig, fstat, iproute, route, netstat, ipconfig /release, ipconfig /renew

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**UNIT-II**
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**Working of cables**: Coaxial cable, Unshielded twisted pair (UTP), Types of UTP Cable, Shielded Twisted-Pair Cable, Fibre optics, Patch Cords: UTP Patch cords, Fibre patch cords, Cable Manager, Cable Tag, Cable stripper, Scissors.
**Working on Hub and Switch**: Types of Hub: Active Hub, Passive Hub and Intelligent Hub,Types of switches: Unmanaged Network Switches, Managed Switches, Smart Switches. Setting up of network: UTP cables, Switch, LAN tester, Switch Rack, Patch Panel, Cable Manager, Cable tagging, I/O box, I/O face plate, patch cords, connectors, terminals.

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**UNIT- III**
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**Patching of LAN Cable**: Strip cable end, Untwist wire ends, Arrange wires, Trim wires to size, Attach connector, Check, Crimp, and Test. Setting up of LAN: UTP cables, Switch, LAN tester, Switch Rack, Patch Panel, Cable Manager, Cable tagging, I/O box, I/O faceplate, patch cords, connectors, terminals.
**Internet connectivity**: Different types of internet connection: Wireless, mobile, Hotspot, Dial-up, Broadband, DSL, Cable, Satellite, ISDN, Internet Service Provider (ISP), bandwidth or speed tester, Internet connectivity switch and PC, configuration of switch, managing of switching, troubleshooting of switching, testing application for switch.

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**UNIT- IV**
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**Wi-Fi Connectivity**: Basic Configuration of Wi-Fi device or access point, IP address configuration, DNS Address, DHCP mode, Security and Password, Admin login and password, MAC Filtering, Monitoring, Backup and restore, etc.
**Switch connectivity**: Managed and unmanaged switch, Basic configuration of switch, macfiltering, IP address configuration, DNS address, DHCP Mode, Admin login and Password, VLAN, backup file and restore settings.

**Books Recommended:**
- CCNA Cisco Certified Network Associate Study Guide 3rd Edition, Mcgraw Hill Education
- Cisco Networking Essentials, Author: mcmillan, troyauthor; John Wiley & Sons
- Vikas Gupta, Comdex Hardware and Networking Course Kit, 1st Edition, Dreamtech Press
- Crypto and Network Security, 3rd Edition, Mcgraw Hill Education
- Cisco a Beginner's Guide, Fifth Edition, McGraw-Hill/Osborne Media
- Networking: The Complete Reference 1st Edition, Mcgraw Hill Education
- Tannenbaum, A.S., 2003: Computer Networks, Prentice Hall.
- Stallings, William, Local and Metropolitan Area Networks: Macmillan Publishing Co.
- Black: Data Network, Prentice Hall of India.
- Bhavneet Sidhu, Computer Networks, Khanna Publishing House, New Delhi (AICTE Recommended Textbook)

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**Year-2- Advanced Diploma (SEMESTER – IV)**

**Paper Title: UGEN – 401: ENVIRONMENTAL STUDIES**

**Objective:** Keeping in view the modern status of environment, the course primarily aims at providing various awareness programs required for the welfare of the environment apart from the emphasis on the general and conventional issues surrounding the environment.

### UNIT - I

Multidisciplinary nature of environmental studies - Definition, scope and importance, need for public Awareness, Natural Resources: Renewable and non - renewable resources, Natural resources and associated problems, Role of an individual in conservation of natural resources. Equitable use of resources for sustainable lifestyles, Ecosystems: Concept, Structure and function of an ecosystem. Producers, consumers and decomposers. Energy flow in the ecosystem. Ecological succession. Food chains, food webs and ecological pyramids.

### UNIT - II

Biodiversity and its conservation , Bio - geographically classification of India, Value of biodiversity, Biodiversity at global, National and local levels. India as a mega diversity Nation, Hot - sports of biodiversity. Threats to biodiversity: habitat loss, poaching of wildlife, man - wildlife conflicts. Endangered and endemic species of India. Conservation of biodiversity: In - situ and Ex - situ conservation of biodiversity.

### UNIT - III

Environmental Pollution: Definition , Cause, effects and control measures of : Air pollution, Water pollution, Soil pollution, Marine pollution, Noise pollution, Thermal pollution, Nuclear hazards. Solid waste Management: Causes, effects and control measures of urban and industrial wastes. Role of an individual in prevention of pollution. Pollution case studies. Disaster management: floods, earthquake, cyclone and landslides . Social Issues and the Environment: From Unsustainable to Sustainable development. Urban problems related to energy. Water conservation, rain water harvesting, watershed management. Resettlement and Rehabilitation of people; its problems and concerns. Case Studies.

### UNIT - IV

Environmental ethics: Issues and possible solutions. Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case Studies. Wasteland reclamation. Consumerism and waste products. Environment Protection Act. Air (Prevention and Control of Pollution) Act. Water (Prevention and control of Pollution)Act. Wildlife Protection Act Forest Conservation Act. Issues involved in enforcement of environmental legislation. Public awareness. Human Population and the Environment. Population growth, variation among nations. Population explosion - Family Welfare Programme. Environment and human health. Human Rights. Value Education. HIV/AIDS. Women and Child Welfare. Role of Information Technology in Environment and Human health. Case Studies.

**Books Recommended:**
- M.P. Poonia & S.C. Sharma, Environmental Studies, Khanna Publishing House
- Mike Hulme, Climates and Cultures.
- Mark Garrett, Encyclopaedia of Transportation Social Science and Policy.
- Steel, Science An A - to - Z Guide to Issues and Controversies.
- John A Matthews, Encyclopaedia of Environmental Change.
- O.P. Gupta, Elements of Environmental Pollution Control, Khanna Publishing House

**Paper Title: UGEN - 481 PRACTICE SESSION ON ENVIRONMENTAL STUDIES**

**Planning for Practical session: (Based on UGEN – 401)**

- Case studies
- Tree plantation program
- PPT presentation on selected areas
- Poster making

**Paper Title: UGEN – 402: QUALITY MANAGEMENT**

**Objective:** This course will help the students to digest the basic features of the subject apart from a handful of theories, laws, hypothesis included in the course, before the students stamp their feet on the corporate sector.

### UNIT - I
Introduction to Quality Management, Evolution of Quality Management, Concepts of Product and Service Quality
Dimensions of Quality, Deming's, Juran's, Crosby's Quality Philosophy, Quality Cost

### UNIT - II
Introduction to Process Quality, Graphical and statistical techniques for Process Quality Improvement
Graphical tools for data representation, 7 QC tools

### UNIT - III
Sampling, sampling distribution, and hypothesis Testing Regression, Control charts, Process capability analysis, Measurement system analysis, Analysis of Variance (ANOVA), Design and Analysis of Experiment (DOE), Acceptance sampling plan, TQM, Leadership, Lean and JIT Quality Philosophy, Benchmarking, Process failure mode and effect analysis(PFMEA), Service Quality, Six sigma for Process Improvement, ISO 9001 and QS 9000
Quality Audit, Quality Circles

### UNIT - IV
Quality Improvement, Quality Function Deployment, Robust Design and Taguchi Method, Design Failure Mode & Effect Analysis, Product Reliability Analysis, Six Sigma in Product Development

**Books Recommended:**
- D. C. Montgomery, Introduction to Statistical Quality Control, John Wiley & Sons, 3rd Edition.
- M.P. Poonia & S.C. Sharma, Total Quality Management, Khanna Publishing House (AICTE Recommended Textbook)
- Mitra A. , Fundamentals of Quality Control and Improvement, PHI, 2nd Ed. , 1998.
- J Evans and W Linsay, The Management and Control of Quality, 6'th Edition, Thomson, 2005
- Besterfield, D H et al. , Total Quality Management, 3rd Edition, Pearson Education, 2008.
- D. C. Montgomery, Design and Analysis of Experiments, John Wiley & Sons, 6th Edition, 2004
- D. C. Montgomery and G C Runger, Applied Statistics and Probability for Engineers, John Wiley & Sons, 4th Edition.

**Paper Title: UGEN - 482 PRACTICE SESSION ON QUALITY MANAGEMENT**

**Planning for Practical session: (Based on UGEN – 402)**
- Case studies
- PPT presentation on TQM practices
- Survey and sample collection for project

**Paper Title: UHWNV - 403: WINDOWS SERVER ADMINISTRATION**

**Job Role: Hardware and Network Support Engineer**

**Objectives:** The objective of this paper is to provide practical knowledge to the students about the Network Server. This course is meant to examine Windows Server while giving maximum learning potential to new Windows Administrators and Windows Developers.

## UNIT-I

**Network Operating Systems:** Windows Server Editions, Linux, Unix. Windows Server: different ways to install network operating system, pre-installation requirements. Deploying and Managing Windows Server, Introduction to Active Directory Domain Services, Installing Domain Controllers, Managing Active Directory Domain Services Objects Managing User and Service Accounts, Maintaining AD DS. Implementing a Group Policy Infrastructure, Managing User Desktops with Group Policy,

## UNIT-II

**Installing and Configuring a Network Policy Server**: Implementing Network Access Protection, Installing, Configuring, and Troubleshooting the Network Policy Server Role. Implementing Direct Access by Using the Getting Started Wizard Lab : Deploying an Advanced Direct Access Solution Lab : Implementing VPN Lab : Implementing Web Application Proxy, Optimizing File Services, Configuring Quotas and File Screening Using File Server Resource Manager Lab: Implementing Distributed File System, Configuring Encryption and Advanced Auditing, Deploying and Maintaining Server Images, Using Windows Deployment Services to Deploy Windows Server, Implementing Update Management, Monitoring Windows Server.

## UNIT-III

**Microsoft Windows Server:** Automating Active Directory Domain Services Administration, Implementing Dynamic Host Configuration Protocol, Implementing DNS, Configuring and Troubleshooting Domain Name System. Implementing Local Storage, Implementing File and Print Services. Terminal services: Dumb terminals, terminal server configuration, windows server as terminal server, Implementing Remote Access, application configuration with terminal server, advantages of terminal services.

## UNIT-IV

**Windows Security**: Firewalls, Spyware, viruses, User accounts security, Search strategies System performance, Troubleshooting tools, Windows registry. Administering Windows Server: Maintaining Active Directory Domain Services.

**Books Recommended:**
- Windows Server Administration Fundamentals by Microsoft Official Academic Course
- Darril Gibson, Microsoft Windows Networking Essentials 1st Edition
- Tom Carpenter, Microsoft Windows Server Administration Essentials
- Jamsa, Kris A., 1993: Rescued by Windows 3.1, Galgotia. 5. Basandra, S.K., 1995 Computers Today, Galgotia.

**Paper Title: UHWNV-491 WINDOWS SERVER ADMINISTRATION LAB**

**List of Experiments: (Based on UHWNV-403)**
- Installation of windows server.
- Promotion of windows server to domain controller. ( show attended & unattended installation of domain controller both)
- Installation of different roles & features in windows server.
- Configuration of Different user management features of windows server.
- Configuration of domain user account, roaming user account, mandatory user account in windows server.
- Configuration of Organizational Unit (OU)
- Configuration of different group policies on domain user account.
- Automating Active Directory Domain Services Administration.
- Configure Network Access Protection (NAP) in windows server.
- Configure VPN.
- Configure file server.
- Configure Distributed File System(DFS)
- Configure disk quotas & file screening by using file server resource manager.
- Configure encryption in file server.
- Configure advance auditing & show how to filter & read log files.
- Configure Windows Deployment Service (WDS) & install images to client computer with it.
- Configure Windows Server Update Services (WSUS)
- Performance monitor of windows server.
- Configuration of DHCP server, DHCP reservation & DHCP scope backup & restore.
- Configuration of different DNS zones.
- Configuration of storage server.
- Configuration of print server.
- Practical on windows registry with the help of windows registry editor.

**Paper Title: UHWNV-404: SWITCHING AND ROUTING**

**Job Role: Hardware and Network Support Engineer**

**Objectives:** This course provides an integrated and comprehensive coverage of networking topics from fundamentals to advanced application and services, it enable the students to enhance career development skill in the field of networking.

### UNIT-I

Switch: introduction, roles of switches in network, types of switches: managed and unmanaged switch. Working of switch in different layers. Configuration of Switch: Command Mode, Setting Host Names, Setting Passwords, Setting IP Addresses and Default Gateways, Setting Operational Speed, Switch Port Security, Sticky MAC Addresses.

### UNIT- II

Switching: Introduction, Switching Services, Bridging vs LAN Switching, Switch Functions at Layer 2, Definition of Spanning Tree Protocol (STP), Operations of STP, STP Port States, Definition of VLAN, Typing of VLAN: Static and Dynamic, VLAN Identification Methods, VLAN Trunking Protocol (VTP), VTP Modes of Operation, Routing between VLANs, Configuring Inter-VLAN Routing

### UNIT- III

Router: Introduction, components of routers, Types of Routers: Broadband Routers, Wireless Routers, Edge Router, Subscriber Edge Router, Inter-provider Border Router, Core Router, Wired and Wireless Routers. Functions of routers, router modes, Configuration of Router: names, passwords, password encryption, interfaces name, creating a login banner, saving configuration and erasing configuration.

### UNIT-IV

Routing: Introduction, Types of routing: static and dynamic routing, Static routing: Configuring a static route, permanent keyword, static routes and administrative distance, configuring default route. Dynamic routing: Dynamic Routing Protocols: RIPv1, RIPv2,IGRP, EIGRP and OSPF. Delivery Semantics: unicast, anycast, multicast, broadcast, geocast. Configuring and Verifying RIP, IGRP, OSPF, EIGRP.

**Books Recommended:**
- Lacoste, CCNP Routing and Switching TSHOOT 300 - 135: Official Cert Guide, Pearson India
- Todd Lammleccna, Routing and Switching Study Guide, Wiley India Pvt Ltd
- CCNA Cisco Certified Network Associate Study Guide 3rd Edition, Mcgraw Hill Education
- Mcmillan,Cisco Networking Essentials, Author: John Wiley & Sons
- Vikas Gupta, Comdex Hardware and Networking Course Kit, 1st Edition, Dreamtech Press
- Cisco a Beginner's Guide, Fifth Edition, McGraw-Hill/Osborne Media
- Networking: The Complete Reference 1st Edition, Mcgraw Hill Education
- Mastering PC Hardware & Networking, Ajit Mittal & Ajay Rana, Khanna Publishing House

**Paper Title: UHWNV-492 SWITCHING AND ROUTING LAB**

**List of Experiments: (Based on UHWNV-404)**
- Demonstration of basic operation of Switch in Cisco Packettracer
- Demonstration of MAC Table management in Cisco Switch
- Configure simple Port-Security of Cisco Switch
- Demonstration of port performance of Cisco Switch (speed, duplex, portfast)
- Demonstarion on Password, management IP address, default gateway for Cisco Switch
- Demonstration of Switching loop
- Demonstration on switching loop management by Spanning Tree Protocol
- Demonstration on STP port states
- Demonstration on STP topology wrt Root Bridge, Root Port, Designated Bridge and Designated Port
- Demonstration on VLAN and L2 Broadcast Domain segmentation
- Demonstration on Standard and Extended VLAN, Management VLAN, Voice VLAN
- Demonstration on VLAN Trunking and VTP
- Demonstration on Inter VLAN communication
- Demonstrate basic management of Cisco Router
- Configure Static Route and Default Route
- Configure basic level RIPv1, RIPv2, EIGRP, OSPF
- Demonstrate Routing table wrt Administrative Distance and Cost
- Demonstrate how Routing Protocols decide route cost

**Paper Title: UHWNV – 493: PRACTICAL ON ROUTING CONFIGURATION & NETWORK CONNECTIVITY**

**Job Role: Hardware and Network Support Engineer**

**Objectives:** Routing technology provides an integrated and comprehensive coverage of networking topics from fundamentals to advanced application and services, while providing opportunities for hands on practical experiences and career skill development.

### UNIT- I

Functionality of Router and Switch: Describe basic routing concepts: packet forwarding, router lookup process, Process Switching/Fast Switching/CEF, Configure and verify utilizing the CLI to set basic Router configuration: hostname, local user and password, enable secret password, console and VTY logins, exec-timeout, service password encryption, Interface IPAddress, loopback, banner, motd, copy run start.

### UNIT-II

Configure and verify operation status of a device interface: Serial, Ethernet, Verify router configuration and network connectivity using, ping, extended, traceroute, telnet, SSH, shcdp neighbors. Describe the boot process of Cisco IOS routers, Configure and verify utilizing the CLI to set basic Router configuration, Configure and verify operation status of a device interface, both serial and Ethernet, Verify router configuration and network connectivity. IPRouting Technologies: Configure and verify routing configuration for a static or default route given specific routing requirements.

### UNIT-III

Differentiate methods of routing and routing protocols, Static versus Dynamic, 4.6.b Linkstate versus Distance Vector, next hop, ip routing table, Passive Interfaces (how they work),Admin Distance, and split horizon, metric. Configure and Verify OSPF: Benefit of singlearea, Configure OSPv2, Configure OSPv3, Router ID, Passive Interface, Discuss multi-areaOSPF, Understand LSA types and purpose.

### UNIT-IV

Configure and verify inter VLAN routing (Router on a stick), sub interfaces, upstream routing, encapsulation, Configure SVI interfaces, Manage Cisco IOS Files, Boot Preferences, Cisco IOS Images (15), Licensing, Show license, Change license, Configure and verify EIGRP (single AS), Feasible Distance/Feasible Successors/Administrative distance, Feasibility condition, Metric composition, Router ID, auto summary, Path Selection, Load Balancing, Unequal, Equal.

**Books Recommended:**
- Lacoste, CCNP Routing and Switching TSHOOT 300-135: Official Cert Guide, Pearson India
- Todd Lammleccna, Routing and Switching Study Guide, Wiley India Pvt Ltd
- CCNA Cisco Certified Network Associate Study Guide 3rd Edition, Mcgraw Hill Education
- Mcmillan,Cisco Networking Essentials, Author: John Wiley & Sons
- Crypto and Network Security, 3rd Edition, Mcgraw Hill Education
- Cisco a Beginner's Guide, Fifth Edition, McGraw-Hill/Osborne Media

**Year-3-Degree (SEMESTER –V)**

**Paper Title: UGEN – 501: INDIAN ECONOMY & SOCIAL CHANGES**

**Objective:** The subject aims to cover a broad canvas of the Indian economy from independence to the present era including the possible social changes witnessed over the period of time.

### UNIT - I
Indian Economy on the eve of Independence, British rule and its impact on Indian Economy, Emergence and development of Planning exercise in India - historical debates, plan models and shift in focus over time

### UNIT - II
Output (National Income) and Employment Structure of Indian Economy; Composition and relative rates of growth of agriculture, industry and services sectors; Sub - sectoral analysis. Trends and patterns in structure of population over time - growth rate, gender, rural - urban, literacy, regional; Structure and trends of Poverty and Inequality (interpersonal and regional);

### UNIT - III
Inflation - trends, structure and causes; Unemployment - trends, structure and types. Trends in Agricultural Production and Productivity; Land Reforms - Genesis, Progress and current status; Green Revolution - Measures and its effects. Trends and Patterns of Industrial Sector; Changes in the structure of Indian Industry; Small Scale Industries - Growth, Structure and its contribution in national economy; Public Sector - Growth, Structure, Historical role, Evolution and Dilution. Trends in Exports and Imports; Composition and Direction of Foreign Trade; Balance of Payments - Current Status

### UNIT - IV
Introduction to different theories of social change, Social conditions and religious thought.

**Books Recommended:**
- R Dutta and K P M Sundaram: Indian Economy, S Chand
- A. N. Agarwal: Indian Economy, Problems of Development and Planning, New Age.
- Mishra and Puri: Indian Economy, Himalaya.
- Planning Commission: Eleventh Five Year Plan, Vol I, II and III, Academic Foundation.
- Government of India: Economic Survey (latest issue)

**Paper Title: UGEN - 581 PRACTICE SESSION ON INDIAN ECONOMY & SOCIAL CHANGES**

**Planning for Practical session: (based on UGEN – 501)**
- Data collection on Indian economy system
- PPT presentation on the current economic scenario
- Case studies on recent economic issues
- Graphical presentation to connect between economy and society

**Paper Title: UGEN – 502: RESEARCH METHODOLOGY**

**Objective:** The course aims to teach the students to read, understand and explore something new from the conventional material before they climb up the ladder for more progressive research works.

### UNIT - I
Foundations of Research: Meaning, Objectives, Motivation, Utility. Concept of theory, empiricism, deductive and inductive theory. Characteristics of scientific method - Understanding the language of research - Concept, Construct, Definition, Variable. Research Process (10%)

### UNIT - II
Problem Identification & Formulation - Research Question - Investigation Question - Measurement Issues - Hypothesis - Qualities of a good Hypothesis - Null Hypothesis & Alternative Hypothesis. Hypothesis Testing - Logic & Importance (10%)

### UNIT - III
Research Design: Concept and Importance in Research - Features of a good research design - Exploratory Research Design - concept, types and uses, Descriptive Research Designs - concept, types and uses. Experimental Design: Concept of Independent & Dependent variables.

### UNIT - IV
Qualitative and Quantitative Research: Qualitative research - Quantitative research - Concept of measurement, causality, generalization, replication. Merging the two approaches.

**Books Recommended:**
- Research methodology by P. K. Manoharam
- Research methodology by Dr. C. Rajindra Kumar
- Research methodology methods and techniques by C. R. Kothari

**Paper Title: UGEN - 582 PRACTICE SESSION ON RESEARCH METHODOLOGY**

**Planning for Practical session: (Based on UGEN – 502)**
- Case studies
- Model paper presentation on assigned topics
- Survey and sample collection for project preparation

**Paper Title: UHWNV-503: LINUX OPERATING SYSTEM**

**Job Role: System Administrator**

**Objectives:** This course enables students to get familiar with Linux system, its commands, files& directories, shell programming, and system administration. Student will learn to Work in the Linux environment and administrate the Linux machine.

### UNIT – I
Introduction: Linux Operating System, features, Basic Architecture, features of Kernel and Shell. Linux File system - Boot block, super block, Inode table, data blocks, How Linux kernel access files, Linux standard file system. Structure of file system, Essential Linux commands - Commands for files and directories : cat, cd, ls, cp, md, rm, mkdir, rmdir, pwd, file, more, less, file comparisons – cmp & comm, View files, disk related commands, checking disk free spaces, chmod with its options, cal, date, who, tty, lp, stty.

### UNIT –II
Filters and pipes: head, tail, wc, pr, cut, paste, sort, uniqe, grep, egrep, fgrep, tee. The process : shell process, parent and children ,process status, system process, multiple jobs in background and foreground, changing process priority with nice, premature termination of process, Mathematical commands- bc, expr, factor, units.

### UNIT –III
Creating and editing files with VI editor with their command options, Operators, text deletion, text movement, changing text, yanking text, filtering text, the ex-mode, moving text from one file to another. Communication: The bulletin board –news, write, mesg, talk, mail, elm, pine, finger, vacation and connecting to remote machine.

### UNIT –IV
System administration Common administrative tasks, identifying administrative files – configuration and log files, Role of system administrator, Managing user accounts-adding &deleting users, changing permissions and ownerships, Installation of Linux system– Linux Installation requirement, complete Procedure steps, Partitioning the Hard drive, System startup and shut-down process, init and run levels. File system mounting, lpstat, backup strategy, installing software on Linux.

**Books Recommended:**
- Tim Parker: Linux Unleashed, Techmedia Publishing House.
- Norton, P.: Complete guide to LINUX, Techmedia.
- Komarinski, M.: LINUX System Administration Handbook, AW.
- John Goerzen: Linux Programming Bible, IDG Books, New Delhi.
- Venkateshmurthy, M.G.: Introduction to UNIX & Shell Programming, Pearson Education.
- Tery Dawson, Gregor N. Purdy, Linux Network Administration Guide, Oreilly.


**Paper Title: UHWNV-591 LINUX OPERATING SYSTEM LAB**

**List of Experiments: (Based on UHWNV-503)**
- **INSTALLATION :**
  - i) Installation Prerequisite of LINUX OS(Different Distros)
  - ii) Installation of LINUX OS
  - iii) Partitioning the HDD
  - iv) Post Installation configuration
- **COMMANDS:**
  - i) **Practice on some commands:** Commands for files and directories: cat, cd, ls, cp, md, rm, mkdir, rmdir, pwd, file, more, less.
  - ii) **file comparisons:** cmp & comm, View files.
  - iii) **Disk related commands, checking disk free spaces**: fdisk, df, hwinfo.
  - iv) **Permission related commands:** Chmod,Chgrp.
  - v) **Special Commands :** , cal, date, who, tty, lp, stty.
  - vi) **Filters and pipes**: head, tail, wc, pr, cut, paste, sort, uniqe, grep, egrep, fgrep, tee.
  - vii) **Process Related Commands:** top,ps,pstree,kill,pgrep,pkill,renice
  - viii) **Creating and editing files:** vi, vim, nano, gedit.
  - ix) **Interaction with Remote System:** ssh,mesg,talk,mail,pine,finger.
- **SYSTEM ADMINISTRATION :** Managing user accounts-adding & deleting users, practical on changing permissions and ownerships,System startup and shut-down process, init and run levels types &  their uses. File system mounting, lpstat, backup strategy, installing software on Linux.

**Paper Title: UHWNV - 504: NETWORK ADMINISTRATION & TROUBLE SHOOTING**

**Job Role: System Administrator**

**Objectives:** The goal of this course is to train students to an exceptionally high standards in network planning, implementation, administration and support.

### UNIT-I
Backing UP and Restoring IOS Software and Configuration: Boot system commands, IOS file system, backing up configuration to a TFTP server, restoring configuration to a TFTP server, backing up the IOS software to a TFTP server, restoring/upgrading the IOS software from a TFTP server, restoring IOS software from ROM Monitor mode using Xmodem.

### UNIT-II
Password-Recovery Procedures and configuration Register: The configuration register: A visual representation, bit means, the boot field, console terminal baud rate setting, And consol line speed: CLI& ROM Monitor mode, password recovery procedures for router, password recovery procedures for switches.

### UNIT-III
Basic troubleshooting: viewing routing table, determining the gateway of last resort, last routing update, OSI layer 3 testing, OSI layer 7 testing, interpreting the show interface command, using CDP to troubleshooting, show controllers command debug commands, time stamps, Operating system IP verification commands, the ip http server command, netstat command.

### UNIT-IV
Security Device Manager: SDM connecting with CLI and GUI, SDM Express Wizard with no CLI pre-configuration, resetting the router to factory defaults, SDM user interfaces, configuration routing using SDM, SDM monitor mode, SDM to configuration a router as a DHCP server & client, SDM configuration NAT/PAT.

**Books Recommended:**
- CCNA Cisco Certified Network Associate Study Guide 3rd Edition, Mcgraw Hill Education
- Cisco Networking Essentials, Author: mcmillan, troy; John Wiley & Sons
- Vikas Gupta, Comdex Hardware and Networking Course Kit, 1st Edition, Dreamtech Press
- Crypto and Network Security, 3rd Edition, Mcgraw Hill Education
- Cisco a Beginner's Guide, Fifth Edition, McGraw-Hill/Osborne Media
- Networking: The Complete Reference 1st Edition, Mcgraw Hill Education
- Mastering PC Hardware & Networking, Ajit Mittal, Khanna Publishing House

**Paper Title: UHWNV-592 NETWORK ADMINISTRATION & TROUBLE SHOOTING LAB**

**List of Experiments: (Based on UHWNV-504)**
- Backing up Cisco Router IOS by TFTP / XMODEM
- Restoring Cisco Router IOS by TFTP / XMODEM
- Upgrading Cisco Router IOS by TFTP / MODEM
- Password recovery of Cisco Router
- Password recovery of Cisco Switch
- Troubleshooting Routing Issues
- Troubleshooting using CDP
- SDM configuration for Cisco Router
- Configuring Cisco router as DHCP Server using SDM
- Configuring NAT / PAT in Cisco Router using SDM

**Paper Title: UHWNV-593: PRACTICAL ON SWITCHING CONFIGURATION & NETWORK CONNECTIVITY**

**Job Role: System Administrator**

**Objectives:** Switching technology provides an integrated and comprehensive coverage of networking topics from fundamentals to advanced application and services, while providing opportunities for hands on practical experiences and career skill development.

### UNIT-I
IP Services: Configure and verify DHCP (IOS Router), Configuring router interfaces to use DHCP, DHCP options (basic overview and functionality), Excluded addresses, Lease time, Describe the types, features, and applications of ACLs, standard (editing and sequence numbers) extended, named, numbered, Log option. Configure and verify ACLs in a network environment, named, numbered, Log option, Identify the basic operation of NAT, purpose, pool, static, 1 to 1, overloading, source addressing, one way NAT, Configure and verify NAT for given network requirements.

### UNIT-II
Configure and verify NTP as a client. Recognize High availability (FHRP), VRRP, HSRP, GLBP, and Configure and verify syslog, Utilize Syslog Output, Describe SNMP v2 and v3. LAN Switching Technologies: Determine the technology and media access control method for Ethernet networks, Identify basic switching concepts and the operation of Cisco switches: Collision Domains, Broadcast Domains, Ways to switch, Store, Forward, Cut through, CAM Table.

### UNIT-III
Configure and verify initial switch configuration including remote access management: Hostname, management IP address, IP default-gateway, local user and password, enable secret password Console and VTY logins, exec-timeout service password encryption, copy run start, Verify network status and switch operation using basic utilities such as: ping, telnet, SSH. Describe how VLANs create logically separate networks and the need for routing between them, Explain network segmentation and basic traffic management concepts, Configure and verify VLANs.

### UNIT-IV
Configure and verify trunking on Cisco switches: dtp (topic), auto-negotiation, Identify enhanced switching technologies: RSTP, PVSTP, Ether channels, Configure and verify PVSTP operation: Describe root bridge election, Spanning tree mode. Configure and verify Switch Port Security: Sticky mac, MAC address limitation, static/dynamic, violation modes, err disable, shutdown, protect restrict, shutdown unused ports, err disable recovery, assign unused ports in unused VLANs, putting Native VLAN to other than VLAN 1.

**Books Recommended:**
- Lacoste, CCNP Routing and Switching TSHOOT 300 - 135: Official Cert Guide, Pearson India
- Todd Lammleccna, Routing and Switching Study Guide, Wiley India Pvt Ltd
- CCNA Cisco Certified Network Associate Study Guide 3rd Edition, Mcgraw Hill Education
- Mcmillan,Cisco Networking Essentials, Author: John Wiley & Sons
- Crypto and Network Security, 3rd Edition, Mcgraw Hill Education
- Cisco a Beginner's Guide, Fifth Edition, McGraw-Hill/Osborne Media

**Year-3-Degree (SEMESTER –VI)**

**Paper Title: UGEN – 601: GENERAL HUMAN PSYCHOLOGY & HR MANAGEMENT**

**Objective:** The classic blend of psychology and human resource will help to deal with the individuals in the corporate sector. The study of proper human mind is to be emphasized before the role of human resource management comes to play.

**UNIT - I**
Introduction to psychology, Nature of psychology; Basic concepts: Person, States of Consciousness: Sleep and Wakefulness and altered States of Consciousness, Behavior and Experience, II Evolution of the discipline of psychology; Psychology and other disciplines; Linkages across psychological processes

**UNIT - II**
Methods of psychology, The bases of human behavior, Evolutionary perspective on human behavior; Biological and cultural roots; Nervous system and endocrine system: Structure and relationship of with behavior and experience; Brain and behavior, Socialization, Enculturation and Acculturation; Globalization; Diversity and pluralism in the Indian context.

**UNIT - III**
Evolution and growth of human resource management (with special reference to Scientific management and Human relations approaches). Role of HR in strategic management. Nature. objectives, scope, and functions of HR management, Challenges of HR (the changing profile of the workforce - knowledge workers, employment opportunities in BPOs, IT and service industries, Flexi options), Workforce diversity (causes, paradox, resolution of diversity by management).

**UNIT - IV**
Concepts of line - staff in the structure of human resource department and the role of human resource manager, Manpower planning, Job analysis, Job evaluation.

**Books Recommended:**
- General Psychology by S. Dandapani, Neelkamal Publication (2016)
- General Psychology by R. K. Gupta
- Aswathappa K. (2002) Human Resource and Personnel Management, Tata McGraw - Hill, New Delhi.
- Bhattacharyya Kumar Deepak (2006) Human Resource Managing, Excel Books, New Delhi.
- Cascio F. W. (2003) Managing Human Resources, Productivity, Quality of Life, Profits, Tata Mc - Graw - Hill, New York.

**Paper Title: UGEN - 681 PRACTICE SESSION ON GENERAL HUMAN PSYCHOLOGY & HR MANAGEMENT**

**Planning for Practical session: (Based on UGEN – 601)**
- How to conduct counseling sessions
- Case studies
- PPT presentation on recent HR practices

**Paper Title: UGEN – 602: ENTREPRENEURSHIP DEVELOPMENT PROGRAMME**

**Objective:** The course aim to give a shape to understand the validity of various entrepreneurship development programs in the field of economics and its related concepts.

### UNIT - I

To make the students understand about entrepreneurs and different classifications. Entrepreneur and entrepreneurship - Definition; traits and features; classification; Entrepreneurs; Women entrepreneurs; Role of entrepreneur in Entrepreneurs in India, Create an awareness about EDP. Entrepreneurial development programme concept; Need for training; phases of EDP; curriculum & contents of Training Programme; Support systems, Target Groups; Institutions conducting EDPs in India and Kerala.

### UNIT - II

General awareness about edeutification of project financing new enterprises; Promotion of a venture; opportunity Analysis Project identification and selection; External environmental analysis economic, social, technological an competitive factors; Legal requirements for establishment of a new unit; loans; Over rum finance; Bridge finance; Venture capital; Providing finance in Approaching financing institutions for loans.

### UNIT - III

To identify different Discuss opportunities in small business; Small business Enterprise - Identifying the Business opportunity in various sectors - formalities for setting up of a small business enterprise - Institutions supporting small business enterprise - EDII (Entrepreneurship Development Institute of India), SLDO (Small Industries Development Organization NSIC (National small Industries Corporation Ltd. (CNSIC) NIESBUD (National Institute for Entrepreneurship and small Business Development) Sickness in small business enterprise causes and remedies.

### UNIT - IV

To understand about a project report relating to a small business; Project formulation - Meaning of a project report significance contents formulation planning commissions guidelines for formulating a project report - specimen of a project report, problems of entrepreneurs case studies of entrepreneurs.

**Books Recommended:**
- Cliffton, Davis S. and Fylie, David E. , Project Feasibility Analysis, John Wiley, New York, 1977.
- Desai A. N., Entrepreneur and Environment, Ashish, New Delhi, 1990.
- Drucker, Peter, Innovation and Entrepreileurship, Heinemann, London, 1985
- Jain Rajiv, Planning a Small Scale Industry: A guide to Entrepreneurs, S. S. Books, Delhi, 1984
- Kumar S. A. , Entrepreneurship in Small Industry, Discovery, New Delhi, 1990
- McCleffand, D. C. and Winter, W. G. , Motivating Economic Achievement, Free Press, New York, 1969

**Paper Title: UGEN - 682  PRACTICE SESSION ON ENTREPRENEURSHIP DEVELOPMENT PROGRAMME**

**Planning for Practical session: (Based on UGEN – 602)**
- PPT presentation
- Case studies on Men/Women entrepreneurs
- Seminar on successful entrepreneurs
- Preparation of project work

**Paper Title: UHWNV – 683: INDUSTRIAL TRAINING**

**Job Role: System Administrator**

Industrial Training of 3 - 4 weeks of 6 credits in each year followed by Report Writing and Viva - voce. These trainings are to be carried out during summer vacations. These training may be done from industries/Skill knowledge providers (SKPs)/Sector Skill Councils (SSCs)/Training centers/Institutes. These credits will be evaluated in Semester VI.