BANGALORE UNIVERSITY

REGULATIONS AND SYLLABUS – SEMESTER COURSE – FROM 2014

BACHELOR OF SPEECH – LANGUAGE PATHOLOGY AND AUDIOLOGY (BSLPA)

RULES REGULATIONS & NORMS FOR BSLPA

1. Nomenclature:

Approved nomenclature of the course shall be – BACHELOR OF SPEECH – LANGUAGE PATHOLOGY AND AUDIOLOGY – Abbreviated as BSLPA.

Medium of Instruction : English

2.0 Duration of the course:

2.1 The duration of the course shall be of 4 years consisting of 6 semesters of coursework and 2 semesters of internship.

2.2 Each semester will be of a minimum period of 16 weeks and internship will be of 10 months.

2.3 **C**ourse work shall begin and end as per Bangalore University calendar of events. As far as possible the first, third and fifth semesters of BSLPA course will commence latest by last week of July each year. These semesters will end by the 4^{th} week of December each year.

2.4 At the end of these semesters there shall be examinations, followed by vacation for students.

2.5 Course shall be completed within 7 years from the date of enrolment for the course.

3.0 Eligibility for admission

a) The candidate applying for admission to BSLPA course should have passed 10+2 examination or equivalent / two years of Pre-University/Pre-Degree examination conducted by the Pre University Board of Education of Government of respective State, and further,

b) The applicant/candidate should have studied:
Physics, Chemistry & Biology / Mathematics / Computer Science / Statistics / Electronics / Psychology/ Home Science.

c) At the time of entry/admission to the first semester BSLPA course the candidate should be of age 17 years and there is no upper age limit for admission.

d) Lateral entry to 2nd year of BSLPA is permitted for candidates who meet the following criteria as per Bangalore University rules.

i) Successfully passed Diploma in Hearing-Language-Speech (DHLS) revised course from any RCI recognized training institute with Science background as specified under 3 (b)

ii) Two years of work experience in the field.

iii) A maximum of 3 seats can be admitted on merit basis as supernumerary to total intake permitted by RCI and respective affiliating University. For candidates who have successfully passed the pre-revised DHLS course recognized by RCI with 2 years of work experience, 3 month short course approved by RCI and entrance test will be the requirement.

4.0 Coursework:

As given for each semester in the Annexures.

5.0 Attendance:

Each candidate should put in at least 75% of attendance in Theory and 90% in Clinical Practicum respectively in each semester. Failure to put in / meet the required attendance by any student renders him/her disqualified from appearing in the University Exam. The candidate failing to put up the required attendance will have to repeat the course as per the university guidelines.

6.0 Criteria for passing:

6.1 Minimum marks required to pass in each Theory paper will be 40% aggregate of all theory papers and practical clinical marks
OR as per rules and guidelines of Bangalore University.

6.2 Question Paper Pattern – Total 70 marks

I)	5 Questions X 10 marks (choice in each unit)	5 x 10 = 50
II)	5 Questions X 4 marks (5 out of 6)	5 X 4 = 20

6.3 Grading:

As per rules of the Bangalore university.

6.4 Carry over passing:

Each paper should be successfully completed within 3 successive attempts including the first one or as per the rules of the affiliating university.

Provision of grace marks and declaration of results to carried out based on rules and norms followed at respective universities.

7.0 Internship:

Internship of one academic year duration (10 months) will start after the candidate completes the required courses till the 4th semester and appears for sixth semester.

7.1 Internship is mandatory

7.2 Eligibility: Internship will start in the immediate academic year after the candidate completes the required courses and has appeared for sixth semester/third year examinations. The candidate failing in final semester exam will be exempted from the duration of Internship period which he/she has already completed till the date of declaration of results.

7.4 Structure and duration of the postings:

a. The place of postings of the students for internship will be decided by the respective institute conducting the course.

b. Students should spend minimum of 50% period of internship outside the parent institute like hospital set ups, educational set ups, special clinical facilities like ASD, cochlear implants, AVT, mother's training program, centres for CP, centres for LD. Exposure should be for those areas where limited exposure was provided in the parent institute.

c. During internship students should get additional training in the areas of neurological related problems, prevention and early intervention programmes, community based rehabilitation, occupational health programmes, structural abnormalities related to speech & hearing.

d. Mode of supervision during internship: Supervision should generally be provided by a Speech Language Pathologist or Audiologist. Where this is not feasible, supervision can be done by a specialist from the allied areas in Medical Sciences like Otolaryngology, Neurology, Mental Health, Paediatrics, etc. Supervised clinical hours spent during internship can be included in the clinical competence certificates issued to students.

7.5 Maintenance of records by students:

Every student should maintain records of the number of hours of clinical work in different areas and institutions. This should be certified by the head of the institution or his/her nominee where the student is undergoing internship.

7.6 Leave permitted: As per norms of the parent Institute.

7.7 Extension of internship: Internship shall be extended by the number of days the student remains absent unauthorizedly.

7.8 Stipend: As per the norms of the parent Institute.

7.9 Grading and evaluation of student:

Grading and evaluation should be done by the institute where the candidate is doing internship. The student is required to repeat those postings in which his/her performance is below 40%.

7.10 Certification :

The parent institute will award a certificate after successful completion of the internship.

8.0 Award of Degree:

The university will award the degree and issue the certificate after a candidate successfully passes the required University examinations and the compulsory Internship. No candidate will be awarded the degree before completion of Internship.

Annexure

SCHEME OF CURRICULUM FOR BSLPA

	Codes/ Paper No.	Paper Title	Teaching hours per Week (min)	Exam Duration (in hours)	IA Marks	Exam Marks	Total	Credits
I SEMESTER BSLPA								
Core Subject	B 1.1	***Introduction to Human Communication***	4	3	30	70	100	2
Core Subject	B 1.2	***Introduction to Hearing & Hearing Sciences***	4	3	30	70	100	2
Core Subject	B 1.3	***Speech Language Diagnostics and Therapeutics***	4	3	30	70	100	2
Core Subject	B 1.4	***Basic Medical Sciences Related to Speech and Hearing***	4	3	30	70	100	2
C. P	B 1.5	***Clinical Practicum a) Speech-Language Pathology***	10	3	30	70	100	2
		b) Audiology	10	3	30	70	100	2
Addl.	B 1.6	***Foundation/Skills Development Course***	3	3	30	70	100	2
		CC & EC			50		50	1
	TOTAL				**260**	**490**	**750**	**15**
II SEMESTER BSLPA								
	Codes/ Paper No.	Paper Title	Teaching hours per Week (min)	Exam Duration (in hours)	IA Marks	Exam Marks	Total	Credits
Core Subject	B 2.1	***Speech-Language Development & Disorders***	4	3	30	70	100	2
Core Subject	B 2.2	***Introduction to Audiology & Auditory Tests***	4	3	30	70	100	2
Core Subject	B 2.3	***Psychology related to Speech and Hearing***	4	3	30	70	100	2
Core Subject	B 2.4	***Management of persons with Hearing Impairment***	4	3	30	70	100	2

C.P	B 2.5	***Clinical Practicum a) Speech-Language Pathology***	10	-	30	70	100	2
		b) Audiology	10	-	30	70	100	2
Foundation / skill Dvpt course	B 2.6	Computer Fundamentals	3	3	30	70	100	2
		CC & EC			50		50	1
	TOTAL				**260**	**490**	**750**	**15**

III SEMESTER BSLPA

	Codes/ Paper No.	Paper Title	Teaching hours per Week (min)	Exam Duration (in hours)	IA Marks	Exam Marks	Total	Credits
Core Subject	B 3.1	***Articulation and Phonological Disorders***	4	3	30	70	100	2
Core Subject	B 3.2	***Maxillofacial Anomalies***	4	3	30	70	100	2
Core Subject	B 3.3	***Diagnostic Audiology Part-1***	4	3	30	70	100	2
Core Subject	B 3.4	***Otorhinolaryngology***	4	3	30	70	100	2
Clinical Practicum	B 3.5	***Clinical Practicum a) Speech-Language Pathology***	10	3	30	70	100	2
		b) Audiology	10	3	30	70	100	2
Foundation / skill Dvpt course	B 3.6	Indian Constitution	3	3	30	70	100	2
		CC & EC			50		50	1
	TOTAL				**260**	**490**	**750**	**15**

IV SEMESTER BSLPA								
	Codes/ Paper No.	Paper Title	Teaching hours per Week (min)	Exam Duration	IA Marks	Exam Marks	Total	Credits
Core Subject	B 4.1	***Voice & Laryngectomy***	4	3	30	70	100	2
Core Subject	B 4.2	***Motor Speech Disorders in Children***	4	3	30	70	100	2
Core Subject	B 4.3	***Diagnostic Audiology Part -2***	4	3	30	70	100	2
Core Subject	B 4.4	***Paediatric Audiology***	4	3	30	70	100	2
Clinical Practicum	B 4.5	***Clinical Practicum a)Speech-Language Pathology***	10	-	30	70	100	2
		b) Audiology	10	-	30	70	100	2
Foundation / skill Dvpt course	B 4.6	Environmental Studies	3	3	30	70	100	2
		CC & EC			50		50	1
	TOTAL				**260**	**490**	**850**	**15**

V SEMESTER BSLPA								
	Codes/ Paper No.	Paper Title	Teaching hours per Week (min)	Exam Duration	IA Marks	Exam Marks	Total	Credits
Core Subject	B 5.1	***Fluency and its Disorders***	4	3	30	70	100	3
Core Subject	B 5.2	***Motor Speech Disorders In Adults***	4	3	30	70	100	3
Core Subject	B 5.3	***Technology & Amplification Devices for persons with Hearing Impairment***	4	3	30	70	100	3
Core Subject	B 5.4	***Rehabilitative Audiology***	4	3	30	70	100	3
Clinical Practicum	B 5.5	***Clinical Practicum a)Speech-Language***	10	3	50	100	150	3

		Pathology						
		b) Audiology	10	3	50	100	150	3
Foundation / skill Dvpt course	B.5.6		3	3	30	70	100	2
	TOTAL				**250**	**550**	**800**	**20**

VI SEMESTER BSLPA

	Codes/ Paper No.	Paper Title	Teaching hours per Week (min)	Exam Duration	IA Marks	Exam Marks	Total	Credits
Core Subject	B 6.1	***Neurogenic Language Disorders***	4	3	30	70	100	3
Core Subject	B 6.2	***Noise Measurements and Hearing Conservation***	4	3	30	70	100	3
Core Subject	B 6.3	***Community Oriented Professional Practices (COPP)***	4	3	30	70	100	3
Core Subject	B 6.4	***Scientific Enquiry and Basic Statistics for Speech-Language & Hearing***	4	3	30	70	100	3
Clinical Practicum	B 6.5	***Clinical Practicum a)Speech-Language Pathology***	10	-	50	100	150	3
		b) Audiology	10	-	50	100	150	3
Foundation / skill Dvpt course	B.6.6		3	3	30	70	100	2
	TOTAL				**250**	**550**	**800**	**20**

Course Content as stipulated by Rehabilitation Council of India, New Delhi

GRAND TOTAL

Subjects	Paper	Instruction hrs/week	Duration of Exam (hrs)	Marks			Credits
				IA	Exam	Total	
a) I/II/III/IV Semester							
Core Subjects	**4T 2P**	**4x4 2x10**	**4x3 2x3**	**4x30 2x30**	**4x70 2x70**	**4x100 2x100**	**4x2 2x2**
Foundation /Skill Development Course	**1 T**	**3**	**3**	**30**	**70**	**100**	**2**
CC & EC				**50**		**50**	**1**
Total Credits per semester							**15**
b) V/VI Semester							
Core Subjects	**4T 2P**	**4x4 2x10**	**4x3 2x3**	**4x30 2x50**	**4x70 2x100**	**4x100 2x150**	**4x3 2x3**
Foundation /Skill Development Course	**1 T**	**1x3**	**1x3**	**1x30**	**1x70**	**1x100**	**1x2**
Total Credits per semester							**20**
Total Credits for 6 semesters (15x4 +20x2)							**100**
c) VII and VIII Semesters							
The Students shall undergo compulsory Internship during the Fourth year of the programme							

Foundation/Skill Development Course for I/V/VI semester will be notified by the University. Syllabus and titles for B.2.6, B.3.6 and B.4.6 will also be changed by the University in due course.

SEMESTER I

B 1.1 INTRODUCTION TO HUMAN COMMUNICATION

(30+70 marks) **(Total = 56 hrs)**

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

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

Unit 1 **(12 hrs)**

1. History and development of the profession of Speech-language pathology (SLP) specifically in India
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 components
    - Interdependency & interrelation between communication, hearing, speech, and language.
    - Function of communication, speech and language
    - Modes of communication (Verbal & Non-verbal)
    - Characteristics of good speech
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 **(12 hrs)**

1. Nervous system:
    - Divisions and functions of the nervous system, nerve cell, receptors and synapse, types of nerve fibres. Peripheral nervous system. Brief description of spinal cord and CSF.
    - Structure of the brain and divisions: general and lobes of cerebrum. Reticular formation, Basal ganglia and cerebellum. Reflex action and common reflexes. Cranial nerves, distribution and supply with the special reference to II , V, VII , IX, X , XII., Nerve tracts (motor and sensory), Broadmann's area, anatomy of the nervous system related to speech and language.

Unit 3 **(12 hrs)**

Mechanism of speech and language production- I

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

Unit 4 **(10 hrs)**

1. Basic Acoustics of speech:

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

2. Mechanism of speech and language production- II

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

Unit 5 **(10 hrs)**

Mechanism of speech and language production- III

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

LIST OF BOOKS

Compulsory Reading:

1. Speech Correction: An Introduction to Speech Pathology and Audiology (8th Ed.). Van Riper, C and Emerick, L. (1990). New Jersey: Prentice Hall Inc.

2. Singh, I. (1996). Textbook of Anatomy with Color Atlas, Vol. III Jaypee Brothers.

3. Zemlin, W.R. (1981). Speech and Hearing Science: Anatomy and Physiology, (2nd Ed.). Englewood Cliffs, New Jersey: Prentice Hall.

Additional / Optional Reading:

1. Minifie, F.D., Hixon, T.J.,and Williams, F. (1973). Normal aspects of Speech, Hearing and Language. New Jersey: Prentice Hall Inc.

2. Skinner, P.H. and Shelton, R.L. (1978). Speech, Language and Hearing-Normal Processes and Disorders. (2nd Ed.). New York: John Wiley and Sons.

3. Human Communication Disorders: An Introduction (4th Ed.). Shames, G.H. Wiig, E.H. & Secord, W.A. (1994) New York: Merill Publishing Co.

4. Speech and Hearing Science, Anatomy and Physiology (3rd ed.). Zemlin, W.R.(1988) New Jersey: Englewood Cliffs

5. Human Communication & Its Disorders (2nd Ed.). Boone, D.R. & Plante, E. (1993). New Jersey: Prentice Hall Inc.

6. Palmer, J.M. (1984). Anatomy for Speech and Hearing, (3rd Ed.). New York: Harper and Row.

7. Perkins, W.H. and Kent, R.D. (1986). Textbook of Functional Anatomy of Speech, Language and Hearing. London: Taylor and Francis.

8. Gray's Anatomy. (37th Ed.). Williams Warwick and Dyson Banniser. (1989).Churchill

SEMESTER I
B 1.2: INTRODUCTION TO HEARING & HEARING SCIENCES

(30+70 marks) **(Total = 56 hrs)**

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

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

Unit 1

(10 hrs)

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

Unit 2 **(12 hrs)**

- Audiovestibular system: Anatomy of the external, middle and internal ears. Ascending and descending auditory and vestibular pathways.

- Physiology of the external, middle & inner ear, central hearing mechanisms, cochlear microphonics, action potentials, theories of hearing (AC & BC)

- Vestibular system: Functions of utricle, saccule and vestibular apparatus. Posture and equilibrium. Tests of posture and equilibrium

- Role of hearing (threshold concept, binaural hearing, head shadow, pinna shadow effect, MAF, MAP – Curve for threshold of hearing) & Causes of hearing impairment

Unit 3 **(12 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 two given values, calculation of overall dB when two signals are superimposed.

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

Unit 4 **(10 hrs)**

Causes of hearing loss

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

Unit 5 **(12 hrs)**

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

LIST OF BOOKS

Compulsory Reading:

1. Hodgson, H.R. (1980) Basic Audiologic Evaluation, London Williams and Wilkins.

2. Martin, F.N. (1991), Introduction to Audiology, IV Edition, New Jersey: Prentice Hall.

3. Newby, H.A. (1985), Audiology, New York: Appletion-Century-Crofts.

4. Testing, interpretation and recording - ISHA Battery (1990). ISHA Publication.

5. The Science of sound – Thomas D. Rossing, Addion – Wasloy Publishing Company

6. Architectural Acoustics. Egan, M. D. Mc Graw Hill Inc, (1988)

7. Bess and Humes (1990) Audiology - Fundamental. Williams and Wilkins, London.

8. Davis and Silverman, (Latest Edition). Hearing and deafness. Holt, Rinehats & Winston, London.

9. Rose, D.M. (Ed.) 1978), Audiological Assessment, New Jersey: Prentice Hill.

Additional Reading:

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

2. Relevant BIS documents

SEMESTER I

B 1.3 SPEECH LANGUAGE DIAGNOSTICS AND THERAPEUTICS

(30+70 marks) **(Total = 56 hrs)**

Objectives

After studying this paper at the end of the semester, 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 **(10 hrs)**

1. Client history – need for the client history – essential factors to be included in the client history form – comparison of adults vs. children client history – usefulness of the client history

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

Unit 2 **(12 hrs)**

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

B. Speech therapeutics

Unit 3 **(10 hrs)**

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

Unit 4 **(12 hrs)**

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

Unit 5 **(12 hrs)**

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

LIST OF BOOKS

Compulsory Reading:

1) Meyer, S.M. (1998). Survival guide for the beginning speech-language clinician. Maryland: Aspen Publishers.

2) Owens, R.E. (1999). Language disorders: Functional approach to assessment and intervention. Boston: Allyn & Bacon Inc.

3) Tomblin, E. et.al. (1994). Diagnosis in Speech language pathology. San Diego: Singular Publishing Inc.

4) Shipley, K.G., 7 Mcafer, J.G. (1998). Assessment in speech language pathology: A resource manual. San Diego: Singular Pub Inc.

5) Klein, H.B., & Nelson, M. (1994). Intervention planning for children with communication disorders: A guide for clinical practicum and professional practice. New Jersey. Prentice Hall.

Additional / Optional Reading:

6) Frattali, C.M. (1998). Measuring outcomes in speech language pathology. New York: Thieme.

7) Shames, G.H. (2000). Counselling the communicatively disabled and their families. Boston: Allyn & Bacon.

8) Hegde, M.N. (1985). Treatment procedures in communicative disorders. Texas. Pro Ed.

9) Darley, F.L., & Spriesterbach (1978). Diagnostic methods in Speech Pathology. San Diego: Singular Pub Inc.

10) Leith, W.R. (1993). Clinical methods in communicative disorders. Texas. Pro. Ed.

SEMESTER I

B 1.4 BASIC MEDICAL SCIENCES RELATED TO SPEECH & HEARING

(30+70 marks) **(Total = 56 hrs)**

Objectives: After studying this paper at the end of the semester, 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 **(10 hrs)**

(a) General introduction, definitions. Coronal / saggital / transverse 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.

Unit 2 **(14 hrs)**

i) Anatomy

(a) Nervous system: Definition of neuron, synapse, reflex action, bio electrical phenomena, action potential, depolarization, 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.

(b) Circulatory system: Definition of capillaries, arteries, veins, cardiac cycle, blood brain barrier, aneurysm, vascular shock – its reference to aphasia / speech disorders.

(c) 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 3 **(12 hrs)**

Physiology

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

Physiology of the ear: external, middle and inner ear functions – auditory apparatus-cochlea- vestibule, organ of corti, sound analysis – audiotry and vestibular pathways and centres; theories of hearing. Audition- posture and equilibrium in brief.

Unit 4 **(10 hrs)**

Pathology
Definition of inflammation, infection, tumor – benign & malignant relating to larynx, tongue and ear – glomus jugulae, VIII nerve tumour, tissue healing.

Unit 5 **(10 hrs)**
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).

LIST OF BOOKS
Compulsory Reading:

1) Singh, I. (1996). Textbook of Anatomy with Color Atlas, Vol. III Jaypee Brothers.

2) Zemlin, W.R. (1981). Speech and Hearing Science: Anatomy and Physiology, (2nd Ed.). Englewood Cliffs, New Jersey: Prentice Hall.

3) Alper, C.M., Myers, E.N., Eibling, D.E. (2001). Decision making in ear, nose & throat disorders. W.B. Saunders Company, Philadelphia.

4) Dhingra, P.L. (1992). Diseases of Ear, Nose & Throat. Churchill Livingstone, New Delhi.

5) Graym R.F., Hawthorne, M. (1992). Synopsis of Otolaryngology. Butterworth Heinemann Ltd, Oxford. 5th Edition.

6) Ramalingam, K.K., Sreeramamoorthy, B. (1990). A short practice of Otolaryngology. A.I.T.B.S. Publishers Distributors.

7) Scott-Brown, W.G., Ballantyne, J., Groves, J. Diseases of the nose & throat. Butterworth & Co., Ltd. 2nd edition, Chichester.

8) Inderbeer Singh (1996) – Text book of embryology.

Additional / Optional Reading:

9) Palmer, J.M. (1984). Anatomy for Speech and Hearing, (3rd Ed.). New York: Harper and Row.

10) Perkins, W.H. and Kent, R.D. (1986). Textbook of Functional Anatomy of Speech, Language and Hearing. London: Taylor and Francis.

11) Gray's Anatomy. (37th Ed.). Williams Warwick and Dyson Banniser. (1989). Churchill Livingstone.

B 1.5 CLINICAL PRACTICUM-(a) Speech Language Pathology

(30+70 marks) **(140 Hours)**

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

1. Taking client 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. Should have an orientation to Indian Sign Language **(25 hours)**

6. 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

7. Measure in 2 normal samples (with the help of video or live)
   - Mean Length of Utterance (MLU)
   - Syllable structure
   - Syntactic structures
   - Communication intent

8. Use proformae for the following disorders:
   - Articulation
   - Voice
   - Fluency
   - Cleft lip and palate
   - Child language assessment

9. Use scale / test for :

- Receptive language skills
- Expressive language skills

- Receptive Expressive Emergent Language Scale (REELS)
- 3-Dimensional Language Acquisition Test (3-DLAT)
- Scales of Early Communication Skills for Hearing impaired children (SECS) and Indian tests

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

Writing of observation reports of the above

Maintenance of a clinical diary

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

B 1.5 CLINICAL PRACTICUM-(b) Audiology

(30+70 marks) **(140 Hours)**

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

1. Public information materials (videos, pamphlets, booklets etc.)

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

3. Analyze 10-15 client histories of adults and children with hearing impairment.

4. Undergo pure-tone audiometry. Become familiar with different types of sound stimuli used for assessment of hearing and sound generator softwares.

5. Identify the different types of audiometers (at least 1 portable & 1 diagnostic) and their accessories referring to their respective manuals. Get familiar with the various parts of audiometers and their functions. Carry out listening checks of audiometers. Trouble-shoot audiometers. List the different earphone/ear cushion combination, BC vibrator, study the same and report the status of the same.

6. Prepare 0 dB HL equivalent chart with different earphone/ear cushion combinations.

B.1.6 : Foundation /Skill Development course – as per Bangalore University notification

(30+70 marks) **(42 Hours)**

Co curricular & Extra Curricular Activities (CC & EC) as per Bangalore University notification

(50 marks (internal only))

SEMESTER II

B 2.1 SPEECH, LANGUAGE DEVELOPMENT AND DISORDERS

(30+70 marks) **(Total = 56 hrs)**

Objectives

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

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

Unit 1 **(10 hrs)**

Development of speech and Language:
Development of language

- Semantics: A brief introduction to different types of homonyms, synonyms and antonyms.
- Morphology: Morpheme – bound and free, process of word formation, content and function words.
- Syntax: grammatical and syntactic categories, sentence types, Syntactic analysis.
- Pragmatics: Introduction to verbal and non-verbal communication and other indicators, intent of communication.

Unit 2 **(10 hrs)**

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

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

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

Unit 3 **(10 hrs)**

Definition, Etiology, Characteristics, Classification and Impact of

- Hearing Impairment
- Mental Retardation
- Cerebral Palsy
- Seizure disorders

Introduction to assessment procedures, differential diagnosis and management (detailed assessment, differential diagnosis and management, specific intervention techniques. Role of parents, caregivers, and families, AAC, team approach)

Unit 4 **(12 hrs)**

Definition, Etiology, Characteristics and classification of

- Autism Spectrum Disorders/Pervasive Developmental Disorders
- Attention Deficit Disorder/ Attention Deficit Hyperactive Disorder

Introduction to assessment procedures, differential diagnosis and management (detailed assessment, differential diagnosis and management, specific intervention techniques. Role of parents, caregivers, and families, AAC, team approach)

Unit 5 **(14 hrs)**

Definition, Etiology, Characteristics, Classification and Impact of

- Specific Language Impairment
- Learning Disability
- Acquired aphasias in childhood
- Traumatic Brain Injury
- Multiple disabilities

Introduction to assessment procedures, differential diagnosis and management (detailed assessment, differential diagnosis and management, specific intervention techniques. Role of parents, caregivers, and families, AAC, team approach)

LIST OF BOOKS

Compulsory Reading:

1) Reed, V. (1994). An Introduction to children with language disorders. (2nd Ed.) New York: Macmillan.

2) Nelson N. W (1998). Childhood language disorders in context – infancy through adolescence, Allyn and Bacon, Boston.

3) Hegde, M. N. (1996). A Coursebook on Language Disorders in Children. San Diego: Singular Publishers.

4) Ladefoged P. (1992). A course in Phonetics. (3rd Ed.). New York: Harcourt Brace Jovanovich.

5) Lees, J.A. and Urwin, S. (1991): Children with Language Disorders. Whurr Publishers

Additional/Optional Reading:

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

7) Thirumalai M. S. Shyamala Chengappa (1988) Simultaneous Acquisition of two languages CIIL, Mysore

8) Fromkin, L.F. and Rodman, R. (1993). An Introduction to Language (5th Ed.). New York: Harcourt Brace Jovanovich

9) Subba Rao (1992). Developing communication skills in MR, NIMH, Secunderabad.

10) Shyamala K. Chengappa (1992). Speech and Language of the cerebral palsied, CIIL, Mysore.

11) Shyamala K. Chengappa (1986). Introduction to speech disorders in children an introduction IED cell, Port Blair, Andaman & Nicobar.

12) O'Connor. (1993). Phonetics. Hammondsworth: Penguin books

13) Yule, G (1996). The Study of Language: An Introduction. (2nd Ed.). Cambrige: Cambridge University Press.

14) Lyons, J. (Ed.). (1970). New Horizons in Linguistics. Hammondsworth: Penguin Books.

15) Akmajian. A. et al. (1990). Linguistics: An Introduction to Language and Communication

SEMESTER II
B 2.2 INTRODUCTION TO AUDIOLOGY & AUDITORY TESTS

(30+70 marks) **(Total = 56 hrs)**

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

Unit 1: **(12 hours)**

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

Unit 2: **(12 hours)**

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

Unit 3: **(12 hours)**

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

Unit 4: **(10 hours)**

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

Unit 5: **(10 hours)**

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

LIST OF BOOKS

Compulsory Reading:

1. Hodgson, H.R. (1980) Basic Audiologic Evaluation, London Williams and Wilkins.

2. Martin, F.N. (1991), Introduction to Audiology, IV Edition, New Jersey: Prentice Hall.

3. Martin, H (1987), Speech Audiometry. Whurr Publisher, London

4. Newby, H.A. (1985), Audiology, New York: Appletion-Century-Crofts.

5. Testing, interpretation and recording - ISHA Battery (1990). ISHA Publication.

Additional Reading:

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

2. Bess and Humes (1990) Audiology - Fundamental. Williams and Wilkins, London.

3. Davis and Silverman, (Latest Edition). Hearing and deafness. Holt, Rinehats & Winston, London.

4. Rose, D.M. (Ed.) 1978), Audiological Assessment, New Jersey: Prentice Hill.
Relevant BIS documents

SEMESTER II
B 2.3 PSYCHOLOGY RELATED TO SPEECH AND HEARING

(30+70 marks) **(56 hrs)**

Objectives

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

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

Unit 1 **(10 hrs)**

- Introduction to psychology- Definition, History and perspectives, Branches and scope, application of psychology in the field of speech and hearing.
- Introduction to Clinical psychology – Definition, Perspectives and models of mental Disorders.

Unit 2 **(12 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 **(12 hrs)**

- Cognitive Psychology – Introduction, Definition and theoretical perspectives (David Rumelhart and David Mc Clelland, Noam Chomsky, George miller, Allan Newell).
- Applications of cognitive psychology in the field of speech and hearing.
- Neuropsychology – Introduction, definition, principles of neuropsychological assessment, diagnosis and rehabilitation.
- Applications of neuropsychology in the field of speech and hearing.

Unit 4 **(10 hrs)**

- Psychodiagnostics – Case history taking, Mental status examination, behavioural analysis, psychological testing.
- Counselling- Meaning and definition, types of counseling, Counseling in rehabilitation practice.

Unit 5 **(12 hrs)**

Developmental psychology:

Introduction, Definition, Principles, Motor development, Emotional development
Cognitive development- Definition, Piaget's theory
Play as a therapeutic tool
Personality development- Introduction, Stages, Hazards

LIST OF BOOKS

Compulsory Reading:

1) Hurlock, E.B. (1981). Child development VI Ed. Mc Graw Hill International Book Co.

2) Morgon C.T., King R.A., Robinson N.M. Introduction to Psychology. Tata McGraw Hill Publishing Co.

3) Coleman J.C. Abnormal Psychology and Modern Life, Taraporevala Sons & Co.

Additional/Optional Reading:

4) Siegal M.G. (Ed). (1987). Psychological Testing from Early Childhood Through Adolescence. International Universities Press.

5) Kline, P. (1993). The Handbook of Psychological Testing, Routledge,

6) Anastasi, A. (1999). Psychological testing, London: Freeman

SEMESTER II
B 2.4 MANAGEMENT OF THE PERSONS WITH HEARING IMPAIRMENT

(30+70 marks) **(Total = 56 hrs)**

Unit 1 **(12 hrs)**

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

Unit 2 **(10 hrs)**

- Methods of teaching language to the individuals with hearing impairment
    - Natural method
    - Structured method
    - Computer aided method

Unit 3 **(12 hrs)**

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

Unit 4 **(12 hrs)**

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

Unit 5 **(10 hrs)**

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

LIST OF BOOKS

Compulsory Reading:

1. Sanders, D. A. (1993). Management of Hearing Handicap; Infants to Elderly, 3rd Ed., New Jersey, Prentice Hall.

2. Tucker, I., & Nolan, M. (1984). Educational Audiology. London: Croom Helm, Chapter.10.

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

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

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

Additional Reading:

1. Davis, J.M. and Hardick, E.J. (1981). Rehabilitative Audiology for Children and Adults. New York: John Wiley and Sons.

2. Ross, M. Brackett, D. and Maxon, A.B. (1991). Assessment and management of mainstreamed hearing-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.

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

(30+70 marks) **(140 hours)**

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

1) Take client history 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 normals and 5 children/adults with speech language complaints

4) Observation of therapy of 10 clients with speech language disorders.

5) Observation of a minimum of 5 diagnostic clients and 5 therapy clients

6) Developing therapy material specific to 10 clients they have observed

7) Writing of observation reports of the above

8) Maintenance of a clinical diary

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

SEMESTER II
B 2.5 CLINICAL PRACTICUM - (b) Audiology

(30+70 marks) **(140 hours)**

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

1. Public information materials (videos, pamphlets, booklets etc.)

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

3. Analyse 10-15 client histories of adults and children with hearing impairment.

4. Undergo pure-tone audiometry. Become familiar with different types of sound stimuli used for assessment of hearing and sound generator softwares.

5. Identify the different types of audiometers (at least 1 portable & 1 diagnostic) and their accessories referring to their respective manuals. Get familiar with the various parts of audiometers and their functions. Carry out listening checks of audiometers. Trouble-shoot audiometers. List the different earphone/ear cushion combination, BC vibrator, study the same and report the status of the same.

6. Prepare 0 dB HL equivalent chart with different earphone/ear cushion combinations.

7. Obtain audiograms of 10 normal subjects.

8. Observe /participate during audiological evaluation on a variety of clients under supervision. Plot audiograms, calculate inter-aural attenuation, occlusion effect.

9. Obtain audiograms under supervision on 20 adult clients (AC & BC).

10. Obtain audiograms with masking (5 clients)

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

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

SEMESTER II

Foundation/Skill Development Course

B 2.6: COMPUTER FUNDAMENTALS

(30+70 marks) **(Total = 42 hrs)**

Unit 1: **(8 hrs)**

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

Unit 2: **(8 hrs)**

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

Unit 3: **(10 hrs)**

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

Unit 4: **(8 hrs)**

Word processing and electronic spread sheet. An overview of MS-WORD, MS- EXCEL and MS-POWERPOINT. Elements of Basic programming. Simple Illustrations.

Unit 5: **(8 hrs)**

Network of computers. Types of networks, LAN, Intranet and Internet, Internet Applications. World wide web, E-mail, browsing and searching. Search engines, Multimedia applications.

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

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

- Simple MS-DOS commands – One session
- Windows operating system - icons, menus and sub menus, my computer – two sessions
- Desktop publishing – preparation of a document using MS.WORD - Two sessions
- Installation of a software, virus scanning – illustration. One session.
- Spreadsheet calculation using MS EXCEL .One session.
- BASIC programming – illustrations – One session.
- Internet use. Surfing, browsing, search engines, E-mail. Two sessions

LIST OF BOOKS

1. Alexis Leon and Mathews Leon (1999): Fundamentals of information technology. Leon Techworld Pub.

2. Jain, S.K.(1999):Information Technology "O" level made simple. BPB Pub.

3. Jain, V.K.(2000): "O" Level Personal Computer software. BPB Pub.

4. Rajaraman, V.{1999}: Fundamental of Computers. Prentice Hall India.

5. Hamacher, Computer Organization. McGrawhill.

6. Alexis Leon: Computers for everyone. Vikas, UBS.

7. Anil Madaan: Illustrated Computer Encyclopedia. Dreamland Pub.

8. Sinha. Computer Fundamentals. BPB Pub.

Co Curricular & Extra Curricular Activities (CC & EC) as per Bangalore University notification

(50 marks (internal only))

SEMESTER III
B 3.1 ARTICULATION AND PHONOLOGICAL DISORDERS

(30+70 marks) **(Total = 56 hrs)**

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

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

Unit 1 **(10 hrs)**

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

Unit 2 **(12 hrs)**

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

Unit 3 **(10 hrs)**

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

Unit 4 **(10 hrs)**

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

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

5. Characteristics of disordered phonology and differential diagnosis

Unit 5 **(14 hrs)**

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

LIST OF BOOKS

Compulsory Reading:

1) Bernthal, J.E. and Bankson, N.W. (1988).Articulation and Phonological Disorders. (3rd Ed.). New Jersey: Prentice Hall Inc.

2) Weiss, C.E., Lillywhite, H.S. and Gordon, M.E. (1980). Clinical Management of Articulation Disorders. St. Louis: C.V. Mosby

3) Creaghead, N.A., Newman, A.W. and Secord, W.A. (1989). Assessment and remediation of articulatory and phonological disorders. (2nd Ed.). New York: Macmillan
Additional/Optional Reading:

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

SEMESTER III
B 3.2 MAXILLOFACIAL ANOMALIES

(30+70 marks) **(Total = 56 hrs)**

Objectives:

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

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

CLEFT LIP AND PALATE

Unit 1 **(10 hrs)**

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

Unit 2 **(10 hrs)**

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

Unit 3 **(12 hrs)**

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

Unit 4 **(12 hrs)**

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

GLOSSECTOMY AND MANDIBULECTOMY

Unit 5 **(12 hrs)**

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

LIST OF BOOKS

Compulsory Reading:

1) Mc. Williams, B.J., Morris, H.L. and Shelton, R.L. (1984).Cleft Palate Speech (1st Edition). Philadelphia: B.C. Decker Inc.

2) Spriesterbach, D. (1968). Cleft palate and Communication. Academic Press, New York

Additional / Optional Reading:

3) Grunwell (1993). Analysis of Cleft palate speech, (Ed.) Whurr publisher. London

4) Kernahan, D.A. and Rosenstein, S.W. (1990). Cleft, Lip and Palate – A System of Management. Maryland (USA): Williams and Wilkins.

5) Appleton, J. and Machin, J. (1995). Working with Oral Cancer. UK: Winslow.

SEMESTER III
B 3.3 DIAGNOSTIC AUDIOLOGY: Part 1

(30+70 marks) **(Total = 56 hrs)**

Unit 1: **(10 hrs)**

Introduction to diagnostic audiology
a) Need for test battery approach in auditory diagnosis and integration of results of audiological tests.
b) Indications for administering audiological tests to identify:

- Cochlear pathology
- Retrocochlear pathology
- Functional hearing loss
- Central auditory processing disorders

Unit 2 **(10 hrs)**

Tests to differentiate between cochlear and retrocochlear pathology
a) ABLB, MLB
b) SISI
c) Tests for adaptation
d) Bekesy Audiometry
e) Brief tone audiometry
f) PIPB function

Unit 3 **(12 hrs)**

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

Unit 4 **(14 hrs)**

Tests to detect central Auditory Disorders

a) Monoaural low redundancy tests
• Filtered speech tests
• Time compressed speech test
• Speech-in-noise test
• SSI with ICM
• Other monaural low redundancy tests

b) Dichotic speech tests

• Dichotic digit test
• Staggered spondaic word test
• Dichotic CV test
• SSI with CCM
• Competing sentence test
• Other dichotic speech tests

c) Binaural interaction tests

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

d) Temporal ordering tasks

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

Unit 5 **(10 hrs)**

a) Variables influencing central auditory assessment
• Procedural variables
• Subject variables

b) Test findings in subjects with central auditory disorders
• Brainstem lesion
• Cortical and hemispheric lesion
• Interhemispheric dysfunction
• CAPD in children
• CAPD in elderly

LIST OF BOOKS

Compulsory Reading:

1. Jerger, J. (1963). Modern developments in Audiology, New York: Academic Press.

2. Jerger, J. (1987). Diagnostic Audiology: Historical Perspectives, Ear and Hearing, 8 7s-12s

3. Katz, J. et al (Ed.) (1994). Handbook of Clinical Audiology, Baltimore: Williams and Wilkins.

4. Musiek, F.E. and Rintlemann, W.F. (1999). Contemporary Perspective in Hearing Assessment. USA: Allyn & Bacon.

5. Silman S. and Silverman C.A. (1991). Auditory Diagnosis Principles and Application. New York: Academic Press, Inc.

Additional Reading:

1. Martin, F.N (1994), Introduction to Audiology, New Jersey: Prentice Hall.

2. Rupp, Stockdell (1980). Speech Protocols in Audiology, New York: Grune & Stratton.

3. Keith, R.M. (Ed.). (1981). Central Auditory Dysfunction. New York: Grune & Stratton.

4. Musiek, and Baran, J.A. (1987). Central Auditory Assessment: Thirty years of challenge and change. Ear and Hearing 3, 225-355.

5. Pinherio, H.L. Kusiek, F.E. (Eds) (1985). Assessment of Central Auditory Dysfunction Foundations and Correlates. Baltimore: Williams and Wilkins.

6. Willsford J.A. (1987), Handbook of Central Auditory Processing Disorders in Children. Drando, Grune & Stratton.

7. Feldman, A.S., & Willber, L.A. (Eds), (1976), Acoustic Impedance, Immittance: Measurement of Middle Ear Function, Baltimore: Williams & Wilkins.

8. Popelka, B.R. (Ed) (1981). Hearing Assessment with acoustic reflex. New York: Grune and Stratton.

9. Jacobson, J.T. (Ed) (1985). Auditory Brain Stem Response. Taylor and Francis, London.

SEMESTER III
B 3.4: OTORHINOLARYNGOLOGY

(30+70 marks) **(Total = 56 hrs)**

Unit 1 **(12 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.

Unit 2 **(12 hrs)**

Other causes of hearing loss – Facial paralysis, Tumors of the cerebello- pontine angle, Acoustic neuroma. Infection and management of inner ear diseases. Cochleo-vestibular diseases and its management.

Vestibular disorders and tests – Vestibular function tests: clinical tests, laboratory tests, nystagmus, Rhomberg's test, caloric tests.

Unit 3 **(10 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 4 **(10 hrs)**

Anatomy & Physiology of the nose
(a) Congenital diseases of nose, complete absence, cleft lip, proboscis lateralis, nasal gliomas choanalatresis
(b) Nasal septum, injuries, septal haematoma, septal deviation, septal perforation, septal abscess
(c) Acute and chronic inflammations of the nasal cavities. Common cold, Rhinitis Caseose, Nasal syphilis, Tuberculosis, Lupus, Chronic Diphtheria, Rhinoscleroma, leprosy, Rhinosporidiosis, nasal polyposes
(d) Vasomotor Rhinitis, Allergic (extrinsic), Non-allergic (Intrinsic)
(e) Sinusitis (in brief)
(f) Tumors of the nose

Unit 5 **(12 hrs)**

(a) Anatomy & Physiology of larynx – physiology of phonation / physiology of respiration.

(b) Congenital diseases of the larynx – difference between an infant and an adult larynx. Stridor – causes of infantile stridor. Disorders of structure – Laryngomalacia, Bifid epiglottis, Laryngeal web, Atresia, fistula, Laryngeal cleft, Tumors and Cysts, Laryngitis, Laryngeal trauma and Stenosis. Neuromuscular dysfunctions of the larynx – Vocal cord palsy, Spastic dysphonia, Hypothyroidism, gastro oesophageal reflux disorders, Laryngectomy, artificial larynx, oesophageal speech, tracheo oesophageal puncture.

LIST OF BOOKS

Compulsory Reading:

1) Singh, I. (1996). Textbook of Anatomy with Color Atlas, Vol. III Jaypee Brothers.

2) Zemlin, W.R. (1981). Speech and Hearing Science: Anatomy and Physiology, (2nd Ed.). Englewood Cliffs, New Jersey: Prentice Hall.

3) Alper, C.M., Myers, E.N., Eibling, D.E. (2001). Decision making in ear, nose & throat disorders. W.B. Saunders Company, Philadelphia.

4) Dhingra, P.L. (1992). Diseases of Ear, Nose & Throat. Churchill Livingstone, New Delhi.

5) Graym R.F., Hawthorne, M. (1992). Synopsis of Otolaryngology. Butterworth Heinemann Ltd, Oxford. 5th Edition.

6) Ramalingam, K.K., Sreeramamoorthy, B. (1990). A short practice of Otolaryngology. A.I.T.B.S. Publishers Distributors.

7) Scott-Brown, W.G., Ballantyne, J., Groves, J. Diseases of the nose & throat. Butterworth & Co., Ltd. 2nd edition, Chichester.

8) Inderbeer Singh (1996) – Text book of embryology.

Additional / Optional Reading:

9) Palmer, J.M. (1984). Anatomy for Speech and Hearing, (3rd Ed.). New York: Harper and Row.

10) Perkins, W.H. and Kent, R.D. (1986). Textbook of Functional Anatomy of Speech, Language and Hearing. London: Taylor and Francis.

11) Gray's Anatomy. (37th Ed.). Williams Warwick and Dyson Banniser. (1989). Churchill Livingstone.

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

(30+70 marks) **(140 hours)**

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

1. Carry out informal and formal assessment procedures for the following aspects of speech and language (from a normal child sample)

i. Pre-linguistic skills
   Non-verbal communication
   Child directed speech
ii. Semantics
   Syntax and morphology
   Pragmatics
iii. Phonological process and its analysis
   Speech intelligibility
   Transcription of the sample in IPA should be done.

2. Use scales / tests for evaluation and treatment of Childhood communication disorders, Articulation and Phonological Disorders, Maxillofacial anomalies:

- Northwest Syntax Screening Test
- Bankson's Language Screening Test
- Test for Examining Expressive Morphology
- Autistic Behaviour Composite Checklist and Profile
- Linguistic Profile Test
- Tests for learning Disability
- Screening Test for Developmental Apraxia of Speech
- Articulation assessment tests in different Indian languages
- Other Indian tests and materials available

3.
i) Perceptual analysis of 5 normal and 5 abnormal articulation samples
ii) Analysis and marking of cleft
iii) Nasalence measurements in normal and cleft palate speech

4. Planning and executing therapy for a minimum of 5 clients (including children and adults with articulation disorders, cleft palate, glossectomy, mandibulectomy) for approximately 5 sessions each and preparation of the following:

- Carry out baseline evaluation
- Preparation of pre therapy reports
- Provide guidelines for home-based intervention in the form of home training programs/modules for the above mentioned disorders

Making appropriate referrals and preparing sample referral letters to various professionals connected with the above mentioned disorders

Know various centers available for rehabilitation (local, national, international)

5. Counseling parents of children and adults with articulation disorders, cleft lip and palate, glossectomy and mandibulectomy

6. Maintaining audio samples used for the practical analysis

7. Maintaining clinical dairy.

B 3.5 CLINICAL PRACTICUM (b) Audiology

(30+70 marks) **(140 hours)**

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

1. Be familiar with instrumentation for speech Audiometry, Immitance Audiometry, sound field-testing.

2. Carryout complete pure tone Audiometry (with AC/BC, unmasked/masked), Interpretation of audiograms, identifying indicators for special/further diagnostic testing, writing client review (25 clients)

3. Speech Audiometry: Be familiar with speech test material in at least two Indian languages, master live voice presentation and recorded test presentation, administer SAL, SRT, SIS, MCL, UCL, PI-PB function test.

4. Collect speech audiometry test materials in Indian languages.

5. Carryout speech audiometry on 10 normal subjects, and 20 clients with conductive hearing loss, sensorineural hearing loss and functional hearing loss. Interpretation of speech audiometry results.

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

Routine pure tone & speech audiometry

Administering special tests using pure tone: Tone Decay Test, STAT, SISI, ABLB, MLB, SPAR, Test for functional hearing loss.

Educational Audiology

1. Note the speech and language characteristics of those with hearing impairment

2. Management of individuals with post-lingual hearing impairment

3. Role-play activities for teaching language to the individuals with hearing impairment.

4. Prepare schedules for educational placement of 5 children with hearing impairment having different hearing capacities.

5. Counsel parents regarding educational placement of the individuals with hearing impairment.

SEMESTER III

Foundation/Skill Development Course

SEMESTER III
B 3.6 INDIAN CONSTITUTION

(30+70 marks) **(Total = 42 hrs)**

(Syllabus for compulsory paper for all undergraduate degree courses in III semester. As revised by the board of Studies in Political Science in June 2005 to suit the requirements of the Semester Scheme)

Unit 1: Indian Constitution: Its Philosophy and Framing **(8 Hrs)**

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

Unit 2: The Union & State Legislature **(8 Hrs)**

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

Unit 3: The Union & State Executive **(8 Hrs)**

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

Unit 4: The Judiciary **(8 Hrs)**

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

Unit 5: Issues **(10 Hrs)**

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

LIST OF BOOKS

1. D.D. Basu : Introduction to the Constitution of India

2.Granville Austin : India's Constitution – Cornerstone of a Nation

3.Granville Austin : Working of a Democratic Constitution - The Indian Experience

4. J. C. Johari : Indian Government and Politics Vol. 1 & 2

5. J.R. Siwach : Dynamics of Indian Government & Politics

6. D.C. Gupta : Indian Government & Politics

7. M.V. Pylee : India's Constitution

8. K.K. Ghai : The Indian Constitution

9. H.M. Rajasekhar : Bharatha Sarkara mattu Rajkiya

9. M.P. Bhuvaneshwara Prasad : Bharathiya Samvidhana Parichaya

10. S.K. Kabburi : Bharata Samvidhana

11. K.J. Suresh : Bharata Samvidhana

12. D.T. Deve Gowda : Bharata Sarkara mattu Rajkiya
13. Lohitashwa : Bharata Samvidhana

Co Curricular & Extra Curricular Activities (CC & EC) as per Bangalore University notification

(50 marks (internal only))

SEMESTER IV
B.4.1 VOICE AND LARYNGECTOMY

(30+70 marks) **(Total = 56 hrs)**

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

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

Unit 1 **(12 hrs)**

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

Unit 2 **(10 hrs)**

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

Unit 3 **(10 hrs)**

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

Unit 4 **(12 hrs)**

Laryngectomy:

- Types and characteristics of laryngectomy surgery
- Assessment of a laryngectomee and associated problems
- Management of a laryngectomee:

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

Unit 5 **(12 hrs)**

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

LIST OF BOOKS

Compulsory Reading:

1) Boone, D.R. & McFarlane, S. C (1994): The Voice and Voice Therapy. (Fifth Ed.). Englewood Cliffs, Prentice-Hall, Inc. New Jersy.

2) Prater, R.J. and Swift, R.W. (1984): Manual of Voice Therapy. Little, Brown and Co, Boston.

3) Andrews . M.L. (1995): Manual of Voice treatment, Singular publishing group, San Diego.

4) Doyle, P C (1994) Foundation of voice and speech rehabilitation following laryngeal cancer. Singular publishing group. San Diego.

Additional/Optional Reading:

5) Brown. W.M.s. and others (1996) (ed): Organic voice disorders. Singular publishing group, Sandiego.

6) Joseph, C Stemple Leble, E Glaze, Bernick K Gerdeman. Clincial voice pathology. Theory & Management (II Edition)

7) Aronson, A.E. (1990): Clinical Voice Disorders, New York: Thieme, Inc.
8) Greene, M.C.L. and Mathieson, L. (1989): The Voice and Its Disorders. Whurr publications, London.

9) Case, J.L. (1991): Clinical Management of Voice Disorders, Pro-Ed, Austin.
10) Fawcus, M. (Ed.) (1991): Voice Disorders and Their Management. Singular Publishing. Group. San Diego

11) Salmon, S.J. and Mount, K.H. (Eds.) (1991): Alaryngeal Speech Rehabilitation. Prof-Ed. Austin.

12) Keith, R L & Darley (III Edition) Laryngectomee rehabilitation. Pro. Ed.Austin

SEMESTER IV
B 4.2 MOTOR SPEECH DISORDERS IN CHILDREN

(30+70 marks) **(Total = 56 hrs)**

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

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

Unit 1 **(12 hrs)**

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

Unit 2 **(12hrs)**

1. Cerebral palsy
   - Definition, causes and classification
   - Neuromuscular development in normals and children with cerebral palsy
   - Reflex profile, development of feeding
   - Associated problems, feeding difficulties
   - Speech and language problems of children with cerebral palsy
   - Assessment of speech in children with cerebral palsy- objective and subjective methods
   - Differential diagnosis of cerebral palsy

   - Management: Introduction to different approaches to neuromuscular education (Bobath, Phelps and the others); Speech rehabilitation in cerebral palsy- Verbal approaches: vegetative exercises, oral sensorimotor facilitation techniques, compensatory techniques- correction of respiratory, phonatory, resonatory and articulatory errors; Team approach to rehabilitation; Neurosurgical techniques for cerebral palsy

Unit 3 **(12 hrs)**

1. Different types of Cerebral palsy:
    - Disorders of muscle tone: Spasticity, rigidity, flaccidity, atonia
    - Disorders of movement: Hyperkinesias and dyskinesis- Ballismus, tremor, tic disorder, myoclons, athetosis, chorea, dystonia, hypokinesis
    - Disorders of coordination- Ataxia

2. Syndromes with motor speech disorders- Examples:
    - Juvenile progressive bulbar palsy
    - Congenital supranuclear palsy
    - Guillain- Barre syndrome
    - Duchenne muscular dystrophy

Unit 4 **(10 hrs)**

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

Unit 5 **(10 hrs)**

1. Application of augmentative and alternative (AAC) communication methods in developmental dysarthrias and developmental apraxia of speech:
    - Symbol selection
    - Techniques
    - Assessment for AAC
    - Training communication patterns,
    - Effective use of AAC

LIST OF BOOKS

Compulsory Reading:

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

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

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

Additional/Optional Reading:

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

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

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

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

SEMESTER IV
B 4.3 DIAGNOSTIC AUDIOLOGY: Part 2

(30+70 marks) **(Total = 56 hrs)**

Unit 1 **(12 hrs)**
Immittance evaluation

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

Unit 2 **(12 hrs)**
Auditory brainstem response
a) Introduction and classification of AEPs including ASSR (80 Hz)
b) Instrumentation
c) Test procedure
d) Factors affecting auditory brainstem responses
e) Interpretation of results and clinical application
f) ASSR, Tone burst ABR

Unit 3 **(12 hrs)**
Middle and long latency auditory evoked potentials
a) Test procedure for MLR, LLR, MMN, P 300, ASSR (40 Hz)
b) Factors affecting middle, long latency evoked potentials (including MMN & P300)
c) Interpretation of results and clinical application

Unit 4 **(10 hrs)**
Otoacoustic emissions

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

Unit 5 **(10 hrs)**
Electronystagmography
a) Introduction and need for electronystagmography
b) Subtests in electronystogmography

c) Interpretation of test results and clinical applications
d) Findings in the paediatric population

Other vestibular tests
a) VEMP
b) EMG
c) Glycerol test etc.

LIST OF BOOKS

Compulsory Reading:

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

Additional Reading:

1. Martin, F.N (1994), Introduction to Audiology, New Jersey: Prentice Hall.

2. Silman S. and Silverman C.A. (1991). Auditory Diagnosis Principles and Application. New York: Academic Press, Inc.

3. Rupp, Stockdell (1980). Speech Protocols in Audiology, New York: Grune & Stratton.

4. Keith, R.M. (Ed.). (1981). Central Auditory Dysfunction. New York: Grune & Stratton.

5. Musiek, and Baran, J.A. (1987). Central Auditory Assessment: Thirty years of challenge and change. Ear and Hearing 3, 225-355.

6. Pinherio, H.L. Kusiek, F.E. (Eds) (1985). Assessment of Central Auditory Dysfunction Foundations and Correlates. Baltimore: Williams and Wilkins.

7. Willsford J.A. (1987), Handbook of Central Auditory Processing Disorders in Children. Drando, Grune & Stratton.

8. Feldman, A.S., & Willber, L.A. (Eds), (1976), Acoustic Impedance, Immittance: Measurement of Middle Ear Function, Baltimore: Williams & Wilkins.

SEMESTER IV
B 4.4 PEDIATRIC AUDIOLOGY

(30+70 marks) **(Total = 56 hrs)**

Unit 1 **(10 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 **(12 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 **(10 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 **(14 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 (ESPT), Speech tests developed in India.
Factors affecting speech audiometry results in children
BC speech audiometry

Unit 5 **(10 hrs)**

a) Functional hearing loss in children
Signs/symptoms
Tests

b) Central Auditory Processing Disorders in children
Signs/symptoms
Screening tests

LIST OF BOOKS

Compulsory Reading:

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

Additional Reading:

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

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

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

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

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

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

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

(30+70 marks) **(140 Hours)**

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

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

i) Perceptual analysis of pitch, loudness and quality of voice

ii) Instrumental analysis of voice – Fo and related measures, amplitude and related measures, CTAS, EGG, maximum phonation duration, s/z ratio, vital capacity, mean airflow rate, analysis and professional voice

iii) Diagnosis of voice disorders

iv) Proformae for cerebral palsy, diagnosis of cerebral palsy

v) Analysis of developmental apraxia of speech

vi) Planning, writing and executing therapy in 5 clients with voice disorders, laryngectomy, cerebral palsy and developmental apraxia of speech

vii) Counseling in the above speech disorders

viii) Record maintenanc

SEMESTER IV
B 4.5 CLINICAL PARACTICUM (b) Audiology

(30+70 marks) **(140 Hours)**

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

1. Be familiar with instrumentation for speech audiometry, immittance audiometry, sound field-testing.

2. Carryout complete pure tone audiometry (with AC/BC, unmasked/masked), interpretation of audiograms, identifying indicators for special/further diagnostic testing, writing client review (25 clients)

3. Speech Audiometry: Be familiar with speech test material in at least two Indian languages, master live voice presentation and recorded test presentation, administer SAL, SRT, SIS, MCL, UCL, PI-PB function test.

4. Collect speech audiometry test materials in Indian languages.

5. Carryout speech audiometry on 10 normal subjects, and 20 clients with conductive hearing loss, sensorineural hearing loss and functional hearing loss. Interpretation of speech audiometry results.

6. Carryout holistic audiological assessment for differential diagnosis (Cochlear & Retro cochlear)

7. Routine pure tone & speech audiometry

8. Administering special tests using pure tone: Tone Decay Test, STAT, SISI, ABLB, MLB, SPAR, Tests for functional hearing loss.

9. Carryout Immittance Audiometry (minimum of 5 clients) – PVT, Tympanometry, Acoustic Reflex testing (ipsi & contra). Interpret the findings taking into consideration the ENT reports.

10. Carry out Auditory Brainstem Response (ABR) & Oto-Acoustic Emissions (OAE) –
• Preparation of the patient
• Informing the patient/caregiver with respect to the procedure
• Electrode montage
• Conduct the procedure with respect to test protocol (5 clients each)
• BC-ABR, Tone burst ABR

Educational Audiology

1. Note the speech and language characteristics of those with hearing impairment

2. Management of individuals with hearing impairment – both children and adults

3. Role-play activities for teaching language to the individuals with hearing impairment.

4. Prepare schedules for educational placement of 5 children with hearing impairment having different hearing capacities.

5. Counsel parents regarding educational placement of the individuals with hearing impairment.

Paediatric Audiology

1. Informal screening – purpose, materials used, noise makers, their spectral characteristics, procedure (5 normal & 5 children with hearing impairment)

2. Sound field testing: BOA, VRA, Play audiometry (5 clients each)

3. Observe auditory response based on video clippings or live client testing.

LIST OF BOOKS

Compulsory Reading:

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

Additional Readings:

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

3. Erber, N.P. (1982), Auditory Training, Washington: A.G. Bell Association for deaf. Fulton, R.L. and Lloyd, L.L. (1975), Auditory assessment of the difficult to test, Baltimore: Williams and Wilkins, Co.

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

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

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

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

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

SEMESTER IV
B 4.6 ENVIRONMENTAL STUDIES

(30+70 marks)

Unit 1: The multidisciplinary nature of environmental studies (4 hrs)
Definition, scope and importance

Unit 2: Natural Resources (7 hrs)

Renewable and non-renewable resources:
Natural resources and associated problems

1. Forest resources: Use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forests and tribal people.

2. Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams' benefits and problems.

3. Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies.

4. Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies

5. Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources, Case studies.

6. Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification.

    - Role of an individual in conservation of natural resources
    - Equitable use of resources for sustainable lifestyles

Unit 3: Eco Systems (7 hrs)

- Concept of an ecosystem
- Structure and function of an ecosystem
- Producers, consumers and decomposers
- Energy flow in the ecosystem
- Ecological succession
- Food chains, food webs and ecological pyramids
- Introduction, types, characteristic features, structure and function of the following ecosystem:

1. Forest ecosystem
2. Grassland ecosystem
3. Desert ecosystem
4. Aquatic ecosystem (ponds, streams, lakes, rivers, oceans, estuaries)

Unit 4: **Biodiversity and its conservation** **(7 hrs)**

- Introduction – Definition, genetic, species and ecosystem diversity
- Biogeographical classification of India
- Value of biodiversity: consumptive use, productive use, social, ethical, esthetic and option values
- Biodiversity at global, national and local levels
- India as a mega diversity nation
- Hot-spots of biodiversity
- Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts
- Endangered and endemic species of India
- Conservation of biodiversity: In-situ and ex-situ conservation of biodiversity

Unit 5: Environmental Pollution **(7 hrs)**

Definition

- Causes, effects and control measures of:-

a. Air pollution
b. Water pollution
c. Soil pollution
d. Marine pollution
e. Noise pollution
f. Thermal pollution
g. Nuclear hazards

- Solid waste management: causes, effects and control measures of urban and industrial wastes
- Role of an individual in prevention of pollution
- Pollution case studies
- Disaster management: floods, earthquakes, cyclone and landslides

Unit 6: Social issues and the environment **(7 hrs)**

- From unsustainable to sustainable development
- Urban problems related to energy
- Water conservation, rain water harvesting, watershed management
- Resettlement and rehabilitation of people, its problems and concerns, case studies
- Environment ethics, issues and possible solutions
- Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case studies
- Wasteland reclamation

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

Unit 7: Human population and the Environment (7 hrs)

- Population growth, variation among nations
- Population explosion, family welfare programme
- Environment and human health
- Human rights
- Value education
- HIV/AIDS
- Women and child welfare
- Role of information technology in environment and human health
- Case studies

Unit 8: Field Work (18 hrs)

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

LIST OF BOOKS

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

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

Brunner R.C 1989, Hazardous Waste

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

Cunningham, W.P. Cooper, T H Gorhani, E & Hepworth, M.T 2001 Environmental

Encyclopedia, Jaico Publ. House, Mumbai 1196 p

De A.K. Environmental Chemistry, Wiley Eastern Ltd

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

Gleiek H.P 1993. Water in crisis. Pacific Institute for Studies in Dev., Environment & Security, Stockholm Env. Institute. Oxford Univ. Press 473 p

Hawkins R.E, Encyclopedia of Indian Natural History, Bombay Natural History Society, Bombay (R)

Heywood, V.H & Watson. R.T 1995. Global Biodiversity Assessment, Cambridge Univ. Press 1140p

Jadhav H & Bhosale V.M. 1995, Environmental Protection and laws, Himalaya Pub. House, Delhi 284 p

Mekinney M.L. & Schocl, R.M. 1996. Environmental Science systems & Solutions, Web enhanced edition 639p

Mhaskar A.K, Matter Hazardous, Techno-Science Publication (TB)

Miller T.G Jr. Environmental Science, Wadsworth Publishing Co. (TB)

Odum, E.P 1971. Fundamentals of Ecology, W.B. Saunders Co. USA,574p

Rao M.N & Datta A.K. 1987. Waste Water Treatment. Oxford & IBH Publ. Co. Pvt. Ltd 345p

Sharma B.K 2001. Environmental Chemistry. Goel Publ. House, Meerut
Survey of the Environment. The Hindu (M)

Co Curricular & Extra Curricular Activities (CC & EC) as per Bangalore University notification

(50 marks (internal only))

SEMESTER V
B 5.1 FLUENCY AND ITS DISORDERS

(30+70 marks) **(Total = 56 hrs)**

Objectives:

After studying this paper at the end of the semester, the student should be able to understand the following –
• Characteristics and types of Fluency disorders
• Theories of stuttering
• Assessment and Management

Unit 1 **(10 hrs)**

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

Unit 2 **(10 hrs)**

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

Unit 3 **(10 hrs)**

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

Unit 4 **(12 hrs)**

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

Unit 5 **(14 hrs)**

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

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

LIST OF BOOKS

Compulsory Reading:

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

SEMESTER V
B 5.2 MOTOR SPEECH DISORDERS IN ADULTS

(30+70 marks) **(Total = 56 hrs)**

Objectives:

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

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

Unit 1 **(14 hrs)**

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

Unit 2 **(10 hrs)**

1. Assessment of dysarthria:

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

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

Unit 3 **(10 hrs)**

1. Management of dysarthria:

• Medical, surgical and prosthetic approaches
• Speech therapy

Facilitatory approaches: Vegetative exercises, Oral sensori motor facilitation techniques
Compensatory approaches – correction of respiratory, phonatory, articulatory and prosodic errors.
Strategies to improve intelligibility of speech.

Unit 4 **(10 hrs)**

1. Apraxia of speech in adults

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

Unit 5 **(12 hrs)**

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

LIST OF BOOKS

Compulsory Reading:

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

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

Additional/Optional Reading

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

2. Acquired Speech and Language disorders - A Neuroanatomical and Functional

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

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

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

(30+70 marks) **(Total = 56 hrs)**

PART A:

Unit 1 **(10 hrs)**

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

1. Basics of electricity & electronics - Direct and alternating current, DC Power supplies, voltage stabilizers, Passive circuit elements, transistors. Linear and digital Integrated circuits, microprocessors. Micro computers and Computers. Filters, Linear and non-linear Amplifiers and Oscillators, Amplifier power and distortion

2. Basics of digital signal processing – Analog signal, digital signal, A to D and D to A conversion, Basic concept of Digital Signal Processing and its implementation, How does a DSP based system work? Application- DSP based hearing aids.

Unit 2 **(10 hrs)**

1. Microphones as transducers. Velocity microphones. uni-directional microphones Microphone impedance and sensitivity. Loudspeakers as transducers. Structure of a dynamic loudspeaker. Air suspension. Baffles and enclosures. Horn speakers. Multi-speaker systems. Loudspeaker Efficiency, Loudspeaker power and distortion. Recording and Reproduction of sound. Recording characteristics. Dynamic Range, Stereophonic recording. Magnetic tape recording and playback. Tape speed and frequency response, Bias and equalization, Tape noise, Digital Tape recording, CD ROM recording

2. Measuring Instruments - Multi-meter. Cathode ray oscilloscope. Sine wave generator. Function Generator, Frequency counter, Measuring microphones, Sound Level Meter, Integrated Sound Level Meter, Artificial ear, Artificial Mastoid, Couplers, Hearing aid test box, Measurement of different types of sound

PART B:

Unit 3 **(14 hrs)**

a. Historical development of hearing aids
   - Non-electrical hearing aids
   - Electric hearing aids

b. Basic elements of hearing aids: Microphone, Amplifier, Receiver, Cords, Batteries

c. Directional hearing aids, modular hearing aids
Routing of signals, head shadow / baffle / diffraction effects
Output limiting: Peak clipping, compression
Extended low frequency amplification, frequency transposition (Bone anchored hearing aid, Master Hearing aids)

d. Recent advances in hearing aids
Signal processing in hearing aids – BILL, TILL, PILL
Programmable and digital hearing aids
Signal enhancing technology

Unit 4 **(10 hrs)**

Electroacoustic characteristics & measurements for hearing aids

a) Instrumentation & Analysis of Electroacoustic characteristics of all types of hearing aids.

b) Measurement of standard & specification of hearing aids according to ISI, IEC and ANSI

c) Interpretation of the analysis

Unit 5 **(12 hrs)**

Hearing Aid selection

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

LIST OF BOOKS

Compulsory Reading:

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

Additional Reading:

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

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

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

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

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

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

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

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

9. ANSI & IEC Specifications

SEMESTER V
B 5.4 REHABILATIVE AUDIOLOGY

(30+70 marks) **(Total = 56 hrs)**

Unit 1 **(10 hrs)**

1. Speech reading

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

2. Factors influencing speech reading

(a) Methods of training: analytical vs. synthetic; (including speech tracking)
(b) Individual and group training

Unit 2 **(12 hrs)**

1. Auditory learning

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

Unit 3 **(10 hrs)**

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

Unit 4 **(10 hrs)**

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

Unit 5 **(14 hrs)**

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

Components, Candidacy, Advantages and Complications of the same.

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

LIST OF BOOKS

Compulsory Reading:

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

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

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

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. BIS, ANSI & IEC Specification

B 5.5 CLINICAL PRACTICUM (a) Speech – Language Pathology

(50+100 marks) **(140 Hours)**

At the end of Semester **V**, the student should be able to carry out the following –
a) Analysis of fluency in 2 normal samples and 2 clientts with stuttering / cluttering, neurogenic stuttering (percent dysfluency), rate of speech, effort, naturalness, various types of dysfluencies)

b) Use of SSI, SPI, and fluency tests

c) Assessment of 2 clients with dysarthria / apraxia / dysphagia using tests

d) Planning, writing, and executing therapy with 10 clients with stuttering / cluttering/ neurogenic stuttering / dysarthria / apraxia / dysphagia

e) Use of AAC in at least 1 client

f) Counseling clients with the above disorder

g) Record maintenance

h) Presenting a case in clinical conference

SEMESTER V

B 5.5 CLINICAL PRACTICUM (b) Audiology

(50+100 marks) **(140 Hours)**

At the end of Semester **V**, the student should be able to carry out the following –
Hearing Aid Trial Postings:

1. Hearing aid trial: pre-selection of hearing aids, styles, EAC, other issues, inspection of ear moulds. Functional gain method (10 children & 10 adults). Concept of speech banana, aided audiogram.

2. Observing Real Ear Insertion Gain measurement (10 clients)

3. Pre-selection based on audiological evaluations (10 clients)

4. Hearing Aid trials:
a. Functional gain, REIG, other methods with monoaural fitting, binaural fitting, Programmable hearing aid – Analog Digital
b. Explaining the benefits of hearing aid to the patient/caregiver

5. Counselling patients/caregivers regarding hearing aids – Care, maintenance, adjustments, tips to caregivers regarding acceptance of hearing aids (5 children & 5 adults). Binaural amplification and its uses.

6. Electro-acoustic evaluation of hearing aids (body level & ear level), with and without ear moulds. Equipment for analysis. Calibration of hearing aid analyser.

7. Models and makes available in the market, their EAC, cost of hearing aids, its suitability to various audiogram configurations, age etc.

8. Specification sheets – BIS, ANSI, IEC with respect to hearing aids.

9. Administration of Self (Help) assessment scales.

10. Fitting hearing aids for sloping hearing loss.

Rehabilitation Audiology

1. Role-playing activities for speech reading, communication strategies and auditory learning.

2. Compile activities on management of deaf-blind children.

3. Compile activities on management of children with central auditory processing disorders.

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

Diagnostic Audiology/Noise/Rehabilitative Technology:

1. Holistic audiological assessment for differential diagnosis:
a. Speech: PI/PB Function, Stenger, BC Speech
b. Noise: SAL, SPIN, (10 cases)
c. Immittance audiometry: Basic tests, Acoustic Reflex Decay, Eustachian Tube function, SPAR

2. Compiling reports for the above.

3. Testing children with multiple impairments

4. Compile information on cochlear implants reg. candidacy, cost, places where it is done and rehabilitation of cases.

5. Calibration of pure tone audiometry (AC, BC, Speech)

6. Noise measurement and attenuation measurement of ear protection devices.

B.5.6 : Foundation /Skill Development course – as per Bangalore University notification

(30+70 marks) **(42 Hours)**

SEMESTER VI
B 6.1 NEUROGENIC LANGUAGE DISORDERS IN ADULTS

(30+70 marks) **(Total = 56 hrs)**

Objectives:
After studying this paper at the end of the semester, the student should be able to understand the following –
• Brain and language relationship
• Aphasic and non-aphasic conditions
• Assessment and management

Unit 1 **(10 hrs)**

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

Unit 2 **(10 hrs)**

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

Unit 3 **(12 hrs)**
1. General and specific neurological examination procedures (higher functions, cranial nerves, motor and sensory systems, reflexes and fundus)
2. Neurological investigations: Electrophysiological (Electroencephalogram, Evoked potentials) and imaging (Computerized Tomography, Magnetic Resonance Imaging)
3. Assessment of speech, language and cognitive behaviour of adults with a language based disorder: Informal and formal test procedures (Western Aphasia Battery, Boston Diagnostic Aphasia Examination, Boston Naming Test, Minnesota Test for Differential Diagnosis of Aphasia, Porch Index of Communicative abilities, Functional Communication Profile, Token Test, Revised Token Test, Bilingual Aphasia Test, MAE and others; Indian tests and adaptations).

Unit 4 **(12 hrs)**

1. Other language disorders in adults: Introduction, Etiology, clinical profile, assessment and management

• Subcortical aphasias
• Traumatic Brain Injury
• Right Hemisphere Damage Disorder
• Primary Progressive Aphasia
• Language disorders in Dementia
• Schizophasia
• Acquired dyslexias
• Metabolic disorders
• Aphasias in illiterates, sign language users, bilinguals / multilinguals and others.

2. Differential diagnosis of Adult Neurogenic disorders

Unit 5 **(12 hrs)**

1. Intervention: Prognostic indicators, Spontaneous recovery; General principles of therapy; specific techniques (Melodic Intonation therapy, Visual Action therapy, Schuell's Auditory stimulation, Thematic language stimulation and others)

2. Team approach; Group therapy; Family support-preparing family, friends and colleagues on what to expect and how to deal with aphasic as a person; Counseling regarding role of family; Individual counselling and spouse and family counseling

3**.** AAC

LIST OF BOOKS

Compulsory Reading:

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

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

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

Additional/Optional Reading:

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

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

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

SEMESTER VI
B 6.2 NOISE MEASUREMENTS AND HEARING CONSERVATION

(30+70 marks) **(Total = 56 hrs)**

Unit 1: **(12 hrs)**

a) Noise in the environment and effects of noise:
Definition of noise
Sources – community, industrial, music, traffic and others
Types – steady & non-steady.

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

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

Unit 2: **(12 hrs)**

Audiometry in NIHL

Puretone audiometry:
- Baseline and periodic monitoring tests, high frequency audiometry, brief tone audiometry, correction for presbyacusis
- Instrumentation: Manual audiometer, automatic audiometer
- Testing environment
- High frequency audiometry

Speech audiometry:
- Speech discrimination tests with and without the presence of noise
- Filtered speech tests and time compressed speech tests
- Social Adequacy Index
- Other audiological evaluations:

- Impedance audiometry
- ERA
- OAE

- Tests for susceptibility

Unit 3: **(10 hrs)**

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

Unit 4: **(10 hrs)**

Hearing conservation:
Need for hearing conservation program, steps in hearing conservation program

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

Unit 5: **(12 hrs)**

Legislations related to noise:
- Damage Risk Criteria (DRC) – definition, historical aspects, use of TTS and PTS, information in establishing DRC, - Committee on Hearing
Bioacoustics & Biomechanics (CHABA), Air Force Regulation (AFR 160-
3), American Academy of Ophthalmology & Otolaryngology (AAOO),
ASA-Z 24.5, Damage risk contours, Walsh – Healey Act, Occupational Safety & Health Act (OSHA), Environmental Protection Agency (EPA), Indian noise standards.

- Claims for hearing loss: Fletcher point eight formula, AMA method, AAOO formula, California variation in laws, factors in claim evaluation, variations in laws and regulations, date of injury, evaluation of hearing loss, number of tests.

- Indian studies/acts/regulations, American acts.

LIST OF BOOKS

1. Bruel, and Kjaer, (1982), Noise Control - Principles and practices.

2. Harris, C.M. (Ed.2), Handbook of Noise Control New York: McGraw-Hill.

3. Kryter, K.D. (1970). The effects of noise on Man. New York: Academic Press.

4. Tempest, N (1985). The Noise Handbook. London: Assessment Press.
5. Sataloff, R.T. (1987). Occupational hearing loss. Marcel Dekker, Inc.

6. Trivedi, P.R. and Gurudeep Raj (1992). Noise Pollution, 1st Ed. New Delhi: Akashdeep Publishing House.

7. BIS Specifications - List attached
- IS Specifications - Noise Measurements.

- IS:7194-1973 Specification for assessment of noise exposure during work for hearing conservation purposes.

- IS:9167-1979 Specification for ear protectors.

- IS:6229-1980 Method for measurement of real-ear protection of hearing protectors any physical attenuation of earmuffs.

- IS:9876-1981 Guide to the measurement of airborne acoustical noise and evaluation of its effects on man.

- IS:7970-1981 Specification for sound level meters.

- IS:9989-1981 Assessment of noise with respect to community response.

- IS:10399-1982 Methods for measurement of noise emitted by Stationary road vehicles

SEMESTER VI
B 6.3 COMMUNITY ORIENTED PROFESSIONAL PRACTICES (COPP)

(30+70 marks) **(Total = 56 hrs)**

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

- Epidemiology of speech, language and hearing disorders – N.S.S.O, census & other studies.
- Service delivery and CBR issues – Health sector, ICDS, NRHM, DRC, DDRC & CBR models.
- Legislative support for rehabilitation – Mental Health Act (1989), RCI (1992), PWD (1995), National Trust (1999), RTI Act (2005), Consumer Protection (1986), FCRA, Environmental Act.
- Documentation and ethical issues
- Understand community oriented professional practice (COPP)

Unit 1 **(10 hrs)**

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

Unit 2 **(10 hrs)**

1. Approaches to service delivery: Institution based, Camp based, Community based and Role of NGOs
2. Review of services in India including ICDS, DRC, DDRC, NPPCD, and NRHM.
3. Integration of Disabled into the community and International classification of functionality & Health (ICF 2001)

Unit 3 **(10 hrs)**

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

Unit 4 **(12 hrs)**

1. Planning services for the communication disordered population: Philosophy, planning, establishment of services for communication disorders- infrastructure, budget, staffing, equipment, furniture, policy making, record keeping, proposal writing.
2. Strategies for awareness, public education and information (Camps, Print and audiovisual media, Surveys. Radio broadcasts, street plays).

Unit 5 **(12 hrs)**

1. Legislative support for rehabilitation- Rehabilitation Council of India Act (1992), Persons With Disability Act (1995), National Trust Act (1999), Environmental Act, Consumer Protection Act (1986), Right To Information Act (2005), UNCRPD.

2. Empowering parents, bringing attitudinal change – socio-cultural factors influencing attitude
- Inclusion
- Empowering persons with disabilities & the community; Skill transfer to DHLS, parents; grass-root level workers, teachers and health workers

3. The professional as a witness; documentation; handling legal issues

LIST OF BOOKS

Compulsory Reading:

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

Directory of schools for children with HI: AYJNIHH publication.

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

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

R.S. Pandey & Lal Advani (1995). Perspectives in disability and rehabilitation. Vikas Publishing House

Speech & Hearing in India: 30 years 1993: Silver Jubilee ISHACON Publication.

Thakur Hariprasad: Enabling the disabled.

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

Professional Issues in Speech-Language Pathology and Audiology - A Text

book. (1994). Lubinski R. and Frattali C. California: Singular Publishing Group

Additional/Optional Reading:

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

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

SEMESTER VI

B 6.4 SCIENTIFIC ENQUIRY AND BASIC STATISTICS FOR SPEECH-LANGUAGE AND HEARING

(30+70 marks) **(Total = 56 hrs)**

Objectives:

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

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

Unit 1 **(12 hrs)**

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

Parameters for scientific research in speech language pathology and audiology:

• Identification of variables and the types
• Types of data and its nature
• Measurement procedures in speech language pathology and audiology
• Instrumental and behavioural measures, and recording procedures

Unit 2 **(12 hrs)**

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

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.

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

Unit 3 **(12hrs)**

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

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 4 **(12hrs)**

Measurement of central tendency: Need, types- mean, median, mode; working out theses measures with illustrations
Measures of variability: Need, types of range, deviation- average deviation, standard deviation, variance; interpretation

Normal distribution: general properties of normal distribution; theory of probability; illustration of normal distribution; area under normal probability curve
Variants from the normal distribution: skewedness, kurtosis; their quantitative measurement; Introduction to non-parametric statistics

Unit 5 **(14hrs)**

Correlation: Historical contribution; meaning of correlation; types of correlation-product-moment correlation, content correlation, rank correlation etc
Standard error sampling distribution; Type I and Type II errors, Y2, 't' and 'F'-tests;
Methods of significance of differences between means and their interpretation and probability levels-small samples, large samples

LIST OF BOOKS

Compulsory Reading:

Hegde, M.N. Clinical Research in Communicative Disorders- Principles and Strategies. (1994) (2nd Edition). Pro-ed.

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

Pannbacker, M.H. and Middleton, G.F. (1994). Introduction to Clinical Research in Communication Disorders. San Diego: Singular Publishing.

Woods, A., Fletcher, P. and Hughes, A. (1986). Statistics in Language Studies. Cambridge: University Press.

Additional/Optional Reading:

3) Stein, F. and Cutler, S.K. (1996). Clinical Research in Allied Health and Special Education. San Diego: Singular Publishing Group Inc.

4) Portney, L.G. and Walkins, M.P. (1993). Foundations of Clinical Research. Connecticut: Appleton and Lange.

SEMESTER VI

B 6.5 CLINICAL PRACTICUM (a) Speech – Language Pathology

(50+100 marks) **(140 marks)**

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

a) Assessment of 5 clients with aphasia / autism / LD /TBI / RHD using relevant tests

b) Planning, writing and executing therapy for 5 clients with apraxia / autism / LD/ TBI / RHD

c) Presenting a client in clinical conference

d) Counseling in the above patients

e) Record maintenance

B 6.5 CLINICAL PRACTICUM (b) Audiology

(50+100 marks) **(140 marks)**

At the end of **VI** Semester, the student should be able to carry out the following –
Hearing Aid Trial Postings:

1. Hearing aid trial: pre-selection of hearing aids, styles, EAC, other issues, inspection of ear moulds. Functional gain method (10 children & 10 adults). Concept of speech banana, aided audiogram.

2. Observing Real Ear Insertion Gain measurement (10 clients)

3. Pre-selection based on audiological evaluations (10 clients)

4. Hearing Aid trials:
a. Functional gain, REIG, other methods with monoaural fitting, binaural fitting, Programmable hearing aid – Analog Digital
b. Explaining the benefits of hearing aid to the patient/caregiver

5. Counselling patients/caregivers regarding hearing aids – Care, maintenance, adjustments, tips to caregivers regarding acceptance of hearing aids (5 children & 5 adults). Binaural amplification and its uses.

6. Electro-acoustic evaluation of hearing aids (body level & ear level), with and without ear moulds. Equipment for analysis. Calibration of hearing aid 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 hearing aids for sloping hearing loss.

Rehabilitation Audiology

1. Role-playing activities for speech reading, communication strategies and auditory learning.

2. Compile activities on management of deaf-blind children.

3. Compile activities on management of children with central auditory processing disorders.

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

Diagnostic Audiology/Noise/Rehabilitative Technology:

1. Holistic audiological assessment for differential diagnosis:
a. Speech: PI/PB Function, Stenger, BC Speech
b. Noise: SAL, SPIN, (10 cases)
c. Immitance audiometry: Basic tests, Acoustic Reflex Decay, Eustachian Tube function, SPAR

2. Compiling reports for the above.

3. Testing children with multiple impairment

4. Compile information on cochlear implants reg. candidacy, cost, places where it is done and rehabilitation of cases.

5. Calibration of pure tone audiometry (AC, BC, Speech)

6. Noise measurement and attenuation measurement of ear protection devices.

B.6.6 : Foundation /Skill Development course – as per Bangalore University notification

(30+70 marks) **(42 Hours)**

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