



# **AMRITA SCHOOL OF MEDICINE**

## **Centre for Allied Health Sciences**

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## **PROGRAM**

# **Bachelor in Audiology and Speech**

# **Language Pathology (BASLP)**

**(Revised with effect from 2017-2018 onwards)**



**A Super Speciality Tertiary Care Hospital Accredited by ISO 9001-2008, NABL & NABH**

# Our Chancellor



## **SPIRITUAL PRINCIPLES IN EDUCATION**

**“In the gurukulas of ancient rishis, when the master spoke it was love that spoke; and at the receiving end disciple absorbed of nothing but love. Because of their love for their Master, the disciples’ hearts were like a fertile field, ready to receive the knowledge imparted by the Master. Love given and love received. Love made them open to each other. True giving and receiving take place where love is present. Real listening and ‘sradha’ is possible only where there is love, otherwise the listener will be closed. If you are closed you will be easily dominated by anger and resentment, and nothing can enter into you”.**

**“Satguru Mata Amritanandamayi Devi”**

## **Introducing AIMS**

India is the second most populous nation on earth. This means that India's health problems are the world's health problems. And by the numbers, these problems are staggering 41 million cases of diabetes, nearly half the world's blind population, and 60% of the world's incidences of heart disease. But behind the numbers are human beings and we believed that every human being has a right to high-quality healthcare.

Since opening its doors in 1998, AIMS, our 1,200 bed tertiary care hospital in Kochi, Kerala, has provided more than 4 billion rupees worth of charitable medical care; more than 3 million patients received completely free treatment. AIMS offers sophisticated and compassionate care in a serene and beautiful atmosphere, and is recognized as one of the premier hospitals in South Asia. Our commitment to serving the poor has attracted a dedicated team of highly qualified medical professionals from around the world.

The Amrita Institute of Medical Sciences is the adjunct to the term "New Universalism" coined by the World Health Organization. This massive healthcare infrastructure with over 3,330,000 sq. ft. of built-up area spread over 125 acres of land, supports a daily patient volume of about 3000 outpatients with 95 percent inpatient occupancy. Annual patient turnover touches an incredible figure of almost 800,000 outpatients and nearly 50,000 inpatients. There are 12 super specialty departments, 45 other departments, 4500 support staff and 670 faculty members.

With extensive facilities comprising 28 modern operating theatres, 230 equipped intensive-care beds, a fully computerized and networked Hospital Information System (HIS), a fully digital radiology department, 17 NABL accredited clinical laboratories and a 24/7 telemedicine service, AIMS offers a total and comprehensive healthcare solution comparable to the best hospitals in the world. The AIMS team comprises physicians, surgeons and other healthcare professionals of the highest caliber and experience.

AIMS features one of the most advanced hospital computer networks in India. The network supports more than 2000 computers and has computerized nearly every aspect of patient care including all patient information, lab testing and radiological imaging. A PET (Positron Emitting Tomography) CT scanner, the first of its kind in the state of Kerala and which is extremely useful for early detection of cancer, has been installed in AIMS and was inaugurated in July 2009 by Dr. A. P. J. Abdul Kalam, former President of India. The most recent addition is a 3 Tesla Silent MRI.

The educational institutions of Amrita Vishwa Vidya Peetham, a University established under section 3 of UGC Act 1956, has at its Health Sciences Campus in Kochi, the Amrita School of Medicine, the Amrita Centre for Nanosciences, the Amrita School of Dentistry, the Amrita College of Nursing, and the Amrita School of Pharmacy, committed to being centres of excellence providing value-based medical education, where the highest human qualities of compassion, dedication, purity and service are instilled in the youth.

Amrita School of Ayurveda is located at Amritapuri, in the district of Kollam. Amrita University strives to help all students attain the competence and character to humbly serve humanity in accordance with the highest principles and standards of the healthcare profession.

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# Part I

## Rules and Regulations

## Under Graduate Programmes (Bachelor of Sciences)

<b>I.1. Details of Under Graduate Courses :</b>			
<b>Sl. No.</b>	<b>Course</b>	<b>Duration</b>	<b>Conditions of Eligibility for admission to the course</b>
1	Medical Laboratory Technology (MLT)	4 years	Pass in plus Two with 50% marks with Physics, chemistry and Biology
2	Medical Radiologic Technology (MRT)	4 Years	First class in plus two with Mathematics, Physics, Chemistry, and Biology
3	Emergency Medical Technology	3 Years + One year internship	Pass in plus two with 50% marks in Physics, Chemistry and Biology.
4	Anaesthesia Technology	3 Years + One year internship	Pass in plus two with 50% marks in Physics, Chemistry and Biology
5	Respiratory Therapy (RT)	3 Years + one year Internship	Pass in plus two with 50% marks in Physics, Chemistry and Biology
6	Dialysis Therapy	3 Years + One year internship	Pass in plus two with 50% marks in Physics, Chemistry and Biology
7	Physician Assistant	3 years + one year internship	Pass in plus two with 50% marks in Physics, Chemistry and Biology.
8	Cardio Vascular Technology (CVT)	3 Years + One year internship	Pass in plus two with 50% marks in Physics, Chemistry and Biology.
9	Echocardiography Technology	3 Years + One year internship	Pass in plus two with 50% marks in Physics, Chemistry and Biology.
10	Cardiac Perfusion Technology (CPT)	3 Years + One year internship	Pass in plus two with 50% marks in Physics, Chemistry and Biology.
11	Diabetes Sciences	3 years + One year internship	Pass in plus two with 50% marks in Physics, Chemistry and Biology.
12	Optometry	3 Years + One year Internship	Pass in plus two with 50% marks in Physics, Chemistry and Biology
13	Optometry (Lateral Entry )	2 Years + One year Internship	Pass in two year Diploma in Optometry
14	Bachelor of Audiology & Speech Language Pathology (BASLP)	3 years + One year internship	Pass in plus two with 50% marks in Physics, Chemistry and Biology.
15	Neuroelectrophysiology	3 years + One year internship	Pass in plus two with 50% marks in Physics, Chemistry and Biology.

## I.2. Medium of Instruction :

English shall be the medium of instruction for all subjects of study and for examinations.

### **I.3. Eligibility :**

Generally Science Graduates with Physics, Chemistry, Biology are eligible for admission to the Under Graduate Courses except in respect of certain specialties for which other qualification or subjects are specifically called for. Essential qualifications for eligibility are mentioned under clause No. I.1

## **II. General Rules :**

Admissions to the courses will be governed by the conditions laid down by the University from time to time and as published in the Regulations for admissions each year.

### **II.1. Duration of the Course**

Duration details are mentioned under clause No. I.1 of this booklet.

Duration of the course	: 4 Years (3 years + 10 months Internship)
Weeks available per year	: 52 weeks
Vacation / holidays	: 5 weeks (2 weeks vacation + 3 weeks calendar holidays)
Examination (including preparatory)	: 6 weeks
Extra-curricular activities	: 2 weeks
Weeks available	: 39 weeks
Hours per week	: 40 hours
Hours available per academic year	: 1560 (39 weeks x 40 hours)

Internship wherever specified are integral part of the course and 50% period of internship (5 months) needs to be done in Amrita Institute of Medical Sciences, Amrita School of Medicine, Kochi itself. Remaining 50% of internship (5 months) should be done in centres outside the parent institute.

### **II.2. Discontinuation of studies**

Rules for discontinuation of studies during the course period will be those decided by the Chairman /Admissions, Amrita School of Medicine, and Published in the "Terms and Conditions" every year.



### **II.3. Educational Methodology**

Learning occurs by attending didactic lectures, as part of regular work, from coworkers and senior faculty, through training offered in the workplace, through reading or other forms of self-study, using materials available through work, using materials obtained through a professional association or union, using materials obtained on students own initiative, during working hours at no cost to the student.

### **II.4. Academic Calendar**

#### **Annual Scheme**

#### **FIRST YEAR**

Commencement of classes	– August 2016
First sessional exam	– November 2016
Second sessional exam	– February 2017
Model Exam (with practical)	– May – June 2017 (one week of study leave)
University exam (with practical)	– June – July 2017 (10 days of study leave)
Annual Vacation	– 3 weeks after the University examination

#### **SECOND YEAR**

Commencement of classes	– August 2017
First sessional exam	– November 2017
Second sessional exam	– February 2018
Model Exam (with practical)	– May - June 2018 (one week of study leave)
University exam (with practical)	– June - July 2018 (10 days of study leave)
Annual Vacation	– 2 weeks after the University examination.

#### **THIRD YEAR**

Commencement of classes	– August 2018
First sessional exam	– November 2018
Second sessional exam	– February 2019
Model Exam (with practical)	– May 2019 (one week of study leave)
University exam (with practical)	– June 2019 (10 days of study leave)
Annual Vacation	– 1 week after the University examination.

#### **INTERNSHIP**

Commencement of internship	– 01 August 2019
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### **III. Examination Regulations :**

#### **III.1. Attendance :**

**75% of attendance (physical presence) is mandatory.** Medical leave or other types of sanctioned leaves will not be counted as physical presence.

Attendance will be counted from the date of commencement of the session to the last day of the final examination in each subject.

#### **III.2. Internal Assessment :**

**1. Regular periodic assessment shall be conducted throughout the course. At least two sessional examinations in theory and preferably two practical examinations should be conducted in each subject. The model examination should be of the same pattern of the University Examination. Average of the two examinations and the marks obtained in assignments / oral / viva / practicals also shall be taken to calculate the internal assessment.**

**2. The internal assessment will be done by the department thrice during the course period in a gap of not more than three months and final model exam which will be the same pattern of university examination as third sessional examination. The period for sessional examinations of academic year are as follows :**

**·First Sessional Exam : November**

**·Second Sessional Exam : February**

**·Model Exam : May /June**

3. Each student should maintain a logbook and record the procedures they do and the work patterns they are undergoing. It shall be based on periodical assessment, evaluation of student assignment, preparation for seminar, clinical case presentation, assessment of candidate's performance in the sessional examinations, routine clinical works, logbook and record keeping etc.

4. Day to day assessment will be given importance during internal assessment. Weightage for Internal assessment shall be 20% of the total marks in each theory subject and 50% of the total marks in each practical/viva voce.

5. Sessional examination as mentioned above and the marks will be conducted and secured by the students along with their attendance details shall be forwarded to the Principal (Result of the first sessional examination should reach before December 1<sup>st</sup> week of the academic year and result of the second sessional examination should reach to the Principal before March 1<sup>st</sup> week of the academic year)

6. Third sessional examinations (model exam) shall be held three to four weeks prior to the University Examination and the report shall be made available to the Principal ten days prior to the commencement of the university examination.

### **III.3. University Examinations:**

- University Examination shall be conducted at the end of every academic year.
- A candidate who satisfies the requirement of attendance as stipulated by the University shall be eligible to appear for the University Examination.
- One academic year will be twelve months including the days of the University Examination. Year will be counted from the date of commencement of classes which will include the inauguration day.
- The minimum pass for the University Examination is 50%. The student should score a total of 50% (adding the internal and external examination) to pass in each subject (separately for theory and practical)
- If a candidate fails in practical paper, he/she shall not be eligible for admission to next academic year.
- Maximum number of attempts permitted for each paper is five (5) including the first attempt.
- The maximum period to complete the course shall not exceed 6 years.
- All practical examinations will be conducted in the respective clinical areas.
- One internal and external examiner should jointly conduct the theory evaluation for each student during the final year.

### **III.4. Eligibility to appear university Examination :**

A student is qualified to appear for University Examination provided he/she satisfies percentage of attendance requirement as already mentioned at the III (1) of the clause.

### **III.5. Valuation of Theory – Revaluation Papers :**

1. Valuation work will be undertaken by the examiners in the premises of the Examination Control Division in the Health Sciences Campus.
2. There will be **Re-Valuation** for all the University examinations. Fees for revaluation will be decided by the Principal from time to time.
3. Application for revaluation should be submitted within 5 days from date of result of examination declared and it should be submitted to the office with payment of fees as decided by the Principal.

### **III.6. Supplementary Examinations :**

Every main University examination will be followed by a supplementary examination which will normally be held within four to six months from the date of completion of the main examination.

As stipulated under clause No.III.2 under Internal Assessment,HOD will hold an internal examination three to four weeks prior to the date of the University Examination. Marks secured in the said examination or the ones secured in the internal examination held prior to the earlier University Examination whichever is more only will be taken for the purpose of internal assessment. HODs will send such details to the Principal ten days prior to the date of commencement of University examination.

Students who have not passed / cleared all or any subjects in the first University examination will be permitted to attend the second year classes and also eligible to appear for second year university examination along with first year supplementary examination. However, he / she can appear for the third (final) year university examination, only if he / she clears all the subjects in the first as well as in the second year examinations.

Same attendance and internal marks of the main examination will be considered for the supplementary examination, unless the HOD furnish fresh internal marks and attendance after conducting fresh examination. Students of supplementary batches are expected to prepare themselves for the University Examinations. No extra coaching is expected to be provided by the Institution. In case at any time the Institution has to provide extra coaching, students will be required to pay fees as fixed by the Principal for the said coaching.

### **III.7. Rules regarding carryover subjects:**

A candidate will be permitted to continue the second and third year respectively of the course even if he/she has failed in the first or second year university examinations.

A candidate must have passed in all subjects to become eligible to undergo compulsory internship of one year, for the candidates who have not passed all the subjects the duration of the third year shall be extended until they become eligible to undergo compulsory internship.

#### **IV. Criteria for Pass in University Examination - Regulations:**

##### **IV.1. Eligibility criteria for pass in University Examination:**

The passing criteria for BASLP shall be combined 50% (i.e. internal + university examination) in each paper.

##### **IV.2. Evaluation and Grade:**

1. Minimum mark for pass shall be 50% in each of the theory and practical papers separately (including internal assessment) in all subjects.
2. A candidate who passes the examination in all subjects with an aggregate of 50% marks and above and less than 65% shall be declared to have passed the examination in the second class.
3. A candidate who passes the examination in all subjects in the first attempt obtaining not less than 65% of the aggregate marks for all the three years shall be declared to have passed the examination with First Class.
4. A candidate who secures an aggregate of 75% or above marks is awarded distinction. A candidate who secures not less than 75% marks in any subject will be deemed to have passed the subject with distinction in that subject provided he / she passes the whole examination in the first attempt.
5. A candidate who takes more than one attempt in any subject and pass subsequently shall be ranked in pass class in that particular subject only.
6. A Candidate passing the entire course is placed in Second class / First class / Distinction based on the cumulative percentage of the aggregate marks of all the subjects in the I, II and III (Final) university examinations
7. Rank in the examination : - Aggregate marks of all three year regular examinations will be considered for awarding rank for the B.Sc Graduate Examination. For the courses where the number of students are more than 15 only, rank will be calculated as under :

·Topmost score will be declared as First Rank

- Second to the topmost will be declared as Second Rank
- Third to the topmost will be declared as Third Rank.

## **V. Internship:**

### **V.1. Eligibility for Internship - Regulations :**

Students should spend minimum of 50% period of internship outside Amrita Institute of Medical Sciences, Kochi campus. A candidate must have passed in all subjects to become eligible to undergo compulsory internship of 10months. For the candidates who have not passed all the subjects the duration of the third year shall be extended until they become eligible to undergo compulsory internship. "Internship has to be done continuously for a period provided in the syllabus except in extra ordinary circumstances where subject to the approval of the Principal the same may be done in not more than two parts with an interruption not exceeding six months. In any case Internship shall be completed within 18 months from the date of acquiring eligibility to the internship.

### **V.2. Attendance and leave details during Internship:**

For 30 days of duty an intern will be eligible for casual leave and one weekly off.

A Student will become eligible to receive his/her degree only after completion of internship to the complete satisfaction of the Principal.

## **VI. General considerations and teaching / learning approach:**

There must be enough experience to be provided for self learning. The methods and techniques that would ensure this must become a part of teaching learning process.

Proper records of the work should be maintained which will form the basis for the students assessment and should be available to any agency who is required to do statutory inspection of the school of the course.

# Part II Syllabus

## SCHEME OF EXAMINATION

There shall be a university examination at the end of each academic year. Duration of each theory paper shall be for 3hours. Every theory paper shall comprise of seven questions out of which the students should write five. Each question shall carry 16marks with internal division of 10+6, 8+8 etc.

### MODEL QUESTION PAPER

**Maximum mark-80**  
**Time- 3hours**

**Answer any five:**

**PAPER TITLE**  
**PAPER CODE**

I

Sl. No	Question no.	Marks
I	xxxxxxxxx	16
II	A xxxxxxxxxxx B xxxxxxxxxxx	8 8
III	A xxxxxxxxxxx B xxxxxxxxxxx	10 6
IV	xxxxxxxxx	16
V	xxxxxxxxx	16
VI	xxxxxxxxx	16
VII	A xxxxxxxxxxx B xxxxxxxxxxx C xxxxxxxxxxx D xxxxxxxxxxx E xxxxxxxxxxx	4x4



## SCHEME OF CURRICULUM FOR BASLP

### FIRST YEAR

Code no.	Paper title	Teaching hrs/week (min.)	Total hrs/week (min.)	Exam dur. (hrs)	Exam marks	I.A. marks	Total marks
B 1.1	Intro. to human communication	3	75	3	80	20	100
B 1.2	Speech-language dev. & disorders	3	75	3	80	20	100
B 1.3	Intro. to hearing & hearing sciences	3	75	3	80	20	100
B 1.4	Technology & Management for persons with HII	3	75	3	80	20	100
B 1.5	Basic medical sciences related to Sp. & Hg.	3	75	3	80	20	100
B 1.6	Psychology related to Sp. & Hg.	3	75	3	80	20	100
B 1.7	Clinical practicum Sp.-Lg. pathology	8			50	50	100
B 1.8	Clinical practicum audiology	8			50	50	100
Total		34	600	18	580	220	800

## SECOND YEAR

Code no.	Paper title	Teaching hrs/week (min.)	Total hrs/week (min.)	Exam dur. (hrs)	Exam marks	I.A. marks	Total marks
B 2.1	Speech language diagnostic & therapeutics	3	75	3	80	20	100
B 2.2	Articulation & phonological disorders	3	75	3	80	20	100
B 2.3	Voice & laryngectomy	3	75	3	80	20	100
B 2.4	Diagnostic audiology	3	75	3	80	20	100
B 2.5	Technology & Management for persons with HIII	3	75	3	80	20	100
B 2.6	Paediatric audiology	3	75	3	80	20	100
B 2.7	Basic statistics & scientific enquiry in audiology & speech language pathology	3	75	3	80	20	100
B 2.8	Clinical practicum Sp.-Lg.	8			50	50	100

	pathology						
B 2.9	Clinical practicum audiology	8			50	50	100
Total		37	675	21	660	240	900

### THIRD YEAR

Code no.	Paper title	Teaching hrs/week (min.)	Total hrs/week (min.)	Exam dur. (hrs)	Exam marks	I.A. marks	Total marks
B 3.1	Fluency & its disorders	3	75	3	80	20	100
B 3.2	Neurogenic language disorders in adults	3	75	3	80	20	100
B 3.3	Motor speech disorders	3	75	3	80	20	100
B 3.4	Rehabilitative audiology	3	75	3	80	20	100
B 3.5	Noise measurements & hearing conservation	3	75	3	80	20	100
B 3.6	Community oriented professional practices in speech-language pathology & audiology	3	75	3	80	20	100
B 3.7	Clinical practicum Sp.-Lg. pathology	8			50	50	100
B 3.8	Clinical practicum	8			50	50	100

	audiology						
Total		34	600	18	580	220	800

### **Program Outcomes:**

**PO1:** Fundamental knowledge on the subject of Audiology and Speech Language Pathology

**PO2:** Effective communication skills.

**PO3:** Knowledge in professional ethics

**PO4:** Leadership qualities and team work

**PO5:** Problem Analysis and solving skills

**PO6:** Basic knowledge on research methodology

**PO7:** Higher Technical skills and competences

**PO8:** Higher study options in many fields

**PO9:** Employability in various sectors

**PO10:** Better employment opportunities

### **Program Specific Outcomes:**

PSO1. Skill in planning, organizing and implementing therapeutic goals and activities.

PSO2. Efficiency in providing a clear and relevant information and feedback to the client and supervisors after proper assessment.

PSO3. Clinical competency and the competency to present cases..

PSO4. Ability to interact with the patient in an appropriate manner.

PSO5. Skill in appropriate analysis, interpretation, counseling and recommendations.

PSO6: Skill in Speech language diagnostics and therapeutics.

PSO7: Skill in Diagnostic Audiology.

PSO8: Skill in Rehabilitative Audiology.

## **FIRST YEAR**

### **B 1.1 INTRODUCTION TO HUMAN COMMUNICATION**

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

Course Outcomes:

CO1: Knowledge of Human communication, processes involved in communication.

CO2: Understanding of the relationship between hearing, speech and language.

CO3: Awareness about the neurological, psychological, social and acoustic bases of communication.

CO4: Understanding of the concept of linguistics and its branches.

### **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.
4. Concept of linguistics. Branches of linguistics.

### **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 (15 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).

□ Exchange of gases in the lungs and tissues. Hypoxia, asphyxia and cyanosis. Regulation of respiration. Respiratory efficiency test.

#### **Unit 4 (15 hrs)**

1. Basic Acoustics of speech:

□ 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 – Acoustics impedance – Helmholtz resonator – sympathetic vibrations.

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 (15 hrs)**

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, diphthongs) and suprasegmentals (stress, pitch, tone and intonation), IPA symbols and transcription of sentences of typical speech.

#### **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.

## **B 1.2 SPEECH - LANGUAGE DEVELOPMENT AND DISORDERS**

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

### **Course Outcomes:**

**CO1: Awareness about the development of speech & language.**

CO2: The ability to identify different speech & language disorders.

CO3: Understanding of the basics of assessment and intervention for child language disorders.

### **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, behavioral, 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 aphasia in childhood
- Traumatic Brain Injury
- Multiple disabilities

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

### **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:



1. Woolfolk, E. & Lynch J. (1982). An integrative approach to language disorders in children. New York: Grune and Stratton.
2. Thirumalai M. S. Shyamala Chengappa (1988) Simultaneous Acquisition of two languages CIIL, Mysore.
3. Fromkin, L.F. and Rodman, R. (1993). An Introduction to Language (5th Ed.). New York. Harcourt Brace Jovanovich
4. Subba Rao (1992). Developing communication skills in MR, NIMH, Secunderabad..
5. Shyamala K. Chengappa (1992). Speech and Language of the cerebral palsied, CIIL, Mysore..
6. Shyamala K. Chengappa (1986). Introduction to speech disorders in children an introduction IED cell, Port Blair, Anadamans & Nichobars.
7. O'Connor. (1993). Phonetics. Hammondsworth: Penguin books
8. Yule, G (1996). The Study of Language: An Introduction. (2nd Ed.). Cambridge: Cambridge University Press.
9. Lyons, J. (Ed.). (1970). New Horizons in Linguistics. Hammondsworth: Penguin Books.
10. Akmajian. A. et al. (1990). Linguistics: An Introduction to Language and Communication

### **B 1.3: INTRODUCTION TO HEARING & HEARING SCIENCES (80+20 marks) (Total = 75 hrs)**

#### **Course Outcomes:**

CO1: Knowledge of the basic aspects of auditory system.

**CO2: Understanding of the physical and psychophysical basis of sound.**

CO3: Knowledge of the causes of hearing loss.

CO4: Skill in the procedures involved in clinical testing – tuning fork tests, air conduction and bone conduction testing in puretone audiometry, clinical masking.

#### **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, air conduction and bone conduction testing in puretone 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 (12 hrs)**

- 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 (25 hrs)**

- 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:

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. 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 – Wesley 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, Rineheart & Winston, London.
9. Rose, D.M. (Ed.) 1978), Audiological Assessment, New Jersey: Prentice Hill.
10. Speaks Charles. Introduction to Sound.
11. Yost, William. (2000). Fundamentals of Hearing. 4th edition.
12. Durrant, J. and Lovrinic, J. (1995). Bases of Hearing Science. 3rd edition.

Additional Reading:

1. Beagley, H.A. (Ed.) (1981). Audiology and Audiological Medicine. Vol.1, Oxford University Press.
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)**

### **Course Outcomes:**

CO1: Knowledge of the basics of electricity, electronics and digital processing

CO2: Knowledge about transducers

CO3: Understanding about basic components and types of hearing aids

CO4: Knowledge about and skill in preparation of ear moulds

### **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.)

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 works? Application- DSP based hearing aids.

### **Unit 2 (15 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.

### **Unit 3 (15 hrs)**

- 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 (15 hrs)**

- 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 (15 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,
- 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:

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)
4. Hearing aid assessment and use in Audiologic Habilitation. (3rd ed.). William Hodgson (Ed.)
5. Audiologist's desk reference.
6. Hearing Aids: Standards, Options and Limitations. Michael Valente.
7. Audiologic Treatment. Michael Valente, Hosford-Dunn, Roeser.
8. Hearing Instrument Technology for the hearing healthcare professional. A. Vonlanthen.

### 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.

## **B 1.5 Basic Medical Sciences related to Speech & Hearing (80+20 marks) (Total = 75 hrs)**

### **Course Outcomes:**

- CO1: Knowledge of anatomy of the auditory system  
CO2: Knowledge of anatomy of speech mechanism

CO3: Knowledge of physiology of hearing mechanism

CO4: Knowledge of functioning of speech and swallowing mechanism

**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 / 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, 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 harmone, functions of thyroid hormone, growth harmone, 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.

Cochleovestibular 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.

(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, (2<sup>nd</sup> 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. Graym R.F., Hawthorne, M. (1992). Synopsis of Otolaryngology. Butterworth Heinemann Ltd, Oxford. 5th Edition.
- Ramalingam, K.K., Sreeramamoorthy, B. (1990). A short practice of Otolaryngology. A.I.T.B.S. Publishers Distributors.
6. Scott-Brown, W.G., Ballantyne, J., Groves, J. Diseases of the nose & throat. Butterworth & Co., Ltd. 2nd edition, Chichester.
- Inderbeer Singh (1996) – Text book of embryology.

Additional / Optional Reading:

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



## **B.1.6 PSYCHOLOGY RELATED TO SPEECH AND HEARING**

**(80+20 marks) (75 hrs.)**

### **Course Outcomes:**

**CO1: Knowledge about the relevant developmental psychology**

**CO2: Understanding of psychology of learning**

**CO3: Awareness about the Neuro-Cognitive issues in the field of speech and hearing**

### **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:

- 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.
- 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
- 6) Counseling Individual with Communication Disorders. Psychodynamic approach and Family aspects, 2nd Edition, Walles J. Rollin, Acc. No. 15706, 616.855.

#### Additional/Optional Reading:

- 1) Siegal M.G. (Ed.), (1987). Psychological Testing from Early Childhood Through Adolescence. International Universities Press.
- 2) Kline, P. (1993). The Handbook of Psychological Testing, Routledge.
- 3) Anastasi, A. (199). Psychological testing, London: Freeman

## **B 1.7 Clinical Practicum Speech Language Pathology (50+50 marks)**

### **Course Outcomes:**

CO1: Acquisition of basic clinical skills in audiology

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 AYJNIHH 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

## **CLINICAL PRACTICUM IN AUDIOLOGY**

1. Public information materials (videos, pamphlets, booklets etc.)
2. Taking case histories of 10 adults and 10 children with normal hearing and with hearing impairment under supervision.
3. Analyse 10-15 case histories of adults and children with hearing impairment.
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. Study 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
    - 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.

## **SECOND YEAR**

### **B.2.1 SPEECH LANGUAGE DIAGNOSTICS AND THERAPEUTICS (80+20 marks) (Total = 75 hrs)**

#### **Course Outcomes**

- CO1. Understanding of the importance of client history, diagnostics and therapeutic approaches
- CO2: Skill in taking client history and therapy in general
- CO3: Understanding of clinical documentation

#### **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 (7hrs)**

1. Basic terminologies and concepts
  - Introduction to diagnostics
  - Terminologies in the diagnostic process

- General principles of diagnosis
- Diagnostic setup and tools

## **Unit 2 (18hrs)**

### 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; advantages/disadvantages
- Team approach to diagnosis
- Characteristics of a good clinician as diagnostician

## **B. Speech therapeutics**

### **Unit 3 (15 hrs)**

#### 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 (19 hrs)**

#### 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 (16hrs)**

#### 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:

1. Frattali, C.M. (1998). Measuring outcomes in Speech Language Pathology. New York: Thieme.
2. Shames, G.H. (2000). Counselling the communicatively disabled and their families. Boston: Allyn & Bacon.
3. Hegde, M.N. (1985). Treatment procedures in communicative disorders. Texas. Pro Ed.
4. Darley, F.L., & Spriesterbach (1978). Diagnostic methods in Speech Pathology. San Diego: Singular Pub Inc.
5. Leith, W.R. (1993). Clinical methods in communicative disorders. Texas. Pro. Ed.

## **B 2.2 ARTICULATION AND PHONOLOGICAL DISORDERS (80+20 marks) (Total = 75 hrs)**

### **Course Outcomes**

CO1: Awareness about the development of phonology

CO2: Knowledge about the factors related to articulation and phonological disorders

CO3: Skill in assessment and therapy procedures

**Objectives:** 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
7. Distinctive features – types, language specific issues, identification of errors and analysis.
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.
4. Distinctive features – types, language specific issues, identification of errors and analysis.
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:

1. Bernthal, J.E. and Bankson, N.W. (1988). Articulation and Phonological Disorders. (3<sup>rd</sup> 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.

### **B.2.3 VOICE AND LARYNGECTOMY**

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

**Course Outcomes:**

**CO1: Knowledge about the** characteristics of voice and its disorders

CO2: Knowledge about laryngeal abnormalities

CO3: Skill in assessment and Management

**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:

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. Clinical 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

## **B 2.4 : DIAGNOSTIC AUDIOLOGY (80+20 marks) (Total = 75hrs)**

### **Course Outcomes:**

CO1: Awareness about the need for test battery approach

CO2: Knowledge about the indications for administering different audiological tests

CO3: Skill in procedures for identifying an individual with pseudohypacusis

CO4: Skill in administration and interpretation of tests for APD

### **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, Retrocochlear 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)**

Immittance Audiometry

Introduction, Principle of Immittance audiometry, Instrumentation,

Tympanometry – Tympanometric peak pressure, static immittance,

gradient/tympanometric width.

- Reflexometry – Ipsilateral & contralateral acoustic reflexes, special tests
- Clinical application of Immittance evaluation

### **Unit 3 (20 Hours)**

#### **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 (10 Hours)**

#### **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, Doefler-Stewart test.
- Identification of functional hearing loss

#### **7. Vestibular testing**

### **Unit 5 (15 Hours)**

#### **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:

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. ISHA Battery
6. Katz, Handbook of Clinical Audiology 4th/5th edn.
7. Rintleman – Contemporary issues in audiology
8. Audiologists Desl Ref. Vol. I, by James W. Hall.

#### 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 IS documents

### **B 2.5 TECHNOLOGY & MANAGEMENT FOR PERSONS WITH HEARING IMPAIRMENT – II** **(80+20 marks) (Total = 75 hrs)**

#### **Course Outcomes:**

CO1: Knowledge of different methods and approaches to train children with hearing impairment

CO2: Familiarity with different types of hearing aids and skill in selection of different types of hearing aids

CO3: Skill in setting up of classrooms for children with hearing impairment

### **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:

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.
6. Skinner HW (1988), Hearing aid evaluation, Prentice Hall, Englewood Cliffs, HJ.
7. Audiologist's desk reference.
8. Hearing Aids: Standards, Options and Limitations. Michael Valente.
9. Audiologic Treatment. Michael Valente, Hosford-Dunn, Roeser.

### **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-impairment 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. Griffths (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

## **B 2.6 PAEDIATRIC AUDIOLOGY (80+20 marks) (Total = 75 hrs)**

### **Course Outcomes:**

- CO1: Knowledge of development of auditory system and behaviour
- CO2: Skill in early identification procedures using subjective and objective measures
- CO3: Competency in diagnostic tests for the paediatric population

## **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)**

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 (15 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 (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

Immittance audiometry in the pediatric population

Auditory Brainstem Response in pediatric population

OAE findings in the pediatric population.

### **LIST OF BOOKS**

Compulsory Reading:

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

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

3. Hayes & Northern (1996). Infants and Hearing

4. McCormick, B. (ed.) (1993) 2nd ed. Pediatric Audiology 0-5 yrs.

5. Valerie Newton (ed) (2003). Pediatric Audiological Medicine

Additional Readings:

1. Davis, J.H., and Hardick, E.J. (1981). Rehabilitative Audiology for children and adults,

2. New York: John Wiley and Sons.

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

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

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

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

7. Ling, D. (1978). Speech and hearing impaired child. Washington: Alexander Graham

8. Bell Association for the deaf.

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

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

## **B 2.7 Basic Statistics and Scientific Enquiry in Audiology and Speech Language Pathology (80+20 marks) (Total = 75hrs)**

### **Course Outcomes:**

**CO1:** Skill in calculations of data related to basic statistical operations

CO2: Ability to interpret statistical results at basic level and make inferences

**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 these 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  
Standard error sampling distribution; Type I and Type II errors,  $\chi^2$ , '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 behavioral 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:

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.
3. Maxwell, D.L. and Satake, E. (1997). Research and Statistical Methods in Communication Disorders. Baltimore: Williams and Wilkins

Additional/Optional Reading:

1. Stein, F. and Cutler, S.K. (1996). Clinical Research in Allied Health and Special Education. San Diego: Singular Publishing Group Inc.
2. Portney, L.G. and Walkins, M.P. (1993). Foundations of Clinical Research. Connecticut: Appleton and Lange.
3. Woods, A., Fletcher, P. and Hughes, A. (1986). Statistics in Language Studies. Cambridge: University Press.

## **B 2.8 CLINICAL PRACTICUM IN SPEECH LANGUAGE PATHOLOGY**

**(50+50 marks)**

### **CO1: Skill in procedures in speech language pathology.**

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
- 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. Familiarization of the tools used for evaluation and treatment of Childhood communication disorders, Articulation and Phonological Disorders, Maxillofacial anomalies:

- Receptive Expressive Emergent Language Scale
- Scale for Early communication Skills in Hearing Impaired children
- 3-Dimensional Language Acquisition Test
- Northwest Syntax Screening Test
- Bankson's Language Screening Test
- Test for Examining Expressive Morphology
- Autism 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
- Voice Handicap Index and other perceptual scales .
- 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)**

**Course Outcomes:**

**CO1: Skill in diagnostic Audiology**

**CO2: Skill in Rehabilitative Audiology**

**CO3: Competency in Paediatric Audiology.**

### **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.

4. Collection of Speech Audiometry test materials in Indian languages.

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.

6. Holistic audiological assessment for differential diagnosis (Cochlear & Retro cochlear):

- o Routine pure tone & speech audiometry

- o 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) –

- o Preparation of the patient

- o Informing the patient/caregiver with respect to the procedure

- o Electrode montage

- o Conduct the procedure with respect to test protocol (5 cases each)

- o BC-ABR, Tone burst ABR

### **Section B: Rehabilitative Audiology**

1. Speech and language characteristics of the deaf

2. Management of post-lingual hearing impaired.

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.

4. Testing multiply handicapped children.

## **THIRD YEAR**

### **B 3.1: FLUENCY AND ITS DISORDERS**

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

#### **Competency**

CO1: Knowledge of the theories of stuttering

CO2: Skill in assessment and Management of disorders of fluency

#### **Objectives:**

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

- Characteristics and types of Fluency disorders, specify- Stuttering and Cluttering; Types of Stuttering viz developmental, Neurogenic and Psychogenic
- Theories of stuttering
- Assessment and Management

### **Unit 1 (15Hrs)**

- Fluency: Definition, development of fluency, factors influencing the development
- Definitions of intonation, stress and rhythm- Development of intonation, rhythm, stress
  - their implications to therapy
- Measures of fluency and other prosodic aspects

### **Unit 2 (15Hrs)**

- Stuttering: definition, nature, Loci Of stuttering viz Adaptation and consistency effect
- Facts - incidence and prevalence, onset , Heredity, speech language development in individuals with stuttering, role of imitation, socio-economic status and cultural factors
- Factors which reduce stuttering and factors which increase it. Normal non fluency; primary stuttering; secondary stuttering.
- Development of stuttering- Van Riper's Tracks and Peter's and Guitar's  
5 developmental levels Cluttering and Neurogenic stuttering

### **Unit 3 (15Hrs)**

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

### **Unit 4 (15Hrs)**

- Assessment of stuttering;
- Associated problems
- Differential diagnosis of developmental stuttering, neurogenic stuttering, cluttering, normal non fluency, spasmodic dysphonia

### **Unit 5 (15Hrs)**

- Prevention
- Therapy; rationale; prolongation; shadowing; habit rehearsal technique, DAF, masking shock therapy, desensitization, timeout, airflow and modified airflow technique; Group therapy
- Sequence of therapy procedures VIZ -
- MIDVAS and Perkin's Approach
- Transfer and maintenance
- Measurement of progress; naturalness rating
- Relapse and recovery

## **LIST OF BOOKS**

Compulsory Reading:

1. Curlee and Perkins (Ed.). (1985): Nature and treatment of stuttering. Taylor and Francis, London.
2. Silverman, F.H. (1992). Stuttering and other fluency disorders. Prentice Hall, Inglewood Cliffs.
3. Peter and Guitar (1991). Stuttering- An integrated approach to its nature and treatment

### **Additional/Optional Reading:**

1. Bloodstein, O. (1993): Stuttering. Allyn and Bacon, Boston.
2. Fawcus, M. (1995): Stuttering. Whurr Publishers, London.
3. Mark Onslow (1996) Behavioural management of stuttering. Singular Publishing Group Inc

## **B 3.2: NEUROGENIC LANGUAGE DISORDERS IN ADULTS (80+20 marks) (Total = 75hrs)**

### **Course Outcomes:**

- CO1:** Knowledge about the relationship between brain and language relationship  
**CO2:** Knowledge about aphasic and non-aphasic conditions  
**CO3:** Skill in assessment and management of neurogenic language disorders in adults.

### **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 (15Hrs)**

Neural bases of language: Neuroanatomical, neurophysiological and for language function

- Pathophysiology of neurological lesions affecting speech, language and hearing; concepts of recovery, reorganization and relearning
- Theoretical considerations in neurogenic language disorders: Competence Vs Performance; loss Vs Interference, Regression hypothesis, multilingualism, Unidimensional Vs multidimensional breakdown

### **Unit 2 (15Hrs)**

- Definitions of Aphasia
- Etiology
- Classification of aphasia based on anatomical, linguistic and psycholinguistic aspects



- Clinical features: Linguistic, psycho-social, neuro-behavioural
- Associated problems in aphasia: their definition, classification and clinical features

### **Unit 3 (15Hrs)**

- General and specific neurological examination procedures (higher functions, cranial nerves, motor and sensory systems, reflexes and fundus)
- Neurological investigations: Electrophysiological (Electro Encephalo Gram, Evoked potentials) and imaging (Computerized Tomography, Magnetic Resonance Imaging)
- 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 and others; Indian tests

### **Unit 4 (15Hrs)**

- Other language disorders in adults: Introduction, Etiology, clinical profile, assessment and management
  - Traumatic Brain Injury
  - Right Hemisphere Damage Disorder
  - Primary Progressive Aphasia
  - Language disorders in Dementia
- Differential diagnosis of Adult Neurogenic disorders

### **Unit 5 (15Hrs)**

- Intervention: Prognostic indicators, Spontaneous recovery; General principles of therapy; specific techniques (Melodic Intonation therapy, Visual Action therapy, Schuell's Auditory stimulation, Thematic language stimulation, developing functional communication and others.
- 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 counseling AAC

### **LIST OF BOOKS**

Compulsory Reading:

1. Understanding Aphasia. (1993). Goodglass, H. Academic Press Inc.
2. Davis, G. A. (1993). A Survey of Adult Aphasia and Related Language Disorders Prentice Hall Inc.
3. Chapey, R. (1994). (Ed). Language Intervention Strategies in Ault Aphasia. Williams and Wilkins Publication

### **Additional/Optional Reading:**

1. Speech and Language Evaluation in Neurology: Adult Disorders. (1985). Ed.

Darby, J. K. Grune and Stratton Inc.

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

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

### **B 3.3: MOTOR SPEECH DISORDERS**

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

#### **Course Outcomes:**

CO1: Knowledge of the characteristics of motor speech disorders in children and adults

CO2: Awareness about the different types of dysarthria, Apraxia (Developmental apraxia of Speech) and other conditions in children and adults

CO3: Skill in assessment and Management of Motor Speech Disorders

#### **Objectives:**

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

- Characteristics of motor speech disorders in children and adults
- Types of dysarthria, Apraxia (Developmental apraxia of Speech) and other conditions in children and adults
- Assessment and Management

### **Part A: Childhood Motor Speech Disorders (38Hrs)**

#### **Unit 1 (8hrs)**

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

#### **Unit 2 (15 Hrs)**

- Cerebral palsy (11 hrs)
  - o Definition, causes and classification
  - o Different types of Cerebral palsy: Can the titled be movement disorders
  - o Disorders of muscle tone: Spasticity, rigidity, flaccidity, atonia
  - o Disorders of movement: Hyperkinesias and dyskinesias- Ballismus, tremor, tic disorder, myoclonus, athetosis, chorea, dystonia, hypokinesias

- o Disorders of coordination- Ataxia
- o Neuromuscular development in normals and children with cerebral palsy -
- o Reflex profile
- o Associated problems
- o Speech and language problems of children with cerebral palsy
- Syndromes with motor speech disorders (4 hrs)
- o Juvenile progressive bulbar palsy
- o Congenital supranuclear palsy
- o Guillain- Barre syndrome
- o Duchenne muscular dystrophy

### **Unit 3 (6hrs)**

- o Assessment of speech in cerebral palsy- objective and subjective methods
- o Differential diagnosis of cerebral palsy
- o 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;
- o Team approach to rehabilitation; Neurosurgical techniques for children with cerebral palsy

### **Unit 4 (5hrs)**

Apraxia of speech in children or developmental apraxia of speech

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

### **Unit 5 (4hrs)**

Definition - alternative and augmentative communication (AAC). Application of alternative and augmentative communication methods in developmental dysarthrias and developmental apraxia of speech- Symbol selection, techniques for communication, assessment for AAC candidacy, choosing an appropriate system and technique, training communication patterns, effective use of AAC

## **Part B: Adult Motor Speech Disorders (37Hrs)**

### **DYSARTHRIA AND APRAXIA**

#### **Unit 1 (12 hrs)**

- (a) Definition and classification of dysarthria in adults.
- (b) Types of dysarthria in adults.
- (c) 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 neurosyphilis.
- 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 (7 hrs)**

d) Assessment of dysarthria

Instrumental analysis

- Physiological and Electrophysiological methods
  - Acoustics
  - Advantages and disadvantages of instrumental analysis of speech in dysarthria.
- Perceptual analysis – measures, standard tests and methods, speech intelligibility assessment scales, advantages and disadvantages of perceptual analysis of speech in dysarthria.

e) Differential diagnosis of dysarthria from functional articulation disorders, apraxia of speech, aphasia and allied disorders.

## **Unit 3 (6 Hrs)**

f) Management of dysarthria - Medical, surgical and prosthetic approaches – Speech therapy

- 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 (7 Hrs)**

g) 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 (5 hrs)**

Dysphagia:

- Definition
- Phases of normal swallow
- Etiology of swallowing disorders
- Assessment and Intervention
- Mechanical dysphagia related to glossectomy

## **LIST OF BOOKS**

### Compulsory Reading:

1. Clinical Management of Motor Speech Disorders in Children. (1999). Caruso, F. J. and Strand, E. A. New York: Thieme.
2. Motor Speech disorders - A Treatment guide. (1991). Dworkin, P.J. St. Louis: Mosby Year Book. Inc.
3. Motor Speech Disorders: Substrates, Differential diagnosis and Management. (1995). Duffy, J. R. St. Louis: Mosby.
4. Pre feeding skills. Morris. S. and Klein. M. U.K.: Winslow

### **Additional/Optional Reading**

1. Working with Swallowing Disorders. Langley. J. U.K.: Winslow
2. Acquired Speech and Language disorders - A Neuroanatomical and Functional Neurological Approach. (1994). Murdoch, B.E. London: Chapman and Hall.
3. Neurology for Speech-Language Pathology. (1986). (2nd ed.) Love, R.J. and Webb, W.G. Butterworth.

## **B 3.4 REHABILITATIVE AUDIOLOGY**

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

### **Course Outcomes:**

- CO1: Knowledge about speech reading and auditory learning  
 CO2: Skill in management of individuals with additional problems

### **Objectives:**

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

- speech reading
- auditory learning
- management of individuals with additional problems
- assistive listening devices
- implantable devices

### **Unit 1 (15 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 (25 hrs)**

### Auditory training

- (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 (15 hrs)**

- 1. Speech Characteristics of persons with hearing impairment.
- 2. Management of hearing impaired individuals with special needs
  - (a) Management of multi handicapped hearing impaired children (MHHI)
  - (b) Management of children with central auditory processing problems
  - (c) Rehabilitation of hearing impaired – elderly population

## **Unit 4 (05 hrs)**

### Assistive Listening Devices (ALDs)

- Classification based in auditory, visual & tactile stimulation
- Classification based on alerting devices Vs devices for speech perception.
- Selection of ALDs.

## **Unit 5 (15 hrs)**

### 1. Implantable Devices

- Middle Ear Implants and BAHA (Bone Anchored Hearing Aid)
- Cochlear Implants
- Brainstem Implants

Components, Candidacy, Advantages and Complications for the same.

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

## **LIST OF BOOKS**

### Compulsory Reading:

- 1. Clark, G.M., Cowan, R.S.C. & Dowell, R.C. (1997). Cochlear Implantation for

- Infants & Children: Advances. Singular Publishing Group Inc.
2. Davis J.M. & Hardick E.J. (1981). Rehabilitative Audiology for Children and Adults. New York: John Wiley & Sons
  3. Erber N.P. (1982) Auditory Training. Washington DC: AG Bell Association for the Deaf
  4. Schow; R.L.; & Nerbonne. M.A.(Eds) (1996). Introduction to Audiologic Rehabilitation (3<sup>rd</sup> edition). Boston: Allyn & Bacon
  5. Maxon, A.B. & Brackett D. (1992). The Hearing Impaired Child: Infancy through high School years
  6. Alpiner & Mc. Carthy
  7. Aural Rehabilitation (2nd ed.) Raymond Hill (1982).
  8. Visual communication for the HOH. History, Research, methods Oneill & Oyer (1981).
  9. Speech reading (lipreading) Jeffers & Barley (1971)
  10. Speech reading – a way to improve understanding (2nd ed) Kaplan, Bally & Garretson (1985).
  11. Deafness and communication – Sims, Walter, Whitehead.
  12. Thirumalai and Gayathri. Speech of the Hearing Impaired.
  13. Bench.

### **B 3.5 NOISE MEASUREMENT AND HEARING CONSERVATION (80+20 marks) (Total = 75 hrs)**

#### **Course Outcomes:**

CO1: Skill in measurement of noise and vibration

CO2: Knowledge of audiological findings in noise induced hearing loss

CO3: Awareness about legislations related to noise

#### **Objectives:**

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

- effects of noise
- measurement of noise and vibration
- audiological findings in noise induced hearing loss
- legislations related to noise

#### **Unit 1 (15 hrs)**

a) Noise in the environment and effects of noise:

- Definition of noise
- Sources – community, industrial, music, traffic and others
- Types – steady & non-steady, Impulsive/Impact, intermittent

b) Auditory effects of noise exposure

- Historical aspects
- TTS and recovery patterns

- PTS
- Histopathological changes (Metabolic, Mechanical, Biochemical, Vascular)
- 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 (15 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:
- Other audiological evaluations:
  - Impedance audiometry
  - ERA
  - OAE
  - Tests for susceptibility

### **Unit 3 (15 hrs)**

Noise & vibration measurement

- Instrumentation and procedure for indoor and outdoor measurement of ambient noise, traffic noise, aircraft noise, community noise and industrial noise.
- Calibration: Biological and instrumental for AC & BC transducers.

### **Unit 4 (15 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 (15 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. Correction for aging in NIHL.

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.

### **B3.6 Community Oriented Professional Practices in Speech**

#### **Language Pathology and Audiology**

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

#### **Course Outcomes:**

**CO1: Knowledge about the epidemiology of speech, language and hearing disorders**

CO2: Skill in service delivery and CBR issues

CO3: Knowledge about legislative support for rehabilitation

CO4: Skill in documentation

#### **Objectives:**

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

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

### **Unit 2 (15 hrs)**

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

### **Unit 3 (15 hrs)**

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

### **Unit 4 (15 hrs)**

- 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.
- Strategies for awareness, public education and information (Camps, Print and audiovisual media, Surveys. Radio broadcasts, street plays).
- Empowering parents, persons with disabilities and the community; Skill transfer to DHLS, parents; grass-root level workers, teachers and health workers

### **Unit 5 (15 hrs)**

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

### **LIST OF BOOKS**

Compulsory Reading:

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

2. Kundu, C.L., Status of Disability in India, (2000 & 2003) Ed. Kundu, C.L., RCI
3. Narsimhan, M.C. & Mukherjee, A.K. (1986). Disability a Continued Challenge: Delhi Willey Eastern.
4. WHO (2001). International classification of Functioning, Disability and Health. Geneva: WHO
5. Professional Issues in Speech-Language Pathology and Audiology - A Text book. (1994). Lubinski R. and Frattali C. California: Singular Publishing Group

**Additional/Optional Reading:**

1. Administration and Management of Programs for Young Children. (1995) Shoemaker, C. J. New Jersey : Prentice Hall Inc.
2. Management of Child Development Centres. (1993) Hildebrand, V. (3rd Ed.). MacMillan Publishing Company

**B 3.7 CLINICAL PRACTICUM IN SPEECH LANGUAGE PATHOLOGY  
(50+50 marks)**

**Course Outcomes:**

**CO1: Skill in the assessment of different disorders.**

**CO2: Competency in counseling.**

1. Understand aspects of informal and formal assessment for
  - i) Fluency disorders
  - ii) Neurogenic language disorders
  - iii) Motor speech disorders
2. Identify the Differential Diagnostic categories of these disorders
3. Familiarization on the use of various tests and materials available for assessment
  - i) Western Aphasia Battery
  - ii) Illinois Test of Psycholinguistic abilities
  - iii) Boston Diagnostic Aphasia Examination
  - iv) Revised Token Test
  - v) Right Hemisphere Language Battery
  - vi) Apraxia Battery for Adults
  - vii) Frenchay Dysarthria Assessment
  - viii) Stuttering Severity Instrument
  - ix) Stuttering Prediction Instrument
  - x) Indian tests and material available
4. Carry out assessment on at least 1 case each from the above mentioned disorders with an assessment report and appropriate referral letters .
5. Carry out therapeutic plan on a client with the above mentioned disorders and submit a report of the same.
6. Conduct a fluency analysis in 4 normal samples (2 child □ sample and 2 adult

sample) for the percentage of total disfluency and the individual disfluency on a conversation, narration and a reading task

- Measurement of rate of speech (words per minute, syllables per second) in normals
  - Familiarization to different intonation, stress and rhythm patterns in speech samples (of different languages)
  - IPA transcription of dysfluent speech; calculating the severity using any of the formal tests
  - Comparing suprasegmental aspects of fluent and dysfluent speech samples
  - Comparing normal non-fluency speech sample and child stuttering sample along with SSI scores
7. Counselling parameters for the following groups of disorders:
- Neurogenic language disorder (adult/geriatric; type)
  - Motor speech disorder (based on age and site of lesion)
  - Fluency disorders (age, motivation)
  - Being cognizant about the legislative support available and direct the same to the parents/caretakers
9. Preparing public education pamphlets, hand-outs on different disabilities

### **B 3.8 CLINICAL PRACTIUM AUDIOLOGY (50+50 marks)**

#### **Course Outcomes:**

**CO1: Skill in hearing aid trial**

**CO2: Skill in noise and rehabilitative technology.**

**CO3: Competency in rehabilitative audiology and diagnostic audiology.**

#### **Section A: 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:
  - Functional gain, REIG, other methods with monaural fitting, binaural fitting, Programmable hearing aid – Analog Digital
  - 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), preparation of harness, cleaning of ear moulds. 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 analyzer.

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 of hearing aids for sloping hearing loss.

### **Section B: Noise & Rehabilitative Technology**

1. Compile information on cochlear implants regarding candidacy, cost, places where it is done and rehabilitation of cases.
  2. Calibration of pure tone audiometry (AC, BC, Speech)
  3. Noise measurement and attenuation measurement of ear protection devices.
  4. 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, Eustachia Tube function, SPAR
- Compiling reports for the above.

### **Section C: 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 reg. candidacy, cost, places where it is done and rehabilitation of cases, in Indian contexts.

### **Section D: Diagnostic Audiology**

Holistic Diagnostic Interpretation and And Report writing for Adult and Paediatric Test battery.

## **VALUE BASED EDUCATION (B.3.40)**

Elective

### **Course Outcomes**

- CO1:** The attitude to be a good human being, with the curiosity to continue lifelong learning.
- CO2:** The conviction to do service to humanity - to put the interests of the individual patient as the foremost priority.
- CO3:** Acquisition of the "skills for life" in addition to the skills to live.
- CO4:** Acquisition of positive lifelong values.
- CO5:** The "practical applications" of the right values.

The Students will undergo training throughout the course on better interaction with others, respect for all human beings, the humility to be a student throughout life. The purpose of life – the component of service in it – is one point which the students should introspect on.

Living life in today's world require skills and positive values.

The students will be evaluated throughout the program. There will be value based education lectures and other activities. Minimum 60 hours during the program.

**AMRITA INSTITUTE OF MEDICAL SCIENCES AND RESEARCH CENTER  
(AIMS)  
PONEKKARA P.O., KOCHI, KERALA-682 041  
Phone: (0484)2801234**

**INTERNSHIP POSTING EVALUTION CERTIFICATE  
BACHELOR OF AUDIOLOGY AND SPEECH LANGUAGE PATHOLOGY  
(BASLP)**

Name of the Trainee :  
Duration of posting :  
Number of days attended / allotted :  
Name of the supervisor :

**Type of work done**

Diagnostic Audiology :  
Rehabilitative Audiology :  
Speech language diagnostics :  
Speech language intervention :

<b>Professional and Technical Skills</b>	<b>Excellent</b>	<b>Good</b>	<b>Average</b>	<b>Poor</b>
<p>1. Interest shown by the student in planning, organizing and implementing therapeutic goals and activities.</p> <p>2. Efficiency in providing a clear and relevant informations and feedback to the client and supervisors.</p> <p>3. Involvement in case presentations and clinical.</p> <p>4. Interaction with the patient.</p> <p><b>Assessment and Reporting</b></p> <p>5. Efficiency in suing formal and informal tests appropriate analysis, interpretation, counseling and recommendations.</p> <p>6. Submission of lesson plans and therapy reports on time.</p> <p><b>Personal Quality</b></p> <p>7. Punctual</p> <p>8. Inform to the supervisors regarding any change in their schedule</p>				

9. Discipline				
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**Remarks if any  
Supervisor**

**IMPORTANT TELEPHONE NUMBERS**

Amrita Institute of Medical Sciences : 0484-2801234/2851234

Principal's Office : 0484-2858131/2858131

Chief Programme Administrator : +91 7034028019, On call: 1919

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BASLP