SECOND YEAR

B.2.1 SPEECH LANGUAGE DIAGNOSTICS AND THERAPEUTICS

(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 –

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

A. Speech language diagnostics

Unit 1

1. Basic terminologies and concepts
   - Introduction to diagnostics
   - Terminologies in the diagnostic process
   - General principles of diagnosis
   - Diagnostic setup and tools

Unit 2

1. Diagnostic approaches and methods
   - Client history – definition, description, utility & need. Essential factors to be included in the client history form – comparison of adults vs. children’s history – usefulness of the client history
   - Approaches to diagnosis – importance of diagnosis in client history, essential factors to be included according to the conditions/disorders. Methods of taking 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 observation, diagnosis by exclusion, diagnosis by treatment, instrumental diagnosis, provocative diagnosis, provisional diagnosis; advantage/disadvantages
   - Team approach to diagnosis
   - Characteristics of a good clinician as diagnostician
B. Speech therapeutics

Unit 3  
1. Basic concepts of therapeutics  
   • Terminologies in speech therapeutics  
   • General principles of speech and language therapy  
   • Speech therapy set-up  
   • Types of speech and language therapy  
   • Individual and group therapy  
   • Integrated and inclusive education

Unit 4  
1. Procedures for speech-language therapy  
   • Approaches to speech and language therapy – formal, informal and eclectic approaches  
   • Planning for speech and language therapy – goals, steps, procedures, activities

2. 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  
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:


Additional / Optional Reading:

B 2.2 ARTICULATION AND PHONOLOGICAL DISORDERS

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

After studying this paper at the end of the year, 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 (20hrs)

1. Review of phonological development and articulatory mechanism
2. Fundamentals of Articulatory phonetics
3. Definition and types of coarticulation
4. Supra segmental aspects
5. Transcription methods in perceptual analysis
6. Phonological processes – types, language specific issues, identification and classification of errors
8. Acoustic aspects of production and perception of speech sounds; use of spectrograms

Unit 2 (15 hrs)

1. Factors related to articulation and phonological disorders:
   Structural
   Cognitive – Linguistic
   Neurological
   Psychosocial
   Social
   Metalinguistic
2. Transcription methods in perceptual analysis
3. Phonological processes – types, language specific issues, identification and classification of errors.
5. Acoustic aspects of production and perception of speech sounds; use of spectrograms
Unit 3  Oral anomalies / abalations (20 hrs)

Cleft lip and palate:

1. Etiological factors
2. Developmental biology of the face and palate
3. Syndromes – Pierre – Robin’s, Treacher – Collin’s, Crouzon’s disease
4. The velopharyngeal mechanism muscles and functions
5. Types of cleft lip and palate
6. Classification systems
7. Team management composition, responsibilities, co-ordinator
8. Speech and language problems of individuals with cleft
9. Associated problems of individuals with cleft hearing, dental, psychosocial, physical.
10. Diagnostic procedures and instruments used in assessment of speech.
11. Treatment Concepts – Surgical repair of cleft lip, palate and velopharynx (outline)
12. Treatment procedures for speech.
13. Prosthetic speech appliances for patients with cleft palate.

Glossectomy

1. Effect of partial and total glossectomy on speech
2. Characteristics of glossectomy speech
3. Rehabilitation of speech
4. Prosthetic fitting, design, assessment
5. Effects on swallow
6. Rehabilitation of swallow

Unit 4 (10 hrs)

Assessment procedures: Types of assessment, sampling procedures, scoring procedures, criteria for selection of instruments for assessment.

Assessment of Oral peripheral mechanism

Speech sound discrimination, stimulability and oral stereognosis

Analysis and interpretation of data:

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

5. Characteristics of disordered phonology and differential diagnosis
Unit 5

(10 hrs)

Intervention: Stages of treatment and measuring improvement, long term goals, short term goals and activities for achieving goals in cases with misarticulation.

Issues in maintenance and generalization.

Team approach and professional communication (inter, intra professional and client oriented)

Approaches to treatment: motokinesthetic, traditional approaches integral stimulation, phonological, distinctive feature, minimal contrast therapy, learning theories, programmed, paired – stimuli.

Computerized intervention packages, metaphon therapy

LIST OF BOOKS

Compulsory Reading:

Additional/Optional Reading:
B.2.3 VOICE AND LARYNGECTOMY

(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:

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

Unit 1 (15 hrs)

Characteristics of normal voice: Physiological, acoustical and aerodynamic correlates
Development: Birth to senescence; including age-related changes
Theories of phonation
Classification of abnormal voice
Voice disorders in other conditions:
  - Voice disorders related to resonatory problems
  - Voice problems in conditions like Hearing impairment and deaf blind
  - Voice problems in Endocrine disorders

Unit 2 (15 hrs)

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 (15 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  (15 hrs)

Laryngectomy:
- Types and characteristics of laryngeal surgery
- Assessment of a laryngectomee and associated problems
- Management of 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  (15 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:

Additional/Optional Reading:
B 2.4 : DIAGNOSTIC AUDIOLOGY

(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 –

• need for test battery approach
• indications for administering different audiological tests
• procedures for identifying an individual with pseudohypacusis
• administration and interpretation of tests for APD

Unit 1 (12 Hours)

1. Introduction to Diagnostic Audiology:
   • Need for test battery approach in auditory diagnosis & integration of results of audiological tests.
   • Indications for administering audiological tests to identify Cochlear pathology, Retro-cochlear pathology, functional hearing loss, Central-processing disorders.

2. Tests to differentiate between cochlear & retro-cochlear pathology
   • 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. Speech discrimination tests with and without the presence of noise. Filtered speech tests and time compressed speech tests. Social Adequacy Index
   • ABLB, MLB
   • SISI
   • Test for adaptation
   • Bekesy Audiometry
   • Brief tone audiometry

Unit 2 (18 Hours)

3. Immittance Audiometry
   • Introduction, Principle of Immittance audiometry, Instrumentation,
   • Tymanometry – Tymanometric peak pressure, static immittance, gradient/tymanometric width.
   • Reflexometry – Ipsilateral & contralateral acoustic reflexes, special tests
   • Clinical application of Immittance evaluation
Unit 3  
4. Auditory Brainstem Response  
   • Introduction & classification of AEPs, Instrumentation, Test procedure, factors affecting Auditory Brainstem Responses, Interpretation of results & clinical application,  
   • ECOG, early response  
   • Middle & Long latency auditory evoked potentials – test procedure, factors affecting  
   • MLR & LLR, Interpretation of results & clinical application.

Unit 4  
5. Otoacoustic Emissions  
   Introduction, classification of OAEs, Instrumentation, measurement of OAE procedure, interpretation of results & clinical applications.

6. Tests to detect Pseudohypoacusis  
   • Pure tone tests including tone in noise test, Stenger test  
   • Speech tests including Lombard test, Stenger test, Lip-reading test, Doelfler-Stewart test.  
   • Identification of functional hearing loss

7. Vestibular testing

Unit 5  
8. Central Auditory Disorders  
   (a) Definition, terminologies used, incidence & causes, indications for administration of CAD test, rationale for CAD tests.  
   (b) Tests to detect Central Auditory Disorders  
      • Monoaural low redundancy tests  
      • Filtered speech tests  
      • Time compressed speech tests  
      • Speech-in-noise test  
      • SSI with ICM  
      • Other monoaural low redundancy tests  
   (c) Dichotic speech tests  
      • Dichotic digit test  
      • Staggered spondaic word test  
      • Dichotic CV test  
      • SSI with CCM  
      • Competing sentence test  
      • Other dichotic speech tests
(d) Binaural interaction tests
  - RASP
  - Binaural Fusion Test (BST)
  - MLD
  - Other binaural interaction tests

(e) Temporal ordering tasks
  - Pitch pattern test
  - Duration pattern tests
  - Other temporal ordering tests

(f) Variables influencing Central Auditory Assessment
  - Procedural variables
  - Subject variables

(g) Test findings in subjects with central auditory disorders
  - Brainstem lesion
  - Cortical & hemispheric lesion
  - Interhemispheric dysfunction
  - CAPD in children
  - CAPD in elderly

(h) Other special test – Minimal auditory capability test, SPIN, HINT, CST.

**LIST OF BOOKS**

Compulsory Reading:
5. ISHA Battery
6. Katz, Handbook of Clinical Audiology 4\textsuperscript{th}/5\textsuperscript{th} edn.
7. Rintleman – Contemporary issues in audiology

Additional Reading:
5. Relevant IS documents
B 2.5 TECHNOLOGY & MANAGEMENT FOR PERSONS WITH HEARING IMPAIRMENT – II

(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 –

- importance of early identification
- different methods and approaches to train children with hearing impairment
- educational options for children with hearing impairment
- classification of hearing aids
- setting up of classrooms for children with hearing impairment
- electroacoustic characteristics
- selection of hearing aids

Unit 1 (15 hrs)

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

Unit 2 (15 hrs)

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

Unit 3 (15 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 Tracy Clinic, SKI-HI), follow up
- Setting up class rooms for the hearing handicapped, Classroom acoustics
- Preferential seating and adequate illumination
Unit 4 (15 hrs)

A) 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
   d) EAC of hearing aid along with ear mould.

B) 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

C) Signal processing in hearing aids
   BILL, TILL, PILL
   Programmable and digital hearing aids
   Signal enhancing technology

Unit 5 (15 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/multiply 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:

Additional Reading:
14. Correspondence Program for Parents of the Deaf, John Tracy clinic.

B 2.6 PAEDIATRIC AUDIOLOGY
Objectives:

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

- development of auditory system and behaviour
- early identification procedures using subjective and objective measures
- diagnostic tests for the paediatric population

Unit 1  
(15 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  
(15 hrs)


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  
(15 hrs)

a. Objective screening tests: Immittance, Evoked potentials, OAE,


c. Individual and group screening / Mass media screening tests

d. Importance of follow-up.

Unit 4  
(15 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.

c) Factors affecting speech audiometry results in children, BC speech audiometry
Unit 5 (15 hrs)

a) Functional hearing loss in children: Signs/symptoms, Tests
b) Central Auditory Processing Disorders in children: Signs/symptoms, Screening tests
c) Use of physiological tests in children
   • Intermittance audiometry in the pediatric population
   • Auditory Brainstem Response in pediatric population
   • OAE findings in the pediatric population.

LIST OF BOOKS

Compulsory Reading:

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

- The basics of statistics and its relevance to the field of speech and hearing
- Carryout calculations of data related to basic statistical operations
- Interpret statistical results at basic level and make inferences
- Need for scientific enquiry
- Documentation of research

Part A: Basic Statistics  (38Hrs)

Unit 1  (6 Hrs)
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  (9 Hrs)
- 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  (5 Hrs)
- Measurement of central tendency: Need, types- mean, median, mode; working out theses measures with illustrations
- Measures of variability: Need, types of range, deviation- average deviation, standard deviation, variance; interpretation

Unit 4  (8 Hrs)
- 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  (10 Hrs)
Correlation: Historical contribution; meaning of correlation; types of correlation product-moment correlation, content correlation, rank correlation etc 73 Standard error sampling distribution; Type I and Type II errors, Y2, ‘t’ and ‘F’- tests; Methods of significance of differences between means and their interpretation and probability levels-small samples, large samples
Part B: Research Methods in Audiology and Speech Language Pathology (37Hrs)

Unit 1 (10 Hrs)
• Scientific status of speech language pathology and audiology; speech language pathology and audiology as a behavioural science; need for scientific enquiry in speech language pathology and audiology; choosing a research problem, formulation of research question, statement of research question, formulation of hypothesis, types of hypotheses

Unit 2 (9 Hrs)
• 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 (6 Hrs)
• Sampling methods: types, methods of data collection
• Application of the above with hypothetical illustrations

Unit 4 (6 Hrs)
• Introduction to research methods and designs: Ex post-facto, experimental, standard group comparisons, evaluation research etc.
• Application of these to clinical population and community research

Unit 5 (6 Hrs)
• Documentation of research: Reporting research-organization, analysis and presentation of data
• Components of research article, report writing style
• Ethics of research in behavioural sciences
• Qualities of a researcher/scientific clinician

LIST OF BOOKS
Compulsory Reading:

Additional/Optional Reading:
1. Carry out informal and formal assessment procedures for the following aspects of speech and language (from a normal child – 2 samples)
   i) Pre-linguistic skills
   ii) Non-verbal communication
   iii) Child directed speech
   iv) Semantics
   v) Syntax and morphology
   vi) Pragmatics
   vii) Phonological process and its analysis
   viii) Speech intelligibility
   ix) Transcription of the sample in IPA should be done.

2. Familiarization of the tools used for evaluation and treatment of Childhood communication disorders, Articulation and Phonological Disorders, Maxillofacial anomalies:
   i) Receptive Expressive Emergent Language Scale
   ii) Scale for Early communication Skills in Hearing Impaired children
   iii) 3-Dimensional Language Acquisition Test
   iv) Northwest Syntax Screening Test
   v) Bankson’s Language Screening Test
   vi) Test for Examining Expressive Morphology
   vii) Autism Behaviour Composite Checklist and Profile
   viii) Linguistic Profile Test
   ix) Tests for learning Disability
   x) Screening Test for Developmental Apraxia of Speech
   xi) Articulation assessment tests in different Indian languages
   xii) Voice Handicap Index and other perceptual scales
   xiii) Other Indian tests and materials available

3. Presentation of 5 cases of detailed assessment and therapy plans (1 each at least under each category), using information from relevant proformae, tests administered and treatment options

4. i) Perceptual analysis of 5 normal and 2 abnormal voice disorder samples
   ii) Measurement of the following parameters in 5 normal samples and 5 samples with voice disorders:
      . Measurement of Fo, Amplitude, Diadochokinetic Rate, Maximum Phonation Duration, s/z ratio, Vital capacity and Mean Air Flow Rate
      . Exposure to Electroglottogram and Perturbation measurements using software
      . Measures of suprasegmental aspects
5. • Transcription and analysis of phonological processes in children using IPA
  • Familiarization with cerebral palsy assessment, reflex testing

6. Planning and executing a minimum of 5 cases (including child and adult) for approximately 5 sessions each and preparation of the following:
   • Carry out baseline evaluation
   • Preparation of pre therapy reports
   • Develop proficiency in using various therapy techniques for childhood communication disorders, voice disorders, articulation and phonological disorders
   • 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
   • Being aware of various centers available for rehabilitation (local, national, international)

7. Counselling parents of children with childhood communication disorders, voice disorders, articulation and phonological disorders; Compiling relevant counseling points pertaining to each of the above mentioned disorders

8. Maintaining audio samples used for the practical analysis

9. Practice in writing sample diagnostic and therapy reports (for real/hypothetical cases)

10. Compiling the clinical work done into a clinical work record for submission
B 2.9 CLINICAL PRACTIUM AUDIOLOGY

(50+50 marks)

Section A: Diagnostic Audiology

1. Familiarization of instrumentation for speech audiometry, immittance audiometry, sound field-testing.
2. 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: familiarizing with speech test material in at least 2 Indian languages, mastering live voice presentation/recorded presentation, administering SAT, SRT, WRS, MCL, UCL, PI/PB function test.
5. 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.
   - Routine pure tone & speech audiometry
   - Administering special tests using pure tone: Tone Decay Test, STAT, SISI, ABLB, MLB, SPAR, Test for functional hearing loss.
7. Immittance Audiometry (minimum of 5 cases) – PVT, Tympanometry, Acoustic Reflex testing (ipsi & contra). Interpretation of the findings taking into consideration the ENT reports.
8. 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

Section B: Rehabilative Audiology

1. Speech and language characteristics of the deaf
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. Counselling parents regarding educational placement of the hearing impaired.

Section C: 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.