B. VOC

In

ELECTRONIC MANUFACTURING SERVICES (UGC)

Program Outcomes:
- Diagnose and repair all major electronics system
- Document repairs of electronic goods accurately and descriptive of concern cause and correction
- Effectively locate and utilize technical information required for the repair of electronic gadgets
- Work safely and responsibly within shop standards and environmental guidelines

Course Relevance:

The Indian electronics industry is one of the largest and fastest - growing industries in the world. Electronics manufacturing industry in India needs to grow at a much faster pace due to the ever - growing demand for consumer electronics, IT and telecom goods. This demand is expected to grow to US$ 400 billion by 2020, according to some estimates.

India is an attractive hub for foreign investments in the manufacturing sector as well. Several mobile phones, luxury and automobile brands, among others, have set up or are looking to establish their manufacturing bases in the country.
The manufacturing sector of India has the potential to reach US$ 1 trillion by 2025 and India is expected to rank amongst the top three growth economies and manufacturing destination of the world by the year 2020.

Here rises the demand for skilled professional Electronics Manufacturing Service providers. B. Voc in Electronic Manufacturing Services is specifically designed for students to gain skills & knowledge of Electronic Manufacturing Services so that they can relate themselves to the expected surge in Electronic Manufacturing industry.

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 Electronic Manufacturing Services (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)	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	-
UEMSV - 103￼FUNDAMENTAL OF ELECTRICAL	Skill	Theory	10	40	-	-	1	1	-
UEMSV - 104￼PRINCIPLE OF ELECTRONICS	Skill	Theory	10	40	-	-	1	1	-
UGEN – 191￼COMPUTER FUNDAMENTALS & IT LAB	Generic	Practical	-	-	10	40	-	-	2
UEMSV - 192￼FUNDAMENTAL OF ELECTRICAL LAB	Skill	Practical	-	-	10	40	-	-	2
UEMSV - 193￼PRINCIPLE OF ELECTRONICS LAB	Skill	Practical	-	-	10	40	-	-	2
UEMSV - 194￼IDENTIFICATION OF COMPONENTS, TOOLS, EUIPMENT, SOLDERING & DE - SOLDERING TECHNIQUES (PRACTICAL)	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

Maulana Abul Kalam Azad University of Technology, West Bengal
(Formerly West Bengal University of Technology)
B.Voc. in Electronic Manufacturing Services (UGC)
(Effective for Academic Session 2018-2019)

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	-
UEMSV - 203 ELCTRONICS DEVICES & CIRCUITS	Skill	Theory	10	40	-	-	1	1	-
UEMSV - 204 DIGITAL ELCTRONICS	Skill	Theory	10	40	-	-	1	1	-
UEMSV - 205 ELECTRONIC MEASUREMENT & INSTRUMENTATION	Skill	Theory	10	40	-	-	1	1	-
UEMSV - 291 ELCTRONICS DEVICES & CIRCUITS LAB	Skill	Practical	-	-	10	40	-	-	2
UEMSV - 292 DIGITAL ELCTRONICS LAB	Skill	Practical	-	-	10	40	-	-	2
UEMSV - 293 ELECTRONIC MEASUREMENT & INSTRUMENTATION LAB	Skill	Practical	-	-	10	40	-	-	2
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

Maulana Abul Kalam Azad University of Technology, West Bengal
(Formerly West Bengal University of Technology)
B.Voc. in Electronic Manufacturing Services (UGC)
(Effective for Academic Session 2018-2019)

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	-
UEMSV - 303 MICROPROCESSOR	Skill	Theory	10	40	-	-	1	1	-
UEMSV - 304 AUDIO& VIDEO ENGINEERING	Skill	Theory	10	40	-	-	1	1	-
UEMSV - 305 FUNDAMENTAL OF TROUBLESHOOTING ELECTRONIC EQUIPMENT	Skill	Theory	10	40	-	-	1	1	-
UEMSV - 391 MICROPROCESSOR LAB	Skill	Practical	-	-	10	40	-	-	2
UEMSV - 392 AUDIO& VIDEO ENGINEERING LAB	Skill	Practical	-	-	10	40	-	-	2
UEMSV - 393 FUNDAMENTAL OF TROUBLESHOOTING ELECTRONIC EQUIPMENT LAB	Skill	Practical	-	-	10	40	-	-	2
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

Maulana Abul Kalam Azad University of Technology, West Bengal
(Formerly West Bengal University of Technology)
B.Voc. in Electronic Manufacturing Services (UGC)
(Effective for Academic Session 2018-2019)

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	-
UEMSV - 403 PC SOFTWARE	Skill	Theory	10	40	-	-	1	1	-
UEMSV - 404 MOBILE & SMART PHONE	Skill	Theory	10	40	-	-	1	1	-
UEMSV - 405 TROUBLESHOOTING & MAINTENANCE OF ELECTRONIC EQUIPMENT – I	Skill	Theory	10	40	-	-	1	1	-
UEMSV - 491 PC SOFTWARE LAB	Skill	Practical	-	-	10	40	-	-	2
UEMSV - 492 MOBILE & SMART PHONE LAB	Skill	Practical	-	-	10	40	-	-	2
UEMSV - 493 TROUBLESHOOTING & MAINTENANCE OF ELECTRONIC EQUIPMENT LAB – I	Skill	Practical	-	-	10	40	-	-	2
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

Maulana Abul Kalam Azad University of Technology, West Bengal
(Formerly West Bengal University of Technology)
B.Voc. in Electronic Manufacturing Services (UGC)
(Effective for Academic Session 2018-2019)

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	-
UEMSV - 503 COMMUNICATION ENGINEERING	Skill	Theory	10	40	-	-	1	1	-
UEMSV - 504 TROUBLESHOOTING & MAINTENANCE OF ELECTRONIC EQUIPMENT – II	Skill	Theory	10	40	-	-	1	1	-
UEMSV - 591 COMMUNICATION ENGINEERING LAB	Skill	Practical	-	-	10	40	-	-	2
UEMSV - 592 TROUBLESHOOTING & MAINTENANCE OF ELECTRONIC EQUIPMENT LAB – II	Skill	Practical	-	-	10	40	-	-	2
UEMSV – 593 PROJECT	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

Maulana Abul Kalam Azad University of Technology, West Bengal
(Formerly West Bengal University of Technology)
B.Voc. in Electronic Manufacturing Services (UGC)
(Effective for Academic Session 2018-2019)

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 GENERAL HUMAN PSYCHOLOGY & HR MANAGEMENT	Generic	Theory	10	40	-	-	1	1	-
UGEN - 602 ENTREPRENEURSHIP DEVELOPMENT PROGRAMME	Generic	Theory	10	40	-	-	1	1	-
UGEN - 681 PRACTICE SESSION ON GENERAL HUMAN PSYCHOLOGY & HR MANAGEMENT	Generic	Sessional	-	-	-	50	-	-	2
UGEN - 682 PRACTICE SESSION ON ENTREPRENEURSHIP DEVELOPMENT PROGRAMME	Generic	Sessional	-	-	-	50	-	-	2
UEMSV - 683 INDUSTRIAL TRAINING	Skill	Sessional	-	-	-	300	-	-	12
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**									

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 transitio

Paper Title: UEMSV – 103: FUNDAMENTAL OF ELECTRICAL

Job Role: Electronics Junior Technician

Objectives: Fundamental of electrical will enable the students to be equipped with the concepts of current electricity, electric cells, capacitors, electromagnetic effects, A. C Circuits etc, and their implementation, uses, troubleshooting and maintenance.

UNIT - I
Current Electricity: Definition of Resistance, Voltage, Current, Power, Energy and their units, Relation between electrical, mechanical and thermal 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, Kirchhoff's Laws and their applications.

UNIT - II
Electric Cells: Primary cell, wet cell, dry cell, battery, Li - ion battery, series and parallel connections of cells, Secondary cells, Lead Acid Cell, Discharging and recharging of cells, preparation of electrolyte, care and maintenance of secondary cells.
Lighting Effects of Current: Lighting effect of electric current, filaments used in lamps, and Tube light, LED, their working and applications.

UNIT - III
Capacitors: Capacitor and its capacity, Concept of charging and Discharging of capacitors, Types of Capacitors and their use in circuits, Series and parallel connection of capacitors, Energy stored in a capacitor.
Electromagnetic Effects: Permanent magnets and Electromagnets, their construction and use, Polarities of an electromagnet and rules for finding them. Faraday's Laws of Electromagnetic Induction, Dynamically induced e. m. f. , its magnitude and induction, inductance and its unit. Mutually induced e. m. f. , its magnitude and direction, Energy stored in an inductance. Force acting on a current carrying conductor in magnetic field, its magnitude and direction, Principles and construction of dynamo.

UNIT - IV
A. C Circuits: Generation of A. C. voltage, its generation and wave shape. Cycle, frequency, peak value, R. M. S. value, form factor, crest factor, Phase difference, power and power factor, A. C. Series Circuits with (i) resistance and inductance (ii) resistance and capacitance and(iii) resistance inductance and capacitance, Q factor of R. L. C. series circuits.
Single Phase Transformer: Construction, principle, e. m. f equation, transformation ratio, various losses in transformation, testing of transformer with polarity testing, equivalent Ckt.
Measurements: Voltage, current & power measurements, Ammeter, Voltmeter, Watt meter, connection diagram & uses, 2 wattmeter methods.

Books Recommended:
- Basic Electrical Engineering, Ritu Sahdev, Khanna Publishing House (AICTE Recommended Textbook-2018)
- Fundamentals of Electrical Engg. & Electronics, B. L. Theraja
- Electrical Science, Vandana Singhal
- Principle of Electrical Engineering, B. R. Gupta

Paper Title: UEMSV – 192 FUNDAMENTAL OF ELECTRICAL LAB

List of Experiments: (Based on UEMSV – 103)
- Introduction to Multimeter (Analog & Digital) and its use as Voltmeter (For AC & DC), Ammeter (For AC & DC) and Ohmmeter.
- Measurement of resistor and capacitor by using color code.
- Idea of variable resistance, project board & power supply.
- Measurement of resistance by voltage drops method.
- Series & Parallel combination of resistances.
- Practical on Ohm's Law.
- Practical on KVL
- Practical on KCL.

- Transformer:
  - Turns ratio measurement.
  - Voltage ratio measurement.
  - Resistance ratio measurement of 1 ry & 2 ry.
  - Loss measurement (Transformer test).
- Characteristics of Transformer

Paper Title: UEMSV – 104: PRINCIPLE OF ELECTRONICS

Job Role: Electronics Junior Technician

Objectives: The course encapsulates the basics and the advanced forms of Analog electronics technologies, their implementation, uses, circuit tracing, troubleshooting and maintenance.

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

UNIT - II
Basics of Semiconductor: Semiconductor materials, Metals and Semiconductors and Photo - electric emission. 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, Tunnel Diode, Varactors Diodes, Schottky Diodes, Types and applications of diode. Diode as a rectifier, Half wave and full wave rectification, Zener diode Regulator. Introduction to Filters, Clippers, Clampers

UNIT - III
Bipolar Transistor: Transistor construction & operation of N - P - N & P - N - P. Common base (CB), common emitter (CE), common collector (CC) configurations. Biasing of transistors, V - I characteristics of CB, CE & CC, comparison of CB, CE & CC. Configuration with respect to I/P & O/P dynamic resistance, current gain and leakage current. α, β, γrelation. Application of CB, CE & CC configurations. Transistor as an amplifier (simple form), Transistor D. C load line.
Field Effect Transistor: JFET construction, principle and operation. MOSFET construction, principle and operation. Characteristics of JFET & MOSFET, relation between them. Definition of drain resistance, transconductance, amplification factor. JFET as a switch, typical application of JFET & MOSFET.
Uni - junction Transistor: Construction, principles of operation & characteristics of UJT. Equivalent circuit. Comparison between FET and UJT. Typical application of UJT.

UNIT - IV
Transistor Amplifier and Applications: Introduction, Single and Multi - stage amplifiers, Introduction to Oscillators: Thyristor Construction, principle of operation & characteristics of SCR, DIAC, TRIAC & their uses.
Opto Electronics: Elementary idea of LDR, LED, Photo Diode, Photo Transistor, Solar cell & Opto Coupler.

Books Recommended:
- Principle of Electronics, V. K. Mehata.
- Fundamentals of Electronics, D. Chattopadhay / P. C Rakshit
- Basic Electronics, S. Biswas, Khanna Publishing House

Paper Title: UEMSV - 193 PRINCIPLE OF ELECTRONICS LAB

List of Experiments: (Based on UEMSV – 104)
- Knowledge of electronics components- different types of R, L and C.
- Practical on Characteristic of P.N junction diode.
- Practical on Characteristic of Zener diode.
- Practical on half wave rectifier ckt (Ripple factor determination).
- Practical on Full wave rectifier ckt (Ripple factor determination).
- Practical on Characteristic of transistor (CB /CE /CC) type.

- Practical on Characteristic of JFET.
- Practical on Characteristic of MOS-FET.
- Practical on Characteristic of UJT.
- Practical on Characteristic of LED
- Practical on Characteristic of Opto-Coupler

Paper Title: UEMSV – 194: IDENTIFICATION OF COMPONENTS, TOOLS, EUIPMENT, SOLDERING & DE - SOLDERING TECHNIQUES (PRACTICAL)

Job Role: Electronics Junior Technician

Objectives: This subject will aid the students to gain a sharp insight into the different components, tools, equipment, soldering and de - soldering techniques.

UNIT - I
Main components & modules/ sub - assemblies of electronic equipment: Control Panel (System Controller), Keypads, Door and Window Contacts, Motion Detectors, Glass Break Detection, Smoke Detectors, Heat Sensors, Carbon Monoxide Detectors, Water Detectors (or Water Bug), Temperature Sensors, Capacitance switches / control push buttons & rotary switches

UNIT - II
Introduction to wireless communication: Signal Converters, Tools & their Uses, Use of tester to monitor AC Power, Skin the electrical wires/cables using the wire stripper and cutter, Main cable for control & electronic circuit wires, Crimping tools and buses
Introduction to measuring equipment's: Signal generator's, CRO, Function Generators, Frequency Counter, Logic analyzer, LCRQ Meter.

UNIT - III
Soldering & De Soldering of Basic Components: Soldering Tools, Different types of Soldering Guns related to Temperature and wattages, types of tips, Solder materials and their grading, Soldering and De Soldering Stations and their Specifications, Preparing Component for Soldering, PCB Applications, Types of PCB, Soldering Basic Components on PCB, De soldering Basic Components, Safety precautions while Soldering & De soldering, Check for cold continuity of PCB, Identification of loose/dry solder, broken tracks on printed wire assemblies & discrete components mounted circuit boards, Join the broken PCB track and test, De soldering using Pump and wick, Introduction of SMD Components.

UNIT - IV
Introduction to SMD Components: Identification of 2, 3, 4 terminal SMD components, Soldering the SMD components on the PCB, Make the necessary settings on SMD soldering station to solder various ICs of different packages by choosing proper clamping tools, Identify various connections and the setup required for SMD soldering station, De solder the SMD components from the given PCB, Make the necessary settings on SMD soldering station to de solder various ICs of different packages by choosing proper clamping tools, Make a panel board using different types of switches for a given application, Identification of crimping tools for various IC packages, Reliable Soldering Practices

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
- 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: UEMSV – 203: ELCTRONICS DEVICES & CIRCUITS

Job Role: Electronics Junior Technician

Objectives: This subject will enable the students to learn about Regulated Power Supply, Amplifiers, Oscillators & Multivibrators, OP - AMP etc.

UNIT - I

Rectifier & Regulated Power Supply: Half wave, full wave rectifier, different types of filters (C, CR, LC &π), ripple factor, peak inverse voltage, transformer utilization factor and regulation, expression for rectifier efficiency and ripple factor, voltage doubler and trippler, voltage limiter. Regulated power supplies - D. C. voltage stabilizer using Zener diode, D. C. series voltage regulator, IC regulator.

Transistor biasing & operating point of stabilization: Selection of operating point, need for bias stabilization, biasing methods battery bias, fixed bias, collector to base bias, self bias, stability and bias compensation. Thermal runway and its prevention, heat sinks.

UNIT - II

Small signal transistor & special purpose Amplifiers: Transistor amplifier circuit operation using D. C. & A. C. load line. Transistor amplifier circuits : - two port and hybrid (h) parameters, amplifier analysis for current, voltage and power gain, I/P and O/P impedance, comparison of CB, CE and CC amplifier configurations, Miller's theorem. Darlington emitter follower. JFET amplifiers - JFET parameters, small signal models for low and high frequency operations. Common - source, common drain and common gate (CS, CD and CG) configurations. Biasing of JFET and enhancement MOSFET, JFET as voltage dependent resistor.

Multistage amplifiers: Cascading of amplifiers (Direct Coupled, RC coupled, transformer coupled), their gain, frequency response, input and output impedance, gain - bandwidth characteristics.

Distortion: Non - linear, frequency and phase shift in amplifiers.

UNIT - III

Feed back & Tuned Amplifier: Feed back in amplifiers, feed back networks, effect of negative feed back on gain, input and output resistance, distortion, frequency response, band width and noise performance of amplifiers. Typical amplifier circuits using feed back.

Tuned amplifiers - Classification (narrow band and broad band single, double, stagger and tuned amplifiers). Quality factor and parallel response single and double tuned amplifiers.

Large signal Amplifiers: Class A, B, ABand C operation. Class A power amplifier, harmonic distortion. Transformer coupled audio amplifier, impedance matching, maximum power output and efficiency. Push pull amplifiers, merits and drawbacks of push - pull operation, class B and AB operation. Push - pull amplifier without output transformer. I. C. driver stage for power amplifier.

UNIT - IV

Oscillators & Multivibrators: Classification of oscillators. Use of positive feed back, negative resistance for generation of oscillations. Barkhausen criterions for oscillators. Different oscillator circuits i. e. tuned collector, tuned base, Hartley, colpitts, RC phase shift, wien bridge, crystal and negative resistance (tuned diode) oscillators. General idea of different wave shapes, diode clipping and clamping circuits. Astable, mono - stable and bi - stable multivibrators. Using IC 555 in multivibrators. Schmitt trigger. Square wave and triangular wave generators.

Differential Amplifier: Introduction, Operation in detail, different modes of operation, advantages & typical application.

OP - AMP: OP - AMP characteristics, inverting & non - inverting OP - Amps. Different OP - AMP, CMRR, OP - AMP as an adder, subtractor, scale changer, phase shifter. Voltage follower, integrator, differentiator, voltage to current & current to voltage converters. OP - AMP active filter, low pass, high pass and band pass filters.

Books Recommended:
- Integrated Electronics. J. Mill man &Haking
- Electronics Device & Circuits, Mottershed
- Electronics Principles, Devices & Circuits, M. L. Anand
- Analog Electronics, A.K. Maini, Khanna Publishing House (AICTE Recommended Textbook)

Paper Title: UEMSV – 291 ELCTRONICS DEVICES & CIRCUITS LAB

List of Experiments: (Based on UEMSV – 203)
- Transistor biasing
- Single Stage transistor amplifier
- UJT as a Relaxation oscillator
- Inverting Amplifier and adder using Op-amp IC 741
- Subtractor and Comparator using Op-amp IC 741
- Differentiator and integrator using Op-amp IC 741
- Series resonance circuit
- Parallel resonance circuit
- Hartley oscillator circuit
- Colpitt oscillator circuit
- Low pass active filter
- High pass Active filter
- Calculation of efficiency of a class A amplifier
- R-C coupled transistor amplifier

Paper Title: UEMSV – 204: DIGITAL ELCTRONICS

Job Role: Electronics Junior Technician

Objectives: The course is designed to enable the students learn about the Digital electronics technologies, their implementation and uses.

UNIT - I

Number System: Binary, Decimal, Octal, Hexadecimal conversion from one Number System to another, Binary addition, subtraction, One's and Two's Compliment no. subtraction using 1's & 2's Compliment no. BCD Arithmetic, Codes: BCD, Excess - 3, Gray, ASCII, Error Code.

Logic Gate: Standard logic Gates (NOT/OR/AND/XOR/XNOR) it's characteristic. Universal logic gate (NAND/NOR).

UNIT - II

Boolean Algebra & Logic Family: Relation of Boolean algebra to switching elements and operation of logic gates. Obtaining a Boolean expression from a truth table. Definition of combination logic K - map method and its use. Graphical description of Boolean function. Brief idea (Fan in, Fan out, Propagation delay time, Voice margins) about: RTL, DTL, TTL, CMOS, Introduction of Logic gate IC's (TTL & CMOS).

Function of Logic ckt: Half adder, Full adder, Half Subtractor, Full Subtractor. Decoder & Encoder. Code converter. Multiplexer & De - multiplexer. Parity checkers / generator, comparator.

UNIT - III

Flip - Flops: Flip - Flop using basic gate. Construction of different ckts. a) R - S flip flop, b) T - flip flop, c) J - K flip flop, d) D - flip flop, e) Master Slave JK - flip flop.

Counter & Shift Resisters: Asynchronous counter (Ripple). Synchronous counter (parallel). Up counter, Down Counter, Up - Down Counter, MOD - N - Counter. Presettable counter, Shift Reg. Parallel - in - serial - out (PISO). Shift registers function. Serial - in - serial - out (SISO, Shift Reg. Serial - in—parallel - out (SIPO), Shift Reg. Parallel - in - parallel - out (PIPO), Shift Reg. Shift & Ring counter. Application of Shift Reg.

UNIT - IV

D/A and A/D conversion: Digital to Analog converter circuit. D/A application. Different method of A/D conversions: - Dual slope counter type, Successive approximation type.

Memory Organization: Characters and functions of: Different types of memory as semiconductor and magnetic, Read/Write memory (RAM) - Static & Dynamic Read only Memory (ROM), (PROM) - Fixed & Erasable (EPROM).

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: UEMSV – 292 DIGITAL ELCTRONICS LAB

List of Experiments: (Based on UEMSV – 204)
- Verification of logic gates
- Practical on half adder/half subtractor
- Practical on full adder/full subtractor
- Practical on multiplexer.
- Practical on De- multiplexer
- Practical on Decoder.
- Practical on Encoder.
- Practical on Flip Flop (RS flip flop, D – Flip Flop, J – K /T – Flip Flop)
- Practical on Shift resister.
- Practical on Up – Counter.
- Practical on Down – Counter.
- Practical on Mod – N –Counter.
- Study of the Characteristics BCD to 7-segment decoder.

Paper Title: UEMSV – 205: ELECTRONIC MEASUREMENT & INSTRUMENTATION

Job Role: Electronics Junior Technician

Objectives: This subject will enable the students to learn about Electronics Measuring Instruments, their implementation, uses, circuit tracing and maintenance.

UNIT - I
Principle of Instrumentation: Principle of operation of sensor and transducer and their applications. Transducer as a system component. Factors affecting the choice of transducer.
Measurement of Physical Quantity with Transducer: Displacement - Potentiometer, L. V. D. T. Strain gauge, Piezoelectric crystal, Velocity - Tachogenerator, Resolution Counter, Pressure -Manometer, elastic type - Bourdon tubes, diaphragm and Bellows. Temperature - RTD. Thermistors & Thermocouple, Flow - positive displacement, Electromagnetic, thermal heat.

UNIT - II
Signal condition: Signal conditioning requirements for DC & AC Transducer signal, Characteristics and application of bridges signal conditioning element. Specification and characteristics of Instrumentation amplifier.
Measurement Instruments: Galvanometer; Moving magnet & Moving coil type; Absolute & Secondary instruments. Operation of PMMC instruments, Construction extension of range -ammeter and voltmeter, Moving iron - Principle of operation types: Construction and operation of Electro dynamic watt meter , Ohmmeter, Megger - description , digital Multimeter - operating principle , types , advantages. Digital voltmeter.

UNIT - III
Impedance Bridge: DC Wheatstone bridge and its application , AC bridge - Maxwell's bridge , Hay's bridge , Schering bridge, Q - meter and RLCmeter - operation & construction.
Cathode Ray Oscilloscope: Block diagram of CRO, construction of CRT, description of different sections, features of Dual trace and Dual beam Oscilloscope, Digital storage Oscilloscope. Triggered & Non - triggered Oscilloscope; application of CRO - Phase & frequency measurement.

UNIT - IV
Signal Generator: Block diagram of AF & RF signal Generator, function generator, sweep generator.
Calibration: Basic concepts of Calibration, Errors in measurement, Trace ability and standards for Electrical Parameters (Time & Frequency).

Books Recommended:
- Electronics Measurement & Instrumentation, A. K. Sahani
- Electronic Instrumentation, H. S. Kalsi
- Electronics Measurement & Measurement Technique, Cooper
- Electronic Measurement & Instrumentation, J.G. Joshi, Khanna Publishing House (AICTE Recommended Textbook)

Paper Title: UEMSV – 293 ELECTRONIC MEASUREMENT & INSTRUMENTATION LAB

List of Experiments: (Based on UEMSV – 205)
- Operational details of CRO
- Measurement of voltage (AC & DC) by using CRO
- Measurement of frequency of AC signal by using CRO
- Measurement of phase of AC signal by using CRO
- Use of PMMC galvanometer as Voltmeter
- Use of PMMC galvanometer as an Ammeter
- Measurement of Power consuming by a load using Wattmeter
- Measurement of unknown resistance using wheatstone bridge
- Identification of different type of Sensors and their functions
- Measurement of R,L,C using RLC meter
- Demonstration of working of Function generator
- Demonstration of different workings of DMM

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, Premvir Kapoor, Khanna Publishing House (AICTE Recommended Textbook)
- 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: UEMSV – 303: MICROPROCESSOR

Job Role: Electronics Senior Technician

Objectives: This subject enables the student to learn about Micro - computer, Micro - Processor, Assembly Language, Microprocessor Architecture, Basic instructions, Programming Techniques etc.

UNIT - I
Micro - computer, Micro - Processor and Assembly Language: Digital Computer, Computer Languages, Single Chip Micro - Computer.

Microprocessor Architecture and Microcomputer system: Microprocessor Architecture and its operations, Memory, Input/output, example of a microcomputer system.

8085 Based Microcomputer system: The 8085 MPU, Example of an 8085 Based Microcomputer. Pin details of 8085 MPU. Pin diagram of 8086, 8088.

UNIT - II
Introduction of 8085, Basic instructions, Timings: Instruction classification, Instruction formats. How to write and execute a simple program. Instruction Timings and Operation status. Data transfer instruction. Arithmetic operations, Branch operations.

Programming Techniques of 8085 MPU: Assembly Language Programs; Looping, Arithmetic Operations related to memory, Logical operations; Rotate, Compare.

UNIT - III
Timing Diagram Technique: Memory Read, Memory write, OPcode - Fetch with and without wait state, T - state calculation of different instruction.

Microprocessor interface: Memory interface, I /O Port interface, programmable peripheral interface, Memory mapped I /O, I /O mapped I /O.

UNIT - IV
Stack, Subroutines and interrupts: Sack, subroutine, Conditional call and return instruction, Advanced subroutine concept. The 8085 interrupt.

Introduction of Data Transfer Schemes: The 8255 / 8155 programmable Peripheral interface: Introduction, Pin details, Concept of Control Reg, Interrupt driven I/O, DMA, Programmable interrupt Controller - 8259 and DMA Controller - 8237.

Books Recommended:
- Microprocessor & Architecture Programming & Application,   Ramesh Gaonkar
- Fundamentals of Microprocessor & Microcomputer Controller,   B. Ram

Paper Title: UEMSV – 391 MICROPROCESSOR LAB

List of Experiments: (Based on UEMSV – 303)
- Introduction to the microprocessor trainer kit. Giving ideas to the students about putting, running a viewing the result of a program in this trainer kit.
- ALP on addition by direct and indirect addressing method.
- ALP on addition by using loop in indirect addressing method.
- ALP on subtraction.
- ALP to find out the larger among two numbers.
- ALP to find out the largest among five numbers.
- ALP to find out smaller out of two numbers
- ALP to find out the smallest out of five numbers
- ALP to check a bit condition of a data byte.
- ALP to check all bits 1 condition of a number
- ALP to check all bits zero condition of a data byte.
- Programming of EPROM

Paper Title: UEMSV – 304: AUDIO & VIDEO ENGINEERING

Job Role: Electronics Senior Technician

Objectives: This subject enables the student to learn about Microphone, Loudspeaker, Analog Recording, Digital Recording, Stereo sound system, Public Address system, TV Standards and channel, Antennas, Transmission, TV Receiver sub - sections, Satellite TV, Advanced TV Technology, CD/VCD/DVD etc and their implementation, uses, troubleshooting and maintenance.

UNIT - I

Acoustics: Brief idea of sound, Amplitude, frequency and wave length.

Microphone and Loudspeaker: Characteristics of Microphone and Loud speaker. Principle of operation of microphone and loud speaker. Brief idea of head phone, wireless microphone, woofer, squawker, sub - woofer and tweeter. Cross - over network, two - way and three - way network, bass - reflex system, battle and enclosure.

Digital Recording: Principle of digital recording, different kinds of digital storage, ICs, card, HD etc. Storage on CD, VCD, DVD and blue ray disk.

UNIT - II

Stereo sound system: Principle of recording and reproduction, Bass, Trebble, volume and balance control, Graphic Equalizer. Noise and Distortion, Dolby system, Hi - fi stereo, quadraphonic sound, 5. 1 channel sound system.

Public Address system: Basic principle, requirements of PA system. Working of PA system with associated controls.

TV Standards and channel: Concept of TV system, CCIR, PAL, NTSC and SECAM. TV broadcasting bands, channels and VSB.

UNIT - III

Transmission of CCVS: Primary colours, Mixing of colours, meaning of R - Y, G - Y, B - Y, U, V etc. Transmission of CCVS. Colour burst signal, CCVS for 1 - scanning line.

TV Receiver sub - sections: Tuner, IF sub - system, Deflection processor & synchronizing, Luminance processing, AGC and AFT, Deflection amplifiers, Monochrome picture tube, Colour picture tube, Chrome signal processing, Video output and R - G - B amplifiers, Remote control & OSD, System control & memory, SMPS,

UNIT - IV

Satellite TV: Off - set dish, Alignment of dish as per look angle, Global coverage of TV transmission, UP Link, Down link and foot print, Components of satellite, satellite bands - C band and KU band frequencies, DTH broadcasting system, broadcasting parameters. Components of SDU, Components of MDU, Cable TV system, CAS.

Advanced TV Technology: Digital TV system, Projection TV & video projector, DVBH and DVBT, LCD TV Technology, LCD Display panel, Plasma display panel, LED TV, IPTV, Features of latest TV, CCTV and DVR.

CD/VCD/DVD: Features of VCD & DVD, DVD Encoding process, DVD decoding process, DVD format, DVD types, DVD HT Digital wireless audio transmission, DVD input and out ports, servo, pick up unit. Blue ray disks

Books Recommended:
- Monochrome and Colour TV, R. R. Gulati
- CTV Principle and Practice, R. R. Gulati
- Audio and Video System, R. G. Gupta
- Audio Video Systems, Bali & Bali, Khanna Publishing House (AICTE Recommended Textbook)

Paper Title: UEMSV – 392 AUDIO& VIDEO ENGINEERING LAB

List of Experiments: (Based on UEMSV – 304)
- Circuit explanation of stereo sound system.
- Experiments on stereo sound system.
- Circuit explanation of PA system.
- Demonstration on PA system.
- Demonstration on high fidelity audio system.
- CTV Receiver stage location as per block diagram.
- CTV Receiver components function.
- CTV(LED) Set assembling
- Demonstration on DVD Player.
- Demonstration on LCD TV/LED TV.
- Demonstration on Smart TV features.
- Replacement of LED TV mother board by universal TV kit.
- Installation of LED/OLED TV.
- Operation of remote control and explanation of features of LCD/LED TV and DVD Player.
- Fault detection of LED display monitor.
- Fault detection of Modern TV sets.

Paper Title: UEMSV – 305: FUNDAMENTAL OF TROUBLESHOOTING ELECTRONIC EQUIPMENT

Job Role: Electronics Senior Technician

Objectives: This course will help the students learn about the Fundamentals of Troubleshooting Electronic Equipment before moving for the advanced level.

UNIT - I
Fundamental Troubleshooting Procedure: Making of an electronic equipment: Electronic circuits, Inside of an electronic equipment, Types of PCB. Reading Drawings and diagrams: Block diagram, circuit diagram, wiring diagram. Equipment Failures: Causes of Equipment Failures: Poor design, Production Deficiencies, Careless Storage and Transport, Inappropriate conditions during working life. Nature of faults. Maintenance terminology. Getting Inside electronic equipment: Dis - assembly, Re - assembly. Troubleshooting Process: Fault location procedure. Fault Finding Aids: Service and maintenance Manuals and Instruction manuals, Test and measuring instruments, special tools. Troubleshooting techniques: Preliminary observation, troubleshooting methods, systematic troubleshooting checks. Approaching components for test Grounding systems for electronic equipment. Corrective action: Arranging replacement parts, Component replacement, performance check, replacement of circuit boards. Situations when repairs should not be attempted. General guidelines

UNIT - II
Tools, Aids, Test equipments for servicing and maintenance: Hand Tools: Pliers, Cutters, Spanners, Screw Drivers, Nut Drivers, Drills, Files, Other Workshop Tools. Soft Tools: (Chemicals for Workbench): Solvents, Adhesives, Lubricants, Freeze Sprays. Test Equipments: Multimeters, Oscilloscope, Logic Analyser, Signal Generators, Power Supplies etc. Mechanical and Electromechanical Components: Fuses and Fuse Holders, Switches, Wires and Cables, Connectors, Circuit Boards, Electromagnetic Relays.

UNIT - III
Preventive Maintenance: Indications of Preventive Maintenance Action, Preventive Maintenance of Electronic Circuit, Preventive Maintenance of Mechanical Systems, General guidelines for cleaning and lubricating.
Maintenance Management: Objectives of Maintenance Management, Maintenance Policy, Equipment Service Options, Maintenance Organization. Essential of Good Equipment Management Program: Planning for New Equipment, Acquisition Process, Planning of Utilities, Inventory Control, User Training, Technical Training, Maintenance Arrangement, Preventive Maintenance, Quality Assurance.

UNIT - IV
Installation Procedures: Environmental Considerations, Humidity, Altitude, Shock and Vibrations, Protection from EMI, Safety. Service and Maintenance Laboratory: Workbench, Power for the Workbench, Lighting, Storage. Documentation: Maintenance of System Overview, Sample of a Work Order for Repairs, Information Tags. Professional Qualities and Work Habits: General Skills, Work Habits, Personal Safety.

Books Recommended:
- Troubleshooting Electronic Equipment, Dr R. S. Khandpur.

Paper Title: UEMSV – 393 FUNDAMENTAL OF TROUBLESHOOTING ELECTRONIC EQUIPMENT LAB

Based on UEMSV - 305

List of Experiments:
- Different tools used in test and troubleshooting an electronic equipment/gadgets
- Including safety tools.
- Multimeter and it's uses.
- Function generator and it's uses.
- Pliers, cutters, spanners, screw drivers, nut drivers, drills, files, other workshop tools
- Reading of drawings and diagrams: Block diagram, circuit diagram, wiring diagram.
- Grounding systems for electronic equipment.
- Use of oscilloscope in the troubleshooting of PCB of an electronic equipment.
- Basic tips before getting inside electronic equipment.
- Basic procedure followed for the de assembly and assembly of electronic equipment.
- The procedure that should be followed for troubleshooting or locating the faults in electronic equipment.
- Troubleshooting techniques: Preliminary observation, troubleshooting methods, systematic troubleshooting checks.
- Arranging replacement parts, component replacement, performance check, replacement of circuit boards.
- Mechanical and Electromechanical Components: Fuses and Fuse Holders, Switches, Wires and Cables, Connectors, Circuit Boards, Electromagnetic Relays.
- Hands on about PCB layout of electronic equipment.

Maulana Abul Kalam Azad University of Technology, West Bengal
(Formerly West Bengal University of Technology)
B.Voc. in Electronic Manufacturing Services (UGC)
(Effective for Academic Session 2018-2019)

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

Maulana Abul Kalam Azad University of Technology, West Bengal
(Formerly West Bengal University of Technology)
B.Voc. in Electronic Manufacturing Services (UGC)
(Effective for Academic Session 2018-2019)

Paper Title: UEMSV – 403: PC SOFTWARE

Job Role: Electronics Senior Technician

Objectives: The objective of this subject 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.

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 char 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. 5. 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.
- Ramesh Bangia, 2017, PC Software Made Easy, Khanna Publishing House
- Mastering Excel, Khanna Publishing House

Paper Title: UEMSV – 491 PC SOFTWARE LAB

List of Experiments: (Based on UEMSV – 403)
- Create directory and files in DOS
- Execute DOS internal commands – DIR, MD, CD, CLS, COPY, DATE, DEL, REN , RD, TYPE
- Execute DOS external command – XCOPY, ATTRIB, FIND, CHKDSK, TREE
- Create folder in Windows Desktop
- Create files within folder using Notepad.
- Create Word document (.docx file)
- Perform formatting task within the word document.
- Apply Header and footer in a multiple page document.
- Create tables and apply different options within table, format table.
- Apply Mail Merge in Word.
- Create Excel worksheet with proper data.
- Apply functions – sum(), average(), count(), max(), min(), countblank(), right(), left(), concatenate(), sumif() in excel.
- Create different charts (bar, column, line, pie) in excel.
- Apply Filters (Auto / Advance) in excel.
- Apply data sorting in excel.
- Create PowerPoint presentation file with multiple slides.
- Apply slide transitions.
- Apply animation to slide objects
- Add chart within slides.
- Practice internet browsing.

Paper Title: UEMSV – 404: MOBILE & SMART PHONE

Job Role: Electronics Senior Technician

Objectives: The objective is to familiarize the students with Mobile and Smart Phone Repairing, Maintenance and Troubleshooting.

UNIT - I

Basics and Basic Electronics: Basics of mobile communication. Assembling and disassembling of various models of mobile phones. Study of various tools and equipment used in mobile phone repairs. Study of parts inside a mobile phone. Using a multimeter. Use of DC Power Supply (Jhatka machine).

UNIT - II

Hardware Repair: Introduction and study of Printed Circuit Board (Motherboard). Details of various components on the PCB. Testing of various parts and components. Study of different ICs (chips) used on the motherboard. How to recognize various ICs. Soldering & desoldering of components by using a soldering iron. Soldering & desoldering of components by using a rework station. Reheating and mounting of various BGA and SMD chips. Ultrasonic cleaning procedure.

UNIT - III

Software Repair: Detailed study of various faults arising due to corrupt software. Introduction of various flasher boxes and software. Flashing of various brands of handsets. Removing virus from infected phones. Unlocking of handsets through codes and/or software. Use of various secret codes.

UNIT - IV

Basic and Advanced Troubleshooting: Fault finding, troubleshooting and repairing of various faults. Common repair procedure for hardware related faults. Common repair procedure for software related faults. Water damaged repair techniques. Circuit tracing, jumper techniques and solutions. Troubleshooting through schematic diagrams. Use of internet for troubleshooting faults. Advanced troubleshooting techniques.

Books Recommended:
- Mobile Phones and Tablets Repairs: A Complete Guide for Beginners and Professionals, Chukky Oparandu
- ANDROID & WINDOWS MOBILE PHONE REPAIRING, SANJIB. PANDIT
- William L. Armstrong, Learn Cell Phone Repair, kindle edition, 2013
- Pandit Sanjib, Advance Mobile Repairing: Multicolour Circuits, Service Diagrams & Repairing, BPB publications. 2010.
- Mobile repairing Books, Manohar Lotia, BPB Publication, New Delhi , latest edition
- Swati Saxena, A Glance over Android with Kotlin, Khanna Publishing House

Paper Title: UEMSV – 492 MOBILE & SMART PHONE LAB

List of Experiments: (Based on UEMSV – 404)
- Demonstration of various Tools and Equipment used in Mobile Phone repairing
- Identification of stages of different mobile Phone as per block diagram.
- Demonstration on Battery booster for smart phone repairing.
- Demonstration on DC power supply for smart phone repairing.
- Demonstration on SMD Rework Station for smart phone repairing.
- Demonstration on BGA plate set.
- Demonstration on PDA separator.
- Explanation of Identification process of different IC's i.e
- Network IC,R F IC, Power IC, CPU, Flash, display etc on PCB.
- Testing process of different components like Microphone, Ear peace,
- Ringer, headphone etc &Track line analysis of the same.
- De assembles and Assemble of branded Hi-end handsets.
- Unlocking of handsets.
- Re balling of IC. with BGA Plate set & rework station.
- Replacing of Battery connectors, LCD ,Head ph socket etc by SMD Rework stn& soldering Iron.
- Driver installation.
- Software flashing.
- Troubleshooting of S/W and H/W problems.

Paper Title: UEMSV – 405: TROUBLESHOOTING & MAINTENANCE OF ELECTRONIC EQUIPMENT - I

Job Role: Electronics Senior Technician

Objectives: The objective of the course is to acquaint the students with the Repair and Maintenance of Domestic Electronic Appliances.

UNIT - I

Washing machine: Installation of front load washing machine, Installation of top load washing machine, Identify the internal and external parts of semi - auto washing machine, Identify the internal and external parts of fully automatic washing machine, Operate semi-automatic washing machine, Operate fully-automatic washing machine, Rectify the fault leading to not working of control panel switches. Rectify the fault leading to not working of pulsator / agitator. Rectify the fault leading to spin drier not working. Rectify the fault leading to one side rotation of motor. Rectify the fault leading to water inlet and outlet valves.

UNIT - II

Microwave oven: Identify the internal and external parts of micro wave oven. Identify the different touch pad controls their functions, Testing of high voltage diode. Identify the HV capacitor and discharge it. Rectify the fault leading to fuse blows off when cooking is initiated. Rectify the fault leading to not responding of touch switches. (front panel). Rectify the fault leading to dead set. Rectify the fault leading to long cooking time. Precautions - importance of interlocking switch in performing maintenance

UNIT - III

Steam Iron: Dismantle and identification of various parts, wiring, tracing of various controls, Electronic circuits in steam Iron, Identify the faults in steam iron & rectify

Electric Rice cooker: Identify various components of Electric rice cooker, controls and trace the circuit and rectify the simulated faults.

Electric kettle: Identify various components of Electric kettle, controls and trace the circuit and rectify the simulated faults.

UNIT - IV

Mixer & Grinder: Dismantle and identification of various parts, wiring, tracing of various controls, Electronic circuits in various types of Mixers/grinders, Identify the faults in various types of Mixers/grinders & rectify.

Induction cooker: Principle of Induction heating, Construction, Working and troubleshooting.

Books Recommended:
- Eric Kleinert, Troubleshooting and Repairing major appliances, McGrawHill, McGraw Hill Professional, third edition, 2012.
- Modern Washing Machine Servicing, Manahar Lotia

Paper Title: UEMSV – 493 TROUBLESHOOTING & MAINTENANCE OF ELECTRONIC EQUIPMENT LAB – I

Based on UEMSV - 405

List of Experiments:
- Mixer grinder- a)Major parts, their functions and checking, b) Features of different Mixer Grinder, Their mantling and dismantling, technical specifications and maintenance.
- Electric Rice cooker: Identification of components, their function and checking their mantling and dismantling, technical specifications and maintenance.
- Steam iron: Identification of components, their function and checking, their mantling and dismantling, technical specifications and maintenance..
- Electric kettle:. Identification of components, their function and checking, their mantling and dismantling, technical specifications and maintenance.
- Induction cooker: a) Identification of components, their function and checking, their mantling and dismantling, technical specifications and maintenance b) Utensils used, Features, Safety devices, calculation of power consumption. Circuit explanation.
- Microwave oven: a) Identification of components, their function and checking, their mantling and dismantling, technical specifications and maintenance b) Utensils used in microwave oven, Important tips for microwave cooking c) Feature Explanation of grill and convection MWO function, comparison between different models d) Circuit explanation
- Washing machine: a)Identification of components, their function and checking, their mantling and dismantling and technical specifications of front loading(semi automatic and fully automatic washing machine) b) Demo on drive mechanism c) Explanation of circuit diagram d) Installation and maintenance.

Year - 3Degree (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)

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: UEMSV – 503: COMMUNICATION ENGINEERING

Job Role: Electronics Engineer

Objectives: The objective is to familiarize the students with the importance of communication engineering and its application on a wider scale in the corporate domain.

UNIT - I

INTRODUCTION TO COMMUNICATION: Introduction, Digital and Analog data: Digital Data. Analog Data. Different characteristics of Analog and Digital data. Band and Bit Rate. Maximum Data Rate of a Channel. Asynchronous and Synchronous Data. Data Transmission Modes: Simplex, Half - duplex, Full - duplex. Guided & Unguided Media. Classification of frequency. Brief description of different types of noise. Brief description of different types of media.

ANALOG COMMUNICATION: MODULATION & TRANSMITTING SYSTEM

Concept of modulation, necessity of modulation. Definition of amplitude / frequency Modulation. Side band, Bandwidth, deviation, percentage of modulation. Phase modulation, comparison of AM, FM and PM system. Block diagram & function of different stages of AM & FM Broad Cast transmitter. Block diagram & Principles of operation of Superhetetrodyne receiver. Block diagram & Principle of operation of FM receiver.

UNIT - II

TELEPHONY:

TELEPHONE SET: Telephone transmitter, Receiver. Side tone and anti - side tone circuit. Push button telephone set. Dialing system.

ELECTRONIC EXCHANGE: Space division switching, time division switching. Different types of tone. Block diagram and different stages of Automatic exchange based on SPC system. Facility & advantages of Exchange.

CELLULAR TELEPHONE SYSTEM: Cell & cell site, Roaming, power supply. Block diagram and different stages of cellular Telephone set. Structure of cellular system. Explain different section. GSM. CDMA

UNIT - III

DIGITAL COMMUNICATION:

PULSE CODE MODULATION: Waveform coding by sampling & quantization operations in a PCM system. Encoding operation in a PCM system. Regeneration and reconstruction of PCM wave.

DELTA MODULATION: Principles of Delta Modulation technique (DM) using block diagram. Discuss the limitations of DM due to fixed step size. Concept of Adaptive Delta Modulation technique.

MULTIPLEXING: Multiplexing and its need. Types of multiplexing. Principles of time division multiplexing (TDM). Principles of Frequency division multiplexing (FDM).

RF MODULATION FOR BASE BAND SIGNAL: Concept of Binary modulation techniques. Principles of Amplitude Shift Keying (ASK), Phase Shift Keying (PSK). Frequency Shift Keying (FSK).

SATELLITE COMMUNICATION SYSTEM: Concept of Microwave Links. Block diagram of microwave link carrier chain. Basic principles of Satellite Communication. Geosynchronous orbit & geosynchronous satellite with advantages & disadvantages. Block diagram of geosynchronous satellite system Telemetry Tracking & Command (T. T &C), Satellite application**:** VSAT, INMERSAT, Satellite Subsystem**,** Earth Station Characteristics:

UNIT - IV

OPTICAL COMMUNICATION: Concept of Fibre optics. Characteristics of Fibre optic system. Advantages & limitations of optical fibre communication. Basic structure of optical fibre with core, cladding and coating. Elementary concept about fibre types: mono - mode. multimode. Opticalfibre performance: about bandwidth, about transmission losses. Principles of operation of types of optical sources LED & Laser diode. Function of optical detectors & name of different types of devices used as optical detector. Block diagram of optical - fibre communication system. Optical fibre connection: Fibre splices, Fusion splices, Mechanical splices. Fibre coupler: Three & Four port coupler, Star coupler, Wave division Multiplexing coupler. Optical Fibre Measurement. OTDR for field measurement

Books Recommended:
- Modern Telephone and Cordless Circuit vol. I & vol II, M. Lotia
- Electronics Communication System, Kennedy / Anokh Singh
- Principle of Communication System, Taub & Schilling
- Modern Digital &Analog Communication, B. P. Lathi
- Understanding of Fiber Optics, Jeff Hecht
- Optical Fiber & Fiber Optical Communication system, Subir Sarkar
- Communication Systems, Rishabh Anand, Khanna Publishing House

Paper Title: UEMSV – 591 COMMUNICATION ENGINEERING LAB

List of Experiments: (Based on UEMSV – 503)
- Verification of AM and Calculation of the value of percentage of modulation of amplitude modulated wave.
- Verification of frequency modulated wave.
- Study of pulse code modulation (PCM) and demodulation.
- Study of PAM, PPM and PWM modulation and demodulation
- Study of delta modulation and adaptive delta modulation/demodulation
- Study of ASK, FSK and PSK.
- Tools and Components identification of OFC(splices, coupler, different types of OFC cables, OFC Rx and Tx)
- Study of signal communication through optical fiber
- Study of push button telephone set.

Paper Title: UEMSV – 504: TROUBLESHOOTING & MAINTENANCE OF ELECTRONIC EQUIPMENT - II

Job Role: Electronics Engineer

Objectives: The objective of this subject is to make the students aware of the necessity of Repair and Maintenance of Office and Personal Electronic Equipments.

UNIT - I

PHOTO COPIER: Operation of a photo copier. Dismantling & Troubleshooting of power supply unit (low & High power). Dismantling and assembling of paper feed mechanism, paper tray, Thermal unit and Toner Unit. Identify the various sensors used in the copier and their fixtures. • Dismantling and fitting of drum unit cleaning of drum unit. Fault finding in light unit. Identify the faults and repair in the thermal unit. Periodic cleaning and servicing of copier machines. Repairing of multipurpose copy printers.

UNIT - II

Printer: Identification & use of controls/ switches/ sockets of a dot matrix printer. Dismantling &Troubleshooting of power supply unit. Identification of internal assembly/ section/parts of DMP. Testing of the paper sensor, print head coils, print head needle coil & cleaning of ribbon. Identify the faults in DMP & rectify. Identification & use of controls/ switches/ sockets of an ink jet printer. Interconnect printer to computer & perform printer test & cleaning of an ink cartridge. Identification of internal assembly/ section/parts of an ink jet printer. Identify the faults of an ink jet printer & rectify. Identification & use of controls/ switches/ sockets of an Laser printer. Interconnect printer to computer & perform printer test & cleaning of an ink cartridge. Identification of internal assembly/ section/parts of Laser printer. Identify the faults of an Laser printer & rectify
Scanner: Identification & use of controls/ switches/ sockets of scanner. Identification of internal assembly of scanner. Installation of scanner driver in the computer. Interconnect scanner to computer & perform scanner operation and store in the computer. Identify the faults in the scanner & rectify

UNIT - III

FAX MACHINE: Operation of a Fax machine. Telephone line access and phone connection. Dismantling &Troubleshooting of power supply unit. Dismantling and assembling of paper feed mechanism, paper tray, Thermal unit and Toner Unit of Fax machine. Identify the various sensors used in the Fax machines.
UPS/Inverter: Installation of UPS and Inverters. Maintenance of battery. Dismantle the UPS and identify the major parts. Testing of major components. Testing of power modules. Charging, discharging and testing of batteries.
EPABX: Identification & use of controls on the front panel/Console of EPBAX. Identify the terminals of trunk line and extension line and connect the extensions. Setting the call transfer, call wait and other facilities available on EPABX. Dismantle and Identify various sections and the power supply components of the system. Simple Programming of EPABX System. Make modifications to the existing set up by introducing more connections.

UNIT - IV

DTH System: Practice procedures for safety and health hazards measures. Identify the various mini - dish components and their functions. Identify & use of different tools and equipments used in DTH installation procedure & cabling procedure. Identification of Various types of connectors, cables and wiring procedure. Follow the chronological order to assemble the minidisk. Install a DTH system & track a TV channel. Site selection, installation mounting tracking for azimuth and elevation angles using SAT meter. Identify the faults in DTH system & rectify. Identification & use of various I/O ports of STB. STB connection and first installation. Identify the faults in STB & rectify.

Books Recommended:
- Troubleshooting and Maintenance of Electronics Equipment, Singh K. Sudeep Katson, Book , New Delhi , II edition , Reprint 2014
- Modern UPS Circuits, Double Colour PCB Layout & Troubleshooting, Manahar Lotia
- Modern Digital Inverter Ckts& D/Colour PCB Layout, Manahar Lotia
- Printer: Introduction, Servicing and Troubleshooting (Modern Computer Hardware Series), Manahar Lotia and Pradeep Nair
- Modern DTH/DVD/MP3/VCD Circuits Servicing & Troubleshooting, Manahar Lotia

Paper Title: UEMSV – 592 TROUBLESHOOTING & MAINTENANCE OF ELECTRONIC EQUIPMENT LAB – II

List of Experiments: (Based on UEMSV – 504)
- **PHOTO COPIER:**
a) Dismantling & Troubleshooting of power supply unit (low & High power).
b) Dismantling and assembling of paper feed mechanism, paper tray, Thermal unit and Toner Unit.
c) Identify the various sensors used in the copier and their fixtures. •
d) Dismantling and fitting of drum unit cleaning of drum unit.
e) Fault finding in light unit. Identify the faults and repair in the thermal unit.
f) Periodic cleaning and servicing of copier machines. Repairing of multipurpose copy printers.
- **PRINTER:**
a) Identification & use of controls/ switches/ sockets of a dot matrix printer, Inkjet printer and Laser printer
b) Dismantling &Troubleshooting of power supply unit.
c) Identification of internal assembly/ section/parts of inkjet printer , DMP and Laser printer
d) Testing of the paper sensor, print head coils, print head needle coil & cleaning of ribbon
e) Identify and rectify faults in inkjet printer, DMP and Laser printer. Interconnect printer to computer & perform printer test & cleaning of an ink cartridge.
f) Interconnect printer to computer & perform printer test & cleaning of cartridge.
- **SCANNER:**
a) Identification & use of controls/ switches/ sockets of scanner.
b)   Identification of internal assembly of scanner.
c) Installation of scanner driver in the computer.
d) Interconnect scanner to computer & perform scanner operation and store in the computer.
e) Identify the faults in the scanner & rectify
- **UPS/INVERTER:**
a) Identification of the major parts
b)   Installation of UPS and Inverters.
c) Circuit explanation
d) Dismantling of UPS and Inverter
e) Testing of major components, power modules and battery.
- **EPABX**:
a) Identification & use of controls on the front panel/Console, terminals of trunk line and extension line.
b)   Connect the extensions. Setting the call transfer, call wait and other facilities available on EPABX.
c)   Dismantle and Identify various sections and the power supply components of the system.
d)   Simple Programming idea of EPABX System.

- **DTH SYSTEM:**
a) Identify the various mini - dish components and their functions.
b) Identify & use of different tools and equipments used in DTH installation procedure & cabling procedure. Identification of Various types of connectors, cables and wiring procedure.
c) Cable preparation and Connectrisation.
d) Select site and install a DTH SDU (H/W).
e) Install a DTH SDU system & track a TV channel. (installation mounting tracking for azimuth and elevation angles using SAT meter).
f) Installation of DTH MDU system(AV session)
g) Identification & use of various I/O ports of STB. STB connection and installation. Identify the faults .
h) Identify the faults in DTH system & rectify.

Paper Title: UEMSV – 593: PROJECT

Job Role: Electronics Engineer

Some of the project activities are given below:
- Projects related to designing small electronic equipment/ instruments
- Projects related to increasing productivity
- Projects related to quality assurance
- Projects connected with repair and maintenance of plant and equipment
- Projects related to design of PCBs
- Projects related to design, fabrication, testing and application of small digital circuits and components
- Projects related to microprocessor based circuitry/ instruments
- Any other related problems of interested of host industry

Year - 3Degree (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: UEMSV – 683: INDUSTRIAL TRAINING

Job Role: Electronics Engineer

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.