DIPLOMA IN COMPUTER EDUCATION & ASSISTIVE TECHNOLOGY (VISUAL IMPAIRMENT)

D.C.E.&A.T.(V.I.)
May, 2023
(w.e.f. 2023-24)

REHABILITATION COUNCIL OF INDIA
(Statutory Body of the Ministry of Social Justice & Empowerment)
Department of Empowerment of Persons with Disabilities (Divyangjan) Government of India
B-22, Qutab Institutional Area
New Delhi – 110 016
www.rehabcouncil.nic.in

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1.0 Preamble:

The present age can, justifiably, be called "The Age of Computers". Computer-applications are fast becoming integral components of our day-to-day life and various operations. Attempts are also afoot at various levels to bridge the oft-quoted "IT-DIVIDE" in the country. Modern technological advances both in the fields of software development and hardware engineering have brought the use of computers within easy reach of the visually impaired youngsters as well. In fact, computer- applications now hold the key to real and meaningful inclusion for the visually impaired. A large number of institutions are today offering various types of courses in the use of computers for the visually impaired, with varying durations and content. What is missing today is a standardized and uniformly recognized course of training in computer-education for teachers/instructors being engaged to provide requisite skills to these youngsters. The present course seeks to fulfill this vital need and to produce competent, creative and skilled teachers/instructors in the field of computer-education for the visually impaired.

2.0 Nomenclature of the Programme: Diploma in Assistive Technology (Visual Impairment) (D.A.T.(VI))

Objectives:

The overall aim of the course is to prepare a cadre of personnel who could provide education in computers and related services to the visually impaired at various stages, including education, vocational training and rehabilitation. On Completion of the Course, the trainees will be able to:

a. Acquire and use knowledge about visual impairment and its implications, in teaching and learning at different levels.
b. Gain and demonstrate knowledge about different Assistive devices and technology which can facilitate access to computers by persons with visual impairment.
c. Apply the knowledge of computers in teaching access to internet using screen reading software.
d. Facilitate access to various computer programs for persons with visual impairment.
e. Acquire knowledge relating to preparing Accessible Books.

3.0 Entry Requirements: Successful completion of 10+2 or senior secondary examination or equivalent from a recognized Board of Education with minimum 50% marks. Relaxation/ Reservation norms will be as per respective Governments as applicable.

4.0 Medium of Instruction: The medium of instruction will be English/ Hindi/ the concerned State language.

5.0 Duration of the Programme:

Duration of the programme will be of 1 year with 1200 hours leading to 40 credits (30 hours = 1 credit). The weightage to the programme will be 60% practical and 40% theory. The course work will comprise of 720 hours of practical and 480 hours of theory. The theory hours will also include 60 hours of Employability skills (Soft Skills) a separate module and the resources for the same are freely downloadable at www.employabilityskills.net. This will enable and empower the trainees

with readiness for applying, working as professionals in supporting diverse students across different setups. This 2 credit (60 hours) module is appended in annexure. The module will also have a weightage of 60:40 of practical and theory with formative assessment at internal and the final exam.

6.0 Distribution of time for Theory and Practical Work: 10 Months - 200 Days (1200 Hrs.)

The Programme shall be spread over a period of 200 days with 1200 hours, in addition to the examination and admission days. The distribution of working hours for theory and Practicals will be as follows:

Theory   : 450 Hours
Practicals   : 750 Hours

Recommended Teacher/Student Ratio: The teacher/student ratio will be 1:15. Number of students in the Programme will be 30.

Content of the Programme: This Course will consist of the following seven theory papers of 100 marks each:

1) Visual Impairment and Special Education   (80 Hrs)
2) Psychology and Rehabilitation of Persons with visual impairment   (80 Hrs)
3) Fundamentals of Computers   (50 Hrs)
4) Computer Software   (60 Hrs)
5) Network and Internet Services   (60 Hrs)
6) Special Computer Devices and Software for the Visually Impaired. (60 Hrs)
7) Employability Skills (Soft skill)   (60 Hrs)

The Course will have the following practicals:
I.   Operating System and Screen Reading Software   (100 Marks, 80 Hrs)
II.   Word Processing Software   (150 Marks, 90 Hrs)
III. Spreadsheet Software   (150 Marks, 90 Hrs)
IV.   Presentation Software   (100 Marks, 70 Hrs)
V.   Database Software   (100 Marks, 70 Hrs)
VI.   Web Browsing   (100 Marks, 70 Hrs)
VII. Assistive Devices   (100 Marks, 60 Hrs)
VIII. Alternative Material in Accessible Formats--Production and Access
                                                       (100 Marks, 50 Hrs)
IX.   Braille   (50 Marks, 80 Hrs)
X.   Practice Teaching   (100 Marks. 50 Hrs)
XI.   Project Work   (50Marks, 40 Hrs)
      (Detailed syllabus for the course is given as Annexure A)

Format of Teaching: Lectures, discussions, seminars, practical work, demonstration, etc.

7.0   Examination: Continuous and Comprehensive Evaluation Pattern will be followed. At the end of the programme, Annual Examination would be conducted, both in Theory and Practicals by an Institution as per NBER rules. The Evaluation will be both Internal as well as External. 40% marks will be based on Internal Evaluation and 60% for External.

8.0   Scheme of Evaluation:

The minimum marks for passing in the theory and practicals shall be 50% in Theory in each paper and 60% in Practicals in each paper. The Guidelines of the NBER / Examining Body with regard to reappearing benefit to the unsuccessful trainees in the first attempt will be followed.

9.0   Requirements of the faculty –

Particulars of the faculty required for the course are given below:

Sl. No.	Name of the Post	Number of Post	Qualifications	Pay band and grade pay
1	Lecturer-cum-Course Coordinator	1	MCA with 2 yrs experience of teaching computers to the visually impaired students Or Graduate with diploma in computers (minimum 4 semesters) with 5 years experience of teaching computers to the V.I students Or Graduate with Diploma in Computers with 15 years experience of teaching computers to the visually impaired students	Grade 9300-34800/- with G.P 5400
2	Faculty-Special Education	1	Masters in any discipline, B.Ed in Special Education (V.I.) with two years experience of teaching the visually impaired students Or Graduate with Diploma in Special Education (V.I.) with 5 years experience of teaching the visually impaired students.	Grade 9300-34800/- with G.P. 4800
3	Supervisor	1	MCA with 1 yr. experience of teaching computers to the visually impaired students Or Graduate with Certificate of Training in Computers for the visually impaired students (minimum 4 months) with ten	Grade 9300-34800/- with G.P 4600

Sl. No.	Name of the post	Number of post	Qualifications	Pay band and grade pay
			years experience of teaching computers to the visually impaired students	

2. **Requirements of Other staff**:

Sl. No.	Name of the post	Number of post	Qualifications	Pay band and grade pay
1.	Office Clerk cum Accounts Assistant	One	As per state Govt. rules	As per state Govt. rules
2.	Library Assistant (Part Time)	One	As per State Govt. Rules	As per State Govt. Rules
3.	Messenger/ MTS	One	As per State Govt. Rules	As per State Govt. Rules

3. **Guest Faculty**: The course will have provision for adequate number of lectures, as per need, from outside experts/ specialists, who will be paid appropriate remuneration.

10.0   Library: The training institution should have an adequate library consisting of the following:

(a) At least 50 books and journals on psychology and education of the visually impaired.
(b) At least 75 books and journals on the subject of Computer-education in general.
(c) At least 50 books and journals on facets concerning Computer-education and special devices and software for the visually impaired.

The training institution must ensure that adequate number of books and journals are available in accessible formats.

11.0   Space Required:

(a) One Class Room for Theory work (400 Sq Ft).
(b) One Computer Lab with A.C. Facility (400 Sq Ft).
(c) One Office cum Staff Room for the faculty (200 Sq Ft).
(d) One Office Room (100 Sq Ft).

(e) Library cum Reading Room (300 Sq Ft).

Sufficient hostel accommodation will need to be arranged for outstation candidates and/or students with disabilities as per need.

Minimum Equipment Required: As per list given in Annexure --B.

12.0 Certification as Registered Personnel

It is mandatory for every rehabilitation professional / personnel to obtain a "Registered Personnel/ Professional Certificate" from the Rehabilitation Council of India to work in the field of disability and special education in India. A Student who has attended the training and completed the requirements for all modules successfully will be qualified as a **Vocational Instructor -Personnel** and be eligible to work in the field of Rehabilitation in India as a **Vocational Instructor (Computer Education &Assistive Technology)**. As continuous professional growth is necessary for the renewal of the certificate, the rehabilitation professional / personnel should undergo in-service programme periodically to update their professional knowledge. Each registered professional/personnel will be required to get himself /herself renew his registration periodically. The periodicity will be decided by the council from time to time. The activities for enrichment training programmes in the form of Continuous Rehabilitation Education (CRE) is decided by the RCI.

13.0   THE DETAILS OF VARIOUS COURSES (Theory and Practical)

PAPER 1

VISUAL IMPAIRMENT AND SPECIAL EDUCATION.

(80 Hours) 100 Marks.

Objectives: After studying this Paper, the trainees will be able to:

(a) Define visual impairment and explain functional implications of different diseases/disorders of the eye;

(b) Demonstrate knowledge about special education and delineate various educational settings for the visually impaired in India;

(c) Describe clearly various educational implications of visual impairment and education - related provisions of the following legislations:
   I. RCI Act
   II. RPWD-16 Act
   III. RTE Act with reference to children with disabilities.

(d) Acquire and apply knowledge and information relating to education/training of persons with low vision;

(e) Demonstrate functional knowledge of ICT and its implications for the visually impaired.

Unit 1 Introduction to Visual Impairment   **(16 Hours)**
   1.1 Defining blindness, low vision and deaf-blindness;
   1.2 International Classification of Functioning (Disability and Health): activity limitation and participation restrictions;
   1.3 Incidence and prevalence of visual impairment in India;
   1.4 Anatomy and Physiology of the human eye and the process of seeing;
   1.5 Refractive errors and the following common eye-diseases in India:- Vitamin A deficiency, Cataract, Glaucoma, Trachoma, Retinitis Pigmentosa, diabetic retinopathy, macular degeneration;
   1.6 Prevention of Visual Impairment
   1.7 Sensitisation towards Eye Donation

Unit 2: Special Education and Educational Settings in India: **(16 Hours)**
2.1.   Theory of Teaching and Meaning, philosophy and goals of special education and implications for the visually impaired;
2.2.   Educational provisions of the following legislations:
   I.   RCI Act;
   II.   RPWD -16 Act;
   III.   RTE Act with reference to children with disabilities;

2.3. Role of government and voluntary organizations in the development of services for the visually impaired in India;

2.4. The rights-based approach—RPWD Act 2016

2.5. Various educational settings for the visually impaired--special schools, integrated education, inclusive education, home-based education.

Unit 3 Educational Implications of Visual Impairment   (16 Hours)

3.1   Restrictions of visual impairment and the roles and responsibilities of Teachers/instructors of the visually impaired children and youth;

3.2. Louis Braille and the Braille system: The seven-line system;

3.3. Principles of teaching the visually impaired;

3.4. Preparation/adaptation of teaching – learning material for the visually impaired.

3.5. Lesson planning – Concept and procedure

Unit 4 Education and Training of Children and Youth with Low Vision   (16 hours)

4.1. Functional assessment of Vision;

4.2 Visual efficiency- concept and training procedure;

4.3 Special optical and non optical devices;

4.4 Classroom management for children with low vision;

4.5 Use of assistive technology for children with low vision.

Unit 5 Information and Communication Technology (ICT) and the Visually Impaired
**   (16 Hours)**

5.1. Meaning and scope of Information Technology;

5.2. ICT promoting accessibility for the visually impaired;

5.3. RPWD Act 2016 and RPWD rules 2017 as amended concerning ICT and Accessibility;

5.4. Individualized instruction, Programmed Instruction, Computer Assisted Instruction and Interactive Learning--an overview;

5.5. Government Schemes for supporting ICT for the visually impaired in particular and other persons with disabilities, in general.

References:
1   Barraga. N.C. (1976). Visual Handicaps and Learning. A Developmental Approach. California:

2.   ICEVI (1995).   Reaching   the   Unreached.   Asian   conference   Proceedings. Ahmedabad: Blind People's Association.

3.   Jose. R. (1983). Understanding Low Vision. New York American Foundation for the Blind

4.   Mani, M.N.G. (1992). Techniques of Teaching Blind Children. New Delhi: Sterling Publishers.

5.   Mani M.N.G. (1992). Concept Development of Blind Children. Coimbator: Sri Ramakrishna Vidyalaya Printing Press.

6. Muricken, Jose S.J. and Kareparampil, G (1995). Persons with Disabilities in Society. Trivandrum: Kerala Federation of the Blind.

7. Pandey, R.S. and Advani, Lal (1995). Perspectives in Disability and Rehabilitation.New Delhi: Vikas Publishing House.

8. Radha Bai. Et al. (Ed.) (1995). All colours are There. Trichy: Holy Cross Service Society.

9. Tuttle. D. (1984). Self-esteem and Adjusting with Blindness. Springfield, IL: Charles C. Thomas.

10. UNESCO (1997). International Consultation on Early Childhood Education and Special Educational Needs. Paris.

11. WHO (1992). Prevention of Blindness. Geneva.

12. World Health Organization (1993). Management of Low Vision in Children. Geneva.

13. World Health Organization (1997). Global Initiative for the Elimination of Avoidable Blindness. Geneva.

14. Ysseldyke. J.E. and Algozzine. (1982). Introduction to Special Education. Boston: Houghton.

PSYCHOLOGICAL REHABILITATION OF STUDENTS WITH VISUAL IMPAIRMENT.

(80 Hours)   **100 Marks.**

This course aims to equip computer teachers with advanced knowledge and skills in psychological rehabilitation for students with visual impairment. The course covers various psychological dimensions and practical strategies to ensure inclusive education and optimal development for visually impaired students.

Learning Outcomes:

By the end of this course, participants will be able to:

• Demonstrate a comprehensive understanding of the psychological implications of visual impairment in students.

• Apply psychological rehabilitation strategies to support the cognitive, academic, and psychosocial development of visually impaired students.

• Utilize assistive technologies effectively to enhance computer education and accessibility for visually impaired students.

• Design and implement individualized education plans and transition programs for the successful integration of visually impaired students.

• Collaborate with stakeholders and professionals to provide holistic support and promote the overall well-being of visually impaired students.

Unit 1: Understanding Visual Impairment and Psychological Implications
1.1   Causes and types of visual impairment
1.2   Psychological impact and challenges faced by visually impaired student
1.3   Psychological theories and frameworks relevant to visual impairment
1.4   Assessment and evaluation of psychological needs in rehabilitation

Unit 2: Cognitive and Academic Development in Visual Impairment
2.1   Cognitive processes and learning difficulties associated with visual impairment
2.2   Adapted instructional strategies and interventions for cognitive development
2.3   Assistive technologies and tools for academic support
2.4   Individualized education plans and accommodations for academic success

Unit 3: Psychosocial Well-being and Emotional Development
3.1   Socialization and peer relationships in the context of visual impairment
3.2   Emotional well-being, self-esteem, and identity development
3.3   Coping strategies and resilience-building for psychological adjustment
3.4   Counselling and therapeutic interventions for psychosocial support

Unit 4: Role of Assistive Technology in Psychological Rehabilitation of students with visual impairment.

4.1   Impact of assistive technology on adjustment with blindness and low vision

4.2   Role of assistive device and technology in enhancing self-confidence, self-esteem of students with blindness and low vision

4.3   Overview of assistive technology for visual impairment

4.4   Integration of technology in rehabilitation programs

4.5   Accessible computer systems and software for visually impaired students

4.6   Training in the use of assistive technology for computer teachers

Unit 5: Transition and Future Planning

5.1   Transition challenges and career development for visually impaired students

5.2   Vocational rehabilitation and employment opportunities

5.3   Individualized transition plans and life skills training

5.4   Collaboration with stakeholders in facilitating successful transitions

References

1.   Barciey. J.R. (1993). Counseling and Philosophy. San Francisco.

2.   Evans, P and Verma, V. (Eds.) (1990) Special Education. Past Present and Future. The Faimer Press.

3.   Guilford. .B. (1996). Fields of Psychology (ed.,) New York: Van Nostrand.

4.   Jones. A.P. (1994). Principles of Guidance. New York: Holt.

5.   Muricken, Jose S.J. and Kareparampil, G (1995). Persons with Disabilities in Society. Trivandrum Kerala Federation of the Blind.

6.   Pandey, R.S and Advani, Lal (1995). Perspectives in Disability and Rehabilitation. New Delhi: Vikas Publishing House.

7.   Punani. B and Rawal, N (1997). Community Based Rehabilitation (Visually Impaired). Bombay : NAB.

8.   Punani. B. and Rawal. N.(1993). Handbook: Visual Handicap. New Delhi: Ashish Publishing House.

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10.   Taylor, R.L. (1993). Assessment of Exceptional Students Educational and Psychological Procedures. Boston Allyn Bacon.

FUNDAMENTALS OF COMPUTERS

(50 Hrs)   **100 Marks**

Objectives: After Studying this paper, the trainees will be able to:
(a)   Get Introduced to Computers
(b)   Trace the evolution of Computers
(c)   Gain and show knowledge about Number system with special reference to its application to Computers
(d)   Obtain Insights about the functioning of Computers.

Unit 1 INTRODUCTION TO COMPUTERS   (10 Hrs)
1.1   Definition of Computers;
1.2   Difference between Calculator and Computer;
1.3   Difference between Data and Information;
1.4   Characteristics and major Application Areas of Computer
1.5   Classification of Computers
   1.5.1 On the basis of Technology- Digital, Analog, Hybrid
   1.5.2 On the basis of Processing Capability- Micro, Mini, Mainframe, Super Computer
1.6   Files and Folders in Computers

Unit 2 EVOLUTION of COMPUTER   (10 Hrs)
2.1   Origin of Computer
2.2   First Generation of computer
2.3   Second Generation of Computer
2.4   Third Generation of Computer
2.5   Fourth Generation of Computer
2.6   Fifth Generation of Computer
2.7   Introduction to Mobile Computing.
2.8   Commonly used computer related digital devices based on IOS and Android – Tablets, Smart phones, and I-Pad.

Unit 3 NUMBER SYSTEM.   (5 Hrs)
3.1   Concept of Number System
3.2   Types and Application of Number System– Binary, Decimal, Hexadecimal, Octal.

Unit 4 COMPUTER FIELDS   (5Hrs)
4.1   Hardware
4.2   Software
4.3   Humanware
4.4   Firmware

Unit 5 COMPUTER COMPONENTS –FUNCTIONAL OVERVIEW   (20 Hrs)

5.1   Input Devices

5.2   Output Devices

5.3   Central Processing Unit and its Components.

5.4   Computer Memory and Its Measurement Units

5.5   Primary Memory – Read only Memory, Random Access Memory, Cache memory

5.6   Secondary Memory.

References:

1.   Arora Sumita. Foundation of Information Technology – Class IX and Class X . Dhanpat Rai and Co 20011

2.   Gupta. Rajul .Fundamentals of Computers. Galgotia Publishing company Jain. Satish. Digital computer Fundamentals. BPB Publications

PAPER 4:

COMPUTER SOFTWARE

(60 Hrs)   **100 Marks**

Objectives: After Studying this paper, the trainees will be able to:
(a)   Get Introduced to Software - Origin and Functioning
(b)   Acquire and demonstrate basic understanding of important facets of System and Application Software.
(c)   Acquire and use detailed Information about Operating System.
(d)   Develop insights about the conceptual framework of different applications of Office Suite of Applications.
(e)   Get introduced to various Computer application software and to programming language--HTML.

Unit 1 SOFTWARE CONCEPTS   (15 Hrs)
   1.1 Meaning of Software.
   1.2 Software – Need and Importance
   1.3 Origin and Development of Software
   1.4 Open Source and Proprietary Software
   1.5 Concept and requirement of Customization of Software.

Unit 2 TYPES OF SOFTWARE - SYSTEM SOFTWARE   (15 Hrs)
   2.1 What is Operating System?
   2.2 Functions of Operating System
   2.3 CUI- (DOS), GUI- (Windows) – Operating Systems
   2.4 Overview of other Operating Systems-Linux including Chrome OS, IOS, Android, MAC OS.

Unit 3 SYSTEM SOFTWARE (Contd.)   (5 Hrs)
   3.1   What is System Software?
   3.2 Functions of System Software.
   3.3 Language translators –Assembler, Compiler, Interpreter
   3.4 Utility Software.
   3.5 Device Driver

Unit 4 TYPES OF SOFTWARE- APPLICATION SOFTWARE   (15 Hrs)
   4.1 What is Application Software?
   4.2 Office and other related packages
       4.2.1   Word Processing
       4.2.2   Spreadsheet
       4.2.3   Database
       4.2.4   Presentation
       4.2.5   Email client

UNIT 5 APPLICATION SOFTWARE-(CONTD)   (5 Hrs)

  5.1 File compression

  5.2 Media Player

  5.3 Accounting

  5.4 CD/DVD burning/USB storage devices

  5.5 Desktop publishing

  5.6 OCR

  5.7 Software to read various file formats-PDF, EPUB, HTML, TXT, RTF.

UNIT 6 PROGRAMMING LANGUAGE   (5 Hrs)

  6.1 Meaning of Program

  6.2 Generations of Computer Languages with their Advantages and Disadvantages

  6.3 Overview of various Programming Languages – Python, Java, R etc.

References:

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4. Jain. Satish. Powerpoint 2007. BPB Publications
5. Rutkosky . Excel 2007. BPB Publication
6. Rutkosky . Word2007. BPB Publication
7. Rutkosky . Aceess 2007. BPB Publication
8. Rutkosky . Office 2007. BPB Publication.
9. Internet Complete Reference – Tata Mcgrawhill

NETWORK AND INTERNET SERVICES

(60 Hrs)   **100 Marks**

Objectives: After Studying this paper, the trainees will be able to:

(a) Gain and show Clear Understanding of Networking and its various facets.

(b) Acquire and use functioning knowledge about the Internet

(c) Develop useful insights about various Internet services-Email, search engines, social networking, chatting and E-commerce

(d) Get introduced to Web Content Access Guidelines with particular reference to the visually impaired.

Unit 1 NETWORKING –An Overview   **(10 Hrs)**

   1.1 Introducing Network

   1.2 Advantages & Limitations of Network.

   1.3 Types of Network- LAN, WAN, MANNetwork Topologies – Star, Ring, Tree, Bus, Mesh, Hybrid

   1.4 Components of Network - Sender,Receiver, Message, Protocol, Communication Channels.

   1.5 Transmission Control Protocol (TCP)/ Internet Protocol (IP).

   1.6 Application of Wired and Wireless Communication media- Twisted pair, Coaxial, Fiber Optic Cables, Radio Transmission, Bluetooth, Microwaves, and Satellites.

Unit 2 INTERNET   **(10 Hrs)**

   2.1 Functioning of Internet

   2.2 Advantages and Disadvantages of Internet

   2.3   Web Terminologies:-

      2.3.1   WWW

      2.3.2   Web server

      2.3.3   Web Address

      2.3.4   Web Browser

      2.3.5   Website

      2.3.6   Web Page

      2.3.7   HTTP/ HTTPS

      2.3.8   Client

      2.3.9   ISP

      2.3.10   URL

      2.3.11   Domain

  2.4 Introduction to Cloud Computing.

Unit 3 EMAIL   **(10 Hrs)**

   3.1 Email-Introduction and Advantages

3.2 Email Account-What and How?

3.3 Email Protocols – POP3, IMAP, SMTP, HTTP

3.4 Structure and Composing of an Email-From, To, CC, BCC, Subject, Message Body, Attachments.

3.5 Accessing Received Mails

3.6 Replying or Forwarding Mails

3.7 Representing Emotions.

Unit 4 SEARCH ENGINES , SOCIAL NETWORKING AND AI (5 Hrs)

4.1 What is a Search Engine?

4.2 Working of a Search Engine

4.3 Most Commonly used Search Engines-- Google, Yahoo and MSN

4.4 Tips for Searching

4.5 What is Social Networking?

4.6 Advantages and Disadvantages of Social Networking.

4.7 Commonly used Social Networking Sites-- Facebook, Twitter, LinkedIn. Mastodon.

4.8 Introduction to AI and related applications.

Unit 5 APPLICATIONS (APPS), CHAT, DISCUSSION FORUMS (5 Hrs)

5.1 Meaning and Purpose of Apps

5.2 Meaning and process of Chat.

5.3 Text Chat, Audio and Video conferencing.

5.4 Conferencing Platforms (Zoom, Teams, Google Meet, Bharat VC etc)

5.5 Blogs

5.6 Newsgroups

5.7 Forums

5.8 Mailing Lists.

Unit 6 BASICS OF E-COMMERCE (10 Hrs)

6.1 E-Commerce--Concept.

6.2 Advantages and Limitations of E-Commerce

6.3 Categories of Ecomerce-B2B, B2C, C2B, C2C

6.4 Applications of Ecommerce-- E-learning, Online-reservation, Online- shopping, Online-Banking, Online-Bill Payment, Online Food Delivery, OTT platforms.

6.5 Cyber Laws- Overview

6.6 Firewalls

Unit 7 WEB ACCESSIBILITY WITH SPECIAL REFERENCE TO THE VISUALLY IMPAIRED-- AN OVERVIEW (10 Hrs)

7.1 What is Web Accessibility and Web Content Accessibility Guidelines (WCAG)?

7.2 Origin and Evolution of WCAG

7.3 Need and Importance of Web Accessibility Guidelines.

7.4   Components of WCAG

7.5   WCAG Compliance Testing – Tools and processes.

7.6   Introduction to BIS (Bureau of Indian Standards), IS17802 Part 1 and 2 and GIGW

References:

1. Koirala Shiv Prasad . Networking Interview . BPB Publication

2. Simpson Alass. Internet to Go. BPB Publication.

3. Internet Complete Reference. Tata Mcgraw Hill

4. Efraim Turban, David King, Dennis Viehland, Jae Lee, (2009), Electronic Commerce – A Managerial Perspective, 4th Edition, Pearson Education.

5. Elias M. Awad, (2007), Electronic Commerce- From Vision to Fulfillment, 3rd Edition. PHI Learning.

6. Joseph, P.T. and S.J., (2008), E-Commerce – An Indian Perspective, 3rd Edition, PHI.

PAPER 6:

SPECIAL COMPUTER DEVICES AND SOFTWARE FOR THE VISUALLY IMPAIRED

(60 Hrs)   **100 Marks**

Objectives: The primary objective of this paper is to enable the trainees to get familiar with the functioning of different computer-based devices and software for the blind and low vision persons.

Unit 1 SPECIAL COMPUTER BASED BRAILLE DEVICES   **(10 Hrs)**
    1.1   Refreshable Braille Display
    1.2   Note Takers
    1.3   Braille Printer
    1.4   Tactile Printer

Unit 2 SPECIAL SOFTWARE FOR THE VISUALLY IMPAIRED – AN OVERVIEW
(10 Hrs)

    2.1   Need and Importance
    2.2   Screen Reading Software
    2.3   Text to speech
    2.4   OCR Software

Unit 3 SPECIAL SOFTWARE FOR THE VISUALLY IMPAIRED – (CONTD.) (15 Hrs)
    3.1   Braille Translation Software and six key input system.
    3.2   Screen Magnification Software
    3.3   Software for Reading Books
    3.4   Software for Recording Books.

Unit 4 A c c e s s i b l e   L i t e r a t u r e   **(15 Hrs)**
    4.1   Daisy Accessible
    4.2   EPUB
    4.3   Large Print
    4.4   Audio Book
    4.5   Braille
    4.6   Braille with Large Print
    4.7   Online Libraries
    4.8   Devices–Hardware and Software for Reading accessible formats.

Unit 5 REGIONAL LANGUAGE CONSIDERATIONS   **(10 Hrs)**
    5.1   Text to Speech and screen reading software for regional languages-- requirement and status
    5.2   Producing Documents in regional languages for Braille Production and accessible E-

text.

5.3 Non-Unicode to Unicode Conversion.

References:
1. http://en.wikipedia.org/wiki/Microsoft_Magnifier
2. 123 of Computer Basics for Visually Impaired Using Jaws, Enable India
3. http://en.wikipedia.org/wiki/Refreshable_Braille_display
4. Taraporevala, S.& D'Sylva, Equip your World: A Synoptic View of Access Technology for the Visually Challenged. NIVH & XRCVC
5. Singh, J.P., Technology for the Blind –Concept and Context, Kanishka Publications.
6. Proceedings : Asian Conference on Adaptive technologies for the Visually Impaired. Asian Blind Union.

PRACTICALS

The following practicals need special attention here. Training for the under mentioned three practicals will be imparted by switching off the visual display unit. Evaluation for these practicals will also be conducted with the visual display unit turned off. The concerned three practicals in which the visual display will be turned off are:

1. Operating System and screen reading software
2. Word Processing software
3. Web Browsing.

PRACTICAL I:

OPERATINGSYSTEM AND SCREEN READING SOFTWARE

(80 Hours)   **100 Marks**

UNIT 1 Keyboard Orientation   **(10 Hrs.)**
   1.1   Getting Started – Character Keys, Special Keys
   1.2   Number Keys
   1.3   Use of Insert, Delete, Home, End, Page Up, Page down and Backspace
   1.4   Use of alpha numeric keys and special keys with Shift key.
   1.5   Numeric Keypad.

UNIT 2 USING JAWS/NARRATOR/ ORCA (Any One)   **(10Hrs)**
   2.1   Installing Screen Reader
   2.2   Installing TTS for English, Hindi / Any other Indian Language
   2.3   Keyboard Orientation
   2.4   General screen reading software Keystrokes
   2.5   Installing screen reading software Updates
   2.6   Working with portable version
   2.7   Working with Text to Speech.
   2.8   Working with OCR Functionality of the Screen Reader.

UNIT 3 USING NVDA (Open Source)   **(10 Hrs)**
   3.1   Installing NVDA
   3.2   Installing TTS for English, Hindi / Any other Indian Language
   3.3   Working with Portable version
   3.4   Keyboard Orientation
   3.5   General Keystrokes
   3.6   Working with Text to Speech software.
   3.7   Working with ADD Ons
   3.8   Updating NVDA

UNIT 4 WORKING WITH DESKTOP   **(10Hrs)**
   4.1   Accessing Default Desktop Icons
   4.2   Customizing desktop Icons
   4.3   Working with system tray
   4.4   Accessing Start Menu
   4.5   Using Window Components and its objects-buttons
   4.6   Accessing Control Panel –Display settings, Language and region, and date and time settings.

UNIT 5 ACCESSING PROGRAMS / APPLICATIONS   (10Hrs)
  5.1   Opening and closing Programs / Applications
  5.2   Working   with Notepad, WordPad (English, Hindi/Any Other Indian Language)
  5.3   Working with Calculator
  5.4   Working with Sound recorder
  5.5   Accessing narrator and default magnifier

UNIT 6 INSTALLING OS, DEVICE DRIVERS AND OTHER APPLICATION SOFTWARES   (15Hrs)
  6.1   Installation of Operating system
       6.1.1 Creating Partitions
       6.1.2 Formatting Drive
  6.2   Installing Device Drivers
  6.3   Add and remove Application Programs
  6.4   Accessing and Formatting Other Drives

UNIT 7 MANAGING FILES AND FOLDERS   (15Hrs)
  7.1   Create Folders and Subfolders
  7.2   Search Files / Folders
  7.3   Rename Files / Folders
  7.4   Open Files / Folders
  7.5   Access properties of Files / Folders
  7.6   Move or Copy Files / Folders
  7.7   Delete Files / Folders
  7.8   Restore Files / Folders from recycle bin.
  7.9   Create Shortcuts
  7.10   Minimize / Maximize and Restore Window.
  7.11   CD/DVD Burning
  7.12   Transferring Data from one device to another
  7.13   Accessing and Managing Cloud Storage Solutions.

PRACTICAL II:

WORD PROCESSING SOFTWARE

(90 Hrs)   **150 Marks**

UNIT 1 WORDPROCESSING FEATURES (With chosen Screen Reader)   (10 Hrs)

    1.1   General Commands for Word Processing software

    1.2   Getting Started – (document window)

    1.3   Creating /Saving / Opening / Closing/ Save As Document

    1.4   Setting Margins

    1.5   Line Spacing

    1.6   Landscape &Portrait Page Orientation

    1.7   Headers & Footers

    1.8   Printing Document

    1.9   Exiting Word Processing.

UNIT 2 NAVIGATION   (10Hrs)

    2.1   Using Basic keys

    2.2   Using Quick Keys

    2.3   Formatting

    2.4   Informational Keystrokes

UNIT 3 EDITING DOCUMENT& FORMATTING   (10Hrs)

    3.1   Inserting / deleting and Moving text in Document

    3.2   Overwriting text in Document

    3.3   Correcting Misspell words (without spell checker)

    3.4   Block Operations – Select, Cut, Copy, Paste, Delete

    3.5   Find & Replace

    3.6   Change Case

    3.7   Bullets & Numbering

    3.8   Changing Font, Style, Size and Color.

    3.9   Bold, Italic, underline, superscript, subscript.

    3.10 Text Alignment

    3.11 Format Painter

UNIT 4 INSERTION IN A DOCUMENT   (10 Hrs)

    4.1   Objects

    4.2   Pictures

    4.3   Shapes

    4.4   Signatures

    4.5   Text Box

    4.6   Clip Art

    4.7   Hyper Link

4.8 System Date & Time.

4.9 Book Mark

UNIT 5 TABLES   (10 Hrs)

5.1 Inserting Table

5.2 Navigation in a Table

5.3 Entering Text

5.4 Add and Delete Rows & Columns

5.5 Converting Text to Table& Vice Versa

5.6 Auto Formatting

5.7 Merge Cells

5.8 Row Header, Cell Header association and Table Titles.

UNIT 6 MAIL MERGE & PRINTING   (25 Hrs)

6.1 Creating Main Document

6.2 Working with Auto Text

6.3 Data Source

6.4 Inserting Field Names

6.5 Merging Source to the main Document

6.6 Printing / saving Merged Document.

UNIT 7 ADDITIONAL FEATURES OF WORD PROCESSOR   (15 Hrs)

7.1 Spell Checker

7.2 Thesaurus

7.3 Auto Correct

7.4 Word Count

7.5 Macros.

7.6 Protecting a document.

7.7 Track Changes

7.8 Comments: Inserting, Deleting, resolving comment, Reopening Resolved comment.

7.9 Table of Contents.

PRACTICAL III:

SPREADSHEET SOFTWARE

(With chosen screen reader)

(90 Hrs) **150 Marks:**

UNIT 1 SPREAD SHEET **(10 Hrs)**

1.1   General Commands for Spreadsheet
1.2   Getting started – (Worksheet window)
1.3   Creating / Opening, Closing /Saving Spreadsheet
1.4   Entering Data
1.5   Data Validation
1.6   Working with   basic Formulas– Addition, Subtraction, Division, Multiplication & Percentage.
1.7   Copying and pasting Formulae
1.8   Cell Referencing.

UNIT 2 NAVIGATION **(10 Hrs)**

2.1   Informational Keystrokes for Rows
2.2   Informational keystrokes for Columns
2.3   Table Layer keystrokes
2.4   Miscellaneous Informational Keystrokes
2.5   Navigation Keystrokes
2.6   Selection Keystrokes.

UNIT 3 EDITING CELL CONTENTS **(10 Hrs)**

3.1   Selecting a range
3.2   Copying / pasting a range
3.3   Moving / Naming a Range
3.4   Clearing Range
3.5   Filling a range.

UNIT 4 COMMANDS – Worksheet **(10 Hrs)**

4.1   Saving / retrieving a workbook
4.2   Inserting cells / Rows/ Columns /sheet.
4.3   Erasing Sheet
4.4   Renaming, moving Sheet
4.5   Printing sheet
4.6   Deleting Rows/Columns/Sheet.
4.7   Navigation between sheets

UNIT 5 WORKINGWITH FUNCTIONS **(20 Hrs)**

5.1   Arguments & Structure of a function

5.2 SUM

5.3 AVERAGE

5.4 COUNT

5.5 MAX/MIN

5.6 DAY, DATE

5.7 IF Statement

UNIT6 FORMATTING, FILTERING AND SORTING DATA (20 Hrs)

6.1 Formatting Numbers /Date & Time

6.2 Formatting Text

6.3 Conditional Formatting

6.4 Filtering Data

6.5 Sorting.

UNIT 7 CHARTS (10Hrs)

7.1 Inserting Charts – Column, Bar, Line, Pie

PRACTICAL IV:

PRESENTATION SOFTWARE

(Using chosen Screen Reader)

(70 Hrs)   **100 Marks**

UNIT 1 - GETTING ACQUAINTED WITH PRESENTATION SOFTWARE (10 HRS)
 1.1 Presentation Software Window
 1.2 Basic Navigation Commands
 1.3 Reading Keystrokes
 1.4 Information Keystrokes

UNIT 2 – PREPARING PRESENTATION   (10 HRS)
 2.1 Creating New Presentation
 2.2 Saving Presentation
 2.3 Opening Presentation
 2.4 Closing Presentation
 2.5 Inserting New Slides
 2.6 Inserting Duplicate Slides
 2.7 Applying Slide Layouts

UNIT 3 – PREPARING PRESENTATION (CONTD.)   (10 HRS)
 3.1 Adding Text to Slides
 3.2 Text Formatting
 3.3 Applying Bullets and Numbering
 3.4 Inserting Clip Art
 3.5 Inserting Pictures
 3.6 Inserting and Formatting Shapes
 3.7 Inserting and Formatting Word Art
 3.8 Inserting Charts
 3.9 Inserting Tables
 3.10 Inserting Hyperlinks

UNIT 4 – ADDING VIDEO AND AUDIO   (10 HRS)
 4.1 Inserting Audio in Slides
 4.2 Inserting Video in Slides
 4.3 Adding Audio in Background of Presentation

UNIT5 – APPLYING ANIMATION AND THEMES   (10 HRS)
 5.1 Applying Slide Transition Animation
 5.2 Applying Custom Animation
 5.3 Applying Themes
 5.4 Formatting Slide Background

UNIT 6 - PRESENTATION VIEWS   **(5 HRS)**
    6.1   Normal View
    6.2   Slide Sorter View
    6.3   Notes Page View
    6.4   Slide Show View

UNIT 7 – PRINTING PRESENTATION   **(5 HRS)**
    7.1   Using Page Setup
    7.2.   Setting Slide Header and Footer
    7.3   Using Print Preview
    7.4   Printing Slides and Handouts.

UNIT 8 – PRESENTING SLIDES (10 HRS)
    8.1   Connecting PC to Projector
    8.2   Reading slides (using Braille /computer keyboard and headphone)
    8.3   Changing Slide through Computer.

PRACTICAL V –
DATABASE SOFTWARE

(70 Hrs)   **100 marks**

UNIT 1 - GETTING ACQUAINTED WITH DATABASE   **(10 HRS)**
    1.1   Database Window
    1.2   Creating New Database
    1.3   Saving Database
    1.4   Opening Database
    1.5   Closing Database

UNIT 2 - TABLES   **(10 HRS)**
    2.1   Creating Tables
    2.2   Defining Fields and their properties
    2.3   Defining Data Types
    2.4   Adding / Deleting Fields
    2.5   Setting and Deleting Primary Key
    2.6   Creating / Deleting Relationship
    2.7   Delete, Rename and Copy Table
    2.8   Printing Table

UNIT 3 – DATA MANIPULATION   **(10 HRS)**
    3.1   Insert / Append Records
    3.2   Update Existing Records
    3.3   Delete Records.

UNIT 4 – WORKING WITH FORMS   **(10 HRS)**
    4.1   Creating form
    4.2   Use form wizard
    4.3   Working with form controls
    4.4   Modifying design of forms
    4.5   Maintain data using form
    4.6   View Existing Forms
    4.7   Deleting, Copying and renaming a form.

UNIT 5 – WORKING WITH REPORTS   **(10 HRS)**
    5.1   Creating Report
    5.2   Using Report Wizard
    5.3   Modifying design of Report
    5.4   Sorting and Grouping Report Data
    5.5   Calculating Group and Overall Totals.
    5.6   Deleting, Copying and renaming a report.

5.7 Viewing and Printing Reports

UNIT 6 – Retrieving Data from Database using Queries (20 HRS)

6.1 Creating Query
6.2 Modifying Query
6.3 Using multiple selection criteria in a query
6.4 Using Logical Operators in a query
6.5 Using Comparison Operators in a query
6.6 Sorting Data using query
6.7. Filtering Data using Query
6.8 Printing Output of a Query
6.9 Deleting a query

PRACTICAL VI:
WEB BROWSING

(70Hrs)   **100 Marks**

UNIT 1 - M I C R O S O F T   E D G E / MOZILLA FIREFOX/ GOOGLE CHROME
(Any one**)**   **(20Hrs)**
    1.1   Accessing Websites
    1.2   Navigation
    1.3   Uploading /Downloading Files
    1.4   Saving Web Pages
    1.5   Accessing Search Engines
    1.6   Cloud Computing

UNIT 2 - MANAGING EMAIL ACCOUNTS USING WEB BROWSER & EMAIL CLIENT SOFTWARE (Outlook)   (15 HRS)
    2.1   Creating Email Account
    2.2   Composing   and Sending Emails
    2.3   Receiving, Reading and Closing mails.
    2.4   Accessing Emails in Different Folders
    2.5   Handling attachments-- Attaching/Opening/Downloading/Saving.
    2.6   Sending Email Using CC, BCC Fields.
    2.7   Forwarding & replying with or without Original Text and Attachment
    2.8   Accessing Address Book
    2.9   Configuring Single / Multiple Email Account
    2.10   Setting of Default Email Account and selecting Email Editor
    2.11   Managing Auto Reply and Signature.
    2.12   Managing Email calendar

UNIT 3 - CHATTING& ACCESSING SOCIAL NETWORKING SITES   (15 Hrs.)
    3.1   Accessing Webcam and MIC with particular reference to V.I
    3.2   Conferencing Tools (Tem, Zoom, G Meet).
    3.3   Audio conferencing
    3.4   Video conferencing
    3.5   Text Chat
    3.6   Using what's App for chatting and calling.
    3.7   Instagram
    3.8   Facebook
    3.9   Twitter
    3.10   LinkedIn.

UNIT 4 - ELECTRONIC TRANSACTION   (20 Hrs)
    4.1   Online Ticketing

4.2   Online shopping
4.3   Online Banking
4.4   Payment of Bills
4.5   Cheque Printing.
4.6   Online Food delivery
4.7   OTT platforms

PRACTICAL VII:
ASSISTIVE DEVICES

(60 HRS)   **100 MARKS**

UNIT – 1   Smart Phones with Screen Readers   (25 HRS)
    1.1.   Make / Receive calls using Personal assistant and Keyboards.
    1.2.   Using Play Store
    1.3.   Working with Online libraries on phone.
    1.4.   Accessing UPI's and E Wallets.
    1.5.   Using Smart Phones for Daily Living.

Unit - 2 – Independent Living, Technological Aids/Solutions.   (25 HRS)

    2.1   Smart Home Devices (Alexa, Google Home/ AI based Apps)
    2.2   Accessible devices for daily living-
       -    Light Detector
       -    Sonic Labeller
       -    Colour Recognizer
       -    Talking BP Monitor
       -    Talking Weighing Machine
       -    Talking Thermometer
       -    Talking Watch
       -    Liquid Level Indicator

Unit 3 –Use of Assistive devices/ technology for Independent Mobility. (10 HRS)
    3.1   Smart Cane
    3.2   Apps for Mobility / Navigation (Indoor, Outdoor)
    3.3   Using Navigation Through Maps.

PRACTICAL VIII:

ALTERNATIVE MATERIAL IN ACCESSIBLE FORMATS– PRODUCTION AND ACCESS

(50 Hrs.)   **100 Marks**

UNIT 1 CONVERTING PRINT MATERIAL / IMAGEs USING OCR   **(15 Hrs)**
  1.1 Process of Scanning and Converting into Accessible Format
  1.2 Saving / downloading the Scanned File in Various Formats
  1.3 Scanning through Camera Accessible scanners
  1.4 Converting Scanned Image/ images-based PDF through OCR in Machine Readable Format.
  1.5 Rescan
  1.6 Using Camera Scanners with Software/ Cloud Platforms
  1.7 Reading Image Based PDF.

UNIT 2 BRAILLE PRINTING   **(15 Hrs)**
  2.1 Installing Braille Translation software (Duxbury/ Braille Blaster)
  2.2 Connecting Embosser with the PC
  2.3 Embosser Settings
  2.4 Creating /Importing Document into Duxbury
  2.5 Formatting data
  2.6 Translation
  2.7 Navigation
  2.8 Embossing.

UNIT 3 - PRODUCTION OF DAISY -- AUDIO   **(10Hrs)**
  3.1 Installation of   OBI.
  3.2 Creating a new project with table of contents.
  3.3 Working/ Editing in Sections with various Menus in OBI.
  3.4 Working / Editing in Phrases with Various Menus in OBI.
  3.5 Marking Page Numbers
  3.6 Dealing with Metadata View
  3.7 Finalization with Tool Menu.

UNIT 4 - PRODUCTION OF EPUB   **(10Hrs)**
  4.1 Installing Word to EPUB
  4.2 Structuring word document:
      4.2.1 Marking Headings and subheadings
      4.2.2 Marking Page Numbers
  4.3 Dealing with Tables, Lists, Images
  4.4 Exporting / Saving as EPUB.

PRACTICAL IX
BRAILLE

(80 Hrs)   **50 Marks**

UNIT 1 BRAILLE WRITING – ENGLISH   (30 Hrs)
    1.1   Alphabet
    1.2   Contractions and Abbreviations
    1.3   Punctuation
    1.4   Numbers
    1.5   Basic Nemeth-code – plus, minus, multiplication, division.
    1.6   Orientation to UEB.

UNIT 2 BRAILLE WRITING –HINDI/ REGIONAL LANGUAGE   (20 Hrs)
    2.1   Alphabet
    2.2   Deviation from print – Conjunct letters, Matras
    2.3   Compound words
    2.4   Poetry-writing.

UNIT 3 USE OF WRITING DEVICES   (15 Hrs)
    3.1   Slate & Stylus
    3.2   Perkins Braille Writer
    3.3   Refreshable Braille Display
    3.4   Braille Note taker.

UNIT 4 READING   (15 Hrs)
    4.1   English Braille
    4.2   Hindi/Regional Language Braille.

PRACTICAL X:
PROJECT WORK:

(40 Hrs)   **50Marks**

1. Prepare material of at least 10 pages in EPUB.   (30 marks)
2. Prepare a project -   (20 marks)
   a. Prepare a presentation of 10 slides on Assistive Technology.

PRACTICE TEACHING:

(20 Hrs)   **100Marks**

1. 10 Lessons in Computer Education for the V.I from Class VI onwards.

2. 10 Lessons in Computer Education in a vocational training/rehabilitation centre for the visually impaired.

LIST OF DEVICES

Essential Devices (Hardware)
- ▶ Computers with latest configuration installed with screen reading software chosen by the implementing agency and Internet connectivity through LAN
- ▶ Scanner -2
- ▶ Printer - 2
- ▶ Braille Embosser (Printer) - 1
- ▶ Daisy Player -1
- ▶ Smart Phone/ Tablet
- ▶ Projector
- ▶ Camera Scanner
- ▶ Smart Cane
- ▶ Braille Note Taker
- ▶ Light Detector
- ▶ Sonic Labeller
- ▶ Talking BP Monitor
     Talking Weighing Machine
     Talking Thermometer
     Talking Watch
     Liquid Level Indicator

Essential Software's
- ▶ Kurzweil/ KIBO Access device/ fine reader
- ▶ Duxbury/ Braille Blaster
- ▶ INDO NVDA
- ▶ Windows default Magnifier
- ▶ OBI
- ▶ Daisy Player Software
- ▶ MS Office/ Open Office
- ▶ Anti virus
- ▶ EPUB reading Software

Optional Devices
- ▶ Refreshable Braille Display -1
- ▶ Power Brailler -1
- ▶ Tactile Printer-1
- ▶ IPAD/ IPHONE
- ▶ Interactive Panel

Optional Software's
- ▶ Linux
- ▶ ORCA