DIPLOMA IN COMPUTER EDUCATION (VISUAL IMPAIRMENT) –D.C.E.(V.I.)

NORMS
&
GUIDELINES

REHABILITATION COUNCIL OF INDIA
(A Statutory Body under Ministry of Social Justice & Empowerment)
Department of Empowerment of Persons with Disabilities (Divyangjan)
B-22, Qutab Institutional Area
New Delhi – 110 016
2016

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DIPLOMA IN COMPUTER EDUCATION
(VISUAL IMPAIRMENT)

1.   **Nomenclature of the Programme**: Diploma in Computer-Education (Visual Impairment).

2.   **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.

3.   **Objectives of the Programme**: 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 hardware and software 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 Daisy Books.

4.   **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.

5.   **Medium of Instruction**: The medium of instruction will be English and Hindi/the concerned state language.

6.   **Duration of the Programme**: One academic year.

7.   **Distribution of time for Theory and Practical Work**: 10 Months - 240 Days (1440Hrs.)

The Programme shall be spread over a period of 240 days with 1440 hours, in addition to the examination and admission days. The distribution of working hours for theory and Practicals will be as follows:

Theory   : 480 Hours
Practicals   : 960 Hours

8.   **Recommended Teacher/Student Ratio**: The teacher/student ratio will be 1:7. Number of students in the Programme will be 20.

9.   **Content of the Programme**: This Course will consist of the following six theory papers of 100 marks each:

1) Visual Impairment and Special Education
2) Psychology and Rehabilitation of Persons with visual impairment
3) Fundamentals of Computers
4) Computer Software
5) Network and Internet Services
6) Special Computer Devices and Software for the Visually Impaired.

The Course will have the following practicals:

I.   Operating System and Screen Reading Software (100 Marks)
II.   Word Processing Software (150 Marks)
III.   Spreadsheet Software (150 Marks)
IV.   Presentation Software (100 Marks)
V.   Database Software (100 Marks)
VI.   Web Browsing (100 Marks)
VII.   HTML- Programming Language (100 Marks)
VIII. Alternative Material In Accessible Formats--Production and Access (100 Marks)
IX.   Braille   (50 Marks)
X.   Practice Teaching (100 Marks)
XI.   Project Work (50Marks)
       (Detailed syllabus for the course is given as Annexure A)

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

11.   **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/ Examining body rules. The Evaluation will be both Internal as well as External. 40% marks will be based on Internal Evaluation and 60% for External.

12.   **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.

13.   **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	Grade 9300-34800/- with

			visually impaired students Or Graduate with Certificate of Training in Computers for the visually impaired students (minimum 4 months) with ten years experience of teaching computers to the visually impaired students	G.P 4600

14. **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

15. **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.

16. **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.

17. **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.

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

19.   **Certification**:

The successful candidates of this Course will be registered with the Council as a Vocational Instructor (Personnel category)   (Computer-Education--Visual Impairment). The certificates will be valid initially for a period of 5 years, renewable subject to the candidate obtaining 100 Continuing Rehabilitation Education (CRE) points.

THEORY PAPERS

PAPER 1: VISUAL IMPAIRMENT ANDSPECIAL 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. PWD 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, Retinis Pigmentosa;

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. PWD 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--Education and the UNCRPD;

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 computer software 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.   UNCRPD Articles 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.

PAPER 2: PSYCHOLOGY AND REHABILITATION OFPERSONS WITH VISUAL IMPAIRMENT. (80 Hours) 100 Marks.

Objectives: After studying this Paper, the trainees will be able to:
   (a) Define and state the importance of various aspects of psychology with particular reference to the rehabilitation of the visually impaired;
   (b) Explain the concept and various forms of rehabilitation;
   (c) Demonstrate adequate knowledge and understanding of different psychological implications of visual impairment in the context of rehabilitation;
   (d) Utilize various guidance and counseling techniques as per need;
   (e) Define the roles of different senses for purposes of information-processing.

Unit 1 Psychology - Basic Concepts :(16 hours)
   1.1.   Psychology--definition, aims and scope with reference to the visually impaired;
   1.2.   Motivation--definition, basic structure, types, relevance to the visually impaired;
   1.3.   Attention--definition, factors affecting attention, with particular reference to the visually impaired;
   1.4.   Learning—definition, process of learning, theories -- Classical and Operant Conditioning--applications for the visually impaired;
   1.5   Individual differences – Implications for classroom teaching and learning.

Unit 2 Rehabilitation--Various Facets (16 Hours)
   2.1.   Concept of Rehabilitation as per the PWD Act or any replacement Disability Legislation;
   2.2.   Habilitation and Rehabilitation--UNCRPD;
   2.3.   Types of rehabilitation services in the country--Centre-Based, Community-Based, Community-participation-Based, Sheltered;
   2.4.   Vocational rehabilitation: - meaning, various opportunities for vocational training and placement, with particular reference to computer Application, vocational rehabilitation services in the Country;
   2.5.   Job-identification and job-analysis for the visually impaired, with particular reference to the IT sector.

Unit 3   Psycho-Social Implications of Visual Impairment (16 Hours)
   3.1.   Impact of visual impairment on early development;
   3.2.   Formation and development of concepts among the visually impaired;
   3.3.   Stereotypes and social misconceptions about the visually impaired;
   3.4.   Positive attitudes to visual impairment;
   3.5.   Public education.

Unit 4   Guidance and Counseling (16 hours)
   4.1.   Guidance and counseling--difference between guidance and counseling;
   4.2.   Forms of Counseling;
   4.3.   Process and techniques of guidance and counseling: individual, family

counseling;

4.4. Special relevance of guidance and counseling with reference to computer-education for the visually impaired;

4.5. Employer-counseling.

Unit 5   Use of Remaining Senses for Information-Processing: (16 Hours)

5.1. Utilizing residual sight for persons with low vision;

5.2. Touch and two-hand co-ordination;

5.3. Audition--sound identification, sound-localization, sound alignment;

5.4. Kinesthetic abilities;

5.5. Sensory integration.

REFERENCES:

1. Adams J.A. (1992). Learning and memory An introduction. Homewood, Illinois Dorsey Press.
2. Barciey. J.R. (1993). Counseling and Philosophy. San Francisco.
3. Evans, P and Verma, V. (Eds.) (1990) Special Education. Past Present and Future. The Faimer Press.
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5. Guilford. .B. (1996). Fields of Psychology (ed.,) New York: Van Nostrand.
6. Jones. A.P. (1994). Principles of Guidance. New York: Holt.
7. Keller. F.S. (1997). The Definitions of Psychology (Ed.,). New York: Appleton century.
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9. Munn. N.L. (1997). Introduction to Psychology. Delhi.
10. Pandey, R.S and Advani, Lal (1995). Perspectives in Disability and Rehabilitation. New Delhi: Vikas Publishing House.
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12. Punani. B and Rawal, N (1997). Community Based Rehabilitation (Visually Impaired). Bombay : NAB.
13. Punani. B. and Rawal. N.(1993). Handbook: Visual Handicap. New Delhi: Ashish Publishing House.
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15. Sawrey. J.H. and Telford. C. (1998). Educational Psychology (2nd ed.,) New Delhi Prentice Hall of India.
16. Taylor, R.L. (1993). Assessment of Exceptional Students Educational and Psychological Procedures. Boston Allyn Bacon.
17. Traxier. A. .1. (1990). Techniques of Guidance New Delhi Prentice Hall of India.
18. The Persons with Disabilities (Equal Opportunities, Protection of Rights and Full Participation) Act (1995), Government of India.
19. UN Convention on the Rights of Persons with Disabilities (2008) United Nations; New York.

PAPER 3: FUNDAMENTALS of COMPUTERS (80 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 (20 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 (15 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 Commonly used computer related digital devices based on IOS and Android –Tablets, Smart phones, and I-Pad.

Unit 3 NUMBER SYSTEM. (15 Hrs)
3.1 Concept of Number System
3.2 Types and Application of Number System – Binary, Decimal, Hexadecimal, Octal.
3.3 Conversion of Decimal to Binary, Octal, Hexadecimal.
3.4 Conversion of Binary, Octal, Hexadecimal to Decimal.
3.5 Conversion of Binary to Octal, Hexadecimal.
3.6 Conversion of Octal, Hexadecimal to Binary.

Unit 4 COMPUTER FIELDS(10Hrs)
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(80 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 softwares and to programming language--HTML.

Unit 1 SOFTWARE CONCEPTS (10 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 System Software?
   2.2   Functions of System Software.
   2.3   Language translators –Assembler, Compiler, Interpreter
   2.4   Utility Software.
   2.5   Device Driver

Unit 3 SYSTEM SOFTWARE (Contd.) (15 Hrs)
   3.1   What is Operating System?
   3.2   Functions of Operating System
   3.3   CUI- (DOS), GUI- (Windows) – Operating Systems
   3.4   Overview of other Operating Systems-Linux, IOS, Android.

Unit 4 TYPES OF SOFTWARE- APPLICATION SOFTWARE (10 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) (10 Hrs)
   5.1   File compression
   5.2   Media Player
   5.3   Accounting
   5.4   CD/DVD burning

5.5   Desktop publishing

5.6   OCR

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

UNIT 6 PROGRAMMING LANGUAGE (20 Hrs)

6.1   Meaning of Program

6.2   Generations of Computer Languages with their Advantages and Disadvantages:

   6.2.1 First Generation Language

   6.2.2 Second Generation Language

   6.2.3 Third Generation Language

   6.2.4 Fourth Generation Language

   6.2.5 Fifth Generation Language

6.3   Characteristics of HTML

REFERENCES:

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2. Jain. Satish. Excel made simple. BPB Publications
3. Jain. Satish. Powerpoint 2007. BPB Publications
4. Rutkosky . Excel 2007. BPB Publication
5. Rutkosky . Word2007. BPB Publication
6. Rutkosky . Aceess 2007. BPB Publication
7. Rutkosky . Office 2007. BPB Publication.
8. HTML – 4.0 Complete Reference – BPB Publication
9. Internet Complete Reference – Tata Mcgrawhill
10. HTML – 4.0 Unleashed. Techmedia publication
11. Bayross Ivan. HTML, DHTML

PAPER 5: NETWORK AND INTERNET SERVICES
(80 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 (20 Hrs)
   1.1   Introducing Network
   1.2   Advantages & Limitations of Network.
   1.3   Types of Network- LAN, WAN, MAN
   1.4   Network Topologies – Star, Ring, Tree, Bus, Mesh, Hybrid
   1.5   Components of Network - Sender, Receiver, Message, Protocol, Communication Channels.
   1.6   Transmission Control Protocol (TCP)/ Internet Protocol (IP).
   1.7   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
         2.3.8 Client
         2.3.9ISP
         2.3.10URL
         2.3.11 Domain

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 (10 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.

Unit 5 APPLICATIONS (APPS), CHAT, DISCUSSION FORUMS (10 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   Use of SKYPE
    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
    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.

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2. Simpson Alass. Internet to Go. BPB Publication.
3. Internet Complete Reference. Tata Mcgraw Hill

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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 (80 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 softwares for the blind and low vision persons.

Unit 1 SPECIAL COMPUTER BASED BRAILLE DEVICES (15 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 (20 Hrs)
2.1   Need and Importance
2.2   Screen Reading Software
2.3   Text to speech
2.4   OCR Software
2.5   Talking Typing Tutor.

Unit 3 SPECIAL SOFTWARE FOR THE VISUALLY IMPAIRED – (CONTD.) (20 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 DAISY BOOK PRODUCTION (15 Hrs)
4.1   What is Daisy?
4.2   Daisy Consortium-Origin and present status
4.3   Types of Daisy Books
4.4   Daisy Standards
4.5   Online Libraries
4.6   Devices–Hardware and Software.

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

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 (100 Hours) 100 Marks

UNIT 1 Keyboard Orientation (15 Hrs)
1.1 Getting Started – Character Keys, Special Keys
1.2 Number Keys
1.3 Use of Insert, Delete, Home, End, Page Up, Pagedown and Backspace
1.4 Use of alpha numeric keys and special keys with Shift key.
1.5 Numeric Keypad.

UNIT 2 USING JAWS/ SUPERNOVA/ WINDOWS-EYES/ ORCA (Any One) (15Hrs)
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 Using Text to Speech.

UNIT 3 USING NVDA (Open Source) (15 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 Using Text to Speech software.

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 (20Hrs)
6.1   Installation of Operating system
      6.1.1 Boot Sequence
      6.1.2 Creating Partitions
      6.1.3 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

PRACTICAL II: WORDPROCESSING SOFTWARE
(120 Hrs) 150 Marks

UNIT 1 WORDPROCESSING FEATURES (With chosen Screen Reader) (20 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.

UNIT 2 NAVIGATION (10Hours)
2.1 Using Basic keys
2.2 Using Quick Keys
2.3 Formatting
2.4 Informational Keystrokes

UNIT 3 EDITING DOCUMENT& FORMATTING (15Hrs)
3.1 Inserting / over writing text in Document
3.2 Correcting Misspell words (without spell checker)
3.3 Block Operations – Select, Cut, Copy, Paste, Delete
3.4 Find & Replace
3.5 Change Case
3.6 Bullets & Numbering
3.7 Changing Font, Style, Size and Color.
3.8 Bold, Italic, underline, superscript, subscript.
3.9 Text Alignment
3.10 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.

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

UNIT 6 MAIL MERGE & PRINTING (40 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.

PRACTICAL III: SPREADSHEET SOFTWARE
(With chosen screen reader) (120 Hrs) 150 Marks:

UNIT 1 SPREAD SHEET(20 Hrs)
      1.1   General Commands for Spreadsheet
      1.2   Getting started – (Worksheet window)d
      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 (15 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 (30 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

UNIT 6 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 (15Hrs)
     7.1   Inserting Charts – Column, Bar, Line, Pie
     7.2   Setting attributes of chart
     7.3   Moving and resizing Charts
     7.4   Copy &Printing charts.

PRACTICAL IV: PRESENTATION SOFTWARE
(Using chosen Screen Reader) (100 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 (20 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.) (20 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 (20 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 / Remote

PRACTICAL V - DATABASE SOFTWARE (100 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 (20 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 (20 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 (20 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 (100Hrs) 100 Marks

UNIT 1 - INTERNET EXPLORER/ MOZILLA FIREFOX/ GOOGLE CHROME(Any one) (10 Hrs)
    1.1   Accessing Websites
    1.2   Navigation
    1.3   Uploading /Downloading Files
    1.4   Saving Web Pages
    1.5   Accessing Search Engines

UNIT 2 - MANAGING EMAIL ACCOUNTS USING WEB BROWSER & EMAIL CLIENT SOFTWARE (Mozilla Thunder world or Any Other)(35 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

UNIT 3 - CHATTING& ACCESSING SOCIAL NETWORKING SITES (25 Hrs)
    3.1   Accessing Webcam and MIC with particular reference to V.I
    3.2   Skype
    3.3   Audio conferencing
    3.4   Video conferencing
    3.5   Text Chat
    3.6   Using what's App for chatting and calling.
    3.7   Yahoo Messenger
    3.8   Facebook
    3.9   Twitter
    3.10   LinkedIn.

UNIT 4 - ELECTRONIC TRANSACTION (30 Hrs)
    4.1   Online Ticketing
    4.2   Online shopping
    4.3   Online Banking
    4.4   Payment of Bills
    4.5   Cheque Printing.

PRACTICAL VII: HTML-- PROGRAMMING LANGUAGE (100 HRS) 100 MARKS

UNIT – 1   HTML BASICS(20 HRS)
1.1. Using Tags
1.2. Container and Empty Tag
1.3. HTML Document Structure
1.4. Basic Tags of a HTML -<HTML>, <TITLE>, <HEAD>, <BODY>
1.5. Steps for Creating and Saving an HTML File.
1.6 Viewing web page in Web Browser

Unit - 2 – HTML Tags(20 HRS)
2.1 Text formatting with <FONT>, <BASEFONT>
2.2 Text Formatting with - <P>,
2.3. Heading Tags (H1-H6)
2.4 Applying some special effects using <MARQUEE> and <BLINK> Tag
2.5 Horizontal Rules -<HR> Tag
2.6 Subscript and Superscript - <SUB>, <SUP>
2.7 Text Styles - <B>, <I>, <U>, <EM>, <STRONG>, <TT>, <PRE>

Unit 3 – LISTS in HTML (15 HRS)
3.1 Ordered List
3.2 Unordered List
3.3. Nested List
3.4. Menu List
3.5. Definition List

UNIT 4. Images and Hyperlinks (15 HRS)
4.1. Insert image in a webpage using <IMG> Tag
4.2 Change the size and position of image
4.3. Using Hyperlink.
4.4 Anchor Tag - <A>
4.5 Link with text
4.6 Email & Website Link
4.7 Links with images

Unit 5 – Working with Tables (15 HRS)
5.1 Create Table using - <TABLE>, <CAPTION>, <TR>, <TH> AND <TD> TAGS
5.2 TABLE BORDER, BORDER COLOR AND ALIGNMENT
5.3. COLSPAN, ROWSPAN
5.4. CELL PADDING, CELL SPACING
5.5. Applying different COLOR Schemes in CELL

Unit 6- Working with Forms (15 HRS)
6.1 Creating Forms
6.2 Text Box – Single Line & Multi Line

6.3. Radio Buttons
6.4. Check Box
6.5. Drop down List Box
6.6 Submit and Reset Buttons.

PRACTICAL VIII: ALTERNATIVE MATERIAL IN ACCESSIBLE FORMATS– PRODUCTION AND ACCESS (100 Hrs) 100 Marks

UNIT 1 IMAGE SCANNING AND USING OCR (15 Hrs)
1.1   Process of Image Scanning and Converting into Accessible Format
1.2   Saving the Scanned File in Various Image Formats
1.3   Scanning through OCR
1.4   Rescan
1.5   Saving the scanned file in different accessible formats.

UNIT 2 BRAILLE PRINTING (15 Hrs)
2.1   Installing Braille Translation software (Duxbury)
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 MATERIAL-- AUDIO (35Hrs)
3.1   Installation of OBI/Save as Daisy/Daisy Pipeline and Configuring Microphone.
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 DAISY MATERIAL-- FULL TEXT FULL AUDIO (35Hrs)
4.1   Installing Save as DAISY - Add-In for MS-Word
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   Using Abbreviations and Acronyms
4.5   Validating Document
4.6   Saving Document in Daisy XML format

PRACTICAL IX:- BRAILLE (60 Hrs) 50 Marks

UNIT 1 BRAILLE WRITING – ENGLISH (20 Hrs)
    1.1   Alphabet
    1.2   Contractions and Abbreviations
    1.3   Punctuation
    1.4   Numbers
    1.5   Basic Nemeth-code – plus, minus, multiplication, division.

UNIT 2 BRAILLE WRITING –HINDI/ REGIONAL LANGUAGE (10 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 (10 Hrs)
    3.1   Slate & Stylus
    3.2   Perkins Braille Writer
    3.3   Refreshable Braille Display
    3.4   Braille Note taker.

UNIT 4 READING (20 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 Daisy Format – Full Text Full Audio. (30 marks)

2. Prepare a project on any one of the following- (20 marks)

    a. Create an admission form using the following controls- text box, text area, radio button , check box, list box , submit and reset button.

    b. Design a calendar   for one full year using tags related to tables.

    c. 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)

- ➢ 15 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

Essential Software's

- ➢ Talking Typing Tutor
- ➢ Kurzweil/ Open Book / fine reader
- ➢ Duxbury/ Braille Blaster
- ➢ NVDA
- ➢ Magic
- ➢ OBI / Save As Daisy/ Daisy Pipeline for Daisy Book Production
- ➢ Daisy Player Software
- ➢ MS Office/ Open Office
- ➢ Anti virus

Optional Devices

- ➢ Refreshable Braille Display -1
- ➢ Braille Note Takers -1
- ➢ Power Brailler -1
- ➢ Tactile Printer-1
- ➢ Mount Batten Brailler -1
- ➢ EMPRINT -1

Optional Software's

- ➢ Linux
- ➢ ORCA