

HOLY CROSS COLLEGE (AUTONOMOUS)



DEPARTMENT OF AUDIOLOGY AND SPEECH LANGUAGE PATHOLOGY

BASLP SYLLABUS

COURSE PATTERN- BASLP

I SEMESTER

S.No	Code	Title of the Course	Teaching Hours per Week
1.	U09AS1MCT01	B1.1. Introduction to Human Communication	4
2.	U09AS1MCT02	B1.2. Introduction to Hearing & Hearing Sciences	4
3.	U09AS1MCT03	B1.3. Speech Language Diagnostics & Therapeutics	4
4.	U09AS1MCT04	B1.4. Basic Medical Sciences related to Speech & Hearing	4
5.	U09AS1MCP05	Clinical Practicum B1.5. a) Speech –Language Pathology - I	12
6.	U09AS1MCP06	Clinical Practicum b) Audiology - II	12
TOTAL			40

II SEMESTER

S.No	Code	Title of the Course	Teaching Hours per Week
1.	U09AS2MCT07	B2.1. Speech – Language Development Disorders	4
2.	U09AS2MCT08	B2.2. Introduction to Audiology & Auditory Tests	4
3.	U09AS2MCT09	B2.3. Psychology related to Speech & Hearing	4
4.	U09AS2MCT10	B2.4. Management of the Hearing Impaired	4
5.	U09AS2MCP11	Clinical Practicum B2.5. a) Speech –Language Pathology - II	12
6.	U09AS2MCP12	Clinical Practicum b) Audiology - II	12
7.	U09AS2MCT37	B 2.6 Computer Fundamentals	4
TOTAL			40

III SEMESTER

S.No	Code	Title of the Course	Teaching Hours per Week
1.	U09AS3MCT13	B3.1. Articulation & Phonological Disorders	4
2.	U09AS3MCT14	B3.2. Maxillofacial Anomalies	4
3.	U09AS3MCT15	B3.3. Diagnostic Audiology Part-1	4

4.	U09AS3MCT16	B3.4. Rehabilitative Audiology	4
5.	U09AS3MCP17	Clinical Practicum B3.5. a) Speech –Language Pathology - III	12
6.	U09AS3MCP18	Clinical Practicum b) Audiology - III	12
7.	U09AS3MCT38	B 3.6 Indian Constitution	4
TOTAL			40

IV SEMESTER

S.No	Code	Title of the Course	Teaching Hours per Week
1.	U09AS4MCT19	B4.1. Voice & Laryngectomy	4
2.	U09AS4MCT20	B4.2. Motor Speech Disorders in Children	4
3.	U09AS4MCT21	B4.3. Diagnostic Audiology Part-2	4
4.	U09AS4MCT22	B4.4. Paediatric Audiology	4
5.	U09AS4MCP23	Clinical Practicum B4.5. a) Speech –Language Pathology - IV	12
6.	U09AS4MCP24	Clinical Practicum b) Audiology - IV	12
7.	U09AS4MCT39	B 4.6 Environment Studies	4
TOTAL			40

V SEMESTER

S.No	Code	Title of the Course	Teaching Hours per Week
1.	U09AS5MCT25	B5.1. Fluency & its Disorders	4
2.	U09AS5MCT26	B5.2. Motor Speech Disorders in Adults	4
3.	U09AS5MCT27	B5.3. Technology & Amplification Devices for persons with Hearing Impairment	4
4.	U09AS5MCT28	B5.4. Professional Practices in Speech, Language & Hearing including Community Work	4
5.	U09AS5MCP29	Clinical Practicum B5.5. a) Speech –Language Pathology - V	12
6.	U09AS5MCP30	Clinical Practicum b) Audiology - V	12
TOTAL			40

VI SEMESTER

S.No	Code	Title of the Course	Teaching Hours per Week
1.	U09AS6MCT31	B6.1. Neurogenic Language Disorders in Adults	4
2.	U09AS6MCT32	B6.2. Noise Measurements & Hearing Conservation	4
3.	U09AS6MCT33	B6.3. Basic Statistics	4
4.	U09AS6MCT34	B6.4. Scientific Enquiry in Audiology & Speech Language Pathology	4
5.	U09AS6MCP35	Clinical Practicum B6.5. a) Speech –Language Pathology - VI	12
6.	U09AS6MCP36	Clinical Practicum b) Audiology - VI	12
TOTAL			40

SEMESTER I
B 1.1 INTRODUCTION TO HUMAN COMMUNICATION

(80+20 marks)

(Total = 64 hrs)

Objectives: After studying this paper at the end of the semester, the student should be able to understand the following –

1. Human communication, process involved in communication
2. Interrelation between hearing, speech and language
3. The neurological, psychological, social and acoustic bases of communication

Unit 1

(12 hrs)

1. History and development of the profession of Speech-language pathology (SLP) specifically in India
1. Major work activities of the SLP
2. Various settings of service delivery
3. Other professions concerned with communication disorders
4. Human communication:
Definition and components
Interdependency & interrelation between communication, hearing, speech, and language.
Function of communication, speech and language Modes of communication (Verbal & Non-verbal) Characteristics of good speech
5. Interactive bases of human communication
 - genetic bases
 - psychological & cognitive bases
 - social bases
6. Speech as an overlaid function
7. Pre-requisites and factors affecting language and speech development

Unit 2

(14 hrs)

1. Nervous system:
 - Divisions and functions of the nervous system, nerve cell, receptors and synapse, types of nerve fibres. Peripheral nervous system. Brief description of spinal cord and CSF.

- Structure of the brain and divisions: general and lobes of cerebrum. Reticular formation, Basal ganglia and cerebellum. Reflex action and common reflexes. Cranial nerves, distribution and supply with the special reference to II , V, VII , IX, X , XII., Nerve tracts (motor and sensory), Brodmann's area, anatomy of the nervous system related to speech and language.

Unit 3

(14 hrs)

Mechanism of speech and language production- I

- Anatomy and physiology of respiratory system: Detailed study of trachea, larynx, oropharynx and nasopharynx.
- Respiration for life and speech
- Physiology: External and internal respiration. Mechanism of respiration-internal and external influence, nervous control, Lung volumes (vital capacity-tidal volume. residual air, artificial respiration.(in brief)
- Composition of gases. Exchange of gases in the lungs and tissues. Hypoxia, asphyxia and cyanosis. Regulation of respiration. Respiratory efficiency test and artificial respiration.

Unit 4

(12 hrs)

1. Basic Acoustics of speech:

- Vibrating system – simple harmonic motion – simple vibrating system – system with two or more masses – system with many modes of vibrations – vibration spectra. Waves – What is a wave? Progressive waves – sound waves – wave propagation – Doppler effect – reflection, diffraction, interference, absorption. Resonance of a mass spring vibrator- standing waves – partials, harmonics and overtones – Acoustic impedance – Helmholtz resonator – sympathetic vibrations.

2. Mechanism of speech and language production- II

- Anatomy and physiology of laryngeal system
- Development of voice
- Bases of pitch and loudness change mechanism

Unit 5

(12 hrs)

Mechanism of speech and language production- III

- Anatomy and physiology of articulatory system
- Anatomy and physiology of resonatory system

LIST OF BOOKS

Compulsory Reading:

- 1) Speech Correction: An Introduction to Speech Pathology and Audiology (8th Ed.). Van Riper, C and Emerick, L. (1990). New Jersey: Prentice Hall Inc.
- 2) Singh, I. (1996). Textbook of Anatomy with Color Atlas, Vol. III Jaypee Brothers.
- 3) Zemlin, W.R. (1981). Speech and Hearing Science: Anatomy and Physiology, (2nd Ed.). Englewood Cliffs, New Jersey: Prentice Hall.

Additional / Optional Reading:

- 1) Minifie, F.D., Hixon, T.J., and Williams, F. (1973). Normal aspects of Speech, Hearing and Language. New Jersey: Prentice Hall Inc.
- 2) Skinner, P.H. and Shelton, R.L. (1978). Speech, Language and Hearing- Normal Processes and Disorders. (2nd Ed.). New York: John Wiley and Sons.
- 3) Human Communication Disorders: An Introduction (4th Ed.). Shames, G.H. Wiig, E.H. & Secord, W.A. (1994) New York: Merrill Publishing Co.
- 4) Speech and Hearing Science, Anatomy and Physiology (3rd ed.). Zemlin, W.R.(1988) New Jersey: Englewood Cliffs
- 5) Human Communication & Its Disorders (2nd Ed.). Boone, D.R. & Plante, E. (1993). New Jersey: Prentice Hall Inc.
- 6) Palmer, J.M. (1984). Anatomy for Speech and Hearing, (3rd Ed.). New York: Harper and Row.
- 7) Perkins, W.H. and Kent, R.D. (1986). Textbook of Functional Anatomy of Speech, Language and Hearing. London: Taylor and Francis.
- 8) Gray's Anatomy. (37th Ed.). Williams Warwick and Dyson Banniser. (1989). Churchill

SEMESTER I
B 1.2: INTRODUCTION TO HEARING & HEARING SCIENCES

(80+20 marks)

(Total = 64 hrs)

Objectives: After studying this paper at the end of the semester, the student should be able to understand the following –

- Basic aspects of auditory system
- Physical and psychophysical basis of sound
- Tuning fork tests

Unit 1

(12 hrs)

- Origin of Audiology
- Its growth & development (since World War II)
- Its growth in India
- Scope of Audiology
- Branches of Audiology

Unit 2

(14 hrs)

- Audiovestibular system: Anatomy of the external, middle and internal ears. Ascending and descending auditory and vestibular pathways.
- Physiology of the external, middle & inner ear, central hearing mechanisms, cochlear microphonics, action potentials, theories of hearing (AC & BC)
- Vestibular system: Functions of utricle, saccule and vestibular apparatus. Posture and equilibrium. Tests of posture and equilibrium
- Role of hearing (threshold concept, binaural hearing, head shadow, pinna shadow effect, MAF, MAP – Curve for threshold of hearing) & Causes of hearing impairment

Unit 3

(14 hrs)

- Sound Pressure, Power and Loudness. Physical and psychophysical scales, Equal loudness contours, Frequency weighting curves, combined sources, Pitch and Timbre. Physical and psychophysical scales. Fourier analysis of complex Tones
- dB concept: power and pressure formulae: zero dB reference for pressure and power calculation of actual SPL, reference and dB values with any to given values, calculation of overall dB when two signals are superimposed.

- Phones and Sones: relation between phones and sones; use of phone and sone; computation of relative loudness of two given sounds using these graphs. Frequency and intensity, their psychological correlates: dL for frequency and intensity

Unit 4

(12 hrs)

- Causes of hearing loss
 - Genetic (congenital, of late onset, progressive, syndromic/non-syndromic)
 - Non-Genetic (Congenital/acquired)
 - Importance of case history in identifying the cause of hearing loss

Unit 5

(12 hrs)

- Tuning fork tests (Rinne, Weber, Bing, Schwabach), interpretation, merits & demerits.
- Basic concepts of AC & BC testing
 - procedure
 - interpretation
 - precautions to be taken while testing
- Theory of bone conduction

LIST OF BOOKS

Compulsory Reading:

1. Hodgson, H.R. (1980) Basic Audiologic Evaluation, London Williams and Wilkins.
2. Martin, F.N. (1991), Introduction to Audiology, IV Edition, New Jersey: Frenice Hall.
3. Newby, H.A. (1985), Audiology, New York: Appleton-Century-Crofts.
4. Testing, interpretation and recording - ISHA Battery (1990). ISHA publication.
5. The Science of sound – Thomas D. Rossing, Addison – Wasloy Publishing Company
6. Architectural Acoustics. Egan, M. D. Mc Graw Hill Inc, (1988)
7. Bess and Humes (1990) Audiology - Fundamental. Williams and Wilkins, London.
8. Davis and Silverman, (Latest Edition). Hearing and deafness. Holt, Rinehats & Winston, London.
9. Rose, D.M. (Ed.) 1978), Audiological Assessment, New Jersey: Prentice Hill.

Additional Reading:

1. Beagly, H.A. (Ed.) (1981). Audiology and Audiological Medicine. Vol. 1, Oxford University Press.
2. Relevant BIS documents

SEMESTER I

B 1.3 SPEECH LANGUAGE DIAGNOSTICS AND THERAPEUTICS

(80+20 marks)

(Total = 64 hrs)

Objectives

After studying this paper at the end of the semester, the student should be able to understand the following –

1. Importance of case history, diagnostics and therapeutic approaches
2. Taking case history and therapy in general
3. Will get theoretical backup for clinical documentation

A. Speech language diagnostics

Unit 1

(12 hrs)

1. Case history – need for the case history – essential factors to be included in the case history form – comparison of adults vs. children case history – usefulness of the case history
2. Basic terminologies and concepts
 - Introduction to diagnostics
 - Terminologies in the diagnostic process
 - General principles of diagnosis
 - Diagnostic setup and tools

Unit 2

(14 hrs)

1. Diagnostic approaches and methods
 - Approaches to diagnosis – case history, need for the case history, essential factors to be included in the case history form, comparison of adults vs. children case history, usefulness of the case history.
 - Interview – principles and techniques
 - Self-reports, questionnaire, observations.
 - Diagnostic models – SLPM, Wepman, Bloom and Lahey
 - Types of diagnoses – Clinical diagnosis, direct diagnosis, differential diagnosis, diagnosis by treatment, diagnosis by exclusion, team diagnosis, instrumental diagnosis, provocative diagnosis, Provisional diagnosis; advantage/disadvantages
 - Characteristics of a good clinician as diagnostic

B. Speech therapeutics

Unit 3

(12 hrs)

1. Basic concepts of therapeutics
 - Terminologies in speech therapeutics
 - General principles of speech and language therapy
 - Speech therapy set-up
 - Individual and group therapy
 - Integrated and inclusive education

Unit 4

(14 hrs)

1. Procedures for speech-language therapy
 - Approaches to speech and language therapy – formal, informal and eclectic approaches
 - Types of speech and language therapy
 - Planning for speech and language therapy – goals, steps, procedures, activities
 - Techniques for:
 - 🕒 Speech and language therapy for various disorders of speech and language
 - 🕒 Importance of reinforcement principles and strategies in speech and language therapy, types and schedules of rewards and punishment

Unit 5

(12 hrs)

1. Clinical documentation and professional codes
 - Documentation of diagnostic, clinical and referral reports
 - Introduction to parent counseling, facilitation of parent participation and transfer of skills, follow-up
 - Evaluation of therapy outcome
 - Ethics in diagnosis and speech language therapy
 - Self-assessment and characteristics of a clinician.

LIST OF BOOKS

Compulsory Reading:

- 1) Meyer, S.M. (1998). Survival guide for the beginning speech-language clinician. Maryland: Aspen Publishers.
- 2) Owens, R.E. (1999). Language disorders: Functional approach to assessment and intervention. Boston: Allyn & Bacon Inc.
- 3) Tomblin, E. et.al. (1994). Diagnosis in Speech language pathology. San Diego: Singular Publishing Inc.

- 4) Shipley, K.G., & McAfer, J.G. (1998). Assessment in speech language pathology: A resource manual. San Diego: Singular Pub Inc.
- 5) Klein, H.B., & Nelson, M. (1994). Intervention planning for children with communication disorders: A guide for clinical practicum and professional practice. New Jersey. Prentice Hall.

Additional / Optional Reading:

- 6) Frattali, C.M. (1998). Measuring outcomes in speech language pathology. New York: Thieme.
- 7) Shames, G.H. (2000). Counselling the communicatively disabled and their families. Boston: Allyn & Bacon.
- 8) Hegde, M.N. (1985). Treatment procedures in communicative disorders. Texas. Pro Ed.
- 9) Darley, F.L., & Spriesterbach (1978). Diagnostic methods in Speech Pathology. San Diego: Singular Pub Inc.
- 10) Leith, W.R. (1993). Clinical methods in communicative disorders. Texas. Pro. Ed.

SEMESTER I
B 1.4 BASIC MEDICAL SCIENCES RELATED TO
SPEECH & HEARING

(80+20 marks)

(Total = 64 hrs)

Objectives: After studying this paper at the end of the year, the student should be able to understand the following –

- Basic anatomy and physiology related to speech and hearing
- Basic neurological, genetic issues related to speech and hearing
- General diseases/conditions related to speech and hearing disorders

Objectives: After studying this paper at the end of the year, the student should be able to understand the following –

- Basic anatomy and physiology related to speech and hearing
- Basic neurological, genetic issues related to speech and hearing
- General diseases/conditions related to speech and hearing disorders

PART A (UNIT 1) ANATOMY

Unit 1 (20 + 5 marks)

(12 hrs)

- (a) General introduction, definitions, Coronal / saggital / plane) Planes. Definition of anatomy, morphology, physiology, histology, embryology.
- (b) Definition of Cell and organelles, tissue, organ system, specialized tissues like nervous tissue, vascular tissue, muscle and bone tissue.
- (c) Nervous system: Definition of neuron, synapse, reflex action, bio electrical phenomena, action potential, depolarisation, division and functions of the nervous system, brain – general lobes, reticular formations, basal ganglia, cerebellum, circle of willis, cranial nerves, spinal cord, CSF – formation & flow.
- (d) Circulatory system: Definition of capillaries, arteries, veins, cardiac cycle, blood brain barrier, aneurysm, vascular shock – its reference to aphasia / speech disorders.
- (e) Respiratory system: General outline, detailed study of trachea, larynx and nasopharynx,

PART B (UNIT 2) PHYSIOLOGY

Unit 2 (20 + 5 marks) (14 hrs)

- (a) Definition of inflammation, infection, tumor – benign & malignant, tissue healing.
- (b) Mechanism of respiration – internal and external influence, nervous control – vital capacity – tidal volume, residual air, artificial respiration (in brief).
- (c) Genetics :introduction – structure of DNA and RNA, karyotyping, family tree (pedigree chart), symbolic representation, inheritance, autosomal dominant, autosomal recessive, sex chromosomal disorders, structural aberrations, mutation (in brief).
- (d) Endocrine system: Definition of hormone, functions of thyroid hormone, growth hormone, androgen, testosterone and its influence in voice disorders.

PART C (UNIT 3, 4, 5) ENT

Unit 3 (40 + 10 marks) (14 hrs)

- (a) Anatomy & Physiology of external, middle & inner ear, auditory pathways, vestibular pathway. Diseases of the external middle and inner ear leading to hearing loss: Congenital malformations, traumatic lesions, infections, management of middle ear and Eustachian tube disorders.
- (b) Other causes of hearing loss – Facial paralysis, Tumors of the cerebello- pontine angle, Acoustic neuroma. Infection and management of inner ear diseases. Cochleo-vestibular diseases and its management.

Unit 4 (12 hrs)

- (a) Anatomy & Physiology of pharynx & oro-peripheral structures
Causes of speech disorder, Disorders of the mouth, Tumors of the jaw and oral cavity, nasopharynx and pharynx, pharyngitis, Diseases of tonsils and adenoids.
- (b) Oesophageal conditions: Congenital abnormality – Atresia, Tracheo-oesophageal fistula, Stenosis, Short oesophagus. Neoplasm – Benign, Malignant, Lesions of the oral articulatory structures like cleft lip, cleft palate, submucosal cleft, Velopharyngeal incompetence.

Unit 5 (12 hrs)

- (a) Anatomy & Physiology of larynx – physiology of phonation / physiology of respiration.
- (b) Congenital diseases of the larynx – difference between an infant and an adult larynx. Stridor – causes of infantile stridor. Disorders of structure –

Laryngomalacia, Bifid epiglottis, Laryngeal web, Atresia, fistula, Laryngeal cleft, Tumors and Cysts, Laryngitis, Laryngeal trauma and Stenosis. Neuromuscular dysfunctions of the larynx – Vocal cord palsy, Spastic dysphonia, Hypothyroidism, gastro oesophageal reflux disorders, Laryngectomy, artificial larynx, oesophageal speech, tracheo oesophageal puncture.

LIST OF BOOKS

Compulsory Reading:

- 1) Singh, I. (1996). Textbook of Anatomy with Color Atlas, Vol. III Jaypee Brothers.
- 2) Zemlin, W.R. (1981). Speech and Hearing Science: Anatomy and Physiology, (2nd Ed.). Englewood Cliffs, New Jersey: Prentice Hall.
- 3) Alper, C.M., Myers, E.N., Eibling, D.E. (2001). Decision making in ear, nose & throat disorders. W.B. Saunders Company, Philadelphia.
- 4) Dhingra, P.L. (1992). Diseases of Ear, Nose & Throat. Churchill Livingstone, New Delhi.
- 5) Gray R.F., Hawthorne, M. (1992). Synopsis of Otolaryngology. Butterworth Heinemann Ltd, Oxford. 5th Edition.
- 6) Ramalingam, K.K., Sreeramamoorthy, B. (1990). A short practice of Otolaryngology. A.I.T.B.S. Publishers Distributors.
- 7) Scott-Brown, W.G., Ballantyne, J., Groves, J. Diseases of the nose & throat. Butterworth & Co., Ltd. 2nd edition, Chichester.
- 8) Inderbeer Singh (1996) – Text book of embryology.

Additional / Optional Reading:

- 9) Palmer, J.M. (1984). Anatomy for Speech and Hearing, (3rd Ed.). New York: Harper and Row.
- 10) Perkins, W.H. and Kent, R.D. (1986). Textbook of Functional Anatomy of Speech, Language and Hearing. London: Taylor and Francis.
- 11) Gray's Anatomy. (37th Ed.). Williams Warwick and Dyson Banniser. (1989). Churchill Livingstone.

SEMESTER I

B 1.5 CLINICAL PRACTICUM-(a) Speech Language Pathology - I

At the end of Semester I, the student should be able to carry out the following –

1. Taking case history of a minimum of 10 individuals (5 normal & 5 clients with complaints of speech-language problems)
2. Label and identify structures of the speech mechanisms with the help of charts, models, specimens and computer software
3. Conduct Oral Peripheral Mechanism examination on at least 5 normal and 5 children/adults with speech language complaints
4. Analyze the following in normal subjects :
 - Pitch – normal / high / low
 - Loudness - normal / loud / soft
 - Quality – normal / hoarse / harsh / breathy / hyper - nasal / hypo –nasal
 - Rate of speech - – normal / fast / slow
 - Articulation – normal / abnormal
 - Fluency – normal / abnormal
 - Intelligibility – using the AYZNIHH intelligibility rating scale
5. Use varying range of pitch and loudness
 - Measure F0, Vital capacity, phonation duration, rate of speech, Alternate Motion Rates and Sequential Motion Rates, s/z ratio in 5 normal individuals
6. Measure in 2 normal samples (with the help of video or live)
 - Mean Length of Utterance (MLU)
 - Syllable structure
 - Syntactic structures
 - Communication intent
7. Use proformae for the following disorders:
 - Articulation
 - Voice
 - Fluency
 - Cleft lip and palate
 - Child language assessment
8. Use scale / test for :

- Receptive language skills
- Expressive language skills

Receptive Expressive Emergent Language Scale (REELS)

3-Dimensional Language Acquisition Test (3DLAT)

Scales of Early Communication Skills for Hearing impaired children (SECS) and Indian tests

Observation of a minimum of 5 diagnostic cases, 5 therapy cases

Writing of observation reports of the above

Maintenance of a clinical diary

Maintenance of a clinical work record to be submitted at the end of the term

SEMESTER I

B 1.5 CLINICAL PRACTICUM-(b) Audiology - II

At the end of Semester I, the student should be exposed and be able to carry out the following:

1. Public information materials (videos, pamphlets, booklets etc.)
2. Taking case histories of 10 adults and 10 children with normal hearing & with hearing impairment under supervision.
3. Analyse 10-15 case histories of adults and children with hearing impairment.
4. Undergo pure-tone audiometry. Become familiar with different types of sound stimuli used for assessment of hearing and sound generator softwares.
5. Identify the different types of audiometers (at least 1 portable & 1 diagnostic) and their accessories referring to their respective manuals. Get familiar with the various parts of audiometers and their functions. Carry out listening checks of audiometers. Trouble-shoot audiometers. List the different earphone/ear cushion combination, BC vibrator, study the same and report the status of the same.
6. Prepare 0 dB HL equivalent chart with different earphone/ear cushion combinations.

SEMESTER II
B 2.1 SPEECH, LANGUAGE DEVELOPMENT AND DISORDERS

(80+20 marks)

(Total = 64 hrs)

Objectives

After studying this paper at the end of the semester, the student should be able to understand the following –

- Development of speech & language
- Identify different speech & language disorders
- Basics of assessment and intervention for Child language disorders.

Unit 1

(14 hrs)

Development of speech and Language:

Development of language

Semantics: A brief introduction to different types of homonyms, synonyms and antonyms.

Morphology: Morpheme – bound and free, process of word formation, content and function words.

Syntax: grammatical and syntactic categories, sentence types, Syntactic analysis.

Pragmatics: Introduction to verbal and non-verbal communication and other indicators, intent of communication.

Unit 2

(10 hrs)

Theories and models of language Acquisition – Behavioral, Nativistic, Cognitive, Linguistic, Pragmatic, Biological and Information processing model.

Developmental issues in communicative development – genetic, neurological, medical, behavioural, social and psychological.

Bilingualism / multilingualism in children; Bilingual Language learning contexts home and school situations, compound / coordinate context and others.

Unit 3

(12 hrs)

Definition, Etiology, Characteristics, Classification and Impact of

Hearing Impairment

Mental Retardation

Cerebral Palsy

Seizure disorders

Introduction to assessment procedures, differential diagnosis and management.

Unit 4**(12 hrs)**

Definition, Etiology, Characteristics and classification of Autism
Spectrum Disorders/Pervasive Developmental Disorders Attention
Deficit Disorder/ Attention Deficit Hyperactive Disorder

Introduction to assessment procedures, differential diagnosis and management.

Unit 5**(16 hrs)**

Definition, Etiology, Characteristics, Classification and Impact of
Specific Language Impairment
Learning Disability
Acquired aphasia in childhood
Traumatic Brain Injury
Multiple disabilities

Introduction to assessment procedures, differential diagnosis and management.

LIST OF BOOKS**Compulsory Reading:**

- 1) Reed, V. (1994). An Introduction to children with language disorders. (2nd Ed.)
New York: Macmillan.
- 2) Nelson N. W (1998). Childhood language disorders in context – infancy through
adolescence, Allyn and Bacon, Boston.
- 3) Hegde, M. N. (1996). A Coursebook on Language Disorders in Children. San
Diego: Singular Publishers.
- 4) Ladefoged P. (1992). A course in Phonetics. (3rd Ed.). New York:
Harcourt Brace Jovanovich.
- 5) Lees, J.A. and Urwin, S. (1991): Children with Language Disorders. Whurr
Publishers

Additional/Optional Reading:

- 6) Woolfolk, E. & Lynch J. (1982). An integrative approach to language disorders
in children. New York: Grune and Stratton.

- 7) Thirumalai M. S. Shyamala Chengappa (1988) Simultaneous Acquisition of two languages CIIL, Mysore
- 8) Fromkin, L.F. and Rodman, R. (1993). An Introduction to Language (5th Ed.). New York: Harcourt Brace Jovanovich
- 9) Subba Rao (1992). Developing communication skills in MR, NIMH, Secunderabad.
- 10) Shyamala K. Chengappa (1992). Speech and Language of the cerebral palsied, CIIL, Mysore.
- 11) Shyamala K. Chengappa (1986). Introduction to speech disorders in children an introduction IED cell, Port Blair, Anadaman & Nichobar.
- 12) O'Connor. (1993). Phonetics. Hammondsworth: Penguin books
- 13) Yule, G (1996). The Study of Language: An Introduction. (2nd Ed.). Cambrige: Cambridge University Press.
- 14) Lyons, J. (Ed.). (1970). New Horizons in Linguistics. Hammondsworth: Penguin Books.
- 15) Akmajian. A. et al. (1990). Linguistics: An Introduction to Language and Communication

SEMESTER II

B 2.2 INTRODUCTION TO AUDIOLOGY & AUDITORY TESTS

(80+20 marks)

(Total = 64 hrs)

After studying this paper at the end of the semester, the student should be able to understand the following –

Unit 1: (14 hours)

- Pure Tone audiometry: Need and scope
- Instrumentation
- Standards
- Different types of transducers
- Permissible ambient noise levels for audiometric testing
- Calibration: Biological and instrumental for AC & BC transducers

Unit 2: (14 hours)

- Classification of audiograms
- Sound field & closed field testing
- Factors affecting AC & BC testing
- Screening Vs Diagnostic pure tone testing
- Extended high frequency testing & its interpretation

Unit 3: (12 hours)

- Masking: Definition, types of masking, types of noises, critical band concept,
- Terminology related to masking: Test ear, non-test ear, masker, maskee, crossover, cross hearing and shadow curve
- Interaural attenuation; Factors affecting IA; Criteria for masking during AC & BC
- Factors determining amount of masking noise, AB gap in masked ear, masking dilemma in bilateral symmetrical conduction hearing loss.
- Fusion Inferred Test (FIT)

Unit 4: (12 hours)

- Orientation to speech audiometry
- Need for speech audiometry
- Speech recognition threshold, speech identification score, UCL, MCL, dynamic range, articulation index
- Tests developed in India and abroad
- Factors affecting speech audiometry
- Limitations of speech audiometry
- Masking for speech audiometry
- PI-PB function

Unit 5:**(12 hours)**

- Acoustics of Rooms. Sound propagation in outdoors and indoors.
- Direct, early and reverberant sound. Calculation of reverberation time.
- Air absorption. Background noise.
- Loudspeaker placement and directivity.
- Sound images and multiple sources.
- Sound field in listening rooms. Quadraphonic sound.
- Listening with earphones. Pressure field, free field and diffused field.
- Audiometric test rooms – Basic requirements concept and structure – transmission loss,
- NRC rating – Standards for sound treated rooms – Basic requirements, concept and structure – standards.
- Classrooms of hearing impaired children – Basic requirements, concept and structure – standards.

LIST OF BOOKS**Compulsory Reading:**

1. Hodgson, H.R. (1980) Basic Audiologic Evaluation, London Williams and Wilkins.
2. Martin, F.N. (1991), Introduction to Audiology, IV Edition, New Jersey: Prentice Hall.
3. Martin, H (1987), Speech Audiometry. Whurr Publisher, London
4. Newby, H.A. (1985), Audiology, New York: Appleton-Century-Crofts.
5. Testing, interpretation and recording - ISHA Battery (1990). ISHA

publication. Additional Reading:

1. Beagly, H.A. (Ed.) (1981). Audiology and Audiological Medicine. Vol. 1, Oxford University Press.
2. Bess and Humes (1990) Audiology - Fundamental. Williams and Wilkins, London.
3. Davis and Silverman, (Latest Edition). Hearing and deafness. Holt, Rinehats & Winston, London.
4. Rose, D.M. (Ed.) 1978), Audiological Assessment, New Jersey: Prentice Hill.
5. Relevant BIS documents

SEMESTER II

B 2.3 PSYCHOLOGY RELATED TO SPEECH AND HEARING

(80+20 marks)

(64 hrs)

Objectives

After studying this paper at the end of the semester, the student should be able to understand the following –

- Developmental Psychology
- Psychology of learning
- Cognitive issues in the field of speech and hearing

Unit 1

(10 hrs)

Introduction to psychology- Definition, History and perspectives, Branches and scope, application of psychology in the field of speech and hearing.

Introduction to Clinical psychology – Definition, Perspectives and models of mental disorders

Unit 2

(14 hrs)

Psychology of learning – Introduction, Definition of learning, Theories of learning, Classical conditioning, Operant conditioning and Social learning.

Application of learning theories in the field of speech and hearing (therapeutic, educational and rehabilitative applications).

Unit 3

(14 hrs)

Cognitive Psychology – Introduction, Definition and theoretical perspectives (David Rumelhart and David Mc Clelland, Noam Chomsky, George miller, Allan Newell).

Applications of cognitive psychology in the field of speech and hearing.

Neuropsychology – Introduction, definition, principles of neuropsychological assessment, diagnosis and rehabilitation.

Applications of neuropsychology in the field of speech and hearing.

Unit 4

(12 hrs)

Psychodiagnostics – Case history taking, Mental status examination, behavioural analysis, psychological testing.

Counselling- Meaning and definition, types of counseling, Counseling in rehabilitation practice.

Unit 5

(14 hrs)

Developmental psychology:

Introduction, Definition, Principles, Motor development, Emotional development Cognitive development- Definition, Piaget's theory

Play as a therapeutic tool

Personality development- Introduction, Stages, Hazards

LIST OF BOOKS

Compulsory Reading:

- 1) Hurlock, E.B. (1981). Child development VI Ed. Mc Graw Hill International Book Co.
- 2) Morgon C.T., King R.A., Robinson N.M. Introduction to Psychology. Tata McGraw Hill Publishing Co.
- 3) Coleman J.C. Abnormal Psychology and Modern Life, Taraporevala Sons & Co.

Additional/Optional Reading:

- 4) Siegal M.G. (Ed). (1987). Psychological Testing from Early Childhood Through Adolescence. International Universities Press.
- 5) Kline, P. (1993). The Handbook of Psychological Testing, Routledge,
- 6) Anastasi, A. (1999). Psychological testing, London: Freeman

SEMESTER II
B 2.4 MANAGEMENT OF THE HEARING IMPAIRED

(80+20 marks)

(Total = 64 hrs)

Unit 1 **(14 hrs)**

- Definitions and goals of rehabilitation & aural rehabilitation
- Early identification and its importance in aural rehabilitation
- Unisensory Vs Multisensory approach
- Manual Vs oral form of communication for children with hearing impairment
- Total communication

Unit 2 **(12 hrs)**

- Methods of teaching language to the hearing impaired
 - Natural method
 - Structured method
 - Computer aided method

Unit 3 **(14 hrs)**

- Educational problems of children with hearing impairment in India
- Educational placement of hearing impaired children
- Criteria for recommending the various educational placements
- Factors affecting their outcome
- Counseling the parents and teachers regarding the education of the hearing handicapped
- Parent Infant Training Programme (PIP) & Mother's Training Programme, Home training –need, preparation of lessons; correspondence programs (John Tracey Clinic, SKI-HI), follow up

Unit 4 **(14 hrs)**

- Introduction to hearing aid technology: Parts of hearing aids & its functions
- Type of hearing aids:
 - Body level Vs ear level
 - Monaural Vs Binaural Vs Pseudobinaural
 - Directional hearing aids Vs modular hearing aids
- Classroom amplification devices; Group amplification systems– hard wired, induction loop, FM, infrared rays.
- Setting up class rooms for the hearing handicapped
- Classroom acoustics preferential seating and adequate illumination

Unit 5

(10 hrs)

- Ear moulds: Importance, types (hard, soft), procedure of making each type of ear mould, styles of ear moulds, criteria for selection of one style over the other, ear mould modifications, EAC of hearing aid along with ear mould.
- Importance of counseling for users & parents – importance of harness, BTE loops. Tips to facilitate acceptance of hearing aids, battery life, battery charger. Counseling for geriatric population, Trouble shooting of hearing aids

LIST OF BOOKS

Compulsory Reading:

1. Sanders, D. A. (1993). Management of Hearing Handicap; Infants to Elderly, 3rd Ed., New Jersey, Prentice Hall.
2. Tucker, I., & Nolan, M. (1984). Educational Audiology. London: Croom Helm, Chapter.10.
3. Markides A (1977) Binaural hearing aids, Academic Press Inc., London.
4. Hodgson HR and Skinner (PH) (1977, 1981), Hearing aid Assessment and use in audiologic habilitation, Williams and Wilkins, Baltimore.
5. Pollack M. (1980). Amplification for the hearing impaired. NY: Grune and Stratton.

Additional Reading:

1. Davis, J.M. and Hardick, E.J. (1981). Rehabilitative Audiology for Children and Adults. New York: John Wiley and Sons.
2. Ross, M. Brackett, D. and Maxon, A.B. (1991). Assessment and management of mainstreamed hearing-impaired children: Principles and practice. Austin: Pro.Ed.
3. Lynas, W. (2000). Communication options. In J. Stokes (Ed.), Hearing impaired infants – Support in the first eighteen months. London: Whurr Publishers Ltd.
4. Sims, L.G., Walter, G.G., and Whitehead, R.L. (1981). Deafness and Communication: Assessment and Training. Baltimore: Williams and Wilkins.
5. Alpiner, J.G. (1982). Handbook of Adult Rehabilitative Audiology. Baltimore: Williams and Wilkins.
6. Chermak, G.D. (1981). Handbook of Audiological Rehabilitation. C.C.Thomas.

7. Ebbin, J.B. (1974). Critical Age in Hearing. In C.Griffiths (Ed), Proceeding of the International Conference on Auditory Techniques. Illinois: Charles C. Thomas.
8. Griffiths, C. (1974). Early Identification - Plus the Auditory Approach. In C. Griffiths (Ed.), Proceeding of the International Conference on Auditory Techniques. Illinois: Charles C. Thomas.
9. Borastein, H. (1977). Systems of Sign. In L.J. Bradford & W.G. Hardy (Eds.), Hearing and Hearing-Impairment. New York: Grune and Stratton Inc.
10. Hull, R.H. (Ed). (1982). Rehabilitative Audiology. New York: Grune and Stratton Inc.
11. Fitzgerald, E. (1929). Straight Language for the Deaf. McClure.
12. Jackson, A. (1981). Ways and Means-3. Hearing-Impairment a Resource Book of Information, Technical Aids, Teaching Material, and Methods used in the Education of Hearing-Impaired Children. Hong Kong: Somerset Education Authority.
13. Tebbs, T. (1978). Ways and Means: A Resource Book of Aids, Methods, Materials, Materials and Systems for use with the Language Retarded Child. Hong Kong: Somerset Education Authority.
14. Correspondence Program for Parents of the Deaf, John Tracy clinic.
15. Nix, G.W. (1976) Mainstream Education for Hearing-Impaired Children and Youth. New York: Grune and Stratton Inc.
16. Ross, M. Brackett, D. and Maxon, A.B. (1991). Assessment and management of mainstreamed hearing-impairment children: Principles and practice. Austin: Pro.Ed.
17. Webster, A. & Ellwood, J. (1985). The Hearing-Impaired Child in the Ordinary School. London: Croom Helm.

SEMESTER II

B 2.5 CLINICAL PRACTICUM (a) Speech Language Pathology - II

At the end of Semester **II**, the student should be able to carry out the following –

- 1) Take case history of 10 individuals (5 normal & 5 cases with complaints of speech-language problems)
- 2) Label and identify structures of the speech mechanisms with the help of charts, models, specimens and computer software
- 3) Conduct Oral Peripheral Mechanism examination on at least 5 normals and 5 children/adults with speech language complaints
- 4) Observation of therapy of 10 clients with speech language disorders.
- 5) Observation of a minimum of 5 diagnostic clients and 5 therapy clients
- 6) Developing therapy material specific to 10 clients they have observed
- 7) Writing of observation reports of the above
- 8) Maintenance of a clinical diary
- 9) Maintenance of a clinical work record to be submitted at the end of the term

SEMESTER II

B 2.5 CLINICAL PRACTICUM - (b) Audiology - II

At the end of Semester **I & II**, the student should be exposed and be able to carry out the following:

1. Public information materials (videos, pamphlets, booklets etc.)
2. Taking case histories of 10 adults and 10 children with normal hearing & with hearing impairment under supervision.
3. Analyse 10-15 case histories of adults and children with hearing impairment.
4. Undergo pure-tone audiometry. Become familiar with different types of sound stimuli used for assessment of hearing and sound generator softwares.
5. Identify the different types of audiometers (at least 1 portable & 1 diagnostic) and their accessories referring to their respective manuals. Get familiar with the various parts of audiometers and their functions. Carry out listening checks of audiometers. Trouble-shoot audiometers. List the different earphone/ear cushion combination, BC vibrator, study the same and report the status of the same.
6. Prepare 0 dB HL equivalent chart with different earphone/ear cushion combinations.
7. Obtain audiograms of 10 normal subjects.
8. Observe /participate during audiological evaluation on a variety of cases under supervision. Plot audiograms, calculate inter-aural attenuation, occlusion effect.
9. Obtain audiograms under supervision on 20 adult clients (AC & BC).
10. Obtain audiograms with masking (5 cases)
11. Classify audiograms as per:
 - Nature of hearing loss
 - Degree of hearing loss
 - Configuration of hearing loss
12. Observe calibration of audiometers (Demonstration) – AC/BC/Sound field, instruments used, identifying the instruments, combination of equipments for different types of calibration, preparing correction charts.

SEMESTER II
B 2.6: COMPUTER FUNDAMENTALS

(80+20 marks)

(Total = 64 hrs)

Unit 1:

(8 hrs)

General features of a computer. Generation of computers. Personal computer, Desktop and laptop workstation, mainframe computer and super computers. Computer applications – signal processing, data processing, information processing, commercial, office automation, industry and engineering, healthcare, education, graphics and multimedia

Unit 2:

(10 hrs)

Computer Organization, Central processing unit, Computer memory, primary memory and secondary memory. Secondary storage devices – magnetic semiconductor and optical media. Input and output units. OMR, OCR, MICR, scanner, mouse, Modem.

Unit 3:

(12 hrs)

Computer hardware and software. Machine language and high level language. Application software. Computer program. Operating system. Computer virus, antivirus, and computer security. Elements of MS-DOS and Windows OS. Computer arithmetic. Binary, Octal and hexadecimal number systems. Algorithm and flowcharts. Illustrations. Elements of a database and its applications

Unit 4:

(10 hrs)

Word processing and electronic spread sheet. An overview of MS-WORD, MS- EXCEL and MS-POWERPOINT (image, file formats, audio and video file formats, print file formats). Elements of Basic programming. Simple Illustrations.

Unit 5:

(10 hrs)

Network of computers. Types of networks, LAN, Intranet and Internet, Internet Applications. World wide web, e-mail, browsing and searching. Search engines, Multimedia applications. Case study : Networking of speech and hearing clinic, networking for tele-rehabilitation.

List of practical assignments (12 sessions of 2 hours each)

System use, keyboard, mouse operations. Word pad and paint brush, creating a folder and saving a document – two sessions

Simple MS-DOS commands – One session

Windows operating system - icons, menus and sub menus, my computer - sharing of files and folders – two sessions

Desktop publishing – preparation of a document using MS.WORD - Two sessions

Installation of a software ,virus scanning – illustration. One session.

Spreadsheet calculation using MS EXCEL .One session.

BASIC programming – illustrations – One session.

Internet use. Surfing, browsing ,search engines ,E-mail. Two sessions

LIST OF BOOKS

1. Alexis Leon and Mathews Leon (1999): Fundamentals of information technology.
Leon Techworld Pub.
2. Jain, S.K.(1999):Information Technology “O” level made simple. BPB Pub.
3. Jain, V.K.(2000): “O” Level Personal Computer software. BPB Pub.
4. Rajaraman, V.{ 1999}: Fundamental of Computers. Prentice Hall India.
5. Hamacher, Computer Organization. McGrawhill.
6. Alexis Leon: Computers for everyone. Vikas, UBS.
7. Anil Madaan: Illustrated Computer Encyclopedia. Dreamland Pub.
8. Sinha. Computer Fundamentals. BPB Pub.

SEMESTER III

B 3.1 ARTICULATION AND PHONOLOGICAL DISORDERS

(80+20 marks)

(Total = 64 hrs)

After studying this paper at the end of the semester, the student should be able to understand the following –

- Development of phonology
- Factors related to articulation and phonological disorders
- Assessment and therapy procedures

Unit 1

(12 hrs)

1. Review of phonological development and articulatory mechanism
2. Fundamentals of Articulatory phonetics
3. Definition and types of coarticulation

Unit 2

(14 hrs)

1. Transcription methods in perceptual analysis
2. Phonological processes – types, language specific issues, identification and classification of errors.
3. Distinctive features – types, language specific issues, identification of errors and analysis.
4. Acoustic aspects of production and perception of speech sounds; use of spectrograms

Unit 3

(12 hrs)

1. Factors related to articulation and phonological disorders:
 - Structural
 - Cognitive – Linguistic
 - Neurological
 - Psychosocial
 - Social
 - Metalinguistic

Unit 4

(12 hrs)

1. Assessment procedures: Types of assessment, sampling procedures, scoring procedures, criteria for selection of assessment instruments
2. Assessment of Oral peripheral mechanism
3. Speech sound discrimination, stimulability and oral stereognosis.

4. Analysis and interpretation of data:

- Intelligibility and severity judgements
- Normative data
- Error patterns.

5. Characteristics of disordered phonology and differential diagnosis

Unit 5

(14 hrs)

1. Intervention: Stages of treatment and measuring improvement, long term goals, short term goals and activities for achieving goals in cases with misarticulation.
2. Issues in maintenance and generalization.
3. Team approach and professional communication (inter, intra professional and client oriented)
4. Approaches to treatment: motokinesthetic, traditional approaches integral stimulation, phonological, distinctive feature, minimal contrast therapy, learning theories, programmed, paired – stimuli.
5. Computerized intervention packages, metaphon therapy

LIST OF BOOKS

Compulsory Reading:

- 1) Bernthal, J.E. and Bankson, N.W. (1988). Articulation and Phonological Disorders. (3rd Ed.). New Jersey: Prentice Hall Inc.
- 2) Weiss, C.E., Lillywhite, H.S. and Gordon, M.E. (1980). Clinical Management of Articulation Disorders. St. Louis: C.V. Mosby
- 3) Creaghead, N.A., Newman, A.W. and Secord, W.A. (1989). Assessment and remediation of articulatory and phonological disorders. (2nd Ed.). New York: Macmillan

Additional/Optional Reading:

- 4) Johnson, J.P. (1980). Nature and Treatment of Articulation Disorders. Springfield: Charles C. Thomas.

SEMESTER III
B 3.2 MAXILLOFACIAL ANOMALIES

(80+20 marks)

(Total = 64 hrs)

Objectives:

After studying this paper at the end of the semester, the student should be able to understand the following –

- Identification of orofacial anomalies, and their effect on speech and other functions
- Effectiveness of Velopharyngeal closure and dysfunction
- Assessment and management

CLEFT LIP AND PALATE

Unit 1

(12 hrs)

1. Etiological factors
2. Embryology of the Face and Palate
3. Types of Cleft lip and Palate
4. Classification systems
5. Syndromes

Unit 2

(14 hrs)

1. Velopharyngeal mechanism- muscles and function; inadequacy, incompetency and insufficiency
2. Speech and Language problems of individuals with Cleft
3. Associated problems of individuals with Cleft

Unit 3

(12 hrs)

1. Diagnostic procedures and Instruments used in Assessment of speech in Cleft palate
2. Team Management: Composition, responsibilities and co-ordinator

Unit 4

(14 hrs)

1. Treatment concepts
2. Treatment procedures for speech
3. Prosthetic speech appliances for patients with Cleft palate

GLOSSECTOMY and MANDIBULECTOMY

Unit 5

(12 hrs)

1. Effect of partial and Total Glossectomy on speech
2. Characteristics of Glossectomy speech
3. Rehabilitation of speech
4. Prosthetic fitting, design, assessment
5. Dysphagia specific to glossectomy and mandibulectomy: assessment and rehabilitation

LIST OF BOOKS

Compulsory Reading:

- 1) Mc. Williams, B.J., Morris, H.L. and Shelton, R.L. (1984). Cleft Palate Speech (1st Edition). Philadelphia: B.C. Decker Inc.
- 2) Spriesterbach, D. (1968). Cleft palate and Communication. Academic Press, New York

Additional / Optional Reading:

- 3) Grunwell (1993). Analysis of Cleft palate speech, (Ed.) Whurr publisher. London
- 4) Kernahan, D.A. and Rosenstein, S.W. (1990). Cleft, Lip and Palate – A System of Management. Maryland (USA): Williams and Wilkins.
- 5) Appleton, J. and Machin, J. (1995). Working with Oral Cancer. UK: Winslow.

SEMESTER III

B 3.3 DIAGNOSTIC AUDIOLOGY: Part 1

(80+20 marks)

(Total = 64 hrs)

Unit 1:

(12 hrs)

Introduction to diagnostic audiology

- a) Need for test battery approach in auditory diagnosis and integration of results of audiological tests.
- b) Indications for administering audiological tests to identify:
 - Cochlear pathology
 - Retrocochlear pathology
 - Functional hearing loss
 - Central auditory processing disorders

Unit 2

(12 hrs)

Tests to differentiate between cochlear and retrocochlear pathology

- a) ABLB, MLB
- b) SISI
- c) Tests for adaptation
- d) Bekesy Audiometry
- e) Brief tone audiometry
- f) PIPB function

Unit 3

(12 hrs)

Tests to detect pseudohypoacusis

- a) Pure tone tests including tone in noise test, Stenger test
- b) Speech tests including yes & no
- c) Lombard test, Stenger test, lip-reading test, Doefler-Stewart test.
- d) Identification of functional hearing loss in children

Unit 4

(16 hrs)

Tests to detect central Auditory Disorders

- a) Monoaural low redundancy tests
 - Filtered speech tests
 - Time compressed speech test
 - Speech-in-noise test
 - SSI with ICM
 - Other monaural low redundancy tests
- b) Dichotic speech tests
 - Dichotic digit test
 - Staggered spondaic word test
 - Dichotic CV test
 - SSI with CCM

- Competing sentence test
- Other dichotic speech tests

c) Binaural interaction tests

- RASP
- BFT (Binaural Fusion Test)
- MLD
- Other binaural interaction tests

d) Temporal ordering tasks

- Pitch pattern test
- Duration pattern tests
- Other temporal ordering tests

Unit 5

(12 hrs)

a) Variables influencing central auditory assessment

- Procedural variables
- Subject variables

b) Test findings in subjects with central auditory disorders

- Brainstem lesion
- Cortical and hemispheric lesion
- Interhemispheric dysfunction
- CAPD in children
- CAPD in elderly

LIST OF BOOKS

Compulsory Reading:

1. Jerger, J. (1963). Modern developments in Audiology, New York: Academic Press.
2. Jerger, J. (1987). Diagnostic Audiology: Historical Perspectives, Ear and Hearing, 8 7s-12s
3. Katz, J. et al (Ed.) (1994). Handbook of Clinical Audiology, Baltimore: Williams and Wilkins.
4. Musiek, F.E. and Rintlemaan, W.F. (1999). Contemporary Perspective in Hearing Assessment. USA: Allyn & Bacon.
5. Silman S. and Silverman C.A. (1991). Auditory Diagnosis Principles and Application. New York: Academic Press, Inc.

Additional Reading:

1. Martin, F.N (1994), Introduction to Audiology, New Jersey: Prentice Hall.
2. Rupp, Stockdell (1980). Speech Protocols in Audiology, New York: Grune & Stratton.

3. Keith, R.M. (Ed.). (1981). *Central Auditory Dysfunction*. New York: Grune & Stratton.
4. Musiek, and Baran, J.A. (1987). Central Auditory Assessment: Thirty years of challenge and change. *Ear and Hearing* 3, 225-355.
5. Pinherio, H.L. Kusiek, F.E. (Eds) (1985). *Assessment of Central Auditory Dysfunction Foundations and Correlates*. Baltimore: Williams and Wilkins.
6. Willsford J.A. (1987), *Handbook of Central Auditory Processing Disorders in Children*. Drando, Grune & Stratton.
7. Feldman, A.S., & Willber, L.A. (Eds), (1976), *Acoustic Impedance, Immittance: Measurement of Middle Ear Function*, Baltimore: Williams & Wilkins.
8. Popelka, B.R. (Ed) (1981). *Hearing Assessment with acoustic reflex*. New York: Grune and Stratton.
9. Jacobson, J.T. (Ed) (1985). *Auditory Brain Stem Response*. Taylor and Francis, London.

SEMESTER III

B 3.4 REHABILITATIVE AUDIOLOGY

(80+20 marks)

(Total = 64 hrs)

Unit 1

(10 hrs)

1. Speech reading
 - (a) Definitions
 - (b) Need
 - (c) Visibility of speech sounds – audio visual perception vs. visual perception
 - (d) Visual perception of speech by the hard of hearing
 - (e) Tests for speech reading ability, including Indian tests
 - (f) Speech reading activities

2. Factors influencing speech reading
 - (a) Methods of training: analytical vs. synthetic; (including speech tracking)
 - (b) Individual and group training

Unit 2

(16 hrs)

1. Auditory learning
 - (a) Definition and historical background
 - (b) Role of audition in speech and language development in normal children and its application in education of the hearing impaired.
 - (c) Factors in auditory training: motivation of the case, intelligence, age, knowledge of progress, etc.
 - (d) Auditory Verbal Therapy
 - (e) Methods of auditory training
 - (f) Auditory training activities
 - (g) Communicative strategies
 - (h) Individual vs. group auditory training

Unit 3

(10 hrs)

- Management of hearing impaired individuals with special needs
- (a) Management of multiple handicapped hearing impaired children (MHHI)
 - (b) Management of children with central auditory processing problems
 - (c) Rehabilitation of hearing impaired – elderly population

Unit 4

(12 hrs)

- Assistive Listening Devices (ALDs)
- Classification based on auditory, visual & tactile stimulation
 - Classification based on alerting devices Vs devices for speech perception.
 - Selection of ALDs.

Unit 5

(16 hrs)

1. Implantable Devices
 - Middle Ear Implants and BAHA (Bone Anchored Hearing Aid)
 - Cochlear Implants
 - Brainstem Implants

Components, Candidacy, Advantages and Complications of the same.

2. Utility of technology/devices in the management of tinnitus, hyperacusis.

LIST OF BOOKS

Compulsory Reading:

Skinner HW (1988), Hearing aid evaluation, Prentice Hall, Englewood Cliffs, NJ.

Pollack M (1980) Amplification for the hearing impaired. Grune and Stratton: NY.

Clark, G.M., Cowan, R.S.C. & Dowell, R.C. (1997). Cochlear Implantation for Infants & Children: Advances. Singular Publishing Group Inc.

Additional Reading:

Loavenbruck All and Madell IR (1981), Hearing aid dispensing for audiologists: A guide for clinical service. New York: Grune and Stratton.

Bess et al (1981). Amplification in Education, Alexander Graham Bell Association for the Deaf, Washington.

Hull, R.H. (1982). Rehabilitation Audiology, New York: Grune and Stratton.

Donnelly K (1974), Interpreting hearing aid technology, CC, Thomas, Springfield.

Markides A (1977) Binaural hearing aids, Academic Press Inc., London.

Hodgson HR and Skinner (PH) (1977, 1981), Hearing aid Assessment and use in audiologic habilitation, Williams and Wilkins, Baltimore.

Cooper (1991), Practical aspects of Audiology: Cochlear implants: A practice guide. Whurr Publisher, London.

Mueller HG, Hawkins DB., Northern JL. (1992), Probe microphone measurements: Hearing aid selection and assessment, Singular publishing group. Inc., California.

BIS, ANSI & IEC Specifications

SEMESTER III

B 3.5 CLINICAL PRACTICUM (a) Speech – Language Pathology - III

At the end of Semester **III**, the student should be able to carry out the following –

1. Carry out informal and formal assessment procedures for the following aspects of speech and language (from a normal child sample)
 - i) Pre-linguistic skills
Non-verbal communication
Child directed speech
 - ii) Semantics
Syntax and morphology
Pragmatics
 - iii) Phonological process and its analysis
Speech intelligibility
Transcription of the sample in IPA should be done.
2. Use scales / tests for evaluation and treatment of Childhood communication disorders, Articulation and Phonological Disorders, Maxillofacial anomalies:
 - Northwest Syntax Screening Test
 - Bankson's Language Screening Test
 - Test for Examining Expressive Morphology
 - Autistic Behaviour Composite Checklist and Profile
 - Linguistic Profile Test
 - Tests for learning Disability
 - Screening Test for Developmental Apraxia of Speech
 - Articulation assessment tests in different Indian languages
 - Other Indian tests and materials available
3.
 - i) Perceptual analysis of 5 normal and 5 abnormal articulation samples
 - ii) Analysis and marking of cleft
 - iii) Nasalence measurements in normal and cleft palate speech
4. Planning and executing therapy for a minimum of 5 clients (including children and adults with articulation disorders, cleft palate, glossectomy, mandibulectomy) for approximately 5 sessions each and preparation of the following:
 - Carry out baseline evaluation
 - Preparation of pre therapy reports
 - Provide guidelines for home-based intervention in the form of home training programs/modules for the above mentioned disorders

Making appropriate referrals and preparing sample referral letters to various professionals connected with the above mentioned disorders
Know various centers available for rehabilitation (local, national, international)

5. Counseling parents of children and adults with articulation disorders, cleft lip and palate, glossectomy and mandibulectomy
6. Maintaining audio samples used for the practical analysis
7. Maintaining clinical dairy.

SEMESTER III
B 3.5 CLINICAL PRACTICUM (b) Audiology - III

At the end of Semester **III**, the student should be exposed to and be able to carry out the following:

1. Be familiar with instrumentation for speech audiometry, immittance audiometry, sound field-testing.
2. Carryout complete pure tone audiometry (with AC/BC, unmasked/masked), interpretation of audiograms, identifying indicators for special/further diagnostic testing, writing case review (25 cases)
3. Speech Audiometry: Be familiar with speech test material in at least two Indian languages, master live voice presentation and recorded test presentation, administer SAT, SRT, SIS, MCL, UCL, PI-PB function test.
4. Collect speech audiometry test materials in Indian languages.
5. Carryout speech audiometry on 10 normal subjects, and 20 cases with conductive hearing loss, sensorineural hearing loss and functional hearing loss. Interpretation of speech audiometry results.
6. Carryout holistic audiological assessment for differential diagnosis (Cochlear & Retro cochlear):
Routine pure tone & speech audiometry
Administering special tests using pure tone: Tone Decay Test, STAT, SISI, ABLB, MLB, SPAR, Test for functional hearing loss.

Educational Audiology

1. Note the speech and language characteristics of those with hearing impairment
2. Management of individuals with post-lingual hearing impairment
3. Role-play activities for teaching language to the hearing impaired.
4. Prepare schedules for educational placement of 5 hearing impaired children having different hearing capacities.
5. Counsel parents regarding educational placement of the hearing impaired.

SEMESTER III
B 3.6 INDIAN CONSTITUTION

(80+20 marks)

(Total = 64 hrs)

(Syllabus for compulsory paper for all undergraduate degree courses in III semester)

Unit 1: Indian Constitution: Its Philosophy and Framing

- The constituent Assembly
- Preamble, Fundamental Rights and Fundamental Duties
- Directive Principles of State Policy
- Amendment and Review of the Constitution

Unit 2: The Union & State Legislature

- Union Parliament
- State Legislature
- Law-making process
- Committee System

Unit 3: The Union & State Executive

- The President of India
- The Prime minister and Council of Ministers
- The State Governor, Chief Minister and Council of Ministers
- Coalition Government

Unit 4: The Judiciary

- The Supreme Court of India
- Judicial Review
- Writs
- Judicial Activism and Public Interest Litigation

Unit 5: Issues

- Indian Federalism
- Human Rights and Environmental Protection
- Reservation and Social Justice
- Secularism

LIST OF BOOKS

1. D.D. Basu : Introduction to the Constitution of India
2. Granville Austin : India's Constitution – Cornerstone of a Nation

3. Granville Austin : Working of a Democratic Constitution - The Indian Experience
4. J. C. Johari : Indian Government and Politics Vol. 1 & 2
5. J.R. Siwach : Dynamics of Indian Government & Politics
6. D.C. Gupta : Indian Government & Politics
7. M.V. Pylee : India's Constitution
8. H.M. Rajasekhar : Bharatha Sarkara mattu Rajkiya
9. M.P. Bhuvaneshwara Prasad : Bharathiya Samvidhana Parichaya
10. S.K. Kabburi : Bharata Samvidhana
11. K.J. Suresh : Bharata Samvidhana
12. D.T. Deve Gowda : Bharata Sarkara mattu Rajkiya
13. Lohitashwa : Bharata Samvidhana

SEMESTER IV
B.4.1 VOICE AND LARYNGECTOMY

(80+20 marks)

(Total = 64 hrs)

Objectives:

After studying this paper at the end of the semester, the student should be able to understand the following –

- Characteristics of voice and its disorders
- Laryngeal abnormalities
- Assessment and Management

Unit 1

(14 hrs)

1. Characteristics of normal voice: Physiological, acoustical and aerodynamic correlates
2. Development: Birth to senescence; including age-related changes
3. Theories of phonation
4. Classification of abnormal voice
5. Voice disorders in other conditions:
 - Voice disorders related to resonatory problems
 - Voice problems in conditions like Cerebral palsy, Hearing impaired, mentally retarded, Cleft lip and palate
 - Voice problems in Endocrine disorders

Unit 2

(12 hrs)

1. Etiology, incidence, prevalence, signs and symptoms of:
 - Organic voice disorders: Laryngeal cancer also to be included here
 - Non-organic voice disorders: eg: Functional disorders (Psychosomatic- Functional aphonia and physiological- voice abuse)
 - Congenital voice disorders
 - Neurological voice disorders

Unit 3

(12 hrs)

1. Evaluative procedures and Instrumentation for:
 - Invasive procedures – endoscopic procedures
 - Non-invasive (Acoustic, perceptual, aerodynamic, Electro Glotto Gram, Inverse filtering procedures)
2. Comparison of normal and abnormal voice patterns based on the above procedures

Unit 4

(14 hrs)

Laryngectomy:

- Types and characteristics of laryngectomy surgery

- Assessment of a laryngectomee and associated problems
- Management of a laryngectomee: a) Esophageal speech: anatomy, candidacy, different types of air intake procedures, speech characteristics of esophageal speech; b) Tracheo-esophageal speech: anatomy, candidacy, different types of TEP, fitting of prosthesis, speech characteristics, complications in TEP; c) Artificial larynx: different types, selection of artificial larynx, speech characteristics; d) Pharyngeal speech, buccal speech, ASAI speech, gastric speech; e) Pre and postoperative counseling

Unit 5

(12 hrs)

1. Medical/Surgical procedures in the treatment of voice disorders
2. Voice therapy – various techniques
3. Professional voice users: Definition, types, characteristics, importance of vocal hygiene and professional voice care

LIST OF BOOKS

Compulsory Reading:

- 1) Boone, D.R. & McFarlane, S. C (1994): The Voice and Voice Therapy. (Fifth Ed.). Englewood Cliffs, Prentice-Hall, Inc. New Jersey.
- 2) Prater, R.J. and Swift, R.W. (1984): Manual of Voice Therapy. Little, Brown and Co, Boston.
- 3) Andrews . M.L. (1995): Manual of Voice treatment, Singular publishing group, San Diego.
- 4) Doyle, P C (1994) Foundation of voice and speech rehabilitation following laryngeal cancer. Singular publishing group. San Diego.

Additional/Optional Reading:

- 5) Brown. W.M.s. and others (1996) (ed): Organic voice disorders. Singular publishing group, Sandiego.
- 6) Joseph, C Stemple Leble, E Glaze, Bernick K Gerdeman. Clincial voice pathology. Theory & Management (II Edition)
- 7) Aronson, A.E. (1990): Clinical Voice Disorders, New York: Thieme, Inc.
- 8) Greene, M.C.L. and Mathieson, L. (1989): The Voice and Its Disorders. Whurr publications, London.

- 9) Case, J.L. (1991): Clinical Management of Voice Disorders, Pro-Ed, Austin.
- 10) Fawcus, M. (Ed.) (1991): Voice Disorders and Their Management. Singular Publishing. Group. San Diego
- 11) Salmon, S.J. and Mount, K.H. (Eds.) (1991): Alaryngeal Speech Rehabilitation. Prof-Ed. Austin.
- 12) Keith, R L & Darley (III Edition) Laryngectomee rehabilitation. Pro. Ed.Austin

SEMESTER IV
B 4.2 MOTOR SPEECH DISORDERS IN CHILDREN

(80+20 marks)

(Total = 64 hrs)

Objectives:

After studying this paper at the end of the semester, the student should be able to understand the following –

- Characteristics of motor speech disorders
- Types of Cerebral palsy, Apraxia and other conditions
- Assessment and Management

Unit 1

(12 hrs)

1. Introduction to neuromotor organization and sensorimotor control of speech

- Motor areas in cerebral cortex, motor control by subcortical structures, brainstem, cerebellum and spinal cord.
- Central nervous system and peripheral nervous system in speech motor control.
- Centrifugal pathways and motor control
- Neuromuscular organization and control
- Sensorimotor integration
- Introduction to motor speech disorders in children- Dysarthria and Developmental apraxia of speech

Unit 2

(12hrs)

1. Cerebral palsy

- Definition, causes and classification
- Neuromuscular development in normals and children with cerebral palsy
- Reflex profile
- Associated problems
- Speech and language problems of children with cerebral palsy
- Assessment of speech in children with cerebral palsy- objective and subjective methods
- Differential diagnosis of cerebral palsy
- Management: Introduction to different approaches to neuromuscular education (Bobath, Phelps and the others); Speech rehabilitation in cerebral palsy- Verbal approaches: vegetative exercises, oral sensorimotor facilitation techniques, compensatory techniques- correction of respiratory, phonatory, resonatory and articulatory errors; Team approach to rehabilitation; Neurosurgical techniques for cerebral palsy

Unit 3

(12 hrs)

1. Different types of Cerebral palsy:

- Disorders of muscle tone: Spasticity, rigidity, flaccidity, atonia
- Disorders of movement: Hyperkinesias and dyskinesias- Ballismus, tremor, tic disorder, myoclonus, athetosis, chorea, dystonia, hypokinesias
- Disorders of coordination- Ataxia

2. Syndromes with motor speech disorders- Examples:

- Juvenile progressive bulbar palsy
- Congenital supranuclear palsy
- Guillain- Barre syndrome
- Duchenne muscular dystrophy

Unit 4

(14 hrs)

1. Apraxia of speech in children or developmental apraxia of speech

- Definition
- Description: verbal and non-verbal apraxia
- Differential diagnosis- dysarthria and other developmental disorders
- Management of developmental apraxia of speech- Facilitation techniques for oral motor movements, speech therapy techniques, generalization of speech

Unit 5

(14 hrs)

1. Application of augmentative and alternative (AAC) communication methods in developmental dysarthrias and developmental apraxia of speech:

- Symbol selection
- Techniques
- Assessment for AAC
- Training communication patterns,
- Effective use of AAC

LIST OF BOOKS

Compulsory Reading:

Crary, M.A. (1993). Developmental Motor Speech Disorders. Singular Publishing group Inc. Whurr publishers. San Diego. California

Caruso, F. J. and Strand, E. A. (1999). Clinical Management of Motor Speech Disorders in Children. New York: Thieme.

Love, R.J. and Webb, W.G. Butterworth. (1986). Neurology for Speech-Language Pathology. (2nd ed.)

Additional/Optional Reading:

Minifie, N.R. Williams Heinemann. (1974). (2nd Ed.) Handling the Young Cerebral Palsied Child at Home. Medical Books.

Cogher, L., Savage, E. and Smith, M.T. Cerebral Palsy: The child and the Young Person. (1992). Eds. London: Chapman and Hall Medical.

Hardy, J. (1983). Cerebral Palsy. Remediation of Communication Disorder Series by F.N. Martin. Englewood Cliffs, Prentice Hall Inc.

Rosenthal. S., Shipp and Lotze. Dysphagia and the child with developmental disabilities.

SEMESTER IV

B 4.3 DIAGNOSTIC AUDIOLOGY: Part 2

(80+20 marks)

(Total = 64 hrs)

Unit 1

(14 hrs)

Immittance evaluation

- a) Introduction
- b) Principle of immittance evaluation, Instrumentation
- c) Tympanometry – tympanometric peak pressure, Static immittance, gradient/tympanometric width
- d) Reflexometry - Ipsilateral and contralateral acoustic reflexes, special tests
- e) Clinical application of immittance evaluation
- f) Immittance evaluation in the paediatric population

Unit 2

(14 hrs)

Auditory brainstem response

- a) Introduction and classification of AEPs including ASSR (80 Hz)
- b) Instrumentation
- c) Test procedure
- d) Factors affecting auditory brainstem responses
- e) Interpretation of results and clinical application
- f) ASSR, Tone burst ABR

Unit 3

(14 hrs)

Middle and long latency auditory evoked potentials

- a) Test procedure for MLR, LLR, MMN, P 300, ASSR (40 Hz)
- b) Factors affecting middle, long latency evoked potentials (including MMN & P300)
- c) Interpretation of results and clinical application

Unit 4

(10 hrs)

Otoacoustic emissions

- a) Introduction and classification of OAEs
- b) Instrumentation
- c) Measurement of OAE procedure
- d) Interpretation of results and clinical application

Unit 5

(12 hrs)

Electronystagmography

- a) Introduction and need for electronystagmography
- b) Subtests in electronystagmography
- c) Interpretation of test results and clinical applications

d) Findings in the paediatric population

Other vestibular tests

- a) VEMP
- b) EMG
- c) Glycerol test etc.

LIST OF BOOKS

Compulsory Reading:

1. Jerger, J. (1963). Modern developments in Audiology, New York: Academic Press.
2. Jerger, J. (1987). Diagnostic Audiology: Historical Perspectives, Ear and Hearing, 8 7s-12s
3. Katz, J. et al (Ed.) (1994). Handbook of Clinical Audiology, Baltimore: Williams and Wilkins.
4. Musiek, F.E. and Rintlemaan, W.F. (1999). Contemporary Perspective in Hearing Assessment. USA: Allyn & Bacon.

Additional Reading:

1. Martin, F.N (1994), Introduction to Audiology, New Jersey: Prentice Hall.
2. Silman S. and Silverman C.A. (1991). Auditory Diagnosis Principles and Application. New York: Academic Press, Inc.
3. Rupp, Stockdell (1980). Speech Protocols in Audiology, New York: Grune & Stratton.
4. Keith, R.M. (Ed.). (1981). Central Auditory Dysfunction. New York: Grune & Stratton.
5. Musiek, and Baran, J.A. (1987). Central Auditory Assessment: Thirty years of challenge and change. Ear and Hearing 3, 225-355.
6. Pinherio, H.L. Kusiek, F.E. (Eds) (1985). Assessment of Central Auditory Dysfunction Foundations and Correlates. Baltimore: Williams and Wilkins.
7. Willsford J.A. (1987), Handbook of Central Auditory Processing Disorders in Children. Drando, Grune & Stratton.
8. Feldman, A.S., & Willber, L.A. (Eds), (1976), Acoustic Impedance, Immittance: Measurement of Middle Ear Function, Baltimore: Williams & Wilkins.

SEMESTER IV
B 4.4 PEDIATRIC AUDIOLOGY

(80+20 marks)

(Total = 64 hrs)

Unit 1

(12 hrs)

- a) Development of human auditory system
 - Basic embryology
 - Embryology of the auditory system
 - Relevance of the information with special reference to syndromes
- b) Development of auditory behaviour
 - Prenatal hearing
 - New born hearing
 - Auditory development from 0-2 years

Unit 2

(14 hrs)

- a) Early identification of hearing loss – need with specific reference to conductive and sensorineural hearing loss.
- b) Screening for hearing loss using high risk registers
- c) Behavioural screening tests: Stimuli, procedures, recording of response, interpretation of results and validation of results
- d) Concept of universal hearing screening

Unit 3

(12 hrs)

- a) Objective screening tests: Immittance, Evoked potentials, OAE,
- b) School Screening – Objective: Screening for hearing sensitivity, screening for middle ear effusion. Need, criteria, instrumentation.
- c) Individual and group screening / Mass media screening tests
- d) Importance of follow-up.

Unit 4

(16 hrs)

- a) Hearing testing in neonates and infants:
 - Behavioural Observation Audiometry (BOA)
 - Conditioning techniques including CORA, VRA and its modifications, TROCA, Play audiometry.
- b) Speech Audiometry in children
 - Tests & material used to obtain:
 - Speech Detection Threshold (SDT)
 - Speech Recognition Threshold (SRT)

Speech recognition tests including VASC, WIPI, NuChip, Glendonald Auditory Screening Procedure (GASP), Early Speech Perception Test (EST), Speech tests developed in India.

Factors affecting speech audiometry results in children BC speech audiometry

Unit 5

(10 hrs)

Functional hearing loss in children

Signs/symptoms

Tests

b) Central Auditory Processing Disorders in children

Signs/symptoms

Screening tests

LIST OF BOOKS

Compulsory Reading:

Northern, J.L. and Downs, M.P. (1991). Hearing in children. 3rd Ed. Baltimore: Williams and Wilkins.

Additional Reading:

Davis, J.H., and Hardick, E.J. (1981). Rehabilitative Audiology for children and adults, New York: John Wiley and Sons.

Erber, N.P. (1982), Auditory Training, Washington: A.G. Bell Association for deaf.

Fulton, R.L. and Lloyd, L.L. (1975), Auditory assessment of the difficult to test, Baltimore: Williams and Wilkins, Co.

Gerber, S.E. (1982). Audiometry in infancy. New York: Grune and Stratton.

Gerber, S.E., and Mencher., S.T. (1978). Early diagnosis of hearing loss, New York, Grune and Stratton.

Ling, D. (1978). Speech and hearing impaired child. Washington: Alexander Graham Bell Association for the deaf.

Martin, F.N. (1978). Paediatric Audiology, New Jersey: Prentice Hall.

Sanders, D. A. (1993). Management of hearing handicap: Infants to elderly. 3rd Ed. New Jersey: Prentice Hall.

SEMESTER IV

B 4.5 CLINICAL PRACTICUM (a) Speech – Language Pathology - IV

At the end of Semester **IV**, the student should be able to carry out the following –

Carry out informal and formal assessment procedures for the following aspects of speech in 10 clients with voice disorders, laryngectomy, cerebral palsy and developmental apraxia of speech

- i) Perceptual analysis of pitch, loudness and quality of voice
- ii) Instrumental analysis of voice – F_0 and related measures, amplitude and related measures, CTAS, EGG, maximum phonation duration, s/z ratio, vital capacity, mean airflow rate, analysis and professional voice
- iii) Diagnosis of voice disorders
- iv) Proformae for cerebral palsy, diagnosis of cerebral palsy
- v) Analysis of developmental apraxia of speech
- vi) Planning, writing and executing therapy in 5 cases with voice disorders, laryngectomy, cerebral palsy and developmental apraxia of speech
- vii) Counseling in the above speech disorders
- viii) Record maintenance

SEMESTER IV

B 4.5 CLINICAL PARACTICUM (b) Audiology - IV

At the end of Semester **III & IV**, the student should be exposed to and be able to carry out the following:

1. Be familiar with instrumentation for speech audiometry, immittance audiometry, sound field-testing.
2. Carryout complete pure tone audiometry (with AC/BC, unmasked/masked), interpretation of audiograms, identifying indicators for special/further diagnostic testing, writing case review (25 cases)
3. Speech Audiometry: Be familiar with speech test material in at least two Indian languages, master live voice presentation and recorded test presentation, administer SAT, SRT, SIS, MCL, UCL, PI-PB function test.
4. Collect speech audiometry test materials in Indian languages.
5. Carryout speech audiometry on 10 normal subjects, and 20 cases with conductive hearing loss, sensorineural hearing loss and functional hearing loss. Interpretation of speech audiometry results.
6. Carryout holistic audiological assessment for differential diagnosis (Cochlear & Retro cochlear)
7. Routine pure tone & speech audiometry
8. Administering special tests using pure tone: Tone Decay Test, STAT, SISI, ABLB, MLB, SPAR, Tests for functional hearing loss.
9. Carryout Immittance Audiometry (minimum of 5 cases) – PVT, Tympanometry, Acoustic Reflex testing (ipsi & contra). Interpret the findings taking into consideration the ENT reports.
10. Carry out Auditory Brainstem Response (ABR) & Oto-Acoustic Emissions (OAE) –
 - Preparation of the patient
 - Informing the patient/caregiver with respect to the procedure
 - Electrode montage
 - Conduct the procedure with respect to test protocol (5 cases each)
 - BC-ABR, Tone burst ABR

Educational Audiology

1. Note the speech and language characteristics of those with hearing impairment
2. Management of individuals with hearing impairment – both children and adults
3. Role-play activities for teaching language to the hearing impaired.
4. Prepare schedules for educational placement of 5 hearing impaired children having different hearing capacities.
5. Counsel parents regarding educational placement of the hearing impaired.

Paediatric Audiology

1. Informal screening – purpose, materials used, noise makers, their spectral characteristics, procedure (5 normal & 5 hearing impaired children)
2. Sound field testing: BOA, VRA, Play audiometry (5 cases each)
3. Observe auditory response based on video clippings or live case testing.

LIST OF BOOKS

Compulsory Reading:

Northern, J.L. and Downs, M.P. (1991). Hearing in children. 3rd Ed. Baltimore: Williams and Wilkins.

Additional Readings:

Davis, J.H., and Hardick, E.J. (1981). Rehabilitative Audiology for children and adults, New York: John Wiley and Sons.

Erber, N.P. (1982), Auditory Training, Washington: A.G. Bell Association for deaf.

Fulton, R.L. and Lloyd, L.L. (1975), Auditory assessment of the difficult to test, Baltimore: Williams and Wilkins, Co.

Gerber, S.E. (1982). Audiometry in infancy. New York: Grune and Stratton.

Gerber, S.E., and Mencher., S.T. (1978). Early diagnosis of hearing loss, New York, Grune and Stratton.

Ling, D. (1978). Speech and hearing impaired child. Washington: Alexander Graham Bell Association for the deaf.

Martin, F.N. (1978). Paediatric Audiology, New Jersey: Prentice Hall.

Sanders, D. A. (1993). Management of hearing handicap: Infants to elderly. 3rd Ed.
New Jersey: Prentice Hall.

SEMESTER IV
B 4.6 ENVIRONMENTAL STUDIES
(80+20 marks) (Total = 64 hrs)

Unit 1:	2 hrs
The multidisciplinary nature of environmental studies Definition, scope and importance	
Unit 2:	8 hrs
Natural Resources	
Renewable and non-renewable resources	
Natural resources and associated problems	
Forest resources: Use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forests and tribal people.	
Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams' benefits and problems.	
Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies.	
Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture , fertilizer-pesticide problems, water logging, salinity, case studies	
Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources, Case studies.	
Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification	
Role of an individual in conservation of natural resources	
Equitable use of resources for sustainable lifestyles	
Unit 3:	6 hrs
Eco Systems	
Concept of an ecosystem	
Structure and function of an ecosystem	
Producers, consumers and decomposers	
Energy flow in the ecosystem	
Ecological succession	
Food chains, food webs and ecological pyramids	
Introduction, types, characteristic features, structure and function of the following Ecosystem:	

Forest ecosystem
Grassland ecosystem
Desert ecosystem
Aquatic ecosystem (ponds, streams, lakes, rivers, oceans, estuaries)

Unit 4: 8 hrs

Biodiversity and its conservation
Introduction – Definition, genetic, species and ecosystem diversity Biogeographical classification of India
Value of biodiversity: consumptive use, productive use, social, ethical, esthetic and option values
Biodiversity at global, national and local levels
India as a mega diversity nation
Hot-spots 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 5: 8 hrs

Environmental Pollution
Definition
Causes, effects and control measures of:-
a. Air pollution
b. Water pollution
c. Soil pollution
d. Marine pollution
e. Noise pollution
f. Thermal pollution
g. 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, earthquakes, cyclone and landslides

Unit 6: 7 hrs

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
Environment ethics, issues and possible solutions
Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case studies
Wasteland reclamation
Environment Protection Act

Air (Prevention and Control of Pollution) Act.
Water (Prevention and control of pollution) Act
Wild life protection Act
Forest conservation Act
Issues involved in enforcement of environment legislation
Public awareness

Unit 7: 6 hrs

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

Unit 8: 19 hrs

Field Work
Visit to local area to document environmental assets- river/forest/grassland/
hill/mountain
Visit to local polluted site urban/rural/industrial/agricultural
Study of common plants, insects, birds
Study of simple ecosystems pond, river, hill slopes etc. (field work equal to 5 lecture
hours)
Each student has to submit a field report on any one of above topics which forms the
basis for evaluation of field work for – 25 marks

LIST OF BOOKS

Agarwal.K.C 2001 Environmental Biology. Nidi Publ.Ltd.Bikaner

Bharucha Erach. The Biodiversity of India, Mapin Publishing Pvt. Ltd,
Ahmedabad – 380 013, India email: mapin@iccnel.net (R)

Brunner R.C 1989, Hazardous Waste

Cark R.S Marine Pollution, Clanderson Press Oxford (TB)

Cunningham, W.P. Cooper, T H Gorhani, E & Hepworth, M.T 2001 Environmental
Encyclopedia, Jaico Publ. House, Mumbai 1196 p

De A.K. Environmental Chemistry, Wiley Eastern Ltd

Down to Earth, Centre for Science and Environment (R)

- Gleick H.P 1993. Water in crisis. Pacific Institute for Studies in Dev., Environment & Security, Stockholm Env. Institute. Oxford Univ. Press 473 p
- Hawkins R.E, Encyclopedia of Indian Natural History, Bombay Natural History Society, Bombay (R)
- Heywood, V.H & Watson. R.T 1995. Global Biodiversity Assessment, Cambridge Univ. Press 1140p
- Jadhav H & Bhosale V.M. 1995, Environmental Protection and laws, Himalaya Pub. House, Delhi 284 p
- Mekinney M.L. & Schocl, R.M. 1996. Environmental Science systems & Solutions, Web enhanced edition 639p
- Mhaskar A.K, Matter Hazardous, Techno-Science Publication (TB)
- Miller T.G Jr. Environmental Science, Wadsworth Publishing Co. (TB)
- Odum, E.P 1971. Fundamentals of Ecology, W.B. Saunders Co. USA,574p
- Rao M.N & Datta A.K. 1987. Waste Water Treatment. Oxford & IBH Publ. Co. Pvt. Ltd 345p
- Sharma B.K 2001. Environmental Chemistry. Goel Publ. House, Meerut
- Survey of the Environment. The Hindu (M)

SEMESTER V
B 5.1 FLUENCY AND ITS DISORDERS

(80+20 marks)

(Total = 64 hrs)

Objectives:

After studying this paper at the end of the semester, the student should be able to understand the following –

- Characteristics and types of Fluency disorders
- Theories of stuttering
- Assessment and Management

Unit 1

(10 hrs)

1. Fluency: Definition, disfluencies and dysfluencies, review of development of fluency, factors influencing the development
2. Definitions of intonation, stress and rhythm- Development of intonation, rhythm, stress – their implications to therapy
3. Measures of fluency and other prosodic aspects

Unit 2

(12 hrs)

1. Stuttering: definition, nature, incidence and prevalence
2. Normal non fluency; primary stuttering; secondary stuttering
3. Development of stuttering
4. Cluttering and neurogenic stuttering

Unit 3

(12 hrs)

Theories of stuttering: organic vs. functional; cerebral dominance; diagnosogenic and learning theories; demand-capacity model

Unit 4

(14 hrs)

1. Assessment of stuttering: Clinical observation, subjective and objective assessment, administration of tests, recording, transcription, analysis and diagnosis.
2. Associated problems: speech and language, psychological etc.
3. Differential diagnosis of developmental stuttering, neurogenic stuttering, cluttering, normal non fluency, spasmodic dysphonia

Unit 5

(16 hrs)

1. Prevention: specific issues in children and adults including management of stress and anxiety.

2. Therapy; rationale; prolongation; shadowing; habit rehearsal technique, DAF, masking, shock therapy, desensitization, timeout, airflow and modified airflow technique; sequence of therapy procedures
3. MIDVAS
4. Transfer and maintenance
5. Measurement of progress; naturalness rating
6. Relapse and recovery

LIST OF BOOKS

Compulsory Reading:

Curlee and Perkins (Ed.). (1985): Nature and treatment of stuttering.
Taylor and Francis, London.

Silverman, F.H. (1992). Stuttering and other fluency disorders. Prentice Hall,
Inglewood Cliffs.

Peter and Guitar (1991). Stuttering- An integrated approach to its nature and treatment

Additional/Optional Reading:

Bloodstein, O. (1993): Stuttering. Allyn and Bacon, Boston.

Fawcus, M. (1995): Stuttering. Whurr Publishers, London.

Mark Onslow (1996) Behavioural management of stuttering. Singular Publishing Group
Inc.

SEMESTER V
B 5.2 MOTOR SPEECH DISORDERS IN ADULTS

(80+20 marks)

(Total = 64 hrs)

Objectives:

After studying this paper at the end of the semester, the student should be able to understand the following –

- Characteristics and types of dysarthria and apraxia in adults
- Dysphagia and other neurogenic conditions
- Assessment and Management

Unit 1

(16 hrs)

1. Definition and classification of dysarthria in adults.
2. Types of dysarthria in adults.
3. Neurogenic disorders learning to dysarthria in adults:
 - Vascular disorders – dysarthria following strokes, CVA, cranial nerve palsies and peripheral nerve palsies.
 - Infection condition of the nervous system – eg. Meningitis, polyneuritis and neuro syphilis.
 - Traumatic conditions – Traumatic brain injury and dysarthria
 - Toxic conditions – dysarthria due to exogenic and endogenic causes.
 - Degenerative and demyelinating conditions – multiple sclerosis, Parkinson’s disease, motor neuron diseases, Amyotrophic lateral sclerosis.
 - Genetic conditions – Huntington’s chorea, Guillian – Barre syndrome.
 - Others leading to dysarthria – Anoxic conditions, metabolic conditions, idiopathic conditions and neoplasm.

Unit 2

(12 hrs)

1. Assessment of dysarthria:
 - Instrumental analysis: Advantages and disadvantages of instrumental analysis of speech in dysarthria.
 - Physiological and Electrophysiological methods
 - Acoustics
 - Perceptual analysis – measures, standard tests and methods, speech intelligibility assessment scales, advantages and disadvantages of perceptual analysis of speech in dysarthria.
2. Differential diagnosis of dysarthria from functional articulation disorders, apraxia of speech, aphasia and allied disorders.

Unit 3

(12 hrs)

1. Management of dysarthria :

- Medical, surgical and prosthetic approaches
- Speech therapy
- 🕒 Facilitatory approaches: Vegetative exercises, Oral sensori motor facilitation techniques
- 🕒 Compensatory approaches – correction of respiratory, phonatory, articulatory and prosodic errors.
- 🕒 Strategies to improve intelligibility of speech.

Unit 4

(12 hrs)

1. Apraxia of speech in adults

- Definition of verbal and nonverbal apraxia of speech
- Different types, characteristics and classification
- Assessment of apraxia of speech – standard tests and scales, subjective methods and protocols
- Management of apraxia of speech – different approaches
- Improving intelligibility of speech.

Unit 5

(12 hrs)

1. Dysphagia:

- Definition
- Neuro Physiology of swallow in children and adults
- Phases of normal swallow
- Etiology of swallowing disorders in children and adults
- Assessment and Intervention – Specific management techniques, Medical and Surgical issues in dysphagia.

LIST OF BOOKS

Compulsory Reading:

Motor Speech disorders - A Treatment guide. (1991). Dworkin, P.J. St. Louis: Mosby Year Book. Inc.

Motor Speech Disorders: Substrates, Differential diagnosis and Management. (1995). Duffy, J. R. St. Louis: Mosby.

Additional/Optional Reading

Working with Swallowing Disorders. Langley. J. U.K.: Winslow

Acquired Speech and Language disorders - A Neuroanatomical and Functional

Neurological Approach. (1994). Murdoch, B.E. London: Chapman and Hall.

Neurology for Speech-Language Pathology. (1986). (2nd ed.) Love, R.J. and Webb, W.G. Butterworth

SEMESTER V
B 5.3 TECHNOLOGY & AMPLIFICATION DEVICES FOR
PERSONS WITH HEARING IMPAIRMENT

(80+20 marks)

(Total = 64 hrs)

PART A:

Unit 1

(10 hrs)

(Operational characteristics, types and specifications -No design aspects. Concepts and block diagrams only)

1. Basics of electricity & electronics - Direct and alternating current, DC Power supplies, voltage stabilizers, Passive circuit elements, transistors. Linear and digital Integrated circuits, microprocessors. Micro computers and Computers. Filters, Linear and non-linear Amplifiers and Oscillators, Amplifier power and distortion
2. Basics of digital signal processing – Analog signal, digital signal, A to D and D to A conversion, Basic concept of Digital Signal Processing and its implementation, How does a DSP based system work? Application- DSP based hearing aids.

Unit 2

(12 hrs)

1. Microphones as transducers. Velocity microphones. uni-directional microphones Microphone impedance and sensitivity. Loudspeakers as transducers. Structure of a dynamic loudspeaker. Air suspension. Baffles and enclosures. Horn speakers. Multi-speaker systems. Loudspeaker Efficiency, Loudspeaker power and distortion. Recording and Reproduction of sound. Recording characteristics. Dynamic Range, Stereophonic recording. Magnetic tape recording and playback. Tape speed and frequency response, Bias and equalization, Tape noise, Digital Tape recording, CD ROM recording
2. Measuring Instruments - Multi-meter. Cathode ray oscilloscope. Sine wave generator. Function Generator, Frequency counter, Measuring microphones, Sound Level Meter, Integrated Sound Level Meter, Artificial ear, Artificial Mastoid, Couplers, Hearing aid test box, Measurement of different types of sound

PART B:

Unit 3

(16 hrs)

- a) Historical development of hearing aids
Non-electrical hearing aids Electric hearing aids
- b) Basic elements of hearing aids: Microphone, Amplifier, Receiver, Cords, Batteries
- c) Directional hearing aids, modular hearing aids
Routing of signals, head shadow / baffle / diffraction effects Output limiting: Peak clipping, compression

Extended low frequency amplification, frequency transposition
(Bone anchored hearing aid, Master Hearing aids)

d) Recent advances in hearing aids

- Signal processing in hearing aids – BILL, TILL, PILL
- Programmable and digital hearing aids
- Signal enhancing technology

Unit 4

(12 hrs)

Electroacoustic Characteristics & measurements for hearing aids

- a) Instrumentation & Analysis of Electroacoustic characteristics of all types of hearing aids.
- b) Measurement of standard & specification of hearing aids according to ISI, IEC and ANSI
- c) Interpretation of the analysis

Unit 5

(14 hrs)

Hearing Aid selection

- a) Pre-selection factors: Ear to be fitted, monoaural vs. binaural hearing aids, type of receiver, style of hearing aid.
- b) Prescriptive & comparative procedure
- c) Functional gain & insertion gain methods: Instrumentation, prescription formulae, Articulation Index, Speech-spectrum (banana), merit & demerits of each.
- d) Hearing aids for conductive hearing loss, congenital malformation, chronic middle ear disorders
- e) Hearing aids for infants/children/multiple handicapped
- f) Hearing aids for adults & geriatrics: recruiting ears, poor word recognition scores (WRS)
- g) Hearing aids for the sightless
- h) Procuring hearing aids under various schemes of the Government of India / State

LIST OF BOOKS

Compulsory Reading:

1. Skinner HW (1988), Hearing aid evaluation, Prentice Hall, Englewood Cliffs, HJ.
2. Pollack M (1980) Amplification for the hearing impaired. Grune and Stratton, NY.
3. Basic Electronics: A text-lab manual; Paul B Zbar, Albert, P. Malvino. (5th Edn), Mc Graw Hill Inc, (1983)

Additional Reading:

1. Loavenbruck All and Madell IR (1981), Hearing aid dispensing for audiologists: A guide for clinical service. New York: Grune and Stratton.
2. Bess et al (1981). Amplification in Education, Alexander Graham Bell Association for the Deaf, Washington.
3. Hull, R.H. (1982). Rehabilitation Audiology, New York: Grune and Stratton.
4. Donnelly K (1974), Interpreting hearing aid technology, CC, Thomas, Springfield.
5. Markides A (1977) Binaural hearing aids, Academic Press Inc., London.
6. Hodgson HR and Skinner (PH) (1977, 1981), Hearing aid Assessment and use in audiologic habilitation, Williams and Wilkins, Baltimore.
7. Cooper (1991), Practical aspects of Audiology: Cochlear implants: A practice guide. Whurr Publisher, London.
8. Mueller HG, Hawkins DB., Northern JL. (1992), Probe microphone measurements: Hearing aid selection and assessment, Singular publishing group. Inc., California.
9. ANSI & IEC Specifications

SEMESTER V

B 5.4 PROFESSIONAL PRACTICES IN SPEECH AND HEARING

(80+20 marks)

(Total = 64 hrs)

Objectives:

After studying this paper at the end of the semester, the student should be able to understand the following –

- Epidemiology of speech, language and hearing disorders
- Service delivery and CBR issues
- Legislative support for rehabilitation
- Documentation and ethical issues

Unit 1

(14 hrs)

1. Epidemiology of speech, language and hearing disorders
2. Environmental, Social, Economic implications and preventive education
3. Levels of prevention: Primary, Secondary, Tertiary
4. Survey, prevalence, Incidence and its implication in planning
5. Health promotion, specific protection, early diagnosis and treatment of a high risk infant, Disability limitation, Educational and Vocational rehabilitation

Unit 2

(12 hrs)

1. Approaches to service delivery: Institution based, Camp based, Community based and Role of NGOs
2. Review of services in India
3. Integration of Disabled into the community and ICF 2001

Unit 3

(12 hrs)

1. Duties and responsibilities of SLP in various settings
2. Professional ethics for SLPs, Code of Ethics, Right to Education Act, Industrial Employment Act
3. Interacting with allied professional and community health workers

Unit 4

(14 hrs)

1. Planning services for the communication disordered population: Philosophy, planning, establishment of services for communication disorders- infrastructure, budget, staffing, equipment, furniture, policy making, record keeping, proposal writing.
2. Strategies for awareness, public education and information (Camps, Print and audiovisual media, Surveys. Radio broadcasts, street plays).
3. Empowering parents, persons with disabilities and the community; Skill transfer to DHLS, parents; grass-root level workers, teachers and health workers

Unit 5

(12 hrs)

1. Legislative support for rehabilitation- Rehabilitation Council of India Act (1992), Persons With Disability Act (1995), National Trust Act for Autism, CP, MR and Multiple Disabilities (1999), Environmental Act, Consumer Protection Act, Right To Information Act.
2. The professional as a witness; documentation; handling legal issues

LIST OF BOOKS

Compulsory Reading:

Baquer, A. & Sharma, A. (1997). Disability: Challenges Vs Responses. CAN publications.

Kundu, C.L., Status of Disability in India, (2000 & 2003) Ed. Kundu, C.L., RCI

Narsimhan, M.C. & Mukherjee, A.K. (1986). Disability a Continued Challenge: Delhi willey eastern.

WHO (2001). International classification of Functioning, Disability and Health. Geneva: WHO

Professional Issues in Speech-Language Pathology and Audiology - A Text book. (1994). Lubinski R. and Frattali C. California: Singular Publishing Group

Additional/Optional Reading:

Administration and Management of Programs for Young Children. (1995) Shoemaker, C. J. New Jersey : Prentice Hall Inc.

Management of Child Development Centres. (1993) Hildebrand, V. (3rd Ed.). MacMillan Publishing Company.

SEMESTER V

B 5.5 CLINICAL PRACTICUM (a) Speech – Language Pathology - V

At the end of Semester **V**, the student should be able to carry out the following –

- a) Analysis of fluency in 2 normal samples and 2 patients with stuttering / cluttering, neurogenic stuttering (percent disfluency), rate of speech, effort, naturalness, various types of disfluencies)
- b) Use of SSI, SPI, and fluency tests
- c) Assessment of 2 patients with dysarthria / apraxia / dysphagia using tests
- d) Planning, writing, and executing therapy with 10 patients with stuttering / cluttering / neurogenic stuttering / dysarthria / apraxia / dysphagia
- e) Use of AAC in at least 1 patient
- f) Counseling patients with the above disorder
- g) Record maintenance
- h) Presenting a case in clinical conference

SEMESTER V
B 5.5 CLINICAL PRACTICUM (b) Audiology - V

At the end of Semester V, the student should be able to carry out the following –

Hearing Aid Trial Postings:

1. Hearing aid trial: pre-selection of hearing aids, styles, EAC, other issues, inspection of ear moulds. Functional gain method (10 children & 10 adults). Concept of speech banana, aided audiogram.
2. Observing Real Ear Insertion Gain measurement (10 cases)
3. Pre-selection based on audiological evaluations (10 cases)
4. Hearing Aid trials:
 - a. Functional gain, REIG, other methods with monaural fitting, binaural fitting, Programmable hearing aid – Analog Digital
 - b. Explaining the benefits of hearing aid to the patient/caregiver
5. Counselling patients/caregivers regarding hearing aids – Care, maintenance, adjustments, tips to caregivers regarding acceptance of hearing aids (5 children & 5 adults). Binaural amplification and its uses.
6. Electro-acoustic evaluation of hearing aids (body level & ear level), with and without ear moulds. Equipment for analysis. Calibration of hearing aid analyser.
7. Models and makes available in the market, their EAC, cost of hearing aids, its suitability to various audiogram configurations, age etc.
8. Specification sheets – BIS, ANSI, IEC with respect to hearing aids.
9. Administration of Self (Help) assessment scales.
10. Fitting hearing aids for sloping hearing loss.

Rehabilitation Audiology

1. Role-playing activities for speech reading, communication strategies and auditory learning.
2. Compile activities on management of deaf-blind children.
3. Compile activities on management of children with central auditory processing disorders.

4. Compile information on cochlear implants regarding candidacy, cost, places where it is done and rehabilitation of cases, in Indian contexts.

Diagnostic Audiology/Noise/Rehabilitative Technology:

1. Holistic audiological assessment for differential diagnosis:
 - a. Speech: PI/PB Function, Stenger, BC Speech
 - b. Noise: SAL, SPIN, (10 cases)
 - c. Immittance audiometry: Basic tests, Acoustic Reflex Decay, Eustachian Tube function, SPAR
2. Compiling reports for the above.
3. Testing multiple handicapped children
4. Compile information on cochlear implants reg. candidacy, cost, places where it is done and rehabilitation of cases.
5. Calibration of pure tone audiometry (AC, BC, Speech)
6. Noise measurement and attenuation measurement of ear protection devices.

SEMESTER VI

B 6.1 NEUROGENIC LANGUAGE DISORDERS IN ADULTS

(80+20 marks)

(Total = 64 hrs)

Objectives:

After studying this paper at the end of the semester, the student should be able to understand the following –

- Brain and language relationship
- Aphasic and non-aphasic conditions
- Assessment and management

Unit 1

(12 hrs)

1. Neural bases of language: Neuroanatomical, neurophysiological and neurochemical correlates for language function
2. Pathophysiology of neurological lesions affecting speech and language including concepts of recovery, reorganization and relearning
3. Theoretical considerations in neurogenic language disorders: Competence Vs Performance; loss Vs Interference, Regression hypothesis, multilingualism, Uni-dimensional Vs multidimensional breakdown

Unit 2

(12 hrs)

1. Definitions of Aphasia
2. Etiologies: CVA, vascular supply to brain, Blood Brain Barrier, trauma etc.
3. Classification of aphasia based on anatomical, linguistic and psycholinguistic aspects
4. Clinical features: Linguistic, psycho-social, neuro-behavioural
5. Associated problems in aphasia: their definition, classification and clinical features

Unit 3

(14 hrs)

1. General and specific neurological examination procedures (higher functions, cranial nerves, motor and sensory systems, reflexes and fundus)
2. Neurological investigations: Electrophysiological (Electro Encephalo Gram, Evoked potentials) and imaging (Computerized Tomography, Magnetic Resonance Imaging)
3. Assessment of speech, language and cognitive behaviour of adults with a language-based disorder: Informal and formal test procedures(Western Aphasia Battery, Boston Diagnostic Aphasia Examination, Boston Naming Test, Minnesota Test for Differential Diagnosis of Aphasia, Porch Index of Communicative abilities, Functional Communication Profile, Token Test, Revised Token Test, Bilingual Aphasia Test, MAE and others; Indian tests and adaptations.

Unit 4

(14 hrs)

1. Other language disorders in adults: Introduction, Etiology, clinical profile, assessment and management
 - Subcortical aphasias
 - Traumatic Brain Injury

- Right Hemisphere Damage Disorder
- Primary Progressive Aphasia
- Language disorders in Dementia
- Schizophasia
- Acquired dyslexias
- Metabolic disorders
- Aphasias in illiterates, sign language users, bilinguals / multilinguals and others.

2. Differential diagnosis of Adult Neurogenic disorders

Unit 5

(12 hrs)

1. Intervention: Prognostic indicators, Spontaneous recovery; General principles of therapy; specific techniques (Melodic Intonation therapy, Visual Action therapy, Schuell's Auditory stimulation, Thematic language stimulation and others)
2. Team approach; Group therapy; Family support-preparing family, friends and colleagues on what to expect and how to deal with aphasic as a person; Counseling regarding role of family; Individual counselling and spouse and family counselling
3. AAC

LIST OF BOOKS

Compulsory Reading:

Understanding Aphasia. (1993). Goodglass, H. Academic Press Inc.

Davis, G. A. (1993). A Survey of Adult Aphasia and Related Language Disorders
Prentice Hall Inc.

Chapey, R. (1994). (Ed). Language Intervention Strategies in Ault Aphasia. Williams
and Wilkins Publication

Additional/Optional Reading:

Speech and Language Evaluation in Neurology: Adult Disorders. (1985). Ed.
Darby, J. K. Grune and Stratton Inc.

Acquired Speech and Language Disorders. (1994). Murdoch, B. E. London:
Chapman and Hall.

Aphasia and Related Language Disorders. (1990). LaPointe, L. L.
Theime Medical Publishers.

SEMESTER VI

B 6.2 NOISE MEASUREMENTS AND HEARING CONSERVATION

(80+20 marks)

(Total = 64 hrs)

Unit 1:

(14 hrs)

a) Noise in the environment and effects of noise:

Definition of noise

Sources – community, industrial, music, traffic and others
Types – steady & non-steady.

b) Auditory effects of noise exposure

- Historical aspects
- TTS and recovery patterns
- PTS
- Histopathological changes
- Effect of noise on communication, Speech Interference Level (SIL), Articulation Index (AI)
- Perceived Noise in dB (PN dB), Perceived Noise Level (PNL), Effective Perceived Noise Level (EPNL), Noise Criteria (NC) curves, Noise Reduction Rating (NRR), Signal to Noise Ratio (SNR)

c) Non-auditory effects of noise exposure

Physiological/Somatic & psychological responses, stress and health, sleep, audio-analgesia effects on CNS and other senses
Effects of noise on work efficiency and performance

Unit 2:

(14 hrs)

Audiometry in NIHL

Puretone audiometry:

- Base line and periodic monitoring tests, high frequency audiometry, brief tone audiometry, correction for presbycusis
- Instrumentation: Manual audiometer, automatic audiometer
- Testing environment
- High frequency audiometry

Speech audiometry:

Speech discrimination tests with and without the presence of noise
Filtered speech tests and time compressed speech tests
Social Adequacy Index

Other audiological evaluations:

- Impedance audiometry
- ERA
- OAE
- Tests for susceptibility

Unit 3:

(12 hrs)

Noise & vibration measurement

- Instrumentation and procedure for indoor and outdoor measurement of ambient noise, traffic noise, aircraft noise, community noise and industrial noise.

Unit 4: (12 hrs)

Hearing conservation:

Need for hearing conservation program, steps in hearing conservation program Ear protective devices: (EPDs)

- Types: Ear plugs, ear muffs, helmets, special hearing protectors, merits and demerits of each
- Properties of EPDs: Attenuation, comfort, durability, stability, temperature, tolerance
- Evaluation of attenuation characteristics of EPDs.
- Toughening

Unit 5: (12 hrs)

Legislations related to noise:

- Damage Risk Criteria (DRC) – definition, historical aspects, use of TTS and PTS, information in establishing DRC, - Committee on Hearing Bioacoustics & Biomechanics (CHABA), Air Force Regulation (AFR 160-3), American Academy of Ophthalmology & Otolaryngology (AAOO), ASA-Z 24.5, Damage risk contours, Walsh – Healey Act, Occupational Safety & Health Act (OSHA), Environmental Protection Agency (EPA), Indian noise standards.
- Claims for hearing loss: Fletcher point eight formula, AMA method, AAOO formula, California variation in laws, factors in claim evaluation, variations in laws and regulations, date of injury, evaluation of hearing loss, number of tests.
- Indian studies/acts/regulations, American acts.

LIST OF BOOKS

1. Bruel, and Kjaer, (1982), Noise Control - Principles and practices.
2. Harris, C.M. (Ed.2), Handbook of Noise Control New York: McGraw-Hill.
3. Kryter, K.D. (1970). The effects of noise on Man. New York: Academic Press.
4. Tempest, N (1985). The Noise Handbook. London: Assessment Press.
5. Sataloff, R.T. (1987). Occupational hearing loss. Marcel Dekker, Inc.
6. Trivedi, P.R. and Gurudeep Raj (1992). Noise Pollution, 1st Ed. New Delhi: Akashdeep Publishing House.
7. BIS Specifications - List attached
 - IS Specifications - Noise Measurements.
 - IS:7194-1973 Specification for assessment of noise exposure during work for hearing conservation purposes.
 - IS:9167-1979 Specification for ear protectors.

- IS:6229-1980 Method for measurement of real-ear protection of hearing protectors any physical attenuation of earmuffs.
- IS:9876-1981 Guide to the measurement of airborne acoustical noise and evaluation of its effects on man.
- IS:7970-1981 Specification for sound level meters.
- IS:9989-1981 Assessment of noise with respect to community response.
- IS:10399-1982 Methods for measurement of noise emitted by Stationary road vehicles.

SEMESTER VI
B 6.3 BASIC STATISTICS

(80+20 marks)

(Total = 64 hrs)

Objectives:

After studying this paper at the end of the semester, the student should be able to understand the following –

- 1) The basics of statistics and its relevance to the field of speech and hearing
- 2) Carryout calculations of data related to basic statistical operations
- 3) Interpret statistical results at basic level and make inferences

Unit 1

(12hrs)

Introduction to statistics: Its importance in behavioural sciences; descriptive statistics and inferential statistics; usefulness of quantification in behavioural sciences; application to speech and hearing

Unit 2

(12hrs)

Measures: scales of measurement; nominal, ordinal, interval and ratio scales

Data collection: classification of data- class intervals, continuous and discrete measurement, drawing frequency curve, drawing inference from a graph

Unit 3

(12hrs)

Measurement of central tendency: Need, types- mean, median, mode; working out these measures with illustrations

Measures of variability: Need, types of range, deviation- average deviation, standard deviation, variance; interpretation

Unit 4

(14hrs)

Normal distribution: general properties of normal distribution; theory of probability; illustration of normal distribution; area under normal probability curve

Variants from the normal distribution: skewness, kurtosis; their quantitative measurement; Introduction to non-parametric statistics

Unit 5

(14hrs)

Correlation: Historical contribution; meaning of correlation; types of correlation- product-moment correlation, content correlation, rank correlation etc

Standard error sampling distribution; Type I and Type II errors, χ^2 , 't' and 'F'-tests; Methods of significance of differences between means and their interpretation and probability levels-small samples, large samples

LIST OF BOOKS

Compulsory Reading:

- 1) Maxwell, D.L. and Satake, E. (1997). Research and Statistical Methods in Communication Disorders. Baltimore: Williams and Wilkins
- 2) Woods, A., Fletcher, P. and Hughes, A. (1986). Statistics in Language Studies. Cambridge: University Press.

SEMESTER VI
B 6.4 SCIENTIFIC ENQUIRY IN AUDIOLOGY AND
SPEECH LANGUAGE PATHOLOGY

(80+20 marks)

(Total = 64 hrs)

Objectives:

After studying this paper at the end of the semester, the student should be able to understand the following –

- Need for scientific enquiry
- Basics of research in speech and hearing
- Documentation of research

Unit 1

(12 hrs)

1. Scientific status of speech language pathology and audiology
2. Speech language pathology and audiology as a behavioural science
3. Need for scientific enquiry in speech language pathology and audiology
4. Choosing a research problem
5. Formulation of research question
6. Statement of research question
7. Formulation of hypothesis
8. Types of hypotheses

Unit 2

(12 hrs)

1. Parameters for scientific research in speech language pathology and audiology:
 - Identification of variables and the types
 - Types of data and its nature
 - Measurement procedures in speech language pathology and audiology
 - Instrumental and behavioural measures, and recording procedures

Unit 3

(12 hrs)

1. Sampling methods: types, methods of data collection
2. Application of the above with hypothetical illustrations

Unit 4

(14 hrs)

1. Introduction to research methods and designs: Ex post-facto, experimental, standard group comparisons, evaluation research etc
2. Application of these to clinical population and community research

Unit 5

(14 hrs)

1. Documentation of research: Reporting research-organization, analysis and presentation of data
2. Components of research article, report writing style
3. Ethics of research in behavioural sciences
4. Qualities of a researcher/scientific clinician

LIST OF BOOKS

Compulsory Reading:

- 1) Hegde, M.N. Clinical Research in Communicative Disorders- Principles and Strategies. (1994) (2nd Edition). Pro-ed.
- 2) Pannbacker, M.H. and Middleton, G.F. (1994). Introduction to Clinical Research in Communication Disorders. San Diego: Singular Publishing.

Additional/Optional Reading:

- 3) Stein, F. and Cutler, S.K. (1996). Clinical Research in Allied Health and Special Education. San Diego: Singular Publishing Group Inc.
- 4) Portney, L.G. and Walkins, M.P. (1993). Foundations of Clinical Research. Connecticut: Appleton and Lange.

SEMESTER VI

B 6.5 CLINICAL PRACTICUM (a) Speech – Language Pathology - VI

At the end of Semester **VI**, the student should be able to carry out the following –

- a) Assessment of 5 clients with aphasia / autism / LD /TBI / RHD using relevant tests
- b) Planning, writing and executing therapy for 5 patients with apraxia / autism / LD / TBI / RHD
- c) Presenting a case in clinical conference
- d) Counseling in the above patients
- e) Record maintenance

SEMESTER VI
B 6.5 CLINICAL PRACTICUM (b) Audiology - VI

At the end of VI Semester, the student should be able to carry out the following –

Hearing Aid Trial Postings:

1. Hearing aid trial: pre-selection of hearing aids, styles, EAC, other issues, inspection of ear moulds. Functional gain method (10 children & 10 adults). Concept of speech banana, aided audiogram.
2. Observing Real Ear Insertion Gain measurement (10 cases)
3. Pre-selection based on audiological evaluations (10 cases)
4. Hearing Aid trials:
 - a. Functional gain, REIG, other methods with monaural fitting, binaural fitting, Programmable hearing aid – Analog Digital
 - b. Explaining the benefits of hearing aid to the patient/caregiver
5. Counselling patients/caregivers regarding hearing aids – Care, maintenance, adjustments, tips to caregivers regarding acceptance of hearing aids (5 children & 5 adults). Binaural amplification and its uses.
6. Electro-acoustic evaluation of hearing aids (body level & ear level), with and without ear moulds. Equipment for analysis. Calibration of hearing aid analyser.
7. Models and makes available in the market, their EAC, cost of hearing aids, its suitability to various audiogram configurations, age etc.
8. Specification sheets – BIS, ANSI, IEC with respect to hearing aids.
9. Administration of Self (Help) assessment scales.
10. Fitting hearing aids for sloping hearing loss.

Rehabilitation Audiology

1. Role-playing activities for speech reading, communication strategies and auditory learning.
2. Compile activities on management of deaf-blind children.
3. Compile activities on management of children with central auditory processing disorders.
4. Compile information on cochlear implants regarding candidacy, cost, places where it is done and rehabilitation of cases, in Indian contexts.

Diagnostic Audiology/Noise/Rehabilitative Technology:

1. Holistic audiological assessment for differential diagnosis:
 - a. Speech: PI/PB Function, Stenger, BC Speech
 - b. Noise: SAL, SPIN, (10 cases)
 - c. Immittance audiometry: Basic tests, Acoustic Reflex Decay, Eustachian Tube function, SPAR
2. Compiling reports for the above.
3. Testing multiply handicapped children
4. Compile information on cochlear implants reg. candidacy, cost, places where it is done and rehabilitation of cases.
5. Calibration of pure tone audiometry (AC, BC, Speech)
6. Noise measurement and attenuation measurement of ear protection devices.

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