FIRST YEAR

B 1.1 INTRODUCTION TO HUMAN COMMUNICATION

(80+20 marks) (Total = 75hrs)

Objectives:
After studying this paper at the end of the year, the student should be able to understand the following –
1. Human communication, processes involved in communication
2. Interrelation between Hearing, Speech and Language
3. The neurological, psychological, social and acoustic bases of communication

Unit 1 (15 hrs)
1. History and development of the profession of Speech-Language Pathology (SLP) specifically in India
2. Major work activities of the SLP
3. Various settings of service delivery
4. Other professions concerned with communication disorders
5. Human communication:
   - Definition and component
   - Interdependency & interrelation between communication, hearing, speech, and language.
   - Function of communication, speech and language
   - Modes of communication (Verbal & Non-verbal)
   - Characteristics of good speech
6. Interactive bases of human communication
   - genetic bases
   - psychological & cognitive bases
   - social bases
7. Speech as an overlaid function
8. Pre-requisites and factors affecting language and speech development

Unit 2 (15 hrs)
1. Nervous system:
   - Divisions and functions of the nervous system, nerve cell, receptors and synapse, types of nerve fibers. 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

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)

Unit 4

1. Basic Acoustics of speech:

2. Mechanism of speech and language production- II
   - Anatomy and physiology of laryngeal system (including Doppler Effect)
   - Development of voice
   - Bases of pitch and loudness change mechanism

Unit 5

Mechanism of speech and language production- III

- Anatomy and Physiology of Articulatory system
- Development of Articulation
- Anatomy and Physiology of Resonatory system
- Phonetics: Definition and Branches. Brief sketch of articulatory, acoustic and auditory phonetics. Classification Of Speech Sounds viz Segmental (consonants and vowels, semi vowels, dipthongs) and Suprasegmentals (stress, pitch, tone and intonation-) IPA symbols and transcription of sentences of typical speech)
LIST OF BOOKS

Compulsory Reading:


Additional / Optional Reading:

B 1.2 SPEECH - LANGUAGE DEVELOPMENT AND DISORDERS

(80+20 marks) (Total = 75 hrs)

Objectives
After studying this paper at the end of the year, 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 (15 hrs)

Development of speech and Language:

Development of language

- Semantics: A brief introduction to different types of meaning homonyms, synonyms and antonyms.
- Phonology :
- 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 (15 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 at home and school situations, compound / coordinate context and others.

Unit 3 (15 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 (15 hrs)

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

Introduction to assessment procedures, differential diagnosis and management.

Unit 5 (15 hrs)

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

Introduction to assessment procedures, differential diagnosis and management in brief - 5 hrs
LIST OF BOOKS

Compulsory Reading:

Additional/Optional Reading:
2. Thirumalai M. S. Shyamala Chengappa (1988) Simultaneous Acquisition of two languages CIIL, Mysore
B 1.3: INTRODUCTION TO HEARING & HEARING SCIENCES

(80+20 marks)  (Total = 75 hrs)

Objectives:

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

- Basic aspects of auditory system
- Physical and psychophysical basis of sound
- Causes of hearing loss
- Procedures involved in clinical testing – tuning fork tests, AC and BC testing in pure tone audiometry, clinical masking

Unit 1  (03 hrs)

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

Unit 2  (25 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.
- Role of anatomy and physiology in hearing (threshold concept, binaural hearing, head shadow, pinna shadow effect, MAF, MAP – Curve for threshold of hearing) & in understanding causes of hearing impairment.

Unit 3  (10 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 sonograph; computation of relative loudness of two given sounds using these graph. Frequency and intensity, their psychological correlates: dL for frequency and intensity
Unit 4  
- Causes of hearing loss  
- Genetic (congenital, late onset, progressive, syndromic / non-syndromic)  
- Non-Genetic (Congenital/acquired)  
- Importance of case history in identifying the cause of hearing loss

Unit 5  
- Tuning fork tests (Rinne, Weber, Bing, Schwabach), interpretation, merits & demerits.  
- Pure Tone audiometry: Need and scope, Instrumentation, Standards, Permissible ambient noise levels for audiometric testing, Different types of transducers, Basic concepts of AC & BC testing procedures, Theories of bone conduction, Precautions to be taken while testing, Sound field & closed field testing, Factors affecting AC & BC testing, Screening Vs Diagnostic pure tone testing. Interpretation of audiograms, Classification of audiograms, Calibration: Biological and instrumental for AC & BC transducers.  
- 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 conductive hearing loss. Fusion Inferred Test (FIT)  
- Orientation to speech audiometry

LIST OF BOOKS

Compulsory Reading:
10. Speaks Charles. Introduction to Sound.

Additional Reading:
2. Relevant BIS documents & ANSI Document
3. Stach – Clinical Audiology
4. Gelfand – Diagnostic Audiology
B.1.4 TECHNOLOGY AND MANAGEMENT FOR PERSONS WITH HEARING IMPAIRMENT – I

(80+20 marks) (Total = 75 hrs)

Objectives:

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

- Basics of electricity, electronics and digital processing
- Transducers
- Basic components and types of hearing aids
- Ear moulds

Unit 1 (15 hrs)

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


Unit 2 (15 hrs)

1. Microphones as transducers. Velocity microphones. uni-directional microphones M
- Microphone impedance and sensitivity. L

Unit 3

a) Historical development of hearing aids Non-electrical hearing aids, Electric hearing aids
b) Introduction to hearing aid technology: Parts of hearing aids & their functions, Basic elements of hearing aids: Microphone, Amplifier, Receiver, Cords, Batteries, ear moulds.

Unit 4

• Classification of hearing aids. Type of hearing aids, their advantages and limitations:
  -Body level, ear level (BTE, ITE, ITC, CIC).
  -Monaural Vs Binaural Vs Pseudobinaural.
  -AC and BC hearing aids.

• Classroom amplification devices; Group amplification systems– hard wired, induction loop, FM, infrared rays.

Unit 5

• 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,
• 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. Solar Charger and its specifications

LIST OF BOOKS

Compulsory Reading:
5. Audiologist’s desk reference.
Additional Reading:

9. ANSI & IEC Specifications
B 1.5 Basic Medical Sciences related to Speech & Hearing

(80+20 marks) (Total = 75 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

Unit 1 (15 hrs)

(a) General introduction, definitions, Coronal / sagittal / 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, mechanism of respiration – internal and external influence, nervous control – vital capacity – tidal volume, residual air, artificial respiration (in brief).

Unit 2 (15 hrs)

(a) Definition of inflammation, infection, tumor – benign & malignant, tissue healing.

(b) 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).

(c) Endocrine system: Definition of hormone, functions of thyroid hormone, growth hormone, androgen, testosterone and its influence in voice disorders.

Unit 3 (15 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 (15 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 (15 hrs)
(a) Anatomy & Physiology of larynx – physiology of phonation / physiology of respiration.

LIST OF BOOKS
Compulsory Reading:

Additional / Optional Reading:
B.1.6 PSYCHOLOGY RELATED TO SPEECH AND HEARING

(80+20 marks) (75 hrs.)

Objectives

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

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

Unit 1

(15 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.
- Disorders of infancy, childhood and adolescence association with hearing and speech and language disorders – Mental Retardation, Learning Disorders, Communication Disorders, Attention Deficit Hyperactivity Disorder, Conduct Disorders.

Unit 2

(15 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

(15 hrs)

- Cognitive Psychology – Introduction, Definition and theoretical perspectives (David Rumelhart and David Mc Clelland, Noam Chomsky, George Miler, Allan Newell). Applications of cognitive psychology in the field of speech and hearing.
- Intelligence – definition, theories and factors affecting intelligence
- Neuropsychology – Introduction, definition, principles of neuropsychological assessment, diagnosis and rehabilitation.
- Applications of neuropsychology in the field of speech and hearing.
Unit 4  
(15 hrs)
- Psychodiagnostics – Case history taking, Mental status examination, behavioural analysis, psychological testing.
- Play as a therapeutic tool
- Counselling – Meaning and definition, types of counseling, Counseling in rehabilitation practice.

Unit 5  
(15 hrs)
- Developmental Psychology – Introduction, definition, principles, motor development, emotional and social development
- Cognitive development – definition, Piaget’s Theory
- Personality Development – Introduction, theories, hallmarks of the well adjusted personality, hazards in personality development.

LIST OF BOOKS

Compulsory Reading:

3) Coleman J.C. Abnormal Psychology and Modern Life, Taraporevala Sons & Co.
4) Cognitive Neuro-Science of Development by Michalle de Hank & Mark H. Johnson
5) Application of Counselling in Speech-Language Pathology and Audiology – Thomas A. Crowe, Acc. No. 12917, 6.8.5506

Additional/Optional Reading:

B 1.7 Clinical Practicum Speech Language Pathology

(50+50 marks)

To include IPA for normal samples
To include tests: LPT, PAT, Reynell's scale, LST - cognitive prerequisites for language learning

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 AYJNHH 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

Maintenance of a clinical work record to be submitted at the end of the term
1. Observation of therapy of 10 clients with speech language disorders.
2. Observation of a minimum of 5 diagnostic clients and 5 therapy clients
3. Developing therapy material specific to 10 clients they have observed

   Writing of observation reports of the above Maintenance of a clinical diary
1. Public information materials (avideos, pamphlets, booklets etc.)

2. Taking case histories of 10 adults and 10 children with normal hearing and with hearing impairment under supervision.


4. Under going pure-tone audiometry. Becoming familiar with different types to sound stimuli used for assessment of hearing and sound generator software’s.

5. Identifying the different types of audiometer (at least 1 portable and 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. Stud the same and report the status of the same.

6. Preparing 0 dB HL equivalent chart with different earphone/ear cushion combination.

7. Obtain audiograms of 10 normal subjects.

8. Observations / Participation during audiological evaluation on a variety of cases under supervision. Plot the audiograms; calculate of Inter-aural attenuation, Occlusion effect.

9. Obtaining audiograms under supervision on 20 adults clients (AC & BC)

10. Obtaining audiograms with masking (5 cases)

11. Classify audiograms as per : nature of hearing loss
    - Nature of hearing loss
    - Degree of hearing loss
    - Contour of audiograms

12. Observe calibration of audiometers (Demonstration) – AC/BC/Sound field, instruments used, identifying the instruments, combination of equipments of different types of calibration, preparing correction charts.