

Curriculum Framework

Bachelor in Audiology and Speech – Language Pathology (B. ASLP)

Norms and Guidelines Course Content

**Effective from Academic Session 2017-18
Four Years Duration**



भारतीय पुनर्वास परिषद

**Rehabilitation Council of India
B-22, Qutab Institutional Area,
New Delhi - 110 016**

**Email: rehabstd@nde.vsnl.net.in, rehcouncil_delhi@bol.net.in
www.rehabcouncil.nic.in**

1.0 Nomenclature

As per UGC Notification of 2014, the nomenclature of the program shall be Bachelor in Audiology and Speech-Language Pathology. B. ASLP is the short form.

2.0 Objectives of the B.ASLP program

The objectives of the B.ASLP program are to equip the students with knowledge and skills to

- function as audiologists and speech-language pathologists in different work settings
- understand concepts in speech, language, communication, hearing and disability screen, evaluate, diagnose and assess the severity of different disorders related to speech, language, swallowing and hearing,
- manage speech, language, swallowing and hearing disorders across life span
- counsel persons with disorders of communication and their family members
- rehabilitate persons with speech, language, swallowing and hearing disorders
- prevent speech, language, swallowing and hearing disorders
- liaise with professionals in allied fields and other stake holders
- implement public awareness and education program,
- undertake advocacy measures on behalf of and for persons with speech language and hearing disorders

3.0 Duration of the program

The program shall be of 4 academic years including 1 year of internship and should be completed within six years from the date of admission.

An academic year consists of two semesters, and each semester shall extend over a minimum period of sixteen weeks excluding examination days. The semesters shall be spread out as follows:

Odd semester – 1	July – December
Odd semesters – 3, 5, 7	June – October/November
Even semesters – 2, 4, 6, 8	December – April

There shall be examinations at the end of each semester. There shall be a vacation of minimum 1 week after the examinations at the end of odd semesters and 3 weeks after the examinations at the end of even semesters.

Number of working days in a semester shall not be more than 100 days.

4.0 Eligibility for admission ²

- i. Candidates passed 10+2 or an equivalent examination from a recognized Board with minimum of 50% aggregate marks. Relaxation in the qualifying marks shall be as per rules and regulations of respective University / State/UTs or Central Government.
- ii. The applicant/candidate should have studied Physics, Chemistry and any one of the subject Biology / Mathematics / Computer Science / Statistics / Electronics / Psychology.
- iii. No age bar

5.0 Program Structure

Time structure of the program shall be as follows:

16 weeks / Semester	16 weeks		
5 days / week	80 days		
7 hours / day	560 hours per semester		
Semester 1	Theory	6 papers x 60 hours	360 hours
	Clinical		200 hours
Semester 2	Theory	4 papers x 60 hours	240 hours
	Practicals		320 hours
Semester 3	Theory	4 papers x 60 hours	240 hours
	Clinicals		320 hours
Semester 4	Theory	4 papers x 60 hours	240 hours
	Clinicals		320 hours
Semester 5	Theory	4 papers x 60 hours	240 hours
	Clinicals		320 hours
Semester 6	Theory	4 papers x 60 hours	240 hours
	Clinicals		320 hours
Theory		360 + (240 x 5)	1560 hours
Clinicals		200+320 + (320 x 4)	1800 hours
Internship		18 weeks per semester	36 weeks
		5 days / week	180 days
		7 hours / day	1260 hours
Total: 6 semesters		560 hours x 6 semesters	3360 hours
Internship		630 hours x 2 semesters	1260 hours
Total	Theory		1560 hours
Total	Clinicals		3060 hours
Grand Total			4620 hours

² Modified as approved in 43rd General Council of Rehabilitation Council of India in its meeting held on 16th February 2021 vide notification no. 2-6/ASLP/2003/RCI dated 7 May, 2021

6.0 Attendance

Minimum attendance shall be as stipulated by the respective University where the students are studying. However, attendance shall not be less than 80% in theory and 90% in Clinical/ Practicals in each semester to be eligible to appear for examination at the end of each semester.

Candidates who cannot appear for the examination for want of attendance will be declared as failed and will have to repeat the particular semester to be eligible to appear for exams subsequently.

Condonation of shortage of attendance in genuine cases shall be from the Vice-Chancellor of the respective University where the candidates are studying.

7.0 Examination Pattern

7.1 The examination pattern and papers shall be as shown in the table below:

No.	Title of the paper	Practical	IA	Exam	Total
B 1.1	Communication Sciences	--	25	75	100
B 1.2	Anatomy and Physiology of Speech and Hearing	--	25	75	100
B 1.3	Clinical Psychology	--	25	75	100
B 1.4	Linguistics and Phonetics	--	25	75	100
B 1.5	Electronics and Acoustics	--	25	75	100
B 1.6	Research Methods and Statistics	--	25	75	100
B 2.1	Neurology	--	25	75	100
B 2.2	Otolaryngology	--	25	75	100
B 2.3	Speech-Language Pathology	--	25	75	100
B 2.4	Audiology	--	25	75	100
B 2.5	Practicals (Speech-language Pathology)	--	25	75	100
B 2.6	Practicals (Audiology)	--	25	75	100
B 3.1	Voice and its Disorders	25	25	50	100
B 3.2	Speech Sound Disorders	25	25	50	100
B 3.3	Diagnostic Audiology - Behavioral Tests	25	25	50	100
B 3.4	Amplification Devices	25	25	50	100
B 3.5	Clinicals in Speech-Language Pathology	--	25	75	100
B 3.6	Clinicals in Audiology	--	25	75	100
B 4.1	Motor Speech Disorders in Children	25	25	50	100

B 4.2	Child Language Disorders	25	25	50	100
B 4.3	Diagnostic Audiology - Physiological Tests	25	25	50	100
B 4.4	Implantable Hearing Devices	25	25	50	100
B 4.5	Clinicals in Speech-Language Pathology	--	25	75	100
B 4.6	Clinicals in Audiology	--	25	75	100
B 5.1	Structural Anomalies & Speech Disorders	25	25	50	100
B 5.2	Fluency and its Disorders	25	25	50	100
B 5.3	Pediatric Audiology	25	25	50	100
B 5.4	Aural Rehabilitation in Children	25	25	50	100
B 5.5	Clinicals in Speech-Language Pathology	--	25	75	100
B 5.6	Clinicals in Audiology	--	25	75	100
B 6.1	Motor Speech Disorders in Adults	25	25	50	100
B 6.2	Language Disorders in Adults	25	25	50	100
B 6.3	Aural Rehabilitation in Adults	25	25	50	100
B 6.4	Audiology in Practice	25	25	50	100
B 6.5	Clinicals in Speech-Language Pathology	--	25	75	100
B 6.6	Clinicals in Audiology	--	25	75	100
B 7.1	Clinicals in Speech-Language Pathology	--	--	100	100
B 7.2	Clinicals in Audiology	--	--	100	100
		400	900	2500	3800

7.2 Course content shall be as in Annexure 1

7.3 Practical exams at the end of 2nd semester shall be University exam and shall be conducted by an external examiner along with an internal examiner. Record of practicals maintained by the students shall also be evaluated by the examiners.

7.4 Performance in at least two written tests and one group assignment shall be the basis for awarding internal assessment marks in each semester.

7.5 All clinical examinations shall be conducted by one internal and one external examiner. B7.1 and B7.2 in the above table shall be conducted at the end of internship (8th semester).

8.0 Criteria for passing

The student is required to obtain a minimum of 50% in each of the theory papers, internal assessment, practical and clinical exams for a pass. Students will not be able to appear for University theory exam if they do not pass in their practical, internal assessment or clinical component. Students will have to pass the clinical examination of the given semester to proceed to the next semester.

8.1 Carry-over of papers

Each paper should be successfully completed within 3 attempts including the first one.

Students can start internship after the 6th semester exams. However, students who fail in their clinical exam of 6th semester will have to discontinue internship. The candidates are permitted to carry over the theory courses until the end of the program.

9.0 Clinical internship

All candidates shall complete a clinical internship of one academic year (10 months) after the 6th semester. The rules and regulations of clinical internship shall be as in Annexure 2.

10.0 Infrastructure for starting the course

Only those institutions which have the infrastructure as given in Annexure 3 can start the B.ASLP program after due formalities.

11.0 Award of Degree

The University shall award the degree and issue certificate only after the candidates successfully complete all the University examinations and clinical internship.

12.0 Others

On all other issues not mentioned in these rules and regulations like the pattern of question paper, grading, award of grace marks, and declaration of rank, among others, the rules and regulations of the respective University shall prevail.

Guidelines for implementation of Clinical Internship of B.ASLP program with effect from the academic session 2017-18

Objectives of the clinical internship are to:

facilitate transition from academic training to independent clinical responsibility, provide additional inputs to attain and maintain competence in the clinical management of persons with communication disorders, initiate group and individual action focusing on prevention/early identification and intervention in individuals with speech, hearing and language impairments at the level of the individual, family and community, and provide training to understand professional responsibilities and ethical practices including :

Rights and dignity of patients.

Consultation and referral to other professionals.

Conduct and professional obligations to peers/patients/families and the community at large.

Guidelines

Internship is mandatory

Duration: One academic year (10 months) split in to two semesters (VII & VIII).

Eligibility: Internship will start immediately after the candidate completes the academic and clinical training till the 6th semester. Students can start internship after the 6th semester exams. However, students who fail in their clinical exam of 6th semester will have to discontinue internship.

Structure and duration of posting

The respective parent institutions shall decide on the institutions where their students will be posted for internship. However, students can be posted for internship only at those institutions approved by the Rehabilitation Council of India.

Students will do internship at their parent institute for one semester and at an institute(s) outside the parent institute for one semester. Internship can be done at institutes like hospitals, special educational centers/schools, centers where clinical facilities for management of ASD, cochlear implantation, AVT etc. are available, centers which undertake empowering of mothers, centers for CP, and centers for LD, etc. Attempts must be made to provide clinical training to students in a variety of set ups.

It shall be mandatory to provide additional clinical training to students in such areas as management of neurologically afflicted persons, prevention and early intervention programs, community based rehabilitation, occupational health programs, structural abnormalities related to speech and hearing, etc.

Mode of supervision during internship: Supervision should generally be provided by a Speech-language Pathologist and Audiologist. However, in institute/centers where this is not feasible, supervision can be done by a specialist from an allied area like Otolaryngology, Neurology, Mental Health, Pediatrics, among others.

Maintenance of records by students: Every student shall 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.

Leave: Candidates should have an attendance of at least 90% during the internship period. Internship shall be extended by the number of days the student falls short of 90% attendance. Compensatory work for shortage of attendance must be completed before the final clinical exams of 8th semester.

Stipend: As per the norms of the parent institute.

Grading and evaluation of student: All internees will be assessed based on their attendance, performance in the postings and presentation of log books. The mode of assessment and frequency of assessment will be prescribed by the institute. The student is required to repeat those postings in which his/her performance is below 40%.

Certification: The parent institute will award a certificate after successful completion of the internship and clinical examination (7.1 and 7.2 in the Scheme of examination). Supervised clinical hours spent during internship shall be included in the clinical competence certificate issued to students.

The University shall award the degree only after the successful completion of clinical internship.

**Infrastructure requirements for B.ASLP programs
(Academic year 2017-18 onwards)**

The following are the minimum requirements for starting/continuing a B.ASLP program. This should be read and interpreted along with the guidelines of RCI for inspectors for inspection of new/existing programs for recognition.

Personnel

	B.ASLP (Intake : 20 / year)	B.ASLP ^u (Intake : 40 / year)
Core Faculty		
Professor- Speech Pathology & Audiology	--	1
Associate Professor- Speech Pathology & Audiology	1	2 (1+1)
Assistant Professor - Speech Pathology	2	2
Assistant Professor - Audiology	2	2
Clinical Staff		
Speech Pathologist - Gr. I	1	2
Speech Pathologist - Gr. II	1	1
Audiologist - Gr. I	1	2
Audiologist - Gr. II	1	1
Allied Faculty (Part time)		
Asst. Prof in Cl. Psychology	1	1
Asst. Prof in Electronics	1	1
Asst. Prof in Otolaryngology	1	1
Asst. Prof in Linguistics	1	1
Asst. Prof in Statistics	1	1
Asst. Prof in Neurology	1	1
Supporting staff - Technical		
Earmold technician	1	1
Bio-medical technician	1	1
Computer technician	1	1
Library & Information Officer	1	1
Library Assistant	1	1
Supporting staff - Administrative		
Secretary - Academics	1	1
Secretary - Clinic	1	1
Secretary - Admin	1	1

A minimum of 2 faculty members in the core areas of Speech-language Pathology and Audiology is a must to get approval to start the B.ASLP program. Two more

faculty members in the core areas must be added before the commencement of the second year. Full contingent of staff must be in place before the commencement of the third year.

- § The B. ASLP program should be conducted by an independent institute/ college/ department in a university / department in a hospital/rehabilitation unit headed and coordinated (administrative/academic and clinical) by a full-time Audiologist and Speech Language Pathologist professional only. His/her qualification and experience should not be less than that of an Associate Professor.

Only on completion of two batches of B.ASLP, an institution becomes eligible to increase the intake subject to availability of recommended infrastructure.

All aided and Government institutions shall implement reservations in admission as per Government rules from time to time. However, there shall be increase in infrastructure commensurate with increase in the number of seats as per reservation policy.

Note: All training institutions must have given infrastructure and faculty and professional requirement before commencement of academic session 2018-19.

Faculty and Professional qualification of in the core areas

Designation	Qualifications	Pay Scale
Professor	<p>Essential</p> <p>a) M.Sc(Sp & Hg)/MASLP/equivalent and Ph.D (in core areas)</p> <p>b) 10 years teaching experience at PG/UG level</p> <p>c) PhD (in core areas*)</p> <p>d) Minimum of five Publications with cumulative impact factor of 05.</p> <p>e) Valid RCI registration</p> <p>Desirable:</p> <p>Experience of running under-graduate training programs</p>	As per UGC guidelines
Associate Professor	<p>Essential</p> <p>a) M.Sc(Sp & Hg)/M.ASLP/equivalent</p> <p>b) 8 years of teaching experience at graduate/ post graduate level;</p> <p>c) Minimum of five Publications with cumulative impact factor of 05.</p> <p>d) Valid RCI registration</p> <p>Desirable:</p> <p>Ph.D (in core areas*)</p> <p>Experience of running under-graduate training programs</p>	As per UGC guidelines

Assistant Professor-Audiology	Essential a) M.Sc(Sp & Hg)/M.ASLP or its equivalent / M.Sc.(Audiology) b) 2 years teaching/ clinical / research experience c) Valid RCI registration Desirable: a) Ph.D (in core area*) b) Publications	As per UGC guidelines
Assistant Professor-Language Pathology	Essential a) M.Sc(Sp & Hg)/M.ASLP or its equivalent / M.Sc.(Speech Language Pathology) b) 2 years teaching/ clinical / research experience c) Valid RCI registration Desirable: a) Ph.D (in core area*) b) Publications	As per UGC guidelines
Audiologist Grade I	Essential M.Sc(Sp & Hg) / M.ASLP or its equivalent M.Sc.(Audiology) Valid RCI registration Desirable: 1 year experience in the field	
Speech Pathologist Grade I	Essential M.Sc(Sp & Hg) / M.ASLP/ or its equivalent M.Sc.(Speech Language Pathology) Valid RCI registration Desirable: 1 year experience in the field	
Speech Pathologist/Audiologist Grade II	Essential B.Sc (Sp & Hg)/B.ASLP or its equivalent Valid RCI registration	

*Audiology & Speech Language Pathology

Clinical

Facility for diagnosis, management and rehabilitation of all types of speech, language, hearing and swallowing disorders in clients of all age groups from infancy to geriatrics.

Size of clinical population shall be 2 per student per semester in a given area (read in consonance with the above clause).

Library

Library should accommodate at least 30% of the staff and students of the institute at any given time.

Library should have internet and photocopying facilities.

Books mentioned under 'Recommended reading' under each paper must be available. There shall be addition of a minimum of two books every year for each subject of study.

There should be at least 5 journals (2 each in Speech-language pathology and Audiology, and 1 general) for the B.ASLP program

Library Staff

Library and Information Officer - 1

Qualification: B.Lib Sci with one year experience in managing a technical library

Library Assistant - 1

Qualification: Diploma in Library Science

Space

Sl.No.		Size	Number
Academic Space			
a)	Class Rooms	Space @ 10 sq. ft per student + 20 Sq. ft for the teacher: Room with a minimum area of 220 sq. ft.	2 class rooms for every 20 students
b)	Seminar hall	Space to accommodate 50% of total student strength	1
c)	Labs to transact practicals	Space to accommodate 50% of total student strength	2
d)	Computer lab/multipurpose hall	Space to accommodate 50% of total student strength	1
e)	Library	Space to accommodate 50% of total student strength	1
Clinical Space			
f)	Room for reception where patients are registered.	10' x 10'	1 room for every 20 students
g)	Room for case history, diagnostic room and interviews	6' x 8'	2 rooms for every 20 students
h)	Speech Lab (Quiet Room) for	15' x 20'	1 room for every 20 students

	diagnostic purposes.		
i)	Recording room (Sound proof)	8' x 10'	1 room for every 20 students
j)	Speech Therapy Rooms/ Cabins (completely partitioned/sound isolated)	6' x 8'	5 rooms for every 20 students
k)	Two room audiometric suite with control and test room situation. (Sound Proof. ANSI 1977)	10' x 16'	1 for every 20 students
l)	Room for hearing aid fitting	10' x 15'	1 room for every 20 students
m)	Earmold Lab & Hearing aid repair lab	12' x 12'	1 room for every 20 students
n)	Electro physiological test room	10' x 10'	1 room for every 20 students
Administrative Space			
o)	Staff Room	15' x 20'	1
p)	Individual work space (with provision for storage facilities)	10' x 10'	1 room for every 2 faculty/staff members
q)	Academic/administrative office	10' x 10'	1
r)	Principal's Office room	10' x 10'	1
Other Facilities			
s)	Sanitary facilities	Separate facility for males and females, staff/students and clinical population	
t)	Hostel	Separate hostel for Men and Women with dining facility. Accommodation for at least 50% of the student population.	
u)	Barrier free access		
v)	Space for recreation - both indoor and outdoor		

Equipment - Audiology (Minimum for a batch of 20 students)

Sl. No.	Equipment	For a batch of 20 students (Clinical)
a)	2 channel diagnostic audiometer with Accessories such as earphone, ear cushion combination with adjustable headband, B.C. vibrator, transducers like microphone and matching loud speakers	1+1 for Lab
b)	Portable audiometer with provision of A.C. and B.C. testing : desirable screening audiometer	1
c)	Clinical immittance audiometer (Desk model) with accessories.	1+1 for Lab
d)	Portable/Screening impedance audiometer	1
e)	Clinical BSEAR	1+1 for Lab
f)	Otoacoustic emission	1+1 for Lab
g)	Calibration equipment for AC, BC and free field (by possession or access)	-
h)	Different types of Hearing Aids of mild moderate and strong categories body level and ear level, canal and spectacle hearing aid (1 each), FM, Digital, Programmable aids, ILS Assistive listening devices.	A representative sample of hearing aids and assistive devices
i)	IGO and HAT for hearing aid trial and making electroacoustic measurements.	1
j)	Stop watch	2
k)	Otoscope	4
l)	Auditory training and Screening material	
m)	Ear Mould Lab-fully equipped	

Equipment - Speech-Language Pathology (Minimum for a batch of 20 students)

Sl. No.	Equipment	For a batch of 20 students
a)	Speech and Language Tests (Tests for differential diagnosis) (English and local language)	As per course requirement
b)	Proformae	As per course requirement
c)	Speech Therapy material (Indian, Language and English)	As per course requirement
d)	Toys and Books	
e)	Mirrors - Size 2' x 3'	4
f)	Speech Trainer	1
g)	Portable and Digital tape recorders	2

h)	Hi-Fi Ampli Deck with speakers and good microphone	1
i)	Spirometer	1 (+1 for lab)
j)	Computer PC-AT with VGA Color Monitor & printer for clinic administration	1
k)	Software for diagnostic/therapeutic use and computer with necessary accessories	1 (+1 for lab)
l)	Stroboscope/VL scope/ FEES (by possession or access)	1
m)	Electroglottograph	1
n)	Audio cassettes for training/CDs	
o)	Pitch pipe	
p)	Tongue depressors	3

Audiovisual Instruments, Furniture in class rooms, clinical areas, labs and other administrative areas and internet access: Appropriately

Course Content
Semester I

B 1.1 Communication Sciences

Hour - 60

Marks -100

Objectives: After completing this course, the student will be able to understand the

basic concepts in speech, hearing, language and communication
basic concepts of hearing sensitivity and acoustics

Part A Speech-Language Pathology

Unit 1: Speech, language and communication

Definitions of speech, language, communication, and their components
Distinctions, similarities and functions of communication, speech and language
Speech as an overlaid function
Speech chain
Normal development of speech & language
Pre-requisites and factors affecting speech-language development
Cultural and linguistic issues in communication; bi/multilingual issues

Unit 2: Bases of speech and language

Overview of speech production – speech sub-systems
Speech mechanism as a sound generator, vocal tract, periodic and aperiodic sounds
Acoustic theory of speech production
Social, cognitive, neurological, and genetic bases of speech and language

Part B Audiology

Unit 3: Sound intensity and concept of decibel

acoustic energy and power, absolute and relative units – importance of reference
sound intensity and intensity levels –absolute and relative measurements and
Bel and decibels, sound pressure and decibel sound pressure levels, relationship between
intensity and pressure
characteristics and application of decibels

Unit 4: Audibility & hearing

Hearing range –intensity and frequency
Up-down and staircase procedure of estimating minimum audible levels
Minimum audible pressure and field, Missing six dB and related issues

Reference equivalent threshold sound pressure levels and hearing levels
Sensation levels, Threshold of pain, Most comfortable levels

Unit 5: Introduction to Audiology and Speech-language Pathology

Part A: Speech and language

Historical aspects of the field of speech-language pathology
Development of speech and language pathology: Indian and global context
Scope of practice in speech-language pathology
Interdisciplinary nature of speech-language pathology

Part B: Audiology

Audiology – historical aspects, development of instrumentation in audiology
Development of audiology: Indian and global context
Branches of audiology
Scope of audiology

Recommended Reading

Bordon, G J., Harris, K S., & Raphael, L J. (2006). Speech science primer: Physiology, acoustics, & perception of speech. Lippincott-Williams & Wilkins.
SubbaRao, T A. (1992). Manual for developing communication skills. NIMH. ISBN: 81-86594-03-5
Speaks, C. E. (1999). Introduction To Sound: Acoustics for the Hearing and Speech Sciences (3 edition). San Diego: Cengage Learning.
Martin, F. N., & Clark, J. G. (2014). Introduction to Audiology (12 edition). Boston: Pearson.
Gelfand, S. A. (2009). Hearing: An Introduction to Psychological and Physiological Acoustics (5 edition). London: CRC Press.
Khara L. Pence, T., Laura M. & Justice (2011). Language Development: From Theory to Practice (2nd Ed.), Allyn & Bacon Communication Sciences and Disorders
Webb, W. G., & Adler, R. K. (2008). Neurology for the speech-language pathologist (5th ed.). St. Louis, Mo: Mosby/Elsevier.

B1.2 Anatomy and Physiology of Speech and Hearing

Hours - 60

Marks - 100

Objectives: After completing this course, the student will be able to understand the

- anatomy of the auditory system
- anatomy of the speech mechanism
- physiology of hearing mechanism
- functioning of speech and swallowing mechanism

Unit 1: Introduction

- General anatomical terms
- Anatomical positions and planes of reference
- Cells, tissues and muscles
- Muscle connection and joints
- Tissue - vascular and neural

Unit 2: Embryology

- Basic terminologies related to embryology
- Development of external ear
- Development of middle ear
- Development of Inner ear and the auditory system
- Five examples of embryonic anomalies affecting speech-language & hearing
- Development of respiratory structures
- Development of larynx
- Development of facial region and palate
- Development of tongue and teeth

Unit 3: Anatomy and physiology of speech production systems and swallowing

- Mechanisms of breathing with emphasis on speech breathing
- Supportive frame work of larynx
- Anatomy of larynx
- Anatomy of oesophagus
- Brief mechanisms of swallowing
- Mechanisms of phonation
- Anatomy of articulators and associated structures
- Contribution of articulatory structures to speech production
- Anatomy of resonatory mechanisms
- Contribution of resonatory mechanisms to speech production

Unit 4: Anatomy and physiology of external and middle ear

Anatomy of the external ear	3	3
Physiology of external ear including localization	3	3
Head shadow effect, inter-aural intensity and time differences	3	3
Brief anatomy of temporal bone	3	3
Anatomy of tympanic membrane and associated structures	3	3
Anatomy of middle ear and ossicles	3	3
Anatomy of Eustachian tube and middle ear muscles	3	3
Physiology of Eustachian tube	3	3
Middle ear transformer action	3	3
Physiology of middle ear muscles	3	3

Unit 5: Anatomy and physiology of labyrinth

Anatomy of bony and membranous labyrinth
Macro anatomy of cochlea
Micro anatomy of cochlea
Innervations and blood supply to cochlea
Overview of theories of hearing
Physiology of cochlea
Electrical potentials of the cochlea
Physiology of hearing through bone conduction
Overview to physiology of balancing mechanisms
Overview to anatomy of central auditory pathway
Overview to central auditory mechanism

Recommended Reading

- Seikel, J. A., King, D. W., & Drumright, D. G. (2010). *Anatomy & Physiology for Speech, Language, and Hearing* (4th edition). Delmar, Cengage Learning, Division of Thomson Learning. NY.
- Zemlin, W. R. (2010). *Speech and Hearing Science: Anatomy and Physiology: International Edition* (4 edition.). Boston: Pearson.
- Chaurasia, B.D (2004). *Human Anatomy, vol 3. Head Neck and Brain* 4 th Eds, CBS Publishers and Distributors, New Delhi. ISBN 81-239-1157-2.
- Kelley, M., Wu, D., & Fay, R. R. (Eds.). (2005). *Development of the Inner Ear* (2005 edition.). New York: Springer.

B1.3 Clinical Psychology

Hour - 60

Marks -100

Objectives: After completing this course, the student will be able to understand the

scope of clinical psychology and its significance for speech and hearing
concept of normality, abnormality and classification of abnormal behavior
cognitive, motor, emotional and social development
theories of learning and therapy techniques based on learning principles
neuropsychological assessment and rehabilitation
application of neuropsychology in the field of speech and hearing
basics of counselling

Unit 1: Introduction to psychology

Introduction to psychology: definition, history and schools of psychology
Scope of psychology
Meaning and definition of clinical psychology
Historical development, modern clinical psychology
Significance of clinical psychology in health sciences
Role of clinical psychology in speech and hearing
Concept of normality
Concept of abnormality
Models of mental disorders: biological, psychological social models

Unit 2: Assessment procedures in clinical psychology

Methods in clinical psychology: case history, clinical interviewing, clinical observation, definition and types of psychological testing
Assessment of cognitive functions
Adaptive functions,
Personality
Behavioural assessment
Classification of abnormal behavior
History, need & rationale of classification
Current classificatory system: DSM, ICD

Unit 3: Developmental psychology

Child and developmental psychology: meaning, definition and scope
Meaning of growth, development & maturation
Principles of child development
Motor development: general principals of motor development
Stages in motor development: early motor development, motor development during later childhood and adolescence, decline with age

Cognitive development: growth from early childhood to adolescence
Piaget's theory of cognitive development
Emotional development
Social development

Unit 4: Principles of learning and behaviour modification

Learning: meaning, definition and characteristics
Theories of learning: introduction
Pavlov's classical conditioning: experiments and principles
Skinner's operant conditioning: experiments and principles
Therapeutic techniques based on learning principles
Skill behavior techniques
Problem behavior techniques

Unit 5: Neuropsychology and its relevance to study of speech

Neuropsychology: introduction and definition
Neuropsychological assessment
Neuropsychological rehabilitation
Application of neuropsychology in the field of speech and hearing
Counselling: introduction and definition
Types of counselling: directive and non- directive
Characteristics of a good counsellor

Recommended Reading

Morgan C.T., King R.A., Robinson N.M. Introduction to Psychology. Tata McGraw Hill Publishing Co.
Anastasi, A. (1999). Psychological testing, London: Freeman
Baura, M (2004). Human Development and Psychology, Rehabilitation Council of India, New Delhi. ISBN: 81-7391-868-6
Coleman J.C. Abnormal Psychology and Modern Life, Taraporevala Sons & Co.
Gregory, R.J. (2000). Neuropsychological and geriatric assessment in Psychological Testing: History, Principles, and Applications (3rd ed.). New York: Allyn & Bacon.
Hurlock, E.B. (1981). Child development. (VI Ed.). Mc Graw Hill International Book Co.
Kline, P. (1993). The Handbook of Psychological Testing. Routledge
Lezak, M., Loring, D.W., and Hannay, H.J. (2004). Neuropsychological Assessment. Fourth Edition. New York: Oxford University Press
Siegal M.G. (Ed). (1987). Psychological Testing from Early Childhood Through Adolescence. International Universities Press.

B1.4 Linguistics and Phonetics

Hour - 60

Marks -100

Objectives: After completing this course, the student will be able to understand

different branches and aspects of linguistics
characteristics and functions of language
different branches of phonetics, applied linguistics, and phonology
morphology, syntax, semantics, pragmatics
acquisition of language and factors affecting it
bi/multilingualism and related issues

Unit 1: Linguistics

Introduction to linguistics and different branches of linguistics: applied linguistics, sociolinguistics, psycholinguistics, metalinguistics, neurolinguistics and clinical linguistics

Language characteristics and functions, difference between animal communication systems and human language

Morphology – concepts of morph, allomorph, morpheme, bound free and compound forms, roots etc.

Processes of word formation, content and function words

Endocentric and exocentric constructions, form classes, grammatical categories

Inflection and derivation, paradigmatic and syntagmatic relationship

Principles and practices of morphemic analysis

Langue versus parole

Competence vs. performance

Unit 2: Phonetics and Phonology

Introduction to phonetics

Articulatory, acoustic, auditory and experimental phonetics – an introduction

Articulatory classification of sounds – segmental and supra-segmental

Classification description and recognition of vowels and consonants

Pathological aspects of speech sound production

Transcription systems with special emphasis on IPA. Transcription of samples of normal and disordered speech

Introduction to phonology, classification of speech sounds on the basis of distinctive features and phonotactics

Application of distinctive feature theory to speech pathology and speech therapy, phonotactics, phonotactic patterns of English and Indian languages

Phonemic analysis – Principles and practices; their practical implications for speech pathologists

Common phonological processes - assimilation, dissimilation, metathesis, haplology, epenthesis, spoonerism, vowel harmony, nasalization, neutralization

Unit 3: Morphology, syntax, semantics and applied linguistics

Morphology – concepts of morph, allomorph, morpheme, roots, compound forms - endocentric and exocentric constructions, free and bound morphemes, inflection and derivation, principles and practices of morphemic analysis
Syntax – different methods of syntactic analysis
IC analysis, phrase structure, grammar, transformational generative grammar
Introduction to the major types of transformations
Sentence types, notions about competence versus performance
Deep structure versus surface structure
Acceptability versus grammaticality language versus parole etc.
A brief introduction to semantics – semantic feature theory, pragmatics
Processes of word formation, content and function words, form classes, grammatical categories
Syntax – concepts of phrases and clauses, sentence and its types
Different methods of syntactic analysis – Immediate constituent analysis, Phrase structure, grammar, transformational generative grammar– deep structure versus surface structure, acceptability versus grammaticality; Introduction to the major types of transformations
Usefulness of morphemic and syntactic analysis in planning speech and language therapy
A brief introduction to semantics, semantic relations, semantic feature theory
A brief introduction to pragmatics and discourse.

Unit 4: Language acquisition

Issues in first language acquisition
Pre-linguistic stages, linguistic stages
Acquisition of phonology, morphology, syntax, semantics, and pragmatics
Language and cognition
A brief introduction to theories and models of language acquisition
Biological maturation theory, linguistic theory, behavioral theory, information processing theory, social interaction theory
An integrated approach to theories communicative competence and its development
Applied linguistics with special reference to communication disorders
Usefulness of morphemic and syntactic analysis in planning speech and language therapy

Unit 5: Bi/multilingualism

Introduction to the language families of the world and India
Issues related to second language acquisition & factors influencing it
Inter-language theory, language transfer and linguistic interference
Differences between first and second language acquisition/learning
Bilingualism/Multilingualism

Metaphonology
Writing systems – types of writing
History of writing systems
Indian writing systems

Recommended Reading

- Ball & Martin (1995). *Phonetics for speech pathology*. Delhi: AITBS Publishes, India.
- Ball, Rahilly&Tench (1996). *The phonetic transcription of disordered speech*. San Diego: Singular Publishing Group Inc.
- Clark and Yallop (1999). *An introduction to phonetics and phonology*. Oxford: Blackwell Publishes Inc.
- Karant, P (2003). *Cross-Linguistic study of Acquired Reading Disorders*. Sage Publications, New Delhi. ISBN : 0-306-48319-X
- Ladefoged, P. (1982). *A course in phonetics*. New York: Harcourt Brace Jovanorich Inc.
- Shriberg & Kent (1982). *Clinical phonetics*. New York: John Wiley & Sons.

B1.5 Electronics and Acoustics

Hours - 60

Marks - 100

Objectives: After completing this course, the student will be able to understand the

concept and types of power supply for biomedical instruments
basic aspects of digital signal processing
theoretical basis of acoustics required for audiologists
functioning of computers and computing systems

Unit 1: Electronic components and power supply

Resistors, capacitors, inductors
Transformers and potentiometers,
Semiconductor diodes and transistors
Light emitting devices, seven segment displays, Liquid crystal displays
Principles of operations and working of Field Effect Transistors, Uni-junction transistors and thyristors
Introduction to linear and digital integrated circuits
Block diagram of a DC power supply
Linear regulated power supplies, line regulation and load regulation, specifications of a DC power supply unit, Switched Mode Power Supply
AC power supply, stabilizers, Uninterrupted Power Supply, and inverters
Basic electronic concepts such as Polarity, Grounding

Unit 2: Introduction to acoustics

ÈĀ	Ā □Ā	Ā	Ā
	ibrations and their characteristics		
ÈĀ	Ā □Ā	Ā	Ā
	ound - generation and propagation		
ÈĀ	Ā □Ā	Ā	Ā
	haracteristics of sound		
ÈĀ	Ā □Ā	Ā	Ā
	mplitude, frequency and phase of pure tones		
ÈĀ	Ā □Ā	Ā	Ā
	mplitude, frequency and phase of complex tones (FFT and spectrum, relationship between time waveform, FFT and impulse response)		
ÈĀ	Ā □Ā	Ā	Ā
	eflection and absorption, acoustic impedance, reverberation		
ÈĀ	Ā □Ā	Ā	Ā
	mpedance and admittance		
ÈĀ	Ā □Ā	Ā	Ā
	lectro-mechano-acoustic transformers		

Unit 3: Acoustical treatment, transducers and basics of computers

Introduction to audiometric rooms
Absorption coefficient, Sabine's formula

Materials for construction of audiometric rooms
Lighting, grounding and other miscellaneous issues related to audiometric rooms
Evaluation of efficiency of sound proofing in the audiometric rooms
Amplifiers

Microphones, loudspeakers - types and function
Fundamentals of digital electronics, binary number system, Hex code, bit, byte, logic gates, counters, flip-flops etc.
Introduction to computers
Operating systems, hardware, software, memory devices and other peripherals, care and preventive maintenance of computers

Unit 4: Digital signal processing

Digital signal processing –introduction and need
Analog to digital converters, sampling and quantization
Fundamentals of digital filtering
Infinite impulse response and finite impulse response filters
Time domain methods of speech processing
Frequency domain methods of speech processing
Linear predictive analysis of speech signals
Digital coding of speech signals
Automatic speech recognition
Speech synthesis

Unit 5: Instrumentation in speech and hearing

Introduction to electronic instrumentation in speech and hearing
Electrodes, filters and preamplifiers
Principle of operations, block diagram, calibration, maintenance and troubleshooting of audiometers, immittance meters, oto-acoustic emissions, hearing aids, evoked potential system, speech and voice analyses systems, artificial larynx, electroglottograph

Recommended Reading

Haughton, P., & Haughton, P. M. (2002). *Acoustics for Audiologists* (1st edition.). San Diego, Calif: Emerald Group Publishing Limited.
Moser, P. (2015). *Electronics and Instrumentation for Audiologists*. Psychology Press.
Moser, P. J. (2013). *Electronics and Instrumentation for Audiologists*. Psychology Press.
Rout, N and Rajendran, S. (2014). *Hearing aid trouble shooting and Maintenance*, Published by National Institute for Empowerment of Persons with Multiple Disabilities, Chennai. Freely downloadable from <http://niepmd.tn.nic.in/publication.php>. ISBN 978-81-928032-1-0.
Speaks, C. E. (1999). *Introduction To Sound: Acoustics for the Hearing and Speech Sciences* (3 edition.). San Diego: Cengage Learning.
Villchur, E. (1999). *Acoustics for Audiologists* (1 edition.). San Diego, Calif: Delmar Cengage Learning.

B1.6 Research Methods and Statistics

Hours - 60

Marks - 100

Objectives: After completing this course, the student will be able to understand the

basic concept of research in the field of audiology and speech-language pathology
design and execution of research
ethical guidelines for conducting research

Part A: Research Methods

Unit I: Introduction to research methods

Meaning and purpose of research: meaning
Need for research in audiology and speech-language pathology
Funds/grants for research
Steps in research: identification, selection
Formulation of research questions: aims, objectives, statement of problem, hypothesis
Types of variables; types of sampling procedures (random and non-random);
Types/ methods of data collection and their advantages and disadvantages
Reliability and validity (internal and external validity)

Unit II: Research design in audiology and speech-language pathology

Types of research: survey, ex-post facto research, normative research, standard-group comparison
Experimental and quasi experimental research: group design & single subject design
Internal and external validity of research
Between groups vs. repeated measures design
Documentation of research: scientific report writing, different formats or styles (APA, AMA and MLA),
Ethics of research

Part B: Statistics

Unit III: Introduction to statistics and data collection

Application of statistics in the field of Audiology and speech-language pathology.
Scales of measurement: nominal, ordinal, interval, ratio
Classification of data: class intervals, continuous and discrete measurement
Normal distribution: general properties of normal distribution, theory of probability, area under normal probability curve
Variants from the normal distribution: skewness and kurtosis
Measure of central tendency: mean, median, mode

Measures of variability: range, deviation (average and standard deviation), variance

Unit IV: Statistics and research designs

Choosing statistics for different research designs

Correlational techniques: Pearson's Product Moment Correlation Coefficient;

Spearman's Rank order correlation coefficient

Statistical inference: concept of standard error and its use; the significance of statistical measures; testing the significance of difference between two means z-test, t-test; analysis of variance, post hoc tests,

Non-parametric tests: Chi-square test, Wilcoxon test, Mann-Whitney U test,

Reliability and validity of test scores: reliability and validity, Item analysis

Analysis of qualitative data

Software for statistical analysis

Unit V: Epidemiology

Basic epidemiologic concepts and principles

Epidemiologic data sources and measurements

Epidemiologic methods – questionnaire survey, screening, personal survey, testing

Media - their advantages and disadvantages

Incidence and prevalence of hearing, speech, language disorders as per different census (NSSO, WHO)

Recommended Reading

Dane F. C. (2011). Sampling and Measurement. In Evaluating research: Methodology for people who need to read research. New Delhi: SAGE publication.

Field, A. (n.d.). Discovering Statistics Using IBM SPSS (4th ed.). SAGE Publications.

Hegde M. N. (2010). A course book on Scientific and professional writing for speech language pathology (4th Edition), Singapore: Delmar publication.

Hegde, M. N. (2003). Clinical research in communicative disorders: Principles and strategies. (3rd Edition), Austin: Pro-ed

Hesse-Biber, S. N. & Leavy, P. (2011). The Ethics of social research. In The Practice of qualitative research. (2nd Edition), New Delhi: SAGE publication.

Jekel, F. J., Katz, L.D., & Elmore, G.J (2001). Basic Epidemiologic Concepts and Principles in epidemiology, Biostatistics, and Preventive Medicine (2nd Edition). Pennsylvian: Saunders

Meline, T. (2010). A research primer for communication sciences and disorders. Singapore: Pearson publication.

Semester II

B 2.1 Neurology

Hour - 60

Marks -100

Objectives: After completing this course, the student will be able to understand

basic concepts, anatomy and physiology of nervous system related to speech and hearing
neural organization –different structures and functions of various systems
neurosensory and neuromotor controls in speech, language and hearing mechanisms
cerebral plasticity and dominance and its relevance for speech, language and hearing disorders
various neural diseases, lesions, nutritional and metabolic conditions affecting speech, language and hearing
basic principles and assessment procedures used in speech, language and hearing disorders associated with neurological conditions
basic principles and management procedures used in speech, language and hearing disorders associated with neurological conditions

Unit 1: Anatomy and physiology of the nervous system

General introduction to basic neurological concepts
Organization of the neural system
Central, peripheral and autonomic neural system
Neural structures - applied anatomy and physiology
Cranial nerves and those important for speech, language, hearing and balance
Cerebral blood supply, nourishment and protection of the brain
General principles of neural organization
Transmission of information in neural system – nerve fibers, synaptic transmission, action potential, chemical transmission, excitatory and inhibitory potential & neuromuscular transmission
Cerebral plasticity and development of neural plasticity and cerebral dominance

Unit 2: Neural organization of speech and hearing processes

Neurosensory organization of speech and hearing
Central auditory nervous system
Anatomy of oral sensation and oral sensory receptors
Neuromotor control of speech
The pyramidal, extra-pyramidal system, basal ganglia and cerebellar system
Lower and upper motor neuron
Alpha and gamma motor neurons
Sensory and motor examination, oral, peripheral and other reflexes
Swallowing mechanism and neural control

Screening and bedside neurological examination

Unit 3: Neural disorders associated with speech and hearing disorders - I

Neural infections – meningitis, encephalitis
Developmental anomalies – spinal cord defects, syringomalacia and bulbia, Arnold
chian malformations
Hydrocephalus – source and circulation of CSF, types and etiopathogenesis
UMN lesions – spastic dysarthria
LMN lesions – flaccid dysarthria
Mixed lesions
Extra pyramidal lesions – dyskinetic dysarthria
Cerebellum and cerebellar pathway lesions – ataxic dysarthria
Other diverse lesions and dysarthrias

Unit 4: Neural disorders associated with speech and hearing disorders - II

Cerebrovascular diseases – ischemic brain damage – hypoxic ischemic
encephalopathy, cerebral infarction – intracranial hemorrhage – intracranial,
subarachnoid
Trauma to the CNS – subdural hematoma, epidural hematoma, parenchymal brain
damages
Demyelinating diseases – multiple sclerosis, perivenous encephalomyelitis, Dementia
Degenerative, metabolic and nutritional disorders – Alzheimer’s disease,
Parkinsonism
Metabolic, hereditary, acquired, neuronal storage disorders
Wilson’s disease, Phenylketonuria
Nutritional – Wernicke’s encephalopathy, pellagra
Alcoholic cerebellar degeneration
Clinical-pathological methods and Neuro-imaging
Tumors of the CNS – gliomas, embryonal tumors of meninges, metastasis, malignant
tumors

Unit 5: Speech-language and swallowing disorders

Central language mechanism and its disorders
Developmental motor speech disorders – cerebral palsy, muscular dystrophy
Neurologic disorders with primitive reflexes, diagnosis and management
Clinical neurological syndromes associated with speech and language disorders
Childhood language disorders associated with neurologic disorders
Swallowing associated with neurogenic disorders and assessing mastication and
deglutition
Agnosia and other conditions associated with speech and hearing disorders
Cognitive disorders associated with neurologic disorders
General management principles and options for childhood neurogenic speech,
language and hearing disorders

General management principles and options for adult neurogenic speech, language and hearing disorders

Recommended Reading

Adams, R.D. & Sidman, R.L. (1968). Introduction to neuropathology. New Jersey: McGraw-Hill.

Bhatnagar, S.C. (2012). Neuroscience for the Study of Communicative Disorders. Lippincott, Williams & Wilkins

Garden, E. (1968). Fundamental of neurology, V Edn., Philadelphia: Sarenders Co.

Webb, W. G., & Adler, R. K. (2008). Neurology for the speech-language pathologist (5th ed.). St. Louis, Mo: Mosby/Elsevier.

Duffy, J. R. (2013). Motor Speech Disorders: Substrates, Differential Diagnosis, and Management (3rd Ed.). University of Michigan, Elsevier Mosby.

B2.2 Otolaryngology

Hour - 60

Marks -100

Objectives: After completing this course, the student will be able to understand the

causes, signs, symptoms, pathophysiology and management of diseases of external, middle and inner ear leading to hearing loss, and
causes, signs, symptoms, pathophysiology and management of diseases of laryngeal and articulatory systems

Unit 1: External and middle ear and their disorders

Clinical anatomy of the ear
Congenital anomalies
Diseases of the external ear
Tumors of the external ear
Perforation and ruptures of tympanic membrane
Eustachian tube dysfunction
Otitis media with effusion
Cholesteatoma and chronic suppurative otitis media
Otosclerosis
Trauma to temporal bone
Facial nerve and its disorder

Unit 2: Inner ear and its disorders

Congenital anomalies
Meniere's Disorder
Ototoxicity
Presbycusis
Disorders of vestibular system
Vestibular Schwannoma
Tinnitus and medical line of treatment
Pre-surgical medical and radiological evaluations for implantable hearing devices
Overview of surgical technique for restoration and preservation of hearing
Post-surgical care and complication of surgery for cochlear implants
Overview of surgical technique, post-surgical care and complication of surgeries for implantable bone conducted hearing aids and middle ear implant

Unit 3: Oral cavity and its disorders

Anatomy of the oral cavity
Common disorders of the oral cavity
Tumors of the oral cavity
Cleft lip and palate – medical aspects

Clinical anatomy and physiology of pharynx
Inflammatory conditions of the pharynx, tonsils and adenoids
Tumors of the pharynx

Unit 4: Larynx and its disorders

Clinical anatomy of larynx
Difference between adult and infant larynx
Clinical examination of larynx
Stroboscopy - technique, procedure, interpretation and precautions
Congenital laryngeal pathologies
Inflammatory conditions of the larynx
Vocal nodule and other disorders of the vocal folds
Benign and malignant tumours of the larynx
Laryngectomy – overview of surgical procedure
Phono surgery and other voice restoration surgeries

Unit 5: Esophagus and its disorders

Clinical anatomy and physiology of esophagus
Clinical examination of esophagus
Congenital anomalies of esophagus
Esophageal fistula
Inflammatory conditions of esophagus
Benign conditions of esophagus
Malignant conditions of the esophagus
Airway management procedures

Recommended Reading

Chan, Y. and Goddard, J.C. (2015). K J Lee's Essential otolaryngology: head and neck surgery. (11th edition). New Delhi: Atlantic Publisher and Distributers
Dhingra, P. L. (2013). Diseases of Ear, Nose and Throat (Sixth edition). Elsevier.
O'Neill, J.P. and Shah, J.P. (2016). Self-assessment in otolaryngology. Amsterdam: Elsevier
Postic, W.P., Cotton, R.T., Handler, S.D. (1997). Ear trauma. Surgical Pediatric Otolaryngology. New York: Thieme Medical Publisher Inc.
Wackym, A. and Snow, J.B. (2015). Ballenger's otorhinolaryngology head and neck surgery. (18th edition). United States: McGraw-Hill Medical

B2.3 Speech-Language Pathology

Hour - 60

Marks -100

Objectives: After completing this course, the student will be able to understand the

different speech and language disorders
basic concepts and tools required for diagnosing speech and language disorders
basics of assessment procedures for speech and language disorders
basic principles and intervention procedures for speech and language disorders
clinical requirements to practice,
different laws, social-cultural and ethical issues
identification and prevention of speech and language disorders
basic principles of providing counselling and guidance to clients and caregivers

Unit 1: Basic concepts and methods of diagnostics

Introduction to Speech Language Disorders
Definition and descriptions of delay, deviancy and disorders; impairment, disability and handicap
Incidence and prevalence of speech and language disorders
Causes of speech and language disorders
Basic principles in assessment, evaluation and appraisal
Tools for diagnosis- case history, interview, 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, tentative diagnosis advantage/disadvantages
Characteristics of a diagnostic clinician
Organization and basic requirements for clinical set up and team approach
DSM, ICD classification and ICF

Unit 2: Basic concepts and methods of therapeutics

Basic concepts and terminologies in speech therapeutics
General principles of speech and language therapy
Speech therapy set-up
Individual and group therapy
Procedures and types of for speech-language therapy
Approaches to speech and language therapy – formal, informal and eclectic approaches
Planning for speech and language therapy – goals, steps, procedures and activities
Importance of reinforcement principles and strategies in speech and language therapy, types and schedules of rewards and punishment
Individual and group therapy

AAC and other nonverbal methods of therapy

Unit 3: Overview of basic assessment and management of speech disorders

Causes of speech disorders

- b) Overview of assessment procedures for voice disorders; articulation and phonological disorders; and fluency disorders
Overview of management procedures for voice disorders; articulation and phonological disorders; and fluency disorders
Early identification and prevention of speech disorders
Basic concepts in assessment and management of swallowing disorders

Unit 4: Overview of basic assessment and management of language disorders

Types, characteristics and classification of language disorders

Causes of language disorders

Overview of assessment procedures for child language disorders; adult language disorders; and neurogenic language disorders

Overview of management procedures for child language disorders; adult language disorders; and neurogenic language disorders

Early identification and prevention of language disorders

Issues related to bi- /multilingualism

Unit 5: Other issues in practice as a speech - language pathologist

Professional code of conduct – social, cultural and other ethical issues

Scope of practice –different set ups and prerequisites

Documentation of diagnostic, therapeutic and referral reports

Counselling, guidance, facilitation of parent participation and transfer of skills

Evaluation of therapy outcome and follow up

Evidence based practice

Community based rehabilitation

Role of itinerant speech therapist, Anganwadis, resource teachers etc.

PWD act, National Trust, Consumer protection Act, noise pollution Act and other public laws, RCI, ISHA and other organizations controlling the field

Facilities and concessions available for speech and hearing disabled

Recommended Reading

Owens. Jr, Kimberly, A. Metz, F.E. (2014). 5th Ed. Introduction to Communication Disorders: A life span based Perspective. Pearson Communication Science and Disorders Series.

Hegde, M. N., & Davis, D. (2005). Clinical methods and practicum in speech-language pathology (4th ed.). Australia; Clifton Park, NY: Thomson Delmar Learning.

- Shiple, K. G., & Roseberry-McKibbin, C. (2006). *Interviewing and counselling in communicative disorders : Principles and procedures* (3rd ed.). Austin, Tex: Pro-Ed.
- Brookshire, R. H. (2003). *Introduction to neurogenic communication disorders* (6th ed.). St. Louis, Mo: Mosby.
- Hulit, L.M., Marle. R., Kathleen, R. H., & Fowey (2010). *Born to Talk*. Pearson Communication Science and Disorders Series 5th Ed.
- Roth, F. P., & Worthington, C. K. (2005). *Treatment resource manual for speech language pathology* (3rd ed.). Australia; Clifton Park, NY: Thomson Delmar Learning.
- Shiple, K. G., & McAfee, J. G. (2004). *Assessment in speech-language pathology: A resource manual* (3rd ed.). Australia; Clifton Park, NY: Delmar Learning.
- Ysseldyke, J. E., & Algozzine, R. (2006). *Teaching students with communication disorders : A practical guide for every teacher*. Thousand Oaks, Calif.: Corwin Press.

B2.4 Audiology

Hour - 60

Marks -100

Objectives: After completing this course, the student will be able to

understand and carryout experiments to measure differential sensitivity loudness and pitch
take case history, administer the tuning fork tests and interpret the results
administer pure tone audiometry including masking on clinical population and appreciate the theoretical back ground of it
carryout different tests involved in speech audiometry appreciate the theoretical back ground
carryout subjective calibration and daily listening checks of the audiometer
get adequate theoretical information necessary to understand concepts involved in objective calibration

Unit 1: Differential sensitivity

Concept of differential sensitivity, just noticeable difference
Weber's fraction
Intensity discrimination
Frequency discrimination
Duration discrimination and temporal resolution
Applications of jnd's
Magnitude estimation and production
Loudness – equal loudness level contours and its application
Loudness scales - sone, phone, Steven's power law
Pitch- scales of pitch

Unit 2: Case history and tuning fork tests

Need for case history
Basics of history taking
Essential factors to be included in case history for adults
Essential factors to be included in case history for children
Interpretation of case history
Audiological evaluation – rationale and purpose
Principles, procedure, interpretation, advantages and disadvantages of Rinne and Schwabach tuning fork test
Principles, procedure, interpretation, advantages and disadvantages of Weber and Bing tuning fork test
Audiometric version of Weber and Bing test

Unit 3: Pure tone audiometry

- a) Classification of audiometers, Parts of an audiometer, characteristics and specifications of transducers used (earphones, bone vibrators, loud speakers)
Audiogram- concept and symbols used
Clinical method of threshold estimation
Factors affecting air conduction threshold
Bone conduction thresholds- measurements, factors effecting
Permissible noise levels in the audiometric room

Unit 4: Speech audiometry

Importance and purpose
Different types of stimuli used in speech audiometry
Concept of phonetically and phonemically balanced
Speech detection thresholds – procedure and application
Speech reception thresholds – procedures and application
Word recognition scores –procedure and applications
PIPB function – procedure and applications
Factors affecting speech audiometry
BC speech audiometry – procedure and its application
Test materials available in various languages

Unit 5: Clinical masking and instrumental calibration

Definition and different terminologies
Purpose and rationale of clinical masking
Different types of stimulus employed in clinical masking
Interaural attenuation and factors affecting interaural attenuation
When to mask and how much to mask – importance of adequate noise levels
Different procedures for masking
Masking for speech audiometry
Calibration definition and purpose
Daily listening checks and subjective calibration
Objective calibration of air conduction transducers
Objective calibration of bone conduction transducers
Frequency calibration

Recommended Reading

Durrant, J. D., &Feth, L. L. (2012). Hearing Sciences: A Foundational Approach (1 edition.). Boston: Pearson.
Emanuel, D. C., &Letowski, T. (2008). Hearing Science (1 edition.). Philadelphia: Lippincott Williams and Wilkins.
Gelfand, S. A. (2009). Hearing: An Introduction to Psychological and Physiological Acoustics (5 edition.). London: CRC Press.

- Kaplan, H., Gladstone, V. S., & Lloyd, L. L. (1993). *Audiometric Interpretation: A Manual of Basic Audiometry* (2 edition.). Boston: Pearson.
- Katz, J. (2014). *Handbook of Clinical Audiology* (7th International edition edition.). Lippincott Williams and Wilkins.
- Martin, F. N., & Clark, J. G. (2014). *Introduction to Audiology*. Boston: Pearson.
- Silman, S., & Silverman, C. A. (1997). *Auditory Diagnosis: Principles and Applications* (Reissue edition.). San Diego: Singular Publishing Group

B2.5 Practicals (Speech-language Pathology)

Marks -100

Practicals

Demonstrate normal aspects of speech and analyse perceptually variations in voice, articulation and fluency in different recorded speech samples of typical individuals at different age groups (children, adults and older adults) and sex.

Demonstrate normal aspects of language and analyse perceptually variations in language in different recorded samples of typical individuals at different age groups (children, adults and older adults) and sex.

Demonstrate stress, rhythm and intonation and variations in rate of speech and analyse perceptually variations in prosody in different recorded samples of typical individuals at different age groups (children, adults and older adults) and sex.

Use IPA to transcribe spoken words.

Record a standard passage, count number of syllables and words, identify syllable structure, syntactic structures in the passage.

Oral mechanism examination on 5 normal children and 5 normal adults.

Prepare a chart and show the developmental stages of speech and language behavior.

Administer standardized tests for assessment of delayed speech and language development such as REEL, SECS, LAT, 3DLAT, ALD each on any 2 children.

Study the available normative data (Indian/Western) of speech such as respiratory, phonatory, resonatory and articulatory parameters.

Measure the following in 5 normal subjects: (a) Habitual frequency (b) Frequency range (c) Intensity (d) Intensity range (e) Phonation duration (f) rate of speech (g) Alternate Motion Rates and Sequential Motion Rates (h) s/z ratio.

Study the available normative data (Indian/Western) of language such as phonology, semantics, syntax, morphology and pragmatic measures.

Perceptual analysis of speech and language parameters in normal (2 children and 2 adults and persons with speech disorders (3 adults + 3 children).

Prepare a model diagnostic report of a patient with speech and language disorder.

Prepare a diagnostic and therapy kit.

Make a list of speech language stimulation techniques and other therapy techniques for various speech disorders.

Familiarize with the sources for referral and parent counseling procedures.

Prepare a report on the available audiovisual material and printed material/pamphlets relating to speech-language pathology, public education of communication and hearing disorders, etc.

Prepare a report on the available clinical facilities and clinical activities of the institute.

Clinical Practicum

Observe the evaluation process and counselling of at least 5 different speech and language disorders in children.

Observe the evaluation process and counselling of at least 5 different speech and language disorders in adults.

Take case history of a minimum of 10 individuals (5 normal & 5 clients with complaints of speech-language problems).

Observation of diagnostic procedures.

Observe various therapeutic methods carried out with children and adults with speech and language disorders.

B2.6 Practicals (Audiology)

Marks -100

Practicals

Calculate/derive the answers for following

- Calculate the relative intensities with different reference intensities.
- Calculate decibels when sound intensities are doubled, increased by 4 times
- Add decibels when two sounds with different intensities are produced simultaneously
- Collect pictures of audiometers that existed between 1920 and 1990.

Perform the following experiments

- Calculate reference equivalent sound pressure levels (RETSPL) for head phones and bone vibrator for any two frequencies using 30 participants.
- Measure most comfortable level on 10 participants with normal hearing sensitivity.
- Measure uncomfortable levels on 10 participants with normal hearing sensitivity.
- Calculate the sensation levels of MCL and UCLs in above 10 participants.
- Measure difference limen of intensity, frequency and duration on 10 normal hearing adults and plot it in graphical form and interpret the results.
- Measure equal loudness level contours at minimum level, 40 dB SPL, 70 dB SPL (1 kHz) in 5 normal hearing adults.
- Measure sone and mel in 5 normal hearing adults using scaling techniques.
- Take case history on 5 adults and 5 children with hearing problem and correlate the information from case history to results of pure tone audiometry.
- Administer different tuning fork tests on 5 simulated conductive and 5 sensori neural hearing loss individuals.
- Carry out pure tone and speech audiometry on 10 normal hearing individuals.
- Carry out clinical masking on 10 normal hearing individuals with simulated conductive hearing loss and carry out clinical masking on 5 individuals with conductive hearing loss and 5 individuals with sensori-neural hearing loss.
- Carryout daily listening checks and subjective calibrations 20 times and observe objective calibration once
- Perform otoscopy and draw the tympanic membrane of 10 healthy normal individuals
- Measure difference limen of intensity, frequency and duration on 10 normal hearing adults and plot it in graphical form and interpret the results
- Measure equal loudness level contours at minimum level, 40 dB SPL, 70 dB SPL (1 kHz) in 5 normal hearing adults
- Measure sone and mel in 5 normal hearing adults using scaling techniques
- Take case history on 5 adults and 5 children with hearing problem and correlate the information from case history to results of pure tone audiometry
- Administer different tuning fork tests on 5 simulated conductive and 5 sensori neural hearing loss individuals
- Carry out pure tone and speech audiometry on 10 normal hearing individuals

Carry out clinical masking on 10 normal hearing individuals with simulated conductive hearing loss and carry out clinical masking on 5 individuals with conductive hearing loss and 5 individuals with sensori-neural hearing loss
Carryout daily listening checks and subjective calibration 20 times and observe objective calibration once

Clinical Practicum

Observe case history being taken on 5 adults and 5 children with hearing problem and correlate the information from case history to results of pure tone audiometry. Administer different tuning fork tests on 5 conductive and 5 sensori neural hearing loss individuals.

Observe the pure tone audiometry being carried out on 30 clients.

Plot the audiogram, calculate the pure tone average and write the provisional diagnosis of observed clients.

Perform otoscopy (under supervision) on at least 1 client with following conditions:
Tympanic membrane perforation, SOM, CSOM

Semester III

B3.1 Voice and its Disorders

Hour - 60

Marks -100

Objectives: After completing this course, the student will be able to

describe characteristics of normal voice and identify voice disorders
explain etiology related to voice problems, and its pathophysiology
assess voice disorders
provide counselling and therapy to individuals with voice disorders

Unit 1: Basic concepts in voice and its production

Definition and functions of voice – biological and non-biological
Parameters of voice
Structures and function of respiratory system for the purpose of phonation
Laryngeal anatomy – Structural support of larynx, muscles, vocal fold
microstructure, blood supply, and innervations
Vocal tract resonance and voice quality
Development of voice: Birth to senescence; structural and voice related changes
Aerodynamic myo-elastic theory of voice production
Voice mechanics – Physiologic, acoustic and aerodynamic correlates of voice
Pitch and loudness changing mechanism, voice registers and voice quality
Description of normal and abnormal voice: Parametric, pathologic/perceptual, social

Unit 2: Characteristics and pathophysiology of voice disorders

Pathologies of the laryngeal mechanism: classification of voice disorders, incidence, and prevalence
Etiology of voice disorders: voice misuse and abuse, medical related etiologies, primary disorder etiologies and personality related etiologies
Pathologies of vocal fold cover (infective and trauma related secondary conditions) and muscular dysfunction
Non-organic voice disorders: functional disorders, psychosomatic- functional aphonia and physiological- voice abuse, puberphonia)
Congenital voice disorders
Neurological voice disorders
Voice problems in systemic illnesses and endocrine disorders
Voice problems in transgenders
Voice problems in the elderly
Voice problems in professional voice users: teachers and singers

Unit 3: Assessment of voice

Referral sources, medical examination and team approach
Protocol for voice assessment: components and philosophies (ICF, ICD)
Clinical voice laboratory: principles of instrumental measurements – electrical error, electrical safety, hygiene safety; recording of data; storage; patented soft wares, free wares
Perceptual evaluation of voice: GRBAS, CAPE -V
Visualization procedures- indirect laryngoscopy, video laryngoscopy & stroboscopy
Acoustic analysis of voice: F0 related measures, intensity related measures, quality related measures, phonetogram, DSI
Electroglottography and inverse filtering procedures
Aerodynamic analysis of voice: static & dynamic measures
Self-evaluation of voice : PROM, VHI, V-DOP
Reporting of voice findings, normative comparisons, differential diagnosis

Unit 4: Management of voice

Voice therapy orientation: basic principles, goal setting and approaches
Vocal hygiene and preventive counselling
Symptomatic voice therapy – voice facilitation techniques
Psychological approaches to voice therapy – psychoanalysis, rational emotive therapy and cognitive behavior therapy
Physiological approach – breathing and postural techniques
Holistic voice therapy approaches -1: accent therapy, confidential voice therapy,
Holistic voice therapy approaches - 2: vocal function exercises, resonant voice therapy, Lee Silverman voice therapy
Medical and surgical procedures in the treatment of benign vocal fold lesions: pharmaceutical effects on voice, phono surgery : re-innervation techniques, laryngeal framework surgeries, micro laryngeal excision
Professional voice care

Unit 5: Intervention strategies for voice disorders

Vocal trauma related disorders
Functional voice disorders – inappropriate vocal components
Functional aphonia
Puberphonia/mutational falsetto
Muscle tension dysphonia
Sulcus vocalis
Vocal fold palsy
Spasmodic dysphonia
GERD/LPR
Benign vocal fold lesions requiring surgical intervention
Post-operative care for benign vocal fold lesions disorders
Documenting voice therapy outcomes

Practicals

Record phonation and speaking samples (counting numbers) from five children, adult men, adult women, geriatric men and geriatric women. Note recording parameters and differences in material.

Make inferences on age and sex differences across the samples obtained in the previous experiment using perceptual voice profiling. Make a note of differences in pitch, loudness, quality and voice control. Explain how voice reflects one's personality and other social needs.

Perform an acoustic voice analysis on phonation sample and generate a voice report based on acoustic findings. Compare findings between men & women.

Perform MPT and s/z ratio. Infer differences across age and sex.

Perform spirometry or any other appropriate aerodynamic procedure. Infer differences across age and sex.

Perform acoustic analysis on five abnormal voice samples.

Observe and document findings from five laryngeal examinations (pre-recorded or live) such as VLS, stroboscopy or any other relevant.

Administer a PROM on five individuals.

Prepare a vocal hygiene checklist.

Demonstrate therapy techniques such as vocal function exercise, resonant voice therapy, digital manipulation, push pull, relaxation exercises.

Recommended Reading

Stemple, J. C., Glaze, L. E., & Gerdeman, B. K. (2014). *Clinical voice pathology: Theory & Management* (5th Ed.). San Diego: Plural publishers.

Aronson, A.E. & Bless, D. M. (2009). *Clinical Voice Disorders*.(4th Ed.). New York: Thieme, Inc.

Boone, D. R., McFarlane, S. C, Von Berg, S. L. & Zraick, R, I. (2013): *The Voice and Voice Therapy*. (9th Ed.). Englewood Cliffs, Prentice-Hall, Inc. New Jersey.

Professional Voice: Assessment and Management. Proceedings of the national workshop on "Professional Voice: Assessment and management", 9-10 Dec 2010.

All India Institute of Speech & Hearing, Mysore. 2010.

Andrews, M. L. (2006). *Manual of Voice treatment: Pediatrics to geriatrics* (3rd Ed.). Thomson Delmar Learning.

Colton, R. H, Casper, J. K. & Leonard, R. (2006). *Understanding voice problems*. Baltimore: Williams & Wilkins.

Sapienza, C. M., & Ruddy, B H. (2013). *Voice Disorders*.(2nd Ed.). San Diego: Plural Publisher.

Voice: Assessment and Management. Proceedings of the national workshop on "Voice: Assessment and management", 14-15 Feb 2008. All India Institute of Speech & Hearing, Mysore. 2008.

B3.2 Speech Sound Disorders

Hour - 60

Marks -100

Objectives: After completing this course, the student will be able to

describe normal speech sound development and characterization of individuals with speech sound disorders.

perform phonological analysis and assessment of speech sound disorders.

plan intervention for individuals with speech sound disorders.

Unit 1: Speech sound acquisition and development

Fundamentals of articulatory phonetics - phonetic description of vowels & consonants.

Phonology & phonological theories – generative phonology, natural phonology.

Phonology & phonological theories – non-linear phonology, optimality theory.

Methods to study speech sound acquisition – diary studies, cross sectional studies and longitudinal studies.

Speech sound acquisition

birth to one year (development of infant speech perception, early speech production).

one to two years (consonant inventories, influence of phonological knowledge on vocabulary acquisition).

two to five years (growth of phonetic, phonemic, phonotactic inventory – consonants, clusters, phonological patterns).

above five years (speech sound mastery and development of literacy – phonological awareness).

Factors influencing speech sound acquisition

Acoustics of speech sounds

Speech intelligibility, factors affecting speech intelligibility, assessment of speech intelligibility

Co articulation: types and effects

Phonological development in bilingual children.

Phonological development in Indian languages.

Unit 2: Assessment of speech sound disorders - I

Current concepts in terminology and classification of speech sound disorders

Organically-based speech sound disorders, childhood apraxia of speech.

Speech sound disorders of unknown origin, classification by symptomatology.

Factors related to speech sound disorders

structure and function of speech & hearing and oro-sensory mechanisms.

cognitive – linguistic, psychosocial and social factors.

metalinguistic factors related to speech sound disorders.

Introduction to assessment procedures: aims of assessment, screening and comprehensive assessment.

Speech sound sampling procedures - issues related to single word and connected speech samples; imitation and spontaneous speech samples, contextual testing, recording of speech samples.

Review of tests in English and other Indian languages - Single word articulation tests, deep articulation of articulation, and computerized tests of phonology.

Influence of language and dialectal variations in assessment.

Transcription of speech sample - transcription methods –IPA and extension of IPA; broad and narrow transcription.

Unit 3: Assessment of speech sound disorders - II

Introduction to independent and relational analysis.

Independent analyses – phonetic inventory, phonemic inventory and phonotactic inventory (utility of independent analysis for analysis of speech of young children and children with severe speech sound disorders).

Relational analyses – SODA, pattern analysis, (distinctive features, phonological process analysis).

Phonological processes analyses - language specific issues, identification and classification of errors.

Assessment of oral peripheral mechanism.

Speech sound discrimination assessment, phonological contrast testing.

Stimulability testing.

Determining the need for intervention – speech intelligibility and speech severity assessment.

Factors influencing target selection – stimulability, frequency of occurrence, developmental appropriateness, contextual testing, and phonological process analysis.

Case study – Documenting the assessment findings and determining the need for intervention.

Unit 4: Management – I

Basic considerations in therapy – target selection, basic framework for therapy, goal-attack strategies, organizing therapy sessions, individual vs. group therapy.

Treatment continuum – establishment, generalization and maintenance; measuring clinical change.

Facilitation of generalization.

Maintenance and termination from therapy.

Motor-based treatment approaches – Principles of motor learning.

Discrimination/ear training and sound contrast training.

Establishing production of target sound – imitation, phonetic placement, successive approximation, context utilization.

Traditional approach, contextual/sensory-motor approaches.

General guidelines for motor-based treatment approaches.

Use of technology in articulation correction.

Unit 5: Management – II

Core vocabulary approach.

Introduction to linguistically-based treatment approaches- Distinctive feature therapy.

Minimal pair contrasts therapy.

Metaphon therapy, Cycles approach.

Broad-based language approaches.

General guidelines for linguistically-based approaches.

Phonological awareness and phonological disorders.

Phonological awareness intervention for preschool children.

Adapting intervention approaches to individuals from culturally and linguistically diverse backgrounds.

Role of family in intervention for speech sound disorders.

Practicals

List the vowels and consonants in your primary language and provide phonetic and acoustic descriptions for the speech sounds.

Identify the vowels and consonants of your language on the IPA chart and practice the IPA symbols by transcribing 25 words.

Make a list of minimal pairs (pairs of words which differ by only one phoneme) in English.

Make a list of minimal pairs in any language other than English.

Identify the stages of speech sound acquisition by observations from videos of children from birth to 5 years of age.

Record the speech of a two year old typically developing child, transcribe and analyze the speech sample.

Record the speech of one typically developing child from 3-5 years of age (include single word and connected speech samples), transcribe the sample, and perform phonological assessment.

Analyze transcribed speech samples of typically developing children – practice independent and relational analysis.

Practice instructions for phonetic placement of selected sounds.

Develop a home plan with activities for any one section of phonological awareness in English and in one Indian language.

Recommended Reading

Berenthal, J.E., Bankson, N.W., & Flipsen, P. (2013). *Articulation and phonological disorders.*(7th Ed.). Boston, MA: Pearson.

Dodd, B. (2013). *Differential diagnosis and treatment of children with speech disorder.*(2nd Ed). NJ: Wiley.

Rout, N (Ed)., Gayathri, P., Keshree, N and Chowdhury, K (2015). *Phonics and Phonological Processing to Develop Literacy and Articulation; A Novel Protocol.* A

publication by NIEPMED, Chennai. Freely downloadable from
<http://niepmd.tn.nic.in/publication.php>. ISBN 978-81-928032-9-5

Vasanta, D. (2014). Clinical applications of phonetics and phonology. ISHA
Monograph. Vol 14, No. 1. Indian Speech & Hearing Association.

Velleman, S. L (2003). Resource guide for Childhood Apraxia of
Speech. Delmar/Thomson Learning.

Williams, A., McLeod, S., & McCauley, R. (2010). Interventions for speech sound
disorders in children. Baltimore: Brookes.

B3.3 Diagnostic Audiology: Behavioural Tests

Hours - 60

Marks - 100

Objectives: After completing this course, the student will be able to

choose individualized test battery for assessing cochlear pathology, retro cochlear pathology, functional hearing loss, CAPD, vestibular dysfunctions, tinnitus and hyperacusis

independently run the tests and interpret the results to identify the above conditions and also use the information for differential diagnosis

make adjustments in the test parameters to improve sensitivity and specificity of tests.

make appropriate diagnosis based on the test results and suggest referrals.

Unit 1: Introduction to diagnostic audiology

Characteristics of a diagnostic test, difference between screening and diagnostic test, functions of a diagnostic test in Audiology

Need for test battery approach in auditory diagnosis and integration of results of audiological tests, cross-check principle

Concept of sensitivity, specificity, true positive, true negative, false positive, false negative, hit rate

Definition of behavioural and physiological tests and their characteristics in diagnostic audiology

Theories and physiological bases of recruitment

Theories and physiological bases of adaptation

Clinical indications for cochlear pathology, retro-cochlear pathology, central auditory processing disorders, functional hearing loss, vestibular disorders

Unit 2: Tests to identify cochlear and retro cochlear pathology

ABLB, MLB and SISI tests

Behavioural tests of adaptation

Bekesy audiometry

Brief tone audiometry

PIPB function

Glycerol test

Test to identify dead regions of cochlea

Unit 3: Tests to diagnose functional hearing loss

Behavioural and clinical indicators of functional hearing loss

Pure tone tests including tone in noise test, Stenger test, BADGE, puretone DAF

Speech tests including Lombard test, Stenger test, lip-reading test, Doerfler-Stewart test, Low level PB word test, Yes-No test, DAF test

Identification of functional hearing loss in children: Swinging story test, Pulse tone methods

Unit 4: Assessment of central auditory processing

Definition, different behavioral processes

Behavioral and clinical indicators of central auditory processing disorders

Bottle neck and subtlety principles and their implications in

Tests to detect central auditory processing disorders

Monaural low redundancy tests - filtered speech tests, time compressed speech test, speech-in-noise test, SSI with ICM, other monaural low redundancy tests.

Dichotic speech tests – Dichotic digit test, Staggered spondaic word test, Dichotic CV test, SSI with CCM, Competing sentence test, other dichotic speech tests.

Binaural interaction tests – RASP, BFT, MLD, other binaural interaction tests

Tests of Temporal processing – pitch pattern test, duration pattern tests, other temporal ordering tests, gap detection test, TMTF

Variables influencing the assessment of central auditory processing: Procedural and subject variables

Test findings of important tests in subjects with central auditory disorders: brainstem lesion, cortical, CAPD in children.

Unit 5: Assessment of persons with vestibular disorder, tinnitus, hyperacusis

Introduction to structure and function of vestibular system

Vestibular ocular reflex and vestibulo spinal reflex

Overview on other systems involved in balance

Signs and Symptoms of vestibular disorders

Team in the assessment and management of vestibular disorders

Behavioral tests to assess vestibular functioning: Fukuda stepping test, tandem gait test, finger nose pointing, Romberg test, Sharpened Romberg test, Dix-Hallpike test, Log-roll test

Overview of tinnitus and hyperacusis and tests for assessment

Pitch matching, loudness matching, residual inhibition, Feldman masking curves

Johnson Hyperacusis Dynamic Range Quotient

Practicals

Administer ABLB, MLB and prepare ladder gram (ABLB to be administered by blocking one ear with impression material)

Administer classical SISI on 3 individuals and note down the scores

Administer tone decay tests (classical and its modifications) and note down the results (at least 3 individuals)

Administer Bekesy audiometry

Administer Brief tone audiometry

Plot PIPB function using standardized lists in any 5 individuals

Administer the tests of functional hearing loss (both tone based and speech based) by asking subject to malingering and having a yardstick of loudness.

Administer CAPD test battery to assess different processes on 3 individuals and note down the scores

Administer Fukuda stepping test, Tandem gait test, Finger nose pointing, Romberg test, Sharpened Romberg test, Dix-Hallpike test, Log-roll test on 5 of the individuals each and note down the observations.

Estimate the pitch and loudness of tinnitus in 2 persons with tinnitus (under supervision). Assess the residual inhibition in them.

Plot Feldman masking curves for a hypothetical case

Administer Johnson Hyperacusis Dynamic Range Quotient on any 2 of the individuals and note down the scores.

Recommended Reading

Gelfand, S. A. (2009). *Essentials of Audiology*. Thieme.

Hall, J. W., & Mueller, H. G. (1996). *Audiologists' Desk Reference: Diagnostic audiology principles, procedures, and protocols*. Cengage Learning.

Jerger, J. (1993). *Clinical Audiology: The Jerger Perspective*. Singular Publishing Group.

Katz, J., Medwetsky, L., Burkard, R. F., & Hood, L. J. (Eds.). (2007). *Handbook of Clinical Audiology* (6th revised North American edition). Philadelphia: Lippincott Williams and Wilkins.

Martin, F. N., & Clark, J. G. (2014). *Introduction to Audiology* (12 edition). Boston: Pearson.

Roeser, R. J., Valente, M., & Hosford-Dunn, H. (2007). *Audiology: Diagnosis*. Thieme.

Stach, B. A. (2010). *Clinical audiology: an introduction* (2nd ed). Clifton Park, NY: Delmar Cengage Learning.

B.3.4 Amplification Devices

Hours - 60

Marks - 100

Objectives: After completing this course, students will be able to

- assess the candidacy for hearing aids and counsel accordingly
- evaluate the listening needs and select the appropriate hearing aid
- independently program digital hearing aids as per the listening needs of the client
- independently assess the benefit from the hearing aid using subjective and objective methods
- make all types of ear molds
- counsel the parents/care givers at all stages

Unit 1: Types of hearing aids

Historical development of hearing aids: development of concept of amplification, development of different types of amplification devices
Review of basic elements of hearing aids: Microphone, Amplifier, Receiver/vibrator, Cords, Batteries.

Classification and Types of hearing aids

- Body level, ear level, in the ear, ITC, invisible in the canal, CIC
- Binaural, pseudo binaural, monaural
- Programmable, trimmer digital and digital hearing aids
- Directional hearing aids, modular hearing aids
- RIC hearing aids
- Implantable hearing aids
- Master hearing aids
- CROS hearing aids

Group amplification – hard wired, induction loop, FM, infrared

Assistive listening devices – types and selection (Telephones, Television, typing technology)

Unit 2: Technological aspects in hearing aids

Routing of signals, head shadow/baffle/diffraction effects

Output limiting and issues related to them: peak clipping, compression

Concept and use of compression in hearing aids: BILL, TILL, PILL, Wide Dynamic Range Compression, Syllabic Compression, Dual Compression

Signal processing in hearing aids – BILL, TILL, PILL

Signal enhancing technology

Noise reduction algorithms

Extended low frequency amplification, frequency lowering technology (transposition, compression)

Recent advances in hearing aids

Unit 3: Electro-acoustic measurements for hearing aids

Purpose and Parameters to be considered: OSPL90, SSPL90, HFA SSPL90, Gain, Full on Gain, HFA Full on Gain, Reference test Gain, Basic Frequency Response, Total Harmonic distortion, Intermodulation Distortion, input Output functions, instrumentation, procedure, variables affecting EAM
Electro-acoustic measurements, BIS, IEC and ANSI standards
Environmental tests.
Care, maintenance and troubleshooting of hearing aids
Counselling and orienting the hearing aid user (Client and significant others)

Unit 4: Selection of hearing aids

Pre-selection factors; Prescriptive and comparative procedures; Functional gain and insertion gain methods; Use of impedance, OAEs and AEPs audiometry; Hearing aids for conductive hearing loss; Hearing aids for children; Hearing aids for elderly; Selection of non-linear programmable and digital hearing aids
Hearing aid programming
Methods for assessing hearing aid benefit
Real ear insertion measurements for verification of hearing aid benefit: REIG, REUR, REAR, REOR, RESR, REIG, REAG, RECD
Acoustic feedback in hearing aids

Unit 5: Mechano-acoustic couplers (Ear molds)

Different types of molds
Procedure for hard molds and soft mold
UV curing methods
Special modifications in the ear molds: Vents (diagonal and parallel), deep canal molds, short canal, horns, Libby horn, reverse horn, acoustic modifier
Effects of mechano-acoustic couplers on the hearing aid output

Practicals

Listen to the output of different types and classes of hearing aids (monaural, binaural, analog, digital hearing aids), in different settings
Troubleshoot hearing aids: Check the continuity of the receiver cord using multi meter, measure the voltage of different sized batteries using multi meter, Check voltage of batteries different types and sizes
Carry out electroacoustic measurements for the body level and ear level hearing aids
Program the hearing aid for different configuration and degrees of hearing loss (at least 5 different audiograms) using different prescriptive formulae
Program the hearing aid for different listening situations (at least 3 different situations)
Vary the compression settings in a digital hearing aid and note down the differences in the output

Perform real ear insertion measurements using different hearing aids (body level and ear level, hearing aids of different gains)

Compare speech perception through conventional BTE and RIC hearing aids using a rating scale

Observe assistive listening devices such as telephone amplifier, vibro-tactile alarms, note down the candidacy and their utility.

Administer a questionnaire to assess hearing aid benefit on 2 persons using hearing aids.

Carry out a role play activity of counselling a hearing aid user

Ear Molds

Take impression for the ear mold using different techniques, different methods and using different materials

Make hard mold for any 2 ears

Make soft mold for any 2 ears

Make vent in hard molds you made

Recommended Reading

Dillon. (2012). *Hearing Aids* (2 edition). Thieme Medical and Scientific Publisher.

Hall, J. W., & Mueller, H. G. (1998). *Audiologists' Desk Reference: Audiologic management, rehabilitation, and terminology*. Singular Publishing Group.

Kates, J. M. (2008). *Digital Hearing Aids* (1 edition). San Diego: Plural Publishing Inc.

Metz, M. J. (2014). *Sandlin's Textbook of Hearing Aid Amplification: Technical and Clinical Considerations*. Plural Publishing.

Mueller, H. G., Hawkins, D. B., & Northern, J. L. (1992). *Probe Microphone Measurements: Hearing Aid Selection and Assessment*. Singular Publishing Group.

Mueller, H. G., Ricketts, T. A., & Bentler, R. A. (2007). *Modern Hearing Aids: Pre-fitting Testing and Selection Considerations: 1* (1 edition). San Diego, CA: Plural Publishing Inc.

Sandlin, R. E. (Ed.). (1989). *Handbook of Hearing Aid Amplification: Clinical Considerations and Fitting Practices v. 2*. Boston: Singular Publishing Group.

Sandlin, R. E. (Ed.). (1993). *Understanding Digitally Programmable Hearing AIDS*. Boston: Allyn & Bacon.

Tate, M. (2013). *Principles of Hearing Aid Audiology*. Springer.

Taylor, B., & Mueller, H. G. (2011). *Fitting and Dispensing Hearing Aids* (1 edition). San Diego: Plural Publishing Inc.

Valente, M. (2002). *Hearing Aids: Standards, Options, and Limitations*. Thieme.

B3.5 Clinicals in Speech Language Pathology

Marks - 100

General considerations:

Exposure is primarily aimed to be linked to the theory courses covered in the semester.

After completion of clinical postings in Speech –language diagnostics, the student will know (concepts), know how (ability to apply), show (demonstrate in a clinical diary/log book based on clinical reports/recordings, etc), and do (perform on patients/client contacts) the following:

Know:

Procedures to obtain a speech language sample for speech & language assessment from children of different age groups such as, pre schoolers, kindergarten, primary school and older age groups.

Methods to examine the structures of the oral cavity/organs of speech.

The tools to assess language abilities in children (with hearing impairment, specific language impairment & mixed receptive language disorder).

Development of speech sounds in vernacular and linguistic nuances of the language.

Know-how:

To evaluate speech and language components using informal assessment methods.

To administer at least two standard tests for childhood language disorders.

To administer at least two standard tests of articulation/ speech sounds.

To assess speech intelligibility.

Show:

Analysis of language components – Form, content & use – minimum of 2 samples.

Analysis of speech sounds at different linguistic levels including phonological processes – minimum of 2 samples.

Transcription of speech language samples – minimum of 2 samples.

Analyse differences in dialects of the local language.

Do:

Case history - minimum of 5 individuals with speech & language disorders.

Oral peripheral examination - minimum of 5 individuals.

Language evaluation report – minimum of 5.

Speech sound evaluation report – minimum of 5.

Evaluation:

Internal evaluation shall be based on attendance, clinical diary, log book and learning conference.

External evaluation: Spot test, OSCE, Record, Viva-voce, case work

B3.6 Clinicals in Audiology

Marks - 100

General considerations:

Exposure is primarily aimed to be linked to the theory courses covered in the semester, however, not just limited to these areas.

After completion of clinical postings in auditory diagnostics and auditory rehabilitation, the student will Know (concept), know how (ability to apply), show (demonstrate in a clinical diary/log book), and do (perform on patients/ client contacts) the following:

Know:

Methods to calibrate audiometer.

Materials commonly employed in speech audiometry.

Calculation pure tone average, % of hearing loss, minimum and maximum masking levels.

Different types of hearing loss and its common causes

Know-how:

To obtain detailed case history from clients or parents/guardians.

To carryout commonly used tuning fork tests.

To administer pure tone audiometry including appropriate masking techniques on adults using at least techniques

To administer tests to find out speech reception threshold, speech identification scores, most comfortable and uncomfortable levels on adults.

Show:

Plotting of audiograms with different degree and type with appropriate symbols – 2 audiograms per degree and type

Detailed case history taken and its analysis

Calculation degree, type and percentage of hearing loss on 5 sample conditions

Do:

Case history on at least 5 adults and 3 children with hearing disorders

Tuning fork test on at least 2 individuals with conductive and 2 individuals with sensori-neural hearing loss

Pure tone audiometry with appropriate masking on 5 individuals with conductive, 5 individuals SN hearing loss and 3 individuals with unilateral/asymmetric hearing loss – 5

Evaluation:

Internal evaluation shall be based on attendance, clinical diary, log book and learning conference.

External evaluation: Spot test, OSCE, Record, Viva-voce, case work

Semester IV

B.4.1 Motor Speech Disorders in Children

Hours - 60

Marks - 100

Objectives: After completing this course, the student will be able to

describe the characteristics of motor speech disorders in children such as cerebral palsy, childhood apraxia of speech and other childhood dysarthrias
assess the speech and non-speech aspects associated with the above conditions
plan and execute therapy strategies for children with motor speech disorders

Unit1: Neuro-developmental processes in speech production and motor speech disorders

Review of neuro-anatomy (cerebral cortex, sub-cortical structures, brainstem, cerebellum, spinal cord & cranial nerves, pyramidal and extra-pyramidal systems)
Sensory-motor integration (spatial temporal planning, motor planning and feedback)
Anatomic development of speech production systems
Development of neural pathways of speech motor control (brain maturation, reflexes, sensory and motor)
Dysarthria in children – cerebral palsy – disorders of tone (spastic, flaccid): definition, etiology, characteristics and associated problems
Dysarthria in children – cerebral palsy – disorders of movement (hyperkinetic, hypokinetic) and disorder of balance (ataxia): definition, etiology, characteristics and associated problems
Dysarthria in children – lower motor neuron and other syndromes with motor speech disorders
Childhood apraxia of speech and nonverbal oral apraxia: definition, characteristics and classification

Unit 2: Assessment of motor speech disorders in children

Case history and developmental neurological evaluation – primitive postural and oro-pharyngeal reflexes, cranial nerve examination
Assessment of oral sensory and motor capacity – Oral peripheral mechanism examination, neuro- muscular status
Assessment of speech sub-systems – quantitative and qualitative
Assessment of speech intelligibility and comprehensibility
Assessment of associated problem
Speech assessment with specific reference to childhood apraxia of speech – Phonetic and phonemic inventory, phonotactics and syllable sequencing, variability of errors, speech intelligibility, fluency and prosody
Test materials – checklist for childhood apraxia of speech, screening test for developmental apraxia of speech

Protocols for non-verbal and verbal praxis specific to Indian languages
Differential diagnosis- dysarthria and other developmental disorders
Differential diagnosis - childhood apraxia of speech and other developmental disorders

Unit 3: Management of childhood dysarthria

Team approach in rehabilitation of motor speech disorders in children
Neuro-developmental therapy
Non speech oral-motor exercises: its application for children with dysarthria
Management of drooling
Behavioral management of respiratory, phonatory, resonatory and articulatory subsystems
Prosthetic appliances in treatment of childhood dysarthria
AAC in management of motor speech disorders- role of devices, AAC team, candidacy and pre-requisites, symbol selection, techniques, assessment for AAC, effective use of AAC
Case studies: Planning intervention for children with dysarthria

Unit 4: Management of childhood apraxia of speech

Principles of motor learning
Integral stimulation – dynamic temporal cueing
Multisensory and tactile cueing techniques (motor kinesthetic speech training, sensory motor approach, PROMPTS, Touch cue method & speech facilitation)
Gestural cueing techniques (signed target phoneme therapy, adapted cueing techniques, cued speech, visual phonics, & Jordan's gestures)
Miscellaneous techniques (melodic intonation therapy, multiple phonemic approach, & instrumental feedback)
Cognitive/conceptual/ linguistic /phonological remedial approaches - phonotactics
Other approaches: Vowel and diphthong remediation techniques (Northampton (Yale) vowel chart and Alcorn symbols), Nancy Kauffman's speech praxis treatment kit
Use of AAC in childhood apraxia of speech
Evidence-based practice in intervention for childhood apraxia of speech
Case studies: Planning intervention for childhood apraxia of speech

Unit 5: Feeding and swallowing disorders in children

Embryology- periods and structures of development
Anatomical structures of swallowing- upper aero digestive system, anatomic difference between adults and children
Physiology of swallowing- swallow phases, neural control of swallowing, reflexes related to swallowing, suckling and sucking, airway and swallowing
Terms involved in dysphagia and development of feeding skills
Causes of dysphagia in children

Signs and symptoms of dysphagia in children

Assessment – inferences from neural developmental assessment, cranial nerve examination, assessment scales, nutritive and non-nutritive assessment, instrumental assessment (VFS, cervical auscultation), gastrointestinal evaluation

Management: positioning, oral- motor treatment, team approach, non oral feeding, transitional feeding, modifications in feeding

Role of speech-language pathologist in neonatal intensive care with reference to feeding and swallowing

Practicals

With the help of models, charts and software, identify the motor control centers in the brain.

Perform oro-motor examination in five children and adults and compare

Identify oro-motor reflexes (rooting, suckling, & phase bite) in 5 infants.

Demonstrate normal posture and breathing patterns required for varied speech tasks.

Alter the postures and breathing patterns and notice changes in speech patterns.

Assess DDK rate in five typically developing children.

Rate intelligibility of speech in five typically developing children. Discuss factors that influenced speech intelligibility and their ratings.

Observe and record (a) physical status, (b) oral sensory motor abilities and vegetative skills, (c) respiration, (d) phonation, (e) resonance, (f) articulation and (g) language abilities in five typically developing children. Compare these with observations made from children with motor speech disorders.

Perform oro-motor exercises – isotonic and isometric. Discuss strategies to modify exercises for children.

Identify from video the AAC system such as low technology vs high technology systems and different symbol system, that is, Bliss symbols, IICP symbols and different signing systems – Makaton.

Observe feeding and swallowing skills in different age groups of children: 2 newborns; 2 infants, 2 toddlers, and 2 older children. Identify the differences in feeding methods, food consistencies, texture, quantity, feeding habits, feeding appliances used by these children.

Recommended Reading

Arvedson, J.C., and Brodsky, L. (2002) (2nd Ed.). Pediatric swallowing and feeding. San Diego, Singular publishing.

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

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

Love, R.J. (2000) (2nd Ed). Childhood Motor Speech Disorders. Allyn & Bacon.

Love, R.J. and Webb, W.G. (1993). (2nd ed.) Neurology for the Speech-Language Pathologist. Reed Publishing (USA)

Rosenthal, S., Shipp and Lotze (1995). Dysphagia and the child with developmental disabilities. Singular Publishing Group.
Velleman, S. L (2003). Resource guide for Childhood Apraxia of Speech. Delmar/Thomson Learning.

B.4.2 Language Disorders in Children

Hours - 60

Marks - 100

Objectives: After completing this course, the student will be able to

- explain the process of acquisition of language and factors that influence its development in children.
- identify and assess language delay and deviance in children.
- select appropriate strategies for intervention.
- counsel and provide guidance to parents/caregivers of children with language disorders.

Unit 1: Bases of language acquisition, development and disorders

- Theories of language acquisition 1: Biological, Psycholinguistic/syntactic theory
- Theories of language acquisition 2: Cognitive, social interaction/pragmatic, information processing, behavioral
- Pre-cursors for normal development of language
- Development of components of language from birth to two years (pre-linguistic/pre-symbolic to symbolic)
- Development of components of language during preschool period
- Development of components of language during early school age and beyond
- Basic concepts and terminologies of language development in bilingual children – simultaneous versus sequential language acquisition, additive and subtractive bilingualism, process of second language acquisition, variables influencing second language acquisition
- Development of language in culturally diverse environments and exceptional circumstances – neglect and abuse, twins, low-socio economic background
- Over view of language disorders – definition and classification based on ICD, DSM
- Application of ICF in language disorders

Unit 2: Language disorders – definition, classification, causes, and characteristics

- Intellectual disability: definition, classification, causes and characteristics
- Autism spectrum disorders: definition, classification, causes and characteristics
- Attention deficit hyperactive disorder: definition, classification, causes and characteristics
- Language impairment - mixed receptive and expressive language disorder, specific language impairment: definition, classification, causes and characteristics
- Learning disability: definition, classification, causes and characteristics
- Acquired childhood aphasia: definition, classification, causes and characteristics
- Sensory impairments and language disorders: types, causes and characteristics
- Syndromic conditions leading to language difficulties: William syndrome, fragile x syndrome, Down syndrome
- Other developmental disabilities: deaf-blind, cerebral palsy and multiple disabilities.

Unit 3: Assessment of language in children

Preliminary components of assessment: Case history, screening, evaluation of environmental, linguistic & cultural variables.

Methods to assess children with language disorder: Formal versus informal assessment; types of assessment materials: assessment scales, observational checklists, developmental scales; standardization, reliability, validity, sensitivity and specificity of test materials

Informal assessment - pre-linguistic behavior, play, mother-child interaction

Language sampling: planning and collecting representative sample; strategies to collecting language sample, audio-video recording, transcription

Analysis of language sample: Specific to various components of language such as phonology, morphology, syntax, semantics and pragmatics.

Test materials for assessing language skills: Assessment of Language Development (ALD), 3D-Language Assessment Test, Linguistic Profile Test, Com-DEALL checklist, other Indian and global tests

Test materials used for children with developmental delay, intellectual disability: Madras Developmental Program Scale, Bayley's Scale for infant and toddler development

Test materials used for children with autism spectrum disorder: Modified-Checklist for Assessment of Autism in Toddlers, Childhood Autism Rating Scale, Indian Scale for Assessment of Autism

Other test materials used for children with ADHD, ACA, LD (NIMH battery for assessment of Learning Disability)

Documenting assessment results: diagnostic report, summary report and referral report specific to disorder

Differential diagnosis of language disorders in children

Unit 4: Management of language disorders in children - I

General principles and strategies of intervention in children with language impairment – purpose of intervention, basic approaches to language intervention (developmental or normative approach, functional approach)

Types of service delivery models - Individuals versus group; direct versus tele-rehabilitation; structure of therapy session, setting the environment, furniture, seating arrangements

Reinforcement in language therapy, types and schedules of reinforcement

Choice of language for intervention, incorporating principles of multiculturalism into treatment activities

Choosing and framing goals and Objectives: SMART Objectives

Specific treatment techniques

Incidental teaching, self-talk, parallel talk, expansion, extension, recasting, joint routines, joint book reading, whole language, modifying linguistic input, communicative temptations drill, modelling

Focused stimulation, vertical structuring, milieu teaching, and model
Caregivers and family in intervention: Structured and informal approaches

Unit 5: Management of language disorders in children - II

Team approach to intervention

Augmentative and alternative communication – types (aided and unaided) and application in child language disorders

Specific approaches to management of children with Autism: PECS, Lovaas, TEACCH, Com-DEALL, ABA, Facilitated Communication

Approaches to management of children with LD

Strategies to facilitate language skills in children with disorders such as intellectual disability: Redundancy, chunking, chaining

Use of technology in language intervention

Home plan and counselling for children with language disorders

Documentation specific to the disorder: pre-therapy; lesson plan; SOAP notes

Documentation specific to the disorder: summary report, referral report

Decision making in therapy: transition to next objective, termination of therapy

Practicals

Record mother-child interaction of one typically developing child in the age range of 0-1, 1-2, 2-4, 4-6 and 6-8 years of age. Compare linguistically the outputs from the mother and the child across the age groups. Make inferences on socio cultural influences in these interactions.

Make a list of loan words in two familiar languages based on interaction with 10 typically developing children in the age range of 2-4, 4-6, 6-8 and 8-10 years. Discuss the influence of bi- or multilingualism on vocabulary.

Record a conversation and narration sample from 3 children who are in preschool kindergarten, and primary school. Perform a language transcription and analyze for form, content and use.

Administer 3D LAT, ALD, LPT, ComDEALL checklist on 2 typically developing children.

Draft a diagnostic report and referral letter for a child with language disorder.

Demonstrate general language stimulation techniques and discuss the clinical application.

Demonstrate specific language stimulation techniques with appropriate materials and discuss its clinical applications.

Draft Subjective Objective Assessment Plan (SOAP) for a pre-recorded sample of a 45 minute session of intervention for a child with language disorder.

Draft a lesson plan for a child with language disorder.

Draft a discharge summary report for a child with language disorder

Recommended Reading

- Roseberry-McKibbin, C. (2007). *Language Disorders in Children: A multicultural and case perspective*. Boston: Pearson Education, Inc.
- Paul, R. (2013). *Language disorders from infancy through adolescence (4th ed.)*. St.Louis, MO: Mosby.
- Dwight, D.M. (2006). *Here's how to do therapy: Hand-on core skills in speech language pathology*. San Diego, CA: Plural Publishing
- Hegde, M.N. (2005). *Treatment protocols for language disorders in children – Vol. 1 & 2*. San Diego: Plural Publishing
- Owens, R.E. (2008). *Language development: An introduction (7th ed.)*. Boston: Pearson
- Reed, V.A. (2004). *An Introduction to children with language disorders (3rd Ed.)*. New York: Allyn & Bacon
- Rout, N and Kamraj, P (2014). *Developing Communication - An Activity Book*, A publication by NIEPMED, Chennai. Freely downloadable from <http://niepmd.tn.nic.in/publication.php>. ISBN 978-81-928032-41.

B.4.3 Diagnostic Audiology: Physiological Tests

Hours - 60

Marks - 100

Objectives: After completing this course, the students will be able to

justify the need for using the different physiological tests in the audiological assessment
independently run the tests and interpret the results to detect the middle ear, cochlear and retro cochlear pathologies and also differentially diagnose
design tailor-made test protocols in immittance, AEPs and OAEs as per the clinical need
make appropriate diagnosis based on the test results and suggest referrals.

Unit 1: Immittance evaluation

Clinical significance of physiological tests in audiology
Immittance evaluation: Principle of immittance evaluation: Concept of impedance and admittance, their components,
Tympanometry: definition, measurement procedure, response parameters, their measurement and normative, classification of tympanogram, clinical significance of tympanometry
Eustachian tube functioning tests of tympanometry: basics of pressure equalization function of ET, Valsalva, Toynbee, William's pressure swallow, inflation-deflation test.
Overview on multicomponent and multi-frequency tympanometry
Overview on wide band reflectance and wide band tympanometry
Reflexometry: definition, acoustic reflex pathway, measurement procedure, clinical applications of acoustic reflexes, special tests

Unit 2: Auditory evoked potentials (AEPs): Auditory brainstem response (ABR)

Introduction and classification of AEPs
Instrumentation
Principles of AEP recording techniques:
Auditory brainstem response generators
Protocol and procedure of recording auditory brainstem response
Factors affecting auditory brainstem responses
Clinical applications of ABR
ABR in the paediatric population
Role of ABR in infant hearing screening

Unit 3: Overview of other AEPs

ECochG
Auditory Middle Latency Responses (AMLR) and their clinical applications

Auditory Long Latency Responses (Obligatory responses) and their clinical applications
Other long latency potentials such as P300, MMN, P600, N400, T-complex, CNV) and their clinical applications
ASSR: Instrumentation, recording and clinical applications
Brainstem responses to speech and other complex signals

Unit 4: Otoacoustic emissions

Introduction to otoacoustic emissions
Origin and classification of OAEs
Instrumentation
Procedure of OAE measurement: SOAE, TEOAEs, and DPOAEs
Interpretation of results: SOAE, TEOAEs, and DPOAEs
Clinical applications of OAEs: SOAE, TEOAEs, and DPOAEs
Contralateral suppression of OAEs and its clinical implications

Unit 5: Physiological tests for assessment of vestibular system

Electronystagmography: procedure, interpretation, clinical applications
Videonystagmography, videoocculograph
Vestibular Evoked Myogenic Potentials
Overview of Rotatory chair test, video Head Impulse Test,
Overview of Dynamic Posturography

Practicals

Measure admittance in the calibration cavities of various volumes and note down the observations
Calculate Equivalent ear canal volume by measuring static admittance in an uncompensated tympanogram (10 ears)
Do tympanogram in the manual mode and measure peak pressure, peak admittance and ear canal volume manually using cursor (10 ears).
Measure gradient of the tympanogram (10 ears)
Administer Valsalva and Toynbee and William's pressure swallow test(5 ears)
Record acoustic reflex thresholds in the ipsi and contra modes, (10 ears)
Plot Jerger box pattern for various hypothetical conditions that affect acoustic reflexes and interpret the pattern and the corresponding condition.
Carry out Acoustic reflex decay test and quantify the decay manually using cursor (5 individuals).
Trace threshold of ABR (in 5 dB nHL steps near the threshold) for clicks and tone bursts of different frequencies (2 persons) and draw latency intensity function.
Record ABR using single versus dual channels and, note down the differences
Record ABR at different repetition rates in 10/sec step beginning with 10.1/11.1 per second. Latency-repetition rate function needs to be drawn.

Record with each of three transducers (HP, insert phones and bone vibrator) and polarities and draw a comparative table of the same. Students should also record with different transducers without changing in the protocol in the instrument and calculate the correction factor required.

Record ASSR for stimuli of different frequencies and estimate the thresholds

Record TEOAEs and note down the amplitude, SNR, noise floor and reproducibility at octave and mid-octave frequencies. Note down the stimulus stability and the overall SNR (10 ears).

Record DPOAEs and note down the amplitude, SNR, noise floor and reproducibility at octave and mid-octave frequencies (10 ears)

Recommended Reading

Hall, J. W., & Mueller, H. G. (1996). *Audiologists' Desk Reference: Diagnostic audiology principles, procedures, and protocols*. Cengage Learning.

Hood, L. J. (1998). *Clinical Applications of the Auditory Brainstem Response*. Singular Publishing Group.

Hunter, L., & Shahnaz, N. (2013). *Acoustic Immittance Measures: Basic and Advanced Practice* (1 edition). San Diego, CA: Plural Publishing.

Jacobson, G. P., & Shepard, N. T. (2007). *Balance Function Assessment and Management* (1 edition). San Diego, CA: Plural Publishing Inc.

Jacobson, J. T. (1985). *The Auditory brainstem response*. College-Hill Press.

Katz, J., Medwetsky, L., Burkard, R. F., & Hood, L. J. (Eds.). (2007). *Handbook of Clinical Audiology* (6th revised North American ed edition). Philadelphia: Lippincott Williams and Wilkins.

- McCaslin, D. L. (2012). *Electronystamography/Videonystamography* (1 edition). San Diego: Plural Publishing.

Musiek, F. E., Baran, J. A., & Pinheiro, M. L. (1993). *Neuroaudiology: Case Studies* (1 edition). San Diego, Calif: Singular.

Robinette, M. S., & Glatke, T. J. (Eds.). (2007). *Otoacoustic Emissions: Clinical Applications* (3rd edition). New York: Thieme.

B.4.4 Implantable Hearing Devices

Hours - 60

Marks - 100

Objectives: After completing this course, the students will be able to

- assess candidacy for bone anchored hearing devices, middle ear implants, cochlear implants, and ABI
- select the appropriate device depending on the audiological and non-audiological findings
- handle post-implantation audiological management
- assess the benefit derived from implantation, and
- counsel the parents/care givers during different stages of implantation

Unit 1: Implantable hearing devices – basics

- Need for implantable hearing devices
- History of implantable hearing devices (bone anchored hearing devices, middle ear implants, cochlear implants, auditory brainstem implants and midbrain implants)
- Candidacy for implantable hearing devices
- Team involved in implantable hearing devices
- Pre-implant counseling, Informed consent

Unit 2: Bone anchored hearing devices and middle ear implants

- Types, components
- Surgical approaches, risks, complications
- Audiological evaluations for candidacy, contraindications
- Assessment of benefits

Unit 3: Cochlear implant and brain stem implants – basics

- Terminology, types, components and features
- Bilateral, bimodal and hybrid cochlear implants
- Factors related to selection of the device, funding sources
- Surgical approaches, risks, complications
- Audiological and non-audiological candidacy criteria, contraindications

Unit 4: Cochlear implants and brainstem implants

- Signal coding strategies, classification, types
- Intraoperative monitoring by audiologists
- Objective measures: ESRT, ECAP, prom stim, EABR, aided cortical potentials
- Post implant Mapping: schedule, pre-requisites, switch-on, mapping parameters, impedance, compliance, role of objective and subjective measures in mapping, post mapping audiological evaluation

Assessment of benefits

Optimization of hearing aid on contralateral ear

Unit 5: Implantable hearing devices - Counselling and troubleshooting; Rehabilitation

Post implant Counselling on care and maintenance and trouble shooting of the device

Overview of post implant rehabilitation including AVT

Factors affecting outcome of implantable devices in adults and children

Practicals

Watch videos of BAHA, middle ear implant, cochlear implant

Create hypothetical cases (at least 5 different cases) who are candidates for cochlear implantation. Make protocol for recording an EABR

List down the technological differences across different models of cochlear implants from different companies, their cost

Observation of mapping

Watching of videos on AVT

Watch video on cochlear implant surgery

Recommended Reading

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

Cooper, H., & Craddock, L. (2006). Cochlear Implants: A Practical Guide. Wiley.

Dutt, S. N. (2002). The Birmingham Bone Anchored Hearing Aid Programme: Some Audiological and Quality of Life Outcomes. Den Haag: Print Partners Ipskamp.

Eisenberg, L. S. (2009). Clinical Management of Children with Cochlear Implants. Plural Publishing.

Gifford, R. H. (2013). Cochlear Implant Patient Assessment: Evaluation of Candidacy, Performance, and Outcomes. Plural Publishing.

Hagr, A. (2007). BAHA: Bone-Anchored Hearing Aid. International Journal of Health Sciences, 1(2), 265–276.

Kim C. S., Chang S. O., & Lim D. (Eds.). (1999). Updates in Cochlear Implantation :The 2nd Congress of Asia Pacific Symposium on Cochlear Implant and Related Sciences, Seoul, April 1999 (Vol. 57). Seoul: KARGER.

Kompis, M., & Caversaccio, M.-D. (2011). Implantable Bone Conduction Hearing Aids. Karger Medical and Scientific Publishers.

Mankekar, G. (2014). Implantable Hearing Devices other than Cochlear Implants. Springer India.

Møller A.R. (2006). Cochlear and Brainstem Implants (Vol. 64).

Niparko, J. K. (2009). Cochlear Implants: Principles & Practices. Lippincott Williams & Wilkins.

- Ruckenstein, M.J. (Ed.).(2012). Cochlear Implants and Other Implantable Hearing Devices. Plural.
- Suzuki J.L. (1988). Middle Ear Implant: Implantable Hearing Aids (Vol. 4). KARGER.
- Thoutenhoofd, E. (2005). Paediatric cochlear implantation: evaluating outcomes. Whurr.
- Valente, M. (2002). Strategies for selecting and verifying hearing aid fittings. 2nd Edn. Thieme.

B4.5 Clinicals in Speech-language Pathology

Marks – 100

General considerations:

Exposure is primarily aimed to be linked to the theory courses covered in the semester.

After completion of clinical postings in Speech –language diagnostics, the student will know (concepts), know how (ability to apply), show (demonstrate in a clinical diary/log book based on clinical reports/recordings, etc), and do (perform on patients/client contacts) the following:

Know:

Speech & language stimulation techniques.

Different samples /procedures required to analyse voice production mechanism. (acoustic/ aerodynamic methods / visual examination of larynx/ self evaluation)

Different samples /procedures required to analyse speech production mechanism in children with motor speech disorders.

Know-how:

To administer at least two more (in addition to earlier semester) standard tests for childhood language disorders.

To administer at least two more (in addition to earlier semester) standard tests of articulation/ speech sounds.

To set goals for therapy (including AAC) based on assessment/test results for children with language and speech sound disorders.

To record a voice sample for acoustic and perceptual analysis.

To assess parameters of voice and breathing for speech.

Assessment protocol for children with motor speech disorders including reflex profile and swallow skills.

Counselling for children with speech-language disorders.

Show:

Acoustic analysis of voice – minimum of 2 individuals with voice disorders.

Simple aerodynamic analysis - minimum of 2 individuals with voice disorders.

Self evaluation of voice – minimum of 2 individuals with voice disorders.

Informal assessment of swallowing – minimum of 2 children.

Assessment of reflexes and pre linguistic skills - minimum of 2 children.

Pre –therapy assessment and lesson plan for children with language and speech sound disorders - minimum of 2 children each.

Do:

Case history - minimum of 2 individuals with voice disorders.

Case history - minimum of 2 children with motor speech disorders

Oral peripheral examination- minimum of 5 children

Apply speech language stimulation/therapy techniques on 5 children with language disorders (with hearing impairment, specific language impairment & mixed receptive language disorder)/speech sound disorders – minimum of 5 sessions of therapy for each child.

Exit interview and counselling - minimum of 2 individuals with speech language disorders.

Evaluation:

Internal evaluation shall be based on attendance, clinical diary, log book and learning conference.

External evaluation: Spot test, OSCE, Record, Viva-voce, case work

B4.6 Clinicals in Audiology

Marks – 100

General considerations:

Exposure is primarily aimed to be linked to the theory courses covered in the semester, however, not just limited to these areas.

After completion of clinical postings in auditory diagnostics and auditory rehabilitation, the student will Know (concept), know how (ability to apply), show (demonstrate in a clinical diary/log book), and do (perform on patients/ client contacts) the following:

Know:

Indications to administer special tests
Procedures to assess the listening needs
National and international standards regarding electroacoustic characteristics of hearing aids

Know-how:

To administer at least 1 test for adaptation, recruitment and functional hearing loss.
Counsel hearing aid user regarding the use and maintenance hearing aids
To troubleshoot common problems with the hearing aids
To select test battery for detection of central auditory processing disorders.
Select different types of ear moulds depending on type of hearing aid, client, degree, type and configuration of hearing loss

Show:

Electroacoustic measurement as per BIS standard on at least 2 hearing aids
How to process 2 hard and 2 soft moulds
How to preselect hearing aid depending on listening needs and audiological findings on at least 5 clinical situations (case files)
How select test battery depending on case history and basic audiological information – 3 situations

Do:

Tone decay test – 2 individuals with sensori-neural hearing loss
Strenger test – 2 individuals with unilateral/asymmetrical hearing loss
Dichotic CV/digit, Gap detection test – 2 individuals with learning difficulty or problem in hearing in noise

Hearing aid fitment for at least 5 individuals with mild to moderate and 3 individuals with mod-severe to profound

Hearing aid selection with real ear measurement system on 3 individuals with hearing impairment

Evaluation:

Internal evaluation shall be based on attendance, clinical diary, log book and learning conference.

External evaluation: Spot test, OSCE, Record, Viva-voce, case work

Semester V

B5.1 Structural Anomalies and Speech Disorders

Hours - 60

Marks - 100

Objectives: After completing the course, the student will be able to

understand the characteristics of disorders with structural anomalies including speech
evaluate and diagnose the speech characteristics seen in these disorders
learn about the techniques for the management of speech disorders in these conditions

Unit 1: Speech characteristics of persons with cleft lip and palate

Types, characteristics and classification of cleft lip and palate
Causes of cleft lip and palate: genetic, syndrome and others
Velopharyngeal inadequacy: types, causes and classification
Associated problems in persons with cleft lip and palate: speech, language, feeding, dental and occlusion, hearing, psychological

Unit 2: Assessment and management of cleft lip and palate speech

Team of professionals in the management of persons with cleft lip and palate: their roles in diagnosis and management.
Assessment of persons with cleft lip and palate for speech language functions:
Subjective assessment of speech characteristics and speech intelligibility: proforma, tests, scales and others.
Objective assessment of phonatory, resonatory and articulatory features
Diagnosis and differential diagnosis of speech related functions
Subjective assessment of language and communication functions
Reporting test results using Universal Parameters
Management of persons with cleft lip and palate
Surgical and prosthetic management
Techniques and strategies to correct speech sound disorders
Techniques and strategies to improve feeding
Counselling and guidance

Unit 3: Structural anomalies of tongue and mandible - Characteristics, assessment and management

Types, classification and characteristics of structural anomalies of tongue and mandible
Causes for structural anomalies of tongue and mandible
Team of professionals in the management of persons with structural anomalies of tongue and mandible and their roles.

Associated problems in persons with structural anomalies of tongue and mandible:

- Speech
- Feeding
- Dental and occlusion
- Psychological and others

Management of persons with structural anomalies of tongue and mandible

- Surgical and prosthetic management
- Techniques and strategies to improve speech intelligibility
- Techniques and strategies to improve feeding
- Counselling and guidance for persons with glossectomy and mandibulectomy

Unit 4: Characteristics & assessment of laryngectomy

- Causes, symptoms and classifications of laryngeal cancers
- Team of professionals in the management of persons with laryngeal cancer
- Surgery for laryngeal cancers: types and outcome
- Associated problems in laryngectomy individuals
- Assessment of speech and communication skills of laryngectomy individuals: Pre and post-operative considerations

Unit 5: Management of speech and communication in laryngectomies

Esophageal speech: candidacy, types of air intake procedures, speech characteristics and its modification through techniques and strategies, complications and contraindications.

Tracheo-esophageal speech: candidacy, types of TEP, fitting of prosthesis, speech characteristics and its modification through techniques and strategies, complications and contraindications.

Artificial larynx: types, factors for selection, output characteristics, techniques for efficient use of artificial larynx, complications and contraindications.

Other remedial procedures: Pharyngeal speech, buccal speech, ASAI speech, gastric speech.

Practicals

Identify the different types of cleft lip and palate by looking at illustrations and images

Listen to 10 speech samples of children with cleft lip and palate and rate their nasality/ speech (articulation and cleft type errors) based on universal reporting parameters.

Identify the type of closure of velopharyngeal port for 5 normal individuals and 5 individuals with cleft lip and palate using videos of nasoendoscopy/ videofluoroscopy. Perform oral peripheral mechanism examination on 10 individuals and document the structure and functions of the articulators.

Analyse the different types of occlusion in 10 individuals.

Identify the type of glossectomy by looking at pictures/illustrations.

Identify the different types of prosthesis in the management of head and neck cancer.
Analyse the speech profile of 5 individuals with laryngectomy.
Identify parts of an artificial larynx and explore its use.
Prepare a checklist / pamphlet illustrating care of the stoma and T- tubes in vernacular.

Recommended Reading

Berkowitz. S. (2001). Cleft Lip and Palate: Perspectives in Management. Vol II. San Diego, London, Singular Publishing Group Inc.

Falzone. P., Jones. M. A., & Karnell. M. P. (2010). Cleft Palate Speech. IV Ed., Mosby Inc.

Ginette, P. (2014). Speech Therapy in Cleft Palate and Velopharyngeal Dysfunction. Guildford, J & R Press Ltd.

Karlind, M. & Leslie, G. (2009). Cleft Lip and Palate: Interdisciplinary Issues and Treatment. Texas, Pro Ed.

Kummer, A.W. (2014). Cleft Palate and Craniofacial Anomalies: The Effects on Speech and Resonance. Delmar, Cengage Learning.

Peterson-Falzone, S. J., Cardomone, J. T., &Karnell, M. P. (2006). The Clinician Guide to Treating Cleft Palate Speech. Mosby, Elsevier.

Salmon . J & Shriley (1999). Alaryngeal speech rehabilitation for clinicians and by clinicians. ProEd

Yvonne, E (Ed) (1983). Laryngectomy: Diagnosis to rehabilitation. London: Croom Helm Ltd

B5.2 Fluency and its Disorders

Hours - 60

Marks - 100

Objectives: After completion of the course, the student will be able to

- understand the characteristics of fluency and its disorders
- evaluate and diagnose fluency disorders
- learn about the techniques for the management of fluency disorders

Unit 1: Fluency

- Scope and definition of fluency
- Factors influencing fluency
- Definition and characteristics of features of suprasegmentals in speech: rate of speech, intonation, rhythm, stress and pause
- Suprasegmental features in typical speech
- Suprasegmental features in the speech of persons with fluency disorders
- Developmental aspects of suprasegmentals of speech
- Normal non-fluency

Unit 2: Stuttering and other fluency disorders

- Stuttering: Definition and causes for stuttering
- Characteristics of stuttering: core and peripheral characteristics, primary and secondary stuttering, effect of adaptation and situation
- Development of stuttering
- Normal non fluency: characteristics and differential diagnosis
- Theories of stuttering: organic, functional, neurogenic, diagnosogenic and learning
- Cluttering: Definition, causes and characteristics
- Neurogenic stuttering: Definition, causes and characteristics

Unit 3: Assessment and differential diagnosis

- Assessment of fluency disorders: stuttering, cluttering, neurogenic stuttering and normal non fluency:
- Subjective methods: protocols and tests
- Objective methods
- Qualitative and quantitative assessment
- Differential diagnosis of fluency disorders

Unit 4: Management of stuttering

- Approaches to management
- Changing scenario in management of stuttering
- Different techniques and strategies used in management with their rationale

Relapse and recovery from stuttering
Issues of speech naturalness in stuttering

Unit 5: Management of fluency-related entities

Management of cluttering: rationale, techniques and strategies
Management of neurogenic stuttering: rationale, techniques and strategies
Management of normal non-fluency: rationale, techniques and strategies
Relapse and recovery in cluttering and neurogenic stuttering. Changes in normal non-fluency
Prevention and early identification of stuttering, and cluttering

Practicals

Assess the rate of speech in 5 normal adults.
Record and analyse the supra segmental features in typically developing children between 2 and 5 years.
Record audio visual sample of 5 typically developing children and 5 adults for fluency analysis.
Listen/see samples of normal non fluency and stuttering in children and document the differences.
Identify the types of dysfluencies in the recorded samples of adults with stuttering.
Instruct and demonstrate the following techniques: Airflow, prolongation, easy onset shadowing techniques.
Record 5 speech samples with various delays in auditory feedback and analyse the differences.
Administer SPI on 5 typically developing children.
Administer SSI on 5 adults with normal fluency.
Administer self-rating scale on 10 adults with normal fluency.

Recommended Reading

Assessment and management of fluency disorders. Proceedings of the national workshop on “Assessment and management of fluency disorders”, 25-26 Oct 2007. All India Institute of Speech & Hearing, Mysore. 2007.
Bloodstein, O., & Ratner, N. B. (2008). A Handbook on Stuttering (6th Ed.). Clifton Park, NY, Thomson Demer Learning.
Guitar, B. (2014). Stuttering-An Integrated Approach to its Nature and Treatment. 4th Ed. Baltimore, Lippincott Williams & Wilkins.
Hegde, M. N. (2007). Treatment Protocols for Stuttering. CA Plural Publishing.
Howell, P. (2011). Recovery from Stuttering. New York, Psychology Press.
Packman, A., & Attanasio, J.S. (2004). Theoretical Issues in Stuttering. NY, Psychology Press.
Rentschler, G. J. (2012). Here`s How to Do: Stuttering Therapy. San Diego, Plural Publishing.

Wall, M. J., & Myers F. L. (1995). *Clinical Management of Childhood Stuttering*. Texas, PRO-ED, Inc.

Ward, D. (2006). *Stuttering and Cluttering: Frameworks for Understanding & Treatment*. NY, Psychology Press.

Yairi, E., & Seery, C. H. (2015). *Stuttering - Foundations and Clinical Applications*. 2nd Ed. USA, Pearson Education, Inc.

B5.3 Paediatric Audiology

Hours - 60

Marks - 100

Objectives: After completing this course, the student will be able to

- describe auditory development
- list etiologies and relate them to different types of auditory disorders that may arise
- explain different hearing screening/identification procedures and their application
- elaborate on different aspects of paediatric behavioral and physiological / electrophysiological evaluation

Unit 1: Auditory development

- Review of Embryology of the ear
- Development of auditory system from periphery to cortex
- Neuroplasticity
- Prenatal hearing
- Normal auditory development from 0-2 years
- Infant speech perception
- Incidence and prevalence of auditory disorders in children

Unit 2: Auditory disorders

- Congenital and acquired hearing loss in children
- Permanent minimal and mild bilateral hearing loss
- Impact on auditory skills, speech-language, educational and socio-emotional abilities
- Moderate to profound sensorineural hearing loss
- Unilateral hearing loss
- Auditory Neuropathy Spectrum Disorders
- Central auditory processing disorders
- Pseudohypacusis
- Auditory disorders in special population and multiple handicap

Unit 3: Early identification of hearing loss

- Principles of early hearing detection and intervention programs
- Principles and history of hearing screening
- Joint Committee on Infant Hearing position statement (2000, 2007,2013)
- High risk register/ checklists for screening
- Sensitivity and specificity of screening tests
- Hearing screening in infants and toddlers: Indian and Global context
- Hearing screening in preschool children: Indian and Global context
- Hearing screening in school-age children (including screening for CAPD): Indian and Global context

Unit 4: Paediatric assessment I

Behavioral observation audiometry
Conditioned orientation reflex audiometry
Visual reinforcement audiometry, TROCA, play audiometry
Pure tone audiometry in children: Test stimuli, response requirement and reinforcement
Speech audiometry (SRT, SDT); Speech recognition and speech perception tests developed in India)
Bone conduction speech audiometry
Immittance evaluation in paediatric population
Central auditory processing disorders assessment

Unit 5: Paediatric assessment II

Recording and interpretation of OAE in paediatric population
Factors affecting OAE in paediatric population
Recording and interpretation of click evoked and tone burst evoked ABR in paediatric population
Factors affecting ABR in paediatric population
Recording ASSR in paediatric population
Recording AMLR, ALLR in paediatric population
Assessment of hearing loss in special population
Diagnostic test battery for different age groups
Diagnosis and differential diagnosis

Practicals

Observe a child with normal hearing (0-2 years) in natural settings. Write a report on his/her responses to sound.
Observe a child with hearing impairment (0-2 years) in natural settings. Write a report on his/her responses to sound with and without his amplification device
Administer HRR on at least 3 newborns and interpret responses
Based on the case history, reflect on the possible etiology, type and degree of hearing loss the child may have.
Compare ABR wave forms in children of varying ages from birth to 24 months.
Observe live or video of BOA/VRA of a child with normal hearing and hearing loss and write a report on the instrumentation, instructions, stimuli used, procedure and interpretation.
Observe OAE in a child with normal hearing and a child with hearing loss. Write a report on the instrumentation, protocol used and interpretation
Observe ABR in a child with normal hearing and a child with hearing loss. Write down a report on the instrumentation, protocol used and interpretation
Observe immittance evaluation in a child with normal hearing and a child with hearing loss. Write a report on the instrumentation, protocol used and interpretation

Using role play demonstrate how the results of audiological assessment are explained to caregiver in children with the following conditions

Child referred in screening and has high risk factors in his history

Child with chronic middle ear disease

Child with CAPD

Child with severe bilateral hearing impairment

Recommended Reading

Finitzo, T., Sininger, Y., Brookhouser, P., & Village, E. G. (2007). Year 2007 position statement: Principles and guidelines for early hearing detection and intervention programs. *Paediatrics*, 120(4), 898–921.

<http://doi.org/10.1542/peds.2007-2333>

Madell, J.R., & Flexer, C. (2008). *Paediatric Audiology: Diagnosis, Technology, and Management*. Ney York NY: Thieme Medical Publishers.

Northern, J.L. and Downs, M.P. (2014). *Hearing in Children*. 6th Ed. San Diego: Plural Publishing.

Seewald, R., and Thorpe, A.M. (2011). *Comprehensive Handbook of Paediatric Audiology*, San Diego: Plural Publishing. (core text book)

www.jcih.org

B5.4 Aural Rehabilitation in Children

Hours - 60

Marks - 100

Objectives: After completing this course the student will be able to

- describe the different communication options available for young children with hearing impairment
- explain the impact of hearing impairment on auditory development and spoken language communication
- describe factors that effect of acoustic accessibility and strategies to manage them at home and in classroom
- design activities for auditory learning at different levels
- enumerate how the needs of individuals with hearing impairment using sign language and spoken language as form of communication in India are being met

Unit 1: Auditory development, spoken communication and acoustic accessibility

- Sensitivity period for auditory development
- Impact of hearing impairment on auditory development, spoken language acquisition, parent child communication
- Factors affecting auditory development
- Hearing loss implications for speech perception: acoustics of speech
- Optimizing hearing potential through hearing aids
- Optimizing hearing potential through cochlear implants
- Barriers to acoustic accessibility: distance, signal to noise ratio, reverberation
- Managing the listening environment for infants, toddlers schools
- Signal to noise ratio enhancing technologies personal FM, loop systems, desktop group systems, blue tooth connectivity

Unit 2: Communication options

- Detecting and confirming hearing loss
- Parent support counselling, individual family service plan
- Choosing communication options
- Auditory oral approach
- Auditory verbal therapy
- Manual/sign language: Indian and Global context
- Cued speech and total communication
- Listening devices hearing aid/cochlear implant
- Early intervention programs

Unit 3: Optimal listening and learning environments infancy and early childhood

Involvement of family

Factors impacting family involvement, supporting families through information and education

Creating optimum listening and learning environment

Intervention: Assessment, auditory learning, listening and language facilitation techniques in infancy and early childhood

Issues with children with mild hearing loss, unilateral hearing loss,

Children with hearing loss, ANSD or APD: Children are intervened late

Children with hearing loss and other special needs

Listening and spoken language in school age: benefits of inclusion

Intervention at school age: Functional hearing assessment, communication assessment and intervention to integrate with academic targets

Unit 4: Auditory - speech reading training and literacy

Candidacy for auditory training and speech reading

Auditory training/learning four design principles skill, stimuli, activity, and difficulty level

Early training Objectives

Analytic and Synthetic training Objectives

Formal and informal training

Auditory training for infants and very young children

Outcomes of training

Speech and language and literacy characteristics

Speech language and literacy evaluation assessment

Speech language therapy

Unit 5: Indian perspectives

Prevalence of hearing impairment in children

Education of the deaf in India historical perspectives

Available resources for education of the hearing impaired

Early intervention programs and centers

Schools for the hearing impaired; day schools, residential schools

Beyond school: college and vocational training

Training manpower resources for service delivery

Indian sign language

Training sign language interpreters

Cued speech in India

Assessment and therapy tools developed for individuals with hearing impairment in India.

Practicals

Watch documentaries such as “Sound and Fury” (2001). Write a reflection of why parents made communication choices for their children

Follow on links to the above film that shows the status of the children with hearing impairment after a few years.

Learn at least 50 signs across different categories of Indian sign language. Make a video of you signing 10 sentences. Have a class mate interpret them.

Interview a parent of a child with hearing impairment on how they adapted their child to wear the hearing aids and /or implant. What were the first responses to sound they observed and how language and speech develop?

Complete a functional auditory evaluation on one child with hearing loss. Do a speech and language evaluation and also write a report on the child strengths and weakness.

Design and demonstrate auditory learning activities at the four levels awareness, discrimination, identification and comprehension. Ensure that the activities encompass different skill level and difficulty levels.

Develop a short audio/film/pamphlet for parents in your local language on one of the following: teaching parent to trouble shooting the hearing aid/cochlear implant, establishing consistent use of listening device, activities to facilitate language across different age groups

Visit a school for the deaf. Document your observation about the acoustic environment in the class, strategies used by the teacher to promote listening and spoken language

Recommended Reading

Fitzpatrick, E.M., and Doucet S.P. (2013) (Eds). Paediatric Audiologic Rehabilitation. Thieme, New York

Hosford-Dumm, H., Roser, R., & Valente, M. (2007). Audiology Practice Management (2nd edition edition). New York: Thieme.

Mardell, J., & Flexer, C. (2013). Paediatric Audiology: Diagnosis, Technology, and Management (2nd ed.). New York, NY: Thieme.

Rout, N and Rajendran, S. (2015). Hearing aid Counselling and Auditory training Manual, A publication of NIPMED, Chennai. Freely downloadable from <http://niepmd.tn.nic.in/publication.php>. ISBN 978-81-928032-5-8.

Schwartz, S., (2007) Choices in Deafness : a Parent’s guide to Communication Options , 3rd edition Woodbine house Bethesda

Status of Disability in India Hearing Impairment (2012) Rehabilitation Council of India, New Delhi

Tye-Murray, N., (2014) Foundations of Aural Rehabilitation: Children , adults and their family members 4th edition Plural Publishing San Diego

B5.5 Clinicals in Speech Language Pathology

Marks - 100

General considerations:

Exposure is primarily aimed to be linked to the theory courses covered in the semester.

After completion of clinical postings in Speech –language diagnostics, the student will know (concepts), know how (ability to apply), show (demonstrate in a clinical diary/log book based on clinical reports/recordings, etc.), and do (perform on patients/ client contacts) the following:

Know:

Procedures to assess speech fluency and its parameters using standardized tests for children and adults.

Differential diagnosis of motor speech disorders in children.

Procedures to assess individuals with cleft lip and palate, and other oro-facial structural abnormalities.

Procedures to assess laryngectomy and provide management options.

Know-how:

To administer at least two more (in addition to earlier semesters) standard tests for childhood language disorders.

To record a speech sample for analysis of fluency skills (including blocks & its frequency, rate of speech, prosody, etc.).

To assess posture and breathing for speech in children with motor speech disorders.

To consult with inter-disciplinary medical/rehabilitation team and counsel the individual/family regarding management options and prognosis.

Show:

Rating of cleft, speech intelligibility and nasality – minimum of 2 individuals with cleft lip and palate.

Language assessment - minimum of 2 individuals with cleft lip and palate.

Transcription of speech sample and assessment of percentage dis/dysfluency– minimum of 2 individuals with stuttering.

Assessment of rate of speech on various speech tasks – at least on 2 children & adults.

Do:

Voice assessment report - minimum of 2 individuals with voice disorders.

Fluency assessment report - minimum of 2 individuals with fluency disorders.

Oral peripheral examination on minimum of 2 individuals with cleft lip and palate.
Apply speech language stimulation/therapy techniques on 5 children with language disorders/speech sound disorders/ motor speech disorders – minimum 5 sessions of therapy for each child.

Evaluation:

Internal evaluation shall be based on attendance, clinical diary, log book and learning conference.

External evaluation: Spot test, OSCE, Record, Viva-voce, case work

B5.6 Clinicals in Audiology

Marks - 100

General considerations:

Exposure is primarily aimed to be linked to the theory courses covered in the semester, however, not just limited to these areas.

After completion of clinical postings in auditory diagnostics and auditory rehabilitation, the student will Know (concept), know how (ability to apply), show (demonstrate in a clinical diary/log book), and do (perform on patients/ client contacts) the following:

Know:

- Different protocols in tympanometry and reflexometry.
- Different protocols used in auditory brainstem responses
- Protocols for screening and diagnostic otoacoustic emissions
- Tests to assess vestibular system
- Different indications for selecting implantable hearing devices
- Various speech stimulation and auditory training techniques

Know-how:

- To administer auditory brainstem responses for the purpose of threshold estimation and site of lesion testing
- To administer high frequency tympanometry and calculate resonance frequency
- To administer high risk register
- To modify the given environment to suit the needs of hearing impairment

Show:

- Analysis of ABR waveforms – threshold estimation 5 and site of lesion 5
- Analysis of immittance audiometry and relating to other tests – 5 individuals with conductive and 5 individuals with sensori-neural hearing loss
- How to formulate select appropriate auditory training technique based on audiological evaluation

Do:

- Threshold estimation on 5 infants (< 2 years)
- TEOAE and DPOAE on 5 infants (<2 years)
- BOA on 5 infants (<2 years)
- VRA on 2 infants (6 month – 3 year)
- Conditioned play audiometry – 3 children (3-6 years)
- Hearing aid fitment on 1 infant (< 3 years) 2 children (3-6 years)

Listening age of 3 children with hearing impairment
Appropriate auditory training on 5 children with hearing loss

Evaluation:

Internal evaluation shall be based on attendance, clinical diary, log book and learning conference.

External evaluation: Spot test, OSCE, Record, Viva-voce, case work

Semester VI

B6.1 Motor Speech Disorders in Adults

Hours - 60

Marks - 100

Objectives: After completing the course, the student will be able to

understand the characteristics of acquired motor speech disorders in adults
evaluate and diagnose speech characteristics in acquired motor speech disorders
learn about the techniques for the management of speech and related errors in
acquired motor speech disorders

Unit 1: Causes & Characteristics of dysarthria

Definition, etiology and classification of acquired dysarthria

General, speech and feeding related characteristics of acquired dysarthria with and without genetic underpinnings:

Vascular lesions: dysarthria following stroke/CVA, cranial and peripheral nerve palsies

Infectious condition of the nervous system: dysarthria following meningitis, encephalitis, polyneuritis, poliomyelitis, neurosyphilis.

Traumatic lesions: Dysarthria following TBI.

Toxic conditions of the nervous system: Dysarthria following exogenic and endogenic toxic conditions of the nervous system.

Anoxia of the nervous system: Dysarthria following anoxic conditions

Metabolic disorders affecting nervous system: Dysarthria following metabolic conditions that affect the nervous system, Wilson's disease etc.

Idiopathic causes: Dysarthria following idiopathic causes

Neoplastic lesions of nervous system: Dysarthria following neoplastic lesions in the nervous system

Demyelinating and degenerative conditions: Huntington's Chorea, Parkinson's, Multiple Sclerosis, Motor Neuron Diseases

Unit 2: Assessment and diagnosis of dysarthria

Subjective assessment of dysarthria:

Assessment of respiratory, phonatory, resonatory, articulatory errors

Assessment of prosodic features

Assessment of speech intelligibility

Scales, protocols and tests used for subjective assessment of dysarthria

Instrumental analysis of speech in dysarthria: Acoustic, kinematic and physiological
Advantages and disadvantages of subjective and instrumental procedures in the assessment of dysarthria in adults

Differential diagnosis of acquired motor speech disorders in adults:

Dysarthria and verbal apraxia

Dysarthria and functional articulation disorders
Dysarthria and aphasia
Apraxia of speech and aphasia
Dysarthria from other allied disorders such as agnosia, alexia, agraphia etc.
Apraxia from other allied disorders such as agnosia, alexia, agraphia etc.
Assessment of feeding, swallowing and related issues in persons with dysarthria

Unit 3: Management of dysarthria

Management of acquired dysarthria
General principles in the management of dysarthria
Influence of medical, prosthetic and surgical procedures on the speech in persons with acquired dysarthria.
Facilitative approach: vegetative, sensorimotor and reflex based.
Systems approach: correction of respiratory, phonatory, resonatory, articulatory and prosodic errors.
Strategies to improve speech intelligibility and speech enhancement techniques
Strategies to improve feeding, swallowing behavior in persons with acquired dysarthria

Unit 4: Assessment and management of apraxia in adults

Definition, etiology and classification of acquired apraxia
Characteristics of nonverbal apraxia's in adults
Characteristics of verbal apraxia's in adults
Subjective assessment strategies: standard tests and scales, protocols and behavioral profiles
Instrumental analysis of the speech of apraxia in adults: Acoustic, Kinematic and Physiological
Management Approaches for verbal & nonverbal apraxia: principles and strategies

Unit 5: Management related issues in motor speech disorders

Team involved in the management of persons with acquired dysarthria and apraxia
Issues related to maintenance and generalization of speech in dysarthria and apraxia
Counselling and guidance for persons with acquired dysarthria and apraxia
Augmentative and alternative strategies for persons with acquired dysarthria and apraxia

Practicals

Identify the cranial nerves and mention its origin and insertion from a picture/ model.
Demonstrate methods to assess the cranial nerves.

Assess the respiratory system using speech and non-speech tasks in 10 healthy adults.
Assess the phonatory system using subjective and acoustic analysis in 10 healthy adults.
Looking at a video identify the clinical signs and symptoms of different neurological conditions resulting in Dysarthria.
Record the speech sample of 5 normal adults and compare with the audio sample of individuals with Dysarthria.
Administer Duffy's intelligibility rating scale on 5 healthy adults.
Administer Frenchay's Dysarthria Assessment on 5 healthy adults.
Demonstrate activities to improve the functions of speech subsystem.
Identify the signs of UMN and LMN based on a video.
Prepare a low tech AAC for functional communication for an individual with apraxia.

Recommended Reading

- Brookshire, R. H. (2007). *Introduction to Neurogenic Communication Disorders*. University of Virginia, Mosby.
- Duffy, J. R. (2013). *Motor Speech Disorders: Substrates, Differential Diagnosis, and Management (3rd Ed.)*. University of Michigan, Elsevier Mosby.
- Dworkin, P. J. (1991). *Motor Speech Disorders: A Treatment Guide*. St. Louis: Mosby.
- Ferrand, C. T., & Bloom, R. L. (1997). *Introduction to Organic and Neurogenic Disorders of Communication: Current Scope of Practice*. US, Allyn & Bacon.
- Goldenberg, G. (2013). *Apraxia: The Cognitive Side of Motor Control*. Oxford University Press, UK.
- Lebrun, Y. (1997). *From the Brain to the Mouth: Acquired Dysarthria and Dysfluency in Adults*. Netherlands, Kluwer Academic Publishers.
- Murdoch, B. E. (2010). *Acquired Speech and Language Disorders: A Neuroanatomical and Functional Neurological Approach (2nd Ed.)*. New Delhi, India: John Wiley & Sons.
- Papathanasiou, I. (2000) (Eds.). *Acquired Neurogenic Communication Disorders – A Clinical Perspective, Chapters 5, 6 & 7*. London, Whurr Publishers.
- Yorkston, K. M., Beukelman, D. R., Strand, E. A., & Hakel, M. (2010). *Management of Motor Speech Disorders in Children and Adults (3rd Ed.)*. Austin, Texas; Pro-Ed Inc.

B.6.2 Language Disorders in Adults

Hours - 60

Marks - 100

Objectives: After completing the course, the student will be able to

understand the characteristics of language disorders in adults
evaluate and diagnose speech characteristics in adults with language disorders
learn about the techniques for the management of speech and related errors in language disorders seen in adults

Unit 1: Neural bases of language

Correlates of language functions:
Neuroanatomical
Neurophysiological
Neurobiological
Cognitive
Neurolinguistic models of language processing
Connectionist models
Hierarchical models
Global models
Process models
Computational models
Language process in bi/multilingualism
Language processing in right hemisphere

Unit 2: Language disorders in adults

Definition, causes and characteristics of speech, language and cognition in
Aphasia: cortical and subcortical
Primary progressive aphasia
Traumatic brain injury
Right hemisphere damage
Schizophasia
Dementia
Differential diagnosis of various language disorders seen in adults.

Unit 3: Assessment and diagnosis of language disorders

Assessment of the following in aphasia, primary progressive aphasia, traumatic brain injury, right hemisphere damage, schizophasia and dementia
Linguistic behaviour including speech: scales, tests, protocols.
Assessment of cognitive, social, behavioural characteristics
Medical Investigation: Neuroimaging

Unit 4: Management of language disorders

Medical, linguistic and programmed intervention for persons with
Aphasia: cortical and subcortical
Primary progressive aphasia
Traumatic brain injury
Right hemisphere damage
Schizophasia
Dementia

Unit 5: Rehabilitation issues relating to adult language disorders

Team involved in the rehabilitation of persons with adult language disorders
Factors influencing the assessment and intervention for language in the context of
bilingual and multilingual influences.
Factors influencing the assessment and management of language in persons who are
preliterate, illiterate and literate.
Assessment of quality of life
Recovery patterns and prognosis in adults with language disorders
Age related influence in adults with language disorders
Counselling and guidance for adults with language disorders
Generalization and maintenance issues in adults with language disorders
Augmentative and alternative strategies for adults with language disorders

Practicals

- Identify different lobes of in the brain by looking at a model/ image and label the
language areas.
Administer a standardized test battery on 3 normal individuals to assess language and
cognition.
Administer bilingual aphasia test on 3 healthy normal adults.
List the language characteristics in different types of aphasia from a video.
Analyse the speech, linguistic and non-linguistic features seen in Right hemisphere
damaged individual from a video.
In a given brain model mark the subcortical structures involved in language
processing/ production.
- g) Demonstrate various facilitatory and compensatory therapy techniques in the
management of aphasia.
Formulate activities to assess linguistic abilities in dementia and aphasia.
Counsel by a role play for a given profile of an individual with adult language
disorder.
Prepare a counselling checklist /guideline that can be used with the family members
of an individual with aphasia and traumatic brain injury.

Recommended Reading

- Chapey, R. (2008). *Language Intervention strategies in aphasia and related neurogenic communication disorders*. Philadelphia: Lippincott Williams and Wilkins
- Davis, G. A. (2014). *Aphasia and related Communication Disorders*. Pearson Education Inc.
- Edwards, S. (2005). *Fluent Aphasia*. Cambridge University Press.
- Laine, M. & Martin, N. (2006). *Anomia: Theoretical and Clinical Aspects*. Psychology Press.
- Lapointe, L. L. (2005). *Aphasia and related neurogenic language disorders*. (3rdEdn.). Thieme.
- Lapointe, L. L., Murdoch, B. E., & Stierwalt, J. A. G. (2010). *Brain based Communication Disorders*. Plural Publishing Inc.
- Stemmer, B., & Whitaker, H. A. (Eds.). (2008). *Handbook of Neuroscience of Language*. Elsevier.
- Whitworth, A., Webster, J., & Howard, D. (2005). *A cognitive neuropsychological approach to assessment and intervention in aphasia: A clinician's guide*. Psychology Press.

B6.3 Aural Rehabilitation in Adults

Hours - 60

Marks - 100

Objectives: After completing this course, the student will be able to

describe the impact on the quality of life of adults with hearing impairment
explain the principles benefits and limitations of auditory training and speech reading
recognize factors that impair communication and suggest facilitative and repair strategies
identify components of aural rehabilitation program for adults (planning to outcome assessment)
identify strategies used with the older adult to implement a successful aural rehabilitation program
administer different tools for assessment of hearing handicap, attitudes and beliefs that can impact aural rehabilitation

Unit 1: Aural rehabilitation

Definition

Scope of aural rehabilitation in adults

Prevalence of hearing loss in children (global and Indian data)

Prevalence of hearing loss in adults (global and Indian data)

Relationship between audiometric data, hearing difficulties and amplification considerations

Limitations of audiometric data

Quality of life and impact on income, education, employment;

Assessing communication handicap : interviews, questionnaires

Vocational rehabilitation

Unit 2: Listening training and speech reading for adults

Listening to speech with a hearing loss

Candidacy for auditory training

Listening training to improve speech perception

Listening training to improve music perception

Benefits of auditory training

Speech reading for communication

Characteristics of good lip readers versus good speech readers

Factors affecting speech reading

Assessing vision only auditory only processing

Traditional methods of speech reading training.

Unit 3: Communication strategies

Factors that influence the reception of spoken message

Facilitative communication strategies
Repair strategies
Repairing a communication breakdown
Conversational styles
Communication strategies training formal instruction, guided learning, real world practice

Unit 4: Aural rehabilitation for adults

Principles of aural rehabilitation in adults
Psychological impact of hearing loss
Support through counselling
Orienting towards hearing aid use
Needs assessment for non-hearing and assistive technology for adults
Categories of assistive technology
Aural rehabilitation programs: Individual vs group
Components of aural rehabilitation program
Process of aural rehabilitation :
Communication under adverse listening conditions

Unit 5: Aural rehabilitation for older adults

Influence of aging on the older adults: quality of life and psychological perspectives
Influence of aging on the older adults: quality of life and social perspectives
Auditory barriers to communication
Non auditory barriers to communication
Barriers to aural rehabilitation
Factors influencing hearing aid use by the older adult
Aural rehabilitation for different populations of older adult: independent and semi-independent older adult
Aural rehabilitation for different populations of older adult: dependent older adult
Aural rehabilitation in an old age home
Hearing aid orientation

Practicals

*All scales and tools available in Hull R. H; Introduction to aural rehabilitation

Listen to the speech recorded using hearing loss simulators (available on internet) and experience the sounds as heard by persons with different degrees of hearing loss. Write your observations on the same
Simulate hearing loss by plugging ears and administer sentence tests of word recognition. Write a report on the performance
Administer any three self-report questionnaires to three adults who have hearing loss and write a report of the relationship of their hearing loss to performance on the scale

Administer any three self-report questionnaires to three older adults who have hearing loss and write a report of the relationship of their hearing loss to performance on the scale

Administer any three self-report questionnaires to three adults who wear hearing aids and write a report of the relationship of their hearing loss to performance on the scale
Administer the hearing belief questionnaire (Saunders, 2013) on an adult. Identify the positive and negative attitude and behavior that may impact the success of aural rehabilitation

Design a session of aural rehab program (Objectives, activities, outcomes assessment) for adults recently fitted with cochlear implant, group of 4 older adults.
Design an individualised program for an executive using a hearing aid for the first time, and an adult moving from an analog to a digital hearing aid

Develop a pamphlet in your local language that would address any topic in aural rehabilitation

Recommended Reading

Hull, R. H., (2014) ed. Introduction to Aural Rehabilitation 2nd edition Plural Publishing, San Diego Chapters 1, 2, 11 to 20

Schow, R.L. & Nerbonne, M.A., (2012). Introduction to Audiologic Rehabilitation (6th edition), Allyn & Bacon, Boston.

Tye-Murray, N., (2014). Foundations of Aural Rehabilitation: Children , adults and their family members 4th edition Plural Publishing San Diego Chapters 5-10

B.6.4 Audiology in Practice

Hours - 60

Marks - 100

Objectives: After completing the course, the student will be able to

- list and describe the highlights of legislations relating to hearing impairment and other disabilities
- incorporate ethical practices in professional service delivery.
- provide information on welfare measures, policies of government when needed
- describe different strategies to create awareness of hearing impairment and programs to address them
- explain the different clinical practice settings in audiology with reference to their requirement, protocols and role and responsibility of audiologist
- describe methods to measure the impact of noise on humans and strategies to address excessive noise exposure in industries and the community.
- describe terminology, technology and methods used in tele practice, and their application in audiological service delivery

Unit 1: Scope, legislation and ethics in audiology

- Scope of practice in audiology (National – ISHA & International body - AAA)
- Professional ethics (ISHA)
- Legislations and conventions relating to disability: need and historical aspects
- Classification of hearing impairment and disability certification, Rehabilitation Council of India Act (1992) and its amendments
- Person with Disability Act (1995)
- National Trust Act (1999)
- Right to Education (2012)
- Biwako Millennium framework (2003) and Salamanca Statement 1994
- UNCRPD
- Concept of barrier free access and universal design relating to individuals with hearing impairment

Unit 2: Hearing health and strategies for prevention of hearing impairment

- Epidemiology of hearing disorders
- ICD and ICF
- Levels of prevention: Primary, secondary and tertiary
- National programs and efforts national institutes
- Welfare measures by Government,
- Camps (planning, purpose, organizing and providing remedial measures)
- Public education and information (media, radio broadcasts, street plays)
- Hearing health and prevention programs (hearing help line, dangerous decibels, online hearing tests etc.)

Unit 3: Audiological practice in different settings

Audiological Private practice
ENT clinics
Paediatric / neonatology clinic/departments
Neurology departments
Factories and Industry
Hearing aid dispensing centre/hearing aid industry
Rehabilitation centres such as DRC/CRCs
Schools for the hearing impaired
Cochlear implant clinics
Multiple handicap habilitation centre and others

Unit 4: Noise and hearing conservation in industry and community

Introduction to noise, types
Sources of noise in the industry and community
Effects of noise in the auditory system (outer, middle and inner ear)
Temporary threshold shift, permanent threshold shift, factors increasing the risk of NIHL
Non auditory effects of noise (physiological, psychological, stress, sleep, job productivity and accidents)
Legislations related to noise, permissible noise exposure levels, workers compensation, OSHA standards, Indian legislations related to noise
Instrumentation, measurement and procedure for measuring noise in industry
Instrumentation, measurement and procedure for measuring noise in community
Hearing conservation program (HCP), steps, record keeping,
Ear protective devices

Unit 5: Scope and practice of tele audiology

Introduction to tele-health: definition, history of tele-health
Terminologies-tele-health, tele medicine, tele practice
Connectivity: internet, satellite, mobile data
Methods of tele-practice-store and forward and real time
Ethics and Regulations for tele-audiology
Requirements/Technology for tele- audiology: Web based platforms, Video conferencing, infrastructure
Manpower at remote end and audiologist end, training assistants for tele-audiology
Audiological screening using tele-technology : new born hearing screening, school screening, community screening, counselling
i) Diagnostic audiological services using tele-technology : video otoscopy, pure tone audiometry, speech audiometry, oto acoustic emission, tympanometry, auditory brainstem response

Intervention / aural rehabilitation using tele-technology :hearing aid counselling and troubleshooting, tinnitus, counselling, aural rehabilitation services, AVT, and counselling

Practicals

Undertake the activities such as ‘Dangerous decibel’ program
(www.dangerousdecibels.org)
Noise measurement and attenuation measurement of ear protection devices.
Sound level meter measurement in different areas (generator room, audio rooms)
Speech in noise assessment for 10 subjects
Visit an audiologist in different practice settings and provide a report
Administer ICF protocols for patients with different disorders
Explore websites of national institutes, hearing aid companies, NGOs in disability field and describe the accessibility features and information provided
Remote control a PC based audiology equipment connected to internet using any authorized desktop sharing software
Develop one pamphlet/poster/ in local language that would address some aspect of audiology practice
Perform Accessibility ability of your institute/center and prepare a report

Recommended Reading

Audiology Telepractice; Editor in Chief, Catherine V. Palmer, Ph.D.; Guest Editor, Greg D. Givens, Ph.D. Seminars in Hearing, volume 26, number 1, 2005.
Berglund, B., Lindwall, T., Schwela, D.H., eds (1999). Guidelines on Community noise <http://www.who.int/docstore/peh/noise/guidelines2.html> WHO 1999
BIS specifications relating to Noise Measurements.- IS:7194-1973 Specification for assessment of noise exposure during work for hearing conservation purposes.
Census of India information on disability
Dobie, R. A (2001). Medical legal evaluation of hearing loss, 2nd Ed.
Hearing health and strategies for prevention of hearing impairment WHO (2001).
International classification of Functioning, Disability and Health. Geneva: WHO
<http://www.asha.org/Practice-Portal/Professional-Issues/Audiology-Assistants/Teleaudiology-Clinical-Assistants/>
<http://www.asha.org/uploadedFiles/ModRegTelepractice.pdf>
IS:10399-1982 Methods for measurement of noise emitted by Stationary vehicles
IS:6229-1980 Method for measurement of real-ear
IS:9167-1979 Specification for ear protectors. 95
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.
John Ribera. Tele-Audiology in the United States. In Clinical Technologies: Concepts, Methodologies, Tools and Applications (pp. 693-702), 2011. Hershey, PA: Medical Information Science Reference. doi:10.4018/978-1-60960-561-2.ch305

Lipscomb, D. M. (1994). Hearing conservation – In industry, schools and the military.

Mandke, K and Oza R.K (2014). Private practice in speech pathology and audiology, 2014 ISHA

Philippe Valentin Giffard. Tele-Audiology. Tort, 2012. ISBN 6139256615, 9786139256617

Rawool, V. W. (2012). Hearing conservation in occupational, recreational, educational and home setting. Thieme: New York

RCI, PWD and National Trust, and Right to education act

Richard Wootton, John Craig, Victor Patterson, editors. Introduction to telemedicine. Second edition. London: The Royal Society of Medicine Press Ltd. 2006. p. 206 ISBN: 1 85315 677 9.

Salamanca statement and framework for action

Scope of practice by RCI

Swanepoel de W, Hall JW 3rd .A systematic review of tele health applications in audiology. Telemed J E Health. 2010 Mar;16(2):181-200. doi: 10.1089/tmj.2009.0111.

UNCRPD

B6.5 Clinicals in Speech-language Pathology

Marks - 100

General considerations:

Exposure is primarily aimed to be linked to the theory courses covered in the semester.

After completion of clinical postings in Speech–language diagnostics, the student will know (concepts), know how (ability to apply), show (demonstrate in a clinical diary/log book based on clinical reports/recordings, etc.), and do (perform on patients/ client contacts) the following:

Know:

Procedures to assess motor speech disorders in adults.

Differential diagnosis of motor speech disorders in adults.

Procedures to assess individuals with adult language disorders, and other related abnormalities.

Know-how:

To administer at least two standard tests for adult language disorders.

To administer at least two standard tests/protocols for motor speech disorders in adults.

To record a sample for analysis of language and speech skills in adults with neuro-communication disorders.

To assess posture, breathing, speech and swallowing in adults with motor speech disorders.

To consult with inter-disciplinary medical/rehabilitation team and counsel the individual/family regarding management options and prognosis.

Show:

Language assessment - minimum of 2 individuals after stroke.

Associated problems in individuals after stroke and its evaluation.

Dysphagia assessment – minimum of 2 children & adults.

Goals and activities for therapy (including AAC) based on assessment/test results for adults with neuro-communication disorders.

Do:

Voice therapy - Minimum of 2 individuals with voice disorders.

Fluency therapy - Minimum of 2 individuals with fluency disorders.

Bed side evaluation of individuals with neuro-communication disorders – Minimum of 2 individuals.

Apply speech language stimulation/therapy techniques on 5 children with language disorders/speech sound disorders/ motor speech disorders – minimum 5 sessions of therapy for each child.

Evaluation:

Internal evaluation shall be based on attendance, clinical diary, log book and learning conference.

External evaluation: Spot test, OSCE, Record, Viva-voce, case work

B6.6 Clinicals in Audiology

Marks – 100

General considerations:

Exposure is primarily aimed to be linked to the theory courses covered in the semester, however, not just limited to these areas.

After completion of clinical postings in auditory diagnostics and auditory rehabilitation, the student will Know (concept), know how (ability to apply), show (demonstrate in a clinical diary/log book), and do (perform on patients/ client contacts) the following:

Know:

National and international standards related to noise exposure.

Recommend appropriate treatment options such as speech reading, AVT, combined approaches etc.

Know-how:

To carryout noise survey in Industry and community

To carryout mapping of cochlear implant in infants and children using both objective and subjective procedures

To trouble shoot cochlear implant

Show:

Analysis of objective responses like compound action potential, stapelial reflexes on at least 3 samples

Comprehensive hearing conservation program for at least 1 situation

Do:

AVT on at least 1 child with hearing impairment

Trouble shooting and fine tuning of hearing aids on at least 5 geriatric clients

At least one activity for different stages involved in auditory training

Evaluation:

Internal evaluation shall be based on attendance, clinical diary, log book and learning conference.

External evaluation: Spot test, OSCE, Record, Viva-voce, case work

Semester 7 and 8

B7.1 Clinicals in Speech-language Pathology

Marks – 100

General: Clinical internship aims to provide clinical exposure and experience in different set ups. The students would not only carry out greater quantum of work, but also work varied clinical populations and in different contexts. Internship will provide greater opportunity for the students to liaise with professionals from allied fields. The intern is expected to demonstrate competence and independence in carrying out the following, among others:

Diagnosis and management of speech, language, and swallowing disorders across life span.

Report evaluation findings, counsel and make appropriate referrals.

Plan and execute intervention and rehabilitation programs for persons with speech language, communication, and swallowing disorders

Develop and maintain records related to persons with speech-language, communication, and swallowing disorders

Engage in community related services such as camps, awareness programs specifically, and community based rehabilitation activities, in general.

Make appropriate referrals and liaise with professionals from related fields.

Gain experience in different set ups and be able to establish speech centres in different set-ups

Demonstrate that the objectives of the B.ASLP program have been achieved.

Advise on the welfare measures available for their clinical clientele and their families.

Advise and fit appropriate aids and devices for their clinical population.

B7.2 Clinicals in Audiology

Marks – 100

General: Clinical internship aims to provide clinical exposure and experience in different set ups. The students would not only carry out greater quantum of work, but also work varied clinical populations and in different contexts. Internship will provide greater opportunity for the students to liaise with professionals from allied fields. The intern is expected to demonstrate competence and independence in carrying out the following, among others:

Diagnosis and management of hearing disorders across life span.

Report evaluation findings, counsel and make appropriate referrals.

Plan and execute intervention and rehabilitation programs for persons with hearing disorders

Develop and maintain records related to persons with hearing disorders

Engage in community related services such as camps, awareness programs specifically, and community based rehabilitation activities, in general.

Make appropriate referrals and liaise with professionals from related fields.

Gain experience in different set ups and be able to establish hearing centres in different set-ups

Demonstrate that the objectives of the B.ASLP program have been achieved.

Advise on the welfare measures available for their clinical clientele and their families.

Advise and fit appropriate aids and devices for their clinical population.

Curriculum Framework

Master of Science (Audiology) - M.Sc. (Aud)

**Norms and Guidelines
Course Content**

**Effective from Academic Session 2018-19
Two Years Duration**



Rehabilitation Council of India B-22,
Qutab Institutional Area,
New Delhi - 110 016

Email: rehabstd@nde.vsnl.net.in, rehcouncil_delhi@bol.net.in

www.rehabcouncil.nic.in

Master of Science (Audiology)

Regulations, Norms, Scheme of Examination and Curriculum - 2017 (Semester scheme)

1.0 Name of the course offered

The nomenclature of the program shall be Master of Science (Audiology). M.Sc. (Aud) shall be the short form.

2.0 Objectives of the M.Sc. (Aud) program

The objectives of the M.Sc. (Aud) program are to equip the students with knowledge and skills to

- function as teachers and researchers in institutions of higher learning,
- diagnose and manage disorders of hearing and balance across life span,
- counsel and guide persons with disorders of hearing and balance as well as their family members,
- implement rehabilitation programs for persons with hearing and balance disorders,
- to function as the disability certification authority in the field,
- liaise with professionals in allied fields and other stake holders,
- implement prevention and public education programs,
- undertake advocacy measures on behalf of and for persons with hearing and balance disorders,
- advise government and other institutions on legal and policy issues related to persons with hearing and balance disorders, and
- to establish and administer institutions of higher learning in the area.

3.0 Duration of the program

a) The program shall be of 4 semesters (2 academic years) and should be completed within 4 years from the date of admission.

b) An academic year consists of two semesters, and each semester shall extend over a minimum period of sixteen weeks excluding examination days. The semesters shall be spread out as follows:

Odd semesters – 1 & 3	July – November
Even semesters – 2 & 4	January – May

c) There shall be examination at the end of each semester. There shall be a vacation of minimum 2 weeks after the examinations at the end of odd semesters and 4 weeks after the examinations at the end of even semesters.

4.0 Medium of instruction

Medium of instruction shall be English

5.0 Eligibility for admission

- 5.1 Candidates with BASLP/B.Sc.(Speech & Hearing) degree of any recognised university by the Rehabilitation Council of India with a minimum of 55% aggregate marks. ¹
- 5.2 Relaxation in the qualifying marks for designated categories of students shall be as per rules and regulations of respective University / State / Union Territories or the Central Government.
- 5.3 No age bar.

6.0 Program Structure

Time structure of the program shall be as follows:

Semesters		4	
Weeks per Semester		16	
Days per week		5	80 days per semester
Hours per day		7	560 hours per semester
Semester 1	Theory	5 papers x 60 hours	300 hours
	Clinical		240 hours
	Others		20 hours
Semester 2	Theory	4 papers x 60 hours	240 hours
	Clinicals		240 hours
	Others		80 hours
Semester 3	Theory	5 papers x 60 hours	300 hours
	Clinicals		160 hours
	Dissertation		80 hours
	Others		20 hours
Semester 4	Theory	1 paper x 60 hours	60 hours
	Clinicals		160 hours
	Dissertation		320 hours
	Others		20 hours
Theory		300 + 240 + 300 + 60	900 hours
Clinicals		240 + 240 + 160 + 160	800 hours
Dissertation		0 + 0 + 80 + 320	400 hours
Others		20 + 80 + 20 + 20	140 hours
Total			2240 hours

7.0 Attendance

- 7.1 Minimum attendance shall be as stipulated by the respective University of the students. However, attendance shall not be less than 80% in theory and 90% in Clinicals in each semester for students to be eligible to appear for examination at the end of each semester.

¹ Modified as approved in 43rd General Council of Rehabilitation Council of India in its meeting held on 16th February 2021 vide notification no. 2-6/ASLP/2003/RCI dated 7 May, 2021.

7.2 Candidates who cannot appear for examination for want of attendance will be declared failed and will have to repeat the particular semester to be eligible to appear for exams subsequently.

7.3 Condonation of shortage of attendance in genuine cases to a maximum of 5% shall be from the Vice-Chancellor of the respective University where the candidates are studying.

8.0 Examination Pattern

8.1 The examination pattern and papers shall be as shown in the table below:

	Subject	Marks		
		Exam	IA	Total
A101	Research Methods, Epidemiology and Statistics	80	20	100
A102	Technology in Audiology	80	20	100
A103	Cochlear Physiology	80	20	100
A104	Neurophysiology of Hearing	80	20	100
A105	Hearing Sciences	80	20	100
A106	Clinicals (Internal)	80	20	100
A201	Auditory Perception	80	20	100
A202	Auditory Disorders	80	20	100
A203	Electrophysiological Assessment	80	20	100
A204	Advances in the Management of Hearing Loss	80	20	100
A205	Clinicals (External)	100	00	100
A301	Genetics of Hearing and Pediatric Audiology	80	20	100
A302	Implantable Auditory Devices	80	20	100
A303	Speech Perception	80	20	100
A304	Auditory Processing Disorders	80	20	100
A305	Vestibular system & its disorders	80	20	100
A306	Clinicals (Internal)	80	20	100
A401	Audiology in Practice	80	20	100
A402	Dissertation	80	20	100
A403	Clinicals (External)	100	00	100
		1640	360	2000

8.2 Course content shall be as in **Annexure 2**

8.3 Clinical examinations (for A106 and A306) shall be conducted by the designated internal faculty of the department at the end of 1st and 3rd semester. IA marks shall be awarded by all the faculty of the department on the basis of the assessment of the candidates' work throughout the particular semester.

8.4 Clinical examinations for A 205 and A 403 will be conducted by external examiner(s) at the end of the 2nd and 4th semester, respectively. Clinical

examination shall be with clinical population like in medical profession. The examiners shall also evaluate records of clinical and practical work of the students.

- 8.5 An internal faculty member can assist the external examiner(s) in A 205 and A403 Clinicals (External), but shall not award marks.

9.0 Dissertation

- 9.1 Students shall complete a dissertation in the 3rd and 4th semester of the course and shall submit the same at the end of 4th semester before final examination. An external examiner shall assess the dissertation for 80 marks while the guide shall assess the performance of the candidate for 20 marks (internal assessment). The dissertation will be rated for a total of 100 marks (80 +20). Candidates who fail to submit their dissertation on or before the stipulated date shall not be permitted to appear for the final semester examination.

10.0 Criteria for passing

- 10.1 The student is required to obtain a minimum of 50% in each of the theory papers, internal assessment, practical and clinical exams, and dissertation for a pass.
- 10.2 Students will have to pass the clinical examination of the given semester to proceed to the next semester.
- 10.3 Carry-over of papers: Maximum number of attempts for any paper / clinical practicum / dissertation shall be three inclusive of first attempt. There shall be no supplementary examination.

11.0 Board of Examiners

- 11.1 There shall be a Board of Examiners for scrutinizing and approving the question papers as well as scheme of valuation
- 11.2 Fifty percent of the members in the Board of Examiners shall be from outside the institution.

12.0 Award of Degree

The University shall award the degree and issue certificate only after the candidates successfully complete all the examinations stipulated.

13.0 Infrastructure for starting the course

Only institutions who have conducted at least two batches of B.ASLP programs (5 years) and have the infrastructure as given in **Annexure 1** shall be permitted hereafter to offer Masters' program in Audiology, after due formalities.

14.0 Others

- 14.1 On all other issues not mentioned in these rules and regulations like the pattern of question paper, grading, award of grace marks, and declaration of rank, among others, the rules and regulations of the respective University shall prevail.
- 14.2 These revised regulations will apply to students admitted for the academic year 2018-19 and onwards.

**Infrastructure requirements for M.Sc. (Aud) programs
(Academic year 2018-19 onwards)**

The following are the minimum requirements for starting/continuing M.Sc. (Aud) program. This requirement is over and above the stipulated infrastructure (faculty, clinical staff, and physical) for other programs. This should be read and interpreted in conjunction with the guidelines of RCI for recognition of new/existing programs for recognition.

Human Resource Requirement

Requirement of scientific / technical / administrative staff exclusively for M.Sc (Aud) program with an intake of 12 students per year shall be as follows:

Type	Designation	No.
Core Faculty*	Professor - Audiology	1
	Associate Professor - Audiology	1
	Assistant Professors - Audiology	2
Clinical Staff	Audiologist - Gr. I	1
Allied Faculty	Asst. Prof in Statistics	1
Allied Clinical Staff	Clinical Psychologist	1
	Oto-laryngologist	1
	Neurologist	1
Supporting staff – Technical	Electronics Engineer	1
	Bio-medical / Computer technician	1
	Library & Information Officer	1
Supporting staff- Administrative	Library Assistant	1
	Secretary - Academics	1
	Secretary - Clinic	1
	Secretary - Admin	1

Core faculty to student ratio should always be 1:3 (one faculty member for every 3 students)

Note 1: Allied faculty can be part time functionaries and their appointment can be guided by the requirements in a given semester. Besides, allied faculty can be the same for undergraduate as well as postgraduate courses if the institute also has an undergraduate course.

Note 2: The requirement shown here is exclusively for M.Sc. (Aud) program. Increase in intake should be with proportionate increase in the infrastructure particularly faculty.

Note 3: The M.Sc. (Aud) program can only be conducted by an independent institute/ college/ department in a University / department in a hospital / rehabilitation unit, with a full-time Audiologist, or Audiologist & Speech-Language Pathologist as its head/ coordinator (administrative / academic / clinical). The head of the program should possess a doctorate in the core field.

Faculty and Professional qualification in the core areas

Designation	Qualifications
Professor	<p>Essential</p> <p>a) M.Sc (Audiology) / M.Sc (Sp& Hg) / MASLP or its equivalent b) Ph.D (in the core area*) c) 10 years teaching experience at PG / UG level d) Minimum five publications with a cumulative impact factor of 5. e) Valid RCI registration</p> <p>Desirable: Experience of running under-graduate training programs</p>
Associate Professor	<p>Essential</p> <p>a) M.Sc (Audiology) / M.Sc (Sp& Hg) / MASLP or its equivalent b) 8 years teaching experience at PG/UG level c) Minimum 5 publications with a cumulative impact factor of 5. d) Valid RCI registration</p> <p>Desirable: Ph.D (in the core area*) Experience of running under-graduate training programs</p>
Assistant Professor- Audiology	<p>Essential</p> <p>a) M.Sc (Audiology) / M.Sc (Sp& Hg) / MASLP or its equivalent b) 2 years teaching/ clinical / research experience c) Valid RCI registration</p> <p>Desirable: a) Ph.D (in the core area*) b) Publications</p>
Audiologist Grade I	<p>Essential</p> <p>a) M.Sc (Audiology) / M.Sc (Sp& Hg) / MASLP or its equivalent b) Valid RCI registration</p> <p>Desirable: 1 year experience in the field</p>

*Audiology or Speech-Language Pathology & Audiology

Note 1 :Pay and emoluments for all faculty posts shall be on par with UGC norms. RCI norms shall apply for all other clinical and technical posts

Clinical

The institution should have facility for diagnosis, management and rehabilitation of persons with all types of hearing and balance-related problems across life span.

Size of clinical population: The participating institution must have a clinical load of a minimum of 960 new and 1920 follow up therapy cases in the first and second semesters: and, in addition to this, 960 new and 1920 follow up therapy cases in the third and fourth semesters.

Library

Library should accommodate at least 30% of the staff and students of the institute at any given time.

Library should have internet and photocopying facilities.

At least 50% of books mentioned under 'Recommended Reading' under each paper must be available. The institution should add minimum one book every year for each subject of study.

There should be active subscription to at least 5 journals (3 international and 2 national journals in the core areas)

Library Staff*

- a) Library and Information Officer - 1
Qualification: B. Lib Sci with one year experience in managing a technical library
- b) Library Assistant - 1
Qualification: Diploma in Library Science

* Library staff can be common for all the courses at a given institute/college

Space

Sr. No.		Size	Number (for a batch of 12 students)
a)	Class Rooms	Space @ 10 sq. ft per student + 20 Sq. ft for the teacher: Room with a minimum area of 220 sq. ft.	1 class rooms for a batch of 12 students
b)	Seminar hall	Space to accommodate 50% of total student strength	1 hall for a batch of 12 students
c)	Computer lab/multipurpose hall	Space to accommodate 50% of total student strength	1 computer lab for a batch of 12 students
d)	Room for reception where patients are registered.	10' x 10'	1 room for a batch of 12 students
e)	Room for case history, diagnostic room and interviews	6' x 8'	4rooms for a batch of 12 students
f)	Therapy Rooms	6' x 8'	2 rooms for a batch of 12 students
g)	Sound treated room for hearing evaluation - twin-	10' x 14'	1 room for a batch of 12 students

	room set up		
h)	Sound treated room for immittance testing and EP recording	10' x 10'	1 room for a batch of 12 students
i)	Lab for vestibular testing	10' x 10'	1 room for a batch of 12 students
j)	Staff Room	15' x 20'	1 room
k)	Individual work space (with provision for storage facilities)	10' x 10'	1 room for every 2 faculty/staff members
l)	Academic/administrative office	10' x 10'	1
m)	Principal's Office room	10' x 10'	1
n)	Sanitary facilities	Separate facility for males and females, staff/students and clinical population	
o)	Hostel	Separate hostel for Men and Women with dining facility. Accommodation for at least 50% of the student population.	
p)	Barrier free access		
q)	Space for recreation - both indoor and outdoor		

Equipment - Audiology (Minimum for a batch of 12 students)

Sl. No.	Equipment	For a batch of 12 students
a)	Speech audiometry tests including those for assessment of CAPDs - in different languages	As per course requirement
b)	Diagnostic test material	As per course requirement
c)	Diagnostic/clinical pure tone audiometer	1
d)	Diagnostic immittance audiometer	1
e)	Diagnostic OAE analyzer	1
f)	2-Channel EP System	1
g)	Diagnostic material/equipment for assessment of balance disorders	1
h)	Real ear measuring equipment and hearing aid analyzer	1
h)	Equipment set for making earmolds	1
i)	Hi-Fi Ampli Deck with speakers and good microphone	1
j)	Computer PC-AT with VGA Color Monitor & printer for clinic administration	1
k)	Handheld otoscope	1
l)	Software for signal generation and analysis	

Audio-visual Instruments, Furniture in class rooms, clinical areas, labs and other administrative areas and internet access: Appropriately

Course Content

M.Sc. (Audiology)

Semester I

A 101: Research Methods, Statistics & Epidemiology

60 hours: 100 marks

Objectives: After completing this course, the student will be able to understand

- a) clinical research designs and statistical methods,
- b) epidemiological issues and its relevance in hearing research,
- c) evidence based practice in Audiology, and
- d) ethical practices in research

Unit 1: Experimental Designs and Their Applicability in Hearing Research

- a) Types of research- post facto research, normative research, standard group comparison, experimental research, clinical and applied research, sample surveys, evaluation research
- b) Methods of observation and measurement, strategies and designs in research
- c) Experimental designs, single subject designs and group designs
- d) Critical analysis of the research methods employed in hearing research.
- e) Documentation and research writing
- f) Ethical considerations in research – National and international guidelines

Unit 2: Epidemiology

- a) Epidemiology: Definition, basic concepts – scope and function of epidemiology
- b) Study designs in epidemiology: Cohort studies, case-control studies, cross-sectional studies, clinical trials
- c) Measures in epidemiology – Ratios, proportions, rates, relative risk, odds ratio
- c) Identify biases and their consequences in published literature.
- d) Describe criteria for characterizing the causality of associations.
- e) Application of epidemiology in evaluation and screening procedures employed in Speech-language Pathology
- f) Application and impact of epidemiology on national and local policy; influence of epidemiology on ethical and professional issues

Unit 3: Statistical Measures and their Features

- a) Review of data description and exploratory data analysis (Numerical summaries and graphical summaries)
- b) Probability concepts and models
- c) Statistical Inference – Estimation Confidence Intervals
- d) Statistical Inference – Basic concepts related to hypothesis testing –null hypothesis, alternative hypothesis, significance level, statistically significant, critical value,

acceptance / rejection region, p-value, power, types of errors: Type I (α), Type II (β), one-sided (one-tailed) test, Two-sided (two-tailed) test

- e) Parametric and non-parametric approaches to hypothesis testing
- f) Categorical data analysis - contingency tables, Chi-square test for independence of attributes,
- g) Measures of association (Contingency coefficient, Cramer's V), Kappa coefficient

Unit 4: Regression, Univariate and Multivariate Analysis

- a) Correlation, regression analysis and prediction including multiple regression; logistic regression; path analysis
- b) Analysis of Variance (ANOVA)- Basic models, assumptions, one way and two way ANOVA; Consequence of failure of assumptions underlying ANOVA; Tests for additivity, homogeneity, transformation; Post – hoc tests; Analysis of Covariance (ANOCOVA); Repeated measure ANOVA
- c) Multivariate analysis: Need for multivariate analysis, various methods including MANOVA, MANCOVA
- d) Introduction to principal component analysis, factor analysis, discriminant function, multidimensional scaling
- e) Evaluation of application of statistics to different research designs used in different publications
- f) Critical analysis of research articles in the field: Analysis of research designs in different areas of Speech-language Pathology

Unit 5: Evidence Based Practice

- a) Introduction to Evidence Based Practice (EBP) and Steps to EBP from formulating foreground question, finding best current evidence, critical appraisal of best current evidence, summarizing evidence, integrating evidence and tracking progress.
- b) Concepts related to practical significance (effect size) vs. statistical significance, precision of measurement (confidence intervals)
- c) Levels of evidence: For experimental and non-experimental designs; treatment efficacy-randomized control study, quasi experimental study, correlation and case study, single subject designs, expert committee report, consensus conference
- d) Measures of diagnostic accuracy – positive and negative likelihood ratios; positive predictive value, negative predictive value, diagnostic odds ratio
- e) Concepts related to randomized control trials: Comparative groups- allocation concealment / random allocation; importance of participation and follow up in understanding, evaluating and applying randomized controlled trial results
- e) Methods of carrying out therapy trials; execution, indexing and reporting of therapy trials – efficacy studies; Conventions to study outcomes - i) Absolute risk reduction, ii) Absolute benefit increase, iii) Absolute risk increase, and iv) Absolute benefit reduction
- f) Systematic review and meta-analysis; importance of research publications in terms of systematic review, meta-analysis, clinical practice guidelines, health technology assessments.
- g) Challenges in implementation of EBP in Audiology in India and future directions

Recommended Reading

- Russell, C., & Jay, L. (2016). *Rehabilitation Research: Principles and Applications*. Elsevier
- Robert E. Owens Jr., Dale Evan Metz, Kimberly A. Farinella (2014). *Introduction to Communication Disorders: A Lifespan Evidence-Based Perspective*. Pearson Education
- Laura M. Justice, Erin Redle (2013). *Communication Sciences and Disorders: A Clinical Evidence-Based Approach*. Pearson Education.
- Robert F. Orlikoff, Nicholas E. Schiavetti, Dale Evan Metz (2014). *Evaluating Research in Communication Disorders*. Pearson Education
- David L. Irwin, Mary Pannbacker, Norman J. Lass (2013). *Clinical Research Methods in Speech-Language Pathology and Audiology*. Second Edition. Plural Publishing
- Timothy Meline (2009). *A Research Primer for Communication Sciences and Disorders*. Pearson Education
- David, L., Maxwell, EikiSatake. (2006) *Research and Statistical Methods in Communication Sciences and Disorders*. Thomson/Delmar Learning.
- John C Reinard (2006). *Communication Research Statistics*. SAGE Publications
- Nicholas Schiavetti, Dale Evan Metz (2006). *Evaluating Research in Communicative Disorders*. Allyn& Bacon
- Tim Pring (2005). *Research Methods in Communication Disorders*. Wiley
- Donald G. Doehring (2002). *Research Strategies in Human Communication Disorders*. Pro-Ed
- Carole E. Johnson, Jeffrey L. Danhauer (2002). *Handbook of Outcomes Measurement in Audiology*. Singular
- David L. Maxwell, EikiSatake (1997). *Research and Statistical Methods in Communication Disorders*. Williams & Wilkins

A 102: Technology in Audiology

Hour - 60 : Marks - 100

Objectives: After completing this course, the student will be able to understand

- a) advanced aspects of signal acquisition and processing,
- b) development and application of software based tools,
- c) development and application of tele-technology, and
- d) technology of amplification devices

Unit 1: Fundamentals of Digital Signal Processing & Communication Systems

- a) Digitization of data and digital systems; Principles and methods of digital signal processing
- b) Fundamentals of communication systems – (i) AM & FM transmission & reception (ii) Digital modulation techniques, (iii) Satellite communication
- c) Transducers and signal generation
- c) Biomedical signals & signal processing: Principles of generation of acoustic stimuli
- d) Signal acquisition and processing techniques
- e) Working principles of EEG / Magnetoencephalography, event related potentials/ evoked potential.
- f) High-fidelity sound reproducing systems: Auditorium acoustics

Unit 2: Techniques of Speech Processing and Analysis

- a) Artificial neural networks
- b) Speech processing and synthesis models and techniques (linear predictive coding, linear prediction model, LPC-based synthesis) and applications, review of signal processing, Fourier transform and short-time speech analysis(energy, zero-crossing rate, autocorrelation function).
- c) Voice response system, speaker recognition system and speech recognition system: Speech synthesis methods, speech recognition, speaker recognition, speech coding, and speech enhancement.
- d) Basic principles of cepstral analysis, filtering low-time filtering for formant estimation, high-time filtering for pitch estimation, complex cepstrum

Unit 3: Neuro Imaging

- a) Principles of neuro imaging techniques - MRI, fMRI, NIRS, CT, PET, SPECT, TMS and MEG and their technology (working principles, interpretation and implications).
- b) Syncing various speech stimuli and events for fMRI acquisition and speech perception in fMRI
- c) Technology available for intra-operative monitoring of sensory and motor functions

Unit 4: Tele-technology

- a) Tele-technology: Definition, applications, technology, resources
- b) Transmission of information: transmission of patient images, reports, etc.

- c) Remote consultations and databases
- d) Distance learning- multimedia meeting room / videoconferencing

Unit 5: Software for Analysis

- a) Software packages and applications in hearing diagnostics and research - MATLAB, Adobe audition, Audacity, PRAAT
- b) Basics features, vectors and matrices, built-in functions and plotting
- c) Editing audio files, applying effects in waveform editor, amplitude compression and modulation effects, filter and equalizer effects, noise reduction/ restoration effects, basic multitrack controls, saving and exporting
- d) Computer based assessment and intervention programs relating to hearing
- e) Calibration and maintenance of equipment

Recommended Reading

- Moser, P. (2015). Electronics and Instrumentation for Audiologists. Psychology Press.
- Villchur, E. (1999). Acoustics for Audiologists (1 edition.). San Diego, Calif: Delmar Cengage Learning.
- Baber, C. & Noyes, J.M. (1993). Interactive Speech Technology: Human Factors Issues in the Application of Speech Input Output to Computers. London: Taylor and Francis.
- Daniloff, R.G (1985). Speech Sciences: Recent advances. London: Taylor and Francis.
- Gottingen, M.R.S. (Ed.) (1985). Speech and Speaker Recognition. Basel: Kager.
- Haton, J.P. (Eds) (1981). Automatic speech analysis & Recognition. USA, D. Reidel Publishing Company.
- Keller, E. (ed.) (1994). Fundamentals of Speech Synthesis and Speech Recognition: Basic Concepts, State of the art and Future challenges. New York: John Wiley & sons.
- Morgan, D.P. & Scofield, C.L (1991). NeuralNetworks and Speech Processing. Boston, Kluwer Academic Publishers.
- Nakagawa, S. &etal. (1995). Speech, Hearing and Neural Network Models. Oxford: IOS, Press
- Oppenheim & Schafer (1989). Digital signal processing. New Delhi: Prentice Hall of India.
- Boulston, F. R. & Dvorak, J.D (2015). Matlab Primer for Speech Language Pathology and Audiology. San Diego: Plural Publishing Inc
- Silman,S& Emmer, M.B. (2011). Instrumentation in Audiology and Hearing Science: Theory and Practice. San Diego: Plural Publishing Inc

A 103: Cochlear Physiology

60 hours: 100 marks

Objectives: After completing this course, the student will be able to

- a) describe the micro and macro structures of cochlea,
- b) explain the physiology of cochlea,
- c) explain the physiological basis for generation of OAE,
- d) use appropriate protocol for recording OAEs in clinics and for research,
- e) use appropriate protocol for recording ECoChG in clinics and for research, and
- f) understand the research needs in physiological measurements of hearing

Unit 1: Cochlear Anatomy

- a) Macro & microanatomy of cochlea
- b) Homeostatic mechanisms in cochlea
- c) Blood supply to cochlea
- d) Innervations of cochlea
- e) Cochlear regeneration
- f) Evolution of human cochlea

Unit 2: Cochlear Physiology

- a) Techniques to study hair cell and basilar membrane physiology
- b) Basilar membrane mechanics and non-linearity
- c) Outer hair cell physiology – different mechanisms involved in hair cell motility
- d) Inner hair cell physiology
- e) Cochlear non-linearity

Unit 3: Development of cochlea and top down control of sensory process

- a) Efferent control of cochlear hair cells
- b) Nutrients related to sensory cell physiology
- c) Ontogenetic development of cochlea
- d) Phylogentic development of cochlea
- e) Developmental changes in the cochlea; effect of advancing age on cochlea
- f) Comparative physiology of auditory system in non-mammalian species

Unit 4: Otoacoustic Emissions

- a) Classifications of OAEs; mechanism based taxonomy
- b) Characteristics of different types of OAEs
- c) Instrumentation and techniques for recording different types of OAEs
- d) Factors affecting different types of OAEs
- d) Fine structure DPOAEs
- e) Suppression of OAEs: ipsilateral, contralateral, and bilateral
- f) Clinical applications of OAEs

Unit 5: Cochlear Potentials

- a) Endocochlear potentials.
- b) Electrocochleography: Instrumentation and technique
- b) Protocol for recording ECoChG
- c) Interpretation of ECoChG
- d) Clinical application of ECoChG

Recommended Reading

- Altschuler, R. A., & Hoffman, D. W. (1986). Neurobiology of hearing: the cochlea. New York: Raven Press.
- Berlin, C. I. (1996). Hair cells and hearing aids. San Diego: Singular Publishing Group.
- Dallos, P. (1973). Auditory periphery: Biophysics & physiology. New York: Academic Press.
- Dallos, P., Popper, A. N., & Fry, R. R. (1996). The cochlea. New York: Springer.
- De Reuck, A. V. S., & Knight, J. (1968). Hearing mechanisms in vertebrates. London: Churchill.
- Dhar, S and Hall, J.W. (2011). Otoacoustic emissions: Principles, Procedures and Protocols. San Diego: Plural Publishing Inc
- Drescher, D. G. (1985). Auditory biochemistry. Springfield: Charles C. Thomas.
- Flock, A., Ottoson, D., & Ulfendahi, M. (1995). Active hearing. Baltimore: Williams & Wilkins.
- Gelfand, S. A. (2004). Hearing: Introduction to Psychological and Physiological Acoustics. (4thEdn.). New York: Marcel Decker.
- Hall, J.W. (2007). New Handbook of Auditory Evoked Responses. Boston: Pearson.
- Jahn, A. F., & Santos-Sacchi, J. (1989). Physiology of the Ear. New York: Academic Press.
- Kemp, D. T. (1986). Otoacoustic emissions, travelling waves, and cochlear mechanisms. *Hearing Research*. 22, 95-104.
- Moller, A. R. (2000). Hearing: Its physiology and pathology. San Diego: Academic Press.
- Moore, B. C. J. (1995). Hearing. San Diego: Academic Press.
- Musiek, F.E. & Baran, J.A. (2016). Auditory System: Anatomy, Physiology and Clinical Correlates. San Diego: Plural Publishing Inc
- Robinette, M. S., & Glatke, T. J. (1997). Otoacoustic emissions: clinical applications. New York: Thieme Medical Publications.
- Zemlin, W. R. (2010). Speech & Hearing Science: Anatomy & Physiology. Boston: Allyn & Bacon.

A 104: Neurophysiology of Hearing

60 hours: 100 marks

Objectives: After completing this course, the student will be able to

- a) explain the anatomy afferent system,
- b) describe the neurophysiology of hearing,
- c) explain the efferent auditory system,
- d) describe the functioning and role of efferent system,
- e) understand the neurophysiological basis of the disorders affecting the auditory nervous system, and
- f) understand the basis of electrophysiological assessment

Unit 1: Ascending Auditory Pathway: Anatomy

- a) Auditory nerve
- b) Cochlear nucleus
- c) Superior olivary complex
- d) Lateral lemniscus
- e) Inferior colliculus
- f) Medial geniculate body

Unit 2: Functioning of the Auditory Nerve

- a) Stimulus coding
 - i. Frequency, intensity and temporal coding
 - ii. Coding of complex signals
- b) Non linearity
- c) Action potentials
- d) Neurotransmitters and neuromodulators

Unit 3: Physiology of Auditory Brainstem

- a) Tonotopic organization of auditory brainstem
 - i. Cochlear nucleus
 - ii. Superior olivary complex
 - iii. Lateral lemniscus
 - iv. Inferior colliculus
 - v. Medial Geniculate body
- b) Coding of simple and complex acoustic signals at auditory brainstem
 - i. Cochlear nucleus
 - ii. Superior olivary complex
 - iii. Lateral lemniscus
 - iv. Inferior colliculus
 - v. Medial Geniculate body
- c) Role of subcortical structures in sound localization

Unit 4: Anatomy and Physiology of Auditory Cortex

- a) Anatomy of primary and secondary auditory cortex
- b) Tonotopic organization in auditory cortex
- c) Coding of signals in the auditory cortex
 - i. Simple and complex signals
 - ii. Speech
- d) Association of auditory cortex with other structures
- e) Role of auditory cortex in sound localization
- f) Plasticity of auditory cortex

Unit 5: Efferent Auditory System

- a) Efferent auditory pathway: medial and lateral olivocochlear bundle
- b) Functioning of the auditory efferent system
- c) Role of auditory efferent system in hearing
- d) Protective function of auditory efferent system

Recommended Reading

- Aitkin, L. (1990). The auditory cortex: structural and functional bases of auditory perception. University of Michigan: Chapman and Hall.
- Berlin, C.E. (1999). The efferent auditory system: basic science and clinical applications. USA: Singular Publishing Group.
- Enrique A. & Lopez-Poveda, S. (2010). The neurophysiological bases of auditory perception. New York: Springer-Verlag.
- Gelfand, S.A. (2004). Hearing: An introduction to psychological and physiological acoustics. USA: Marcel Dekker Inc.
- Günter, E., & Romand, R. (1997). The central auditory system. United Kingdom: Oxford University Press.
- Jahn, A.F., & Santos-Sacchi J. (2001). Physiology of the ear. San Diego: Singular/Thomson Learning.
- Jeffery, A., & Schreiner, C. (2005). The inferior Colliculus. USA: Springer-Verlag.
- Lambert, M.S., Miriam T. T., & Susan F. M (2010). Superior Olivary Complex. USA: Betascript Publishers.
- Meddis, R. (2010). Computational Models of the Auditory System. USA: Springer-Verlag.
- Moore, D., Rees, A. & Palmer, A.R. (2010). Oxford handbook of auditory science the ear. United Kingdom: Oxford University Press.
- Musiek, F.E., & Baran, J.A. (2006). The auditory system: anatomy, physiology and clinical correlates. USA: Indiana University Press.
- Musiek, F.E., Baran, J.A., Shinn, J., & Raleigh, J. (2012). Disorders of the Auditory System. San Diego: Plural Publishers.
- Pickels, J.O. (2012). An introduction to the physiology of hearing. United Kingdom: Emerald Group Publishing Inc.
- Richard, A. (1991). Neurobiology of Hearing. USA: Raven Press.
- Ryugo, D.K. (2010). Auditory and Vestibular Efferents. USA: Springer-Verlag.
- Schnupp, J., Nelken, I., & Ahissar, E. (2011). Auditory Neuroscience: Making Sense of Sound. USA: Library of Congress.

- Steven, G., & William, A.A. (2006). *Listening to Speech: auditory perspectives*. New Jersey: Lawrence Erlbaum Associates Inc.
- Syka, J. (1997). *Acoustical signal processing in the central auditory system*. USA: Springer Science.
- Syka, J., &Merzenich, M.M. (2003). *Plasticity and signal representation in the auditory system*. USA: Springer Science.
- Tony, L. S., Richard, H. N., &Musiek, F.E. (1997). *Efferent auditory system: structure and function*. USA: Singular Publishing Group.
- Webster, D.B., Popper A.N., & Fay R.R. (1992). *The Mammalian auditory pathway: neuroanatomy*. New York: Springer-Verlag.

A 105: Hearing Sciences

Marks -100: Hours - 60

Objectives: After completing this course, the student will be able to

- a) understand psychophysical components of sound and their measurement,
- b) analyse and critically evaluate the different methods of estimation of thresholds, frequency analysis and application of masking, and
- c) conduct experiments to estimate thresholds, measure pitch.

Unit 1: Introduction to Psychoacoustics

- a) Physical description and parameters for generation of sounds: Sine wave and complex signals; Analysis of sound: Spectrum and spectrogram, LTASS; Filters and their properties
- b) Theory of signal detection: Basic concepts and applications of signal detection
- c) Psychophysical methods - Classical and adaptive methods

Unit 2: Thresholds and Loudness

- a) Overview of absolute and relative measures: Methods of measuring absolute and relative thresholds; thresholds of audibility (MAP & MAF); Models of loudness.
- b) Loudness perception in normal hearing persons
- c) Effect of hearing impairment on perception of loudness
- d) Dynamic range of hearing, equal loudness contours and loudness scaling.
- e) Recruitment and softness imperceptions
- f) Consequences of altered loudness perception
- g) Factors affecting loudness: Bandwidth, duration, adaptation and masking.
- h) DLI

Unit 3: Pitch

- a) Theories of pitch perception - simple and complex signals
- b) Pitch scales
- c) Factors affecting pitch perception
- d) Perception of pure-tones by persons with normal hearing and those with hearing impairment
- d) Perception of complex signals by persons with normal hearing and those with hearing impairment
- e) DLF

Unit 4: Peripheral Masking

- a) Critical band concept and power spectrum model
- b) Estimating the shape of auditory filter: Psycho-physical tuning curve; Notched noise; Non-simultaneous masking
- c) Auditory filter shapes in normal hearing and hearing impaired
- d) Masking patterns and excitation patterns in normal hearing and hearing impaired

Unit 5: Non-Peripheral Masking

- a) Central masking
- b) Informational masking
- c) Overshoot phenomena
- d) Co-modulation masking release
- e) Effect of hearing loss on non-peripheral masking

Recommended Reading

- Brain C.J., Moore (2007). Cochlear Hearing Loss: Physiological, Psychological and Technical Issues. England: John Wiley and Sons Ltd.
- Brain, C.J. Moore (1998). Cochlear Hearing Loss. (2nd and 3rd Editions). London: Whurr Publishers.
- Gelfand, S, A. (2005). Introduction to psychological and physiological acoustics. New York: Marcel Dekker.
- Gullick, W.L. (1971). Hearing physiology and psychophysics. New York: Oxford University Press.).
- Howard, D and Angus, J (2013). Acoustics and Psychacoustics. Oxford: Taylor & Francis
- Moore, B. C. J. (1995). Hearing. San Diego: Academic Press.
- Stanley, A. Gelfand (1998). Hearing. New York: Marcel Dekker Inc.
- Stuart Rosen & Deter Howell (1991). Signals and systems for speech and hearing. CA: Academic Press Inc.
- Stuart Rosen and Deter Howell (1991). Signals and systems for speech and hearing. CA: Academic Press Inc
- Yost, W. A. (1994). Fundamentals of hearing: An introduction. San Diego: Academic Press.
- Zwicker, E., &Fastl, H. (1999). Psychoacoustics-Facts and models. Springer Verlag: Berlin Heidelberg.

Semester II

A 201: Auditory Perception

Marks -100: Hours - 60

Objectives: After completing this course, the student will be able to

- a) understand the processes involved in the perception of speech by persons with normal and impaired hearing, and
- b) apply principles of speech perception in therapy and research.

Unit 1: Temporal processing

- a) Overview of temporal processing: temporal resolution; temporal integration; models of temporal processing
- b) Detection and discrimination of gaps in normals and individuals with hearing impairment
- c) Temporal modulation transfer function in normals and individuals with hearing impairment
- d) Temporal integration in persons with normal hearing and those with hearing impairment
- e) Models of temporal processing in persons with normal hearing and those with hearing impairment

Unit 2: Auditory object and pattern perception

- a) Basic concepts in auditory object perception
- b) Spectral cues for object perception
- c) Temporal cues for object perception
- d) Auditory pattern perception in individuals with normal hearing and those with hearing impairment
- e) Timber perception
- f) Time invariant-pattern and time varying pattern perception

Unit 3: Adaptation

- a) Adaptation vs. fatigue
- b) Methods of studying adaptation
- c) Adaptation in in persons with normal hearing and those with hearing impairment
- d) Neurophysiological basis of adaptation
- e) Factors affecting adaptation

Unit 4: Perception in Space

- a) Perception of distance: localization vs. lateralization; localization of pure tones; localization of complex signals
- b) Effect of hearing loss on localization
- c) Monaural localization
- c) Factors affecting localization
- d) Neurophysiology of localization

Unit 5: Binaural hearing and Perception of Music

- a) Binaural hearing - overview
- b) Models of binaural hearing
- c) Masking level difference
- d) Musical scales/Musical notes
- e) Factors affecting perception of music

Recommended Reading

- Brain, C.J. Moore (1986). Frequency selectivity in Hearing. CA: Academic Press Inc.
- Diana Deutsch (2013). The Psychology of Music, Third Edition (Cognition and Perception) 3rd Edition. Academic Press
- Gelfand, S, A. (2005). Introduction to psychological and physiological acoustics. New York: Marcel Dekker.
- Howard, D and Angus, J (2013). Acoustics and Psychacoustics. Oxford: Taylor & Francis
- M. Riess Jones, R.R. Fay, A.N. Popper (2010). Music Perception. Springer
- Oxenham, A., & Bacon, S. (2003). Cochlear Compression: Perceptual Measures and Implications for Normal and Impaired Hearing. *Ear and Hearing*, 24, 350-366.
- Plack, C.J., Oxenham, A.J., & Fay, R.R. (2005). Pitch: Neural Coding and Perception. New York: Springer.
- Stanley, A. Gelfand (1998). Hearing. New York: Marcel Dekker Inc.
- Warren, R. M. (2008). Auditory Perception: An Analysis and Synthesis. Cambridge: Cambridge University Press.
- Yost, W. A. (1994). Fundamentals of hearing: An introduction. San Diego: Academic Press.
- Zwicker, E., &Fastl, H. (1999). Psychoacoustics-Facts and models. Springer: Verlag Berlin Heidelberg.

A 202: Auditory Disorders

Marks -100: Hours - 60

Objectives: After completing this course, the student will be able to

- a) explain the pathophysiology of auditory disorders,
- b) diagnose and differentially diagnose auditory disorders, and
- c) recommend appropriate management options for the clients with hearing loss .

Unit 1: Disorders of the External and Middle Ear

- a) Congenital malformations of external and middle ear
- b) Diseases of the external ear: otitis – externa, neoplasms of external ear, cerumen, keratosis obturans, injuries, sebaceous cysts, acquired atresia, stenosis of external auditory canal & malignant otitis externa
- c) Diseases of the middle ear cleft: otosclerosis otitis media, non suppurative otitis media, complications of middle ear diseases, neoplasms.
- d) Assessment of middle ear functioning: multicomponent tympanometry, multifrequency tympanometry, wide band reflectance/absorbance, reflexometry
- d) Reconstruction of external and middle ear hearing mechanisms: reconstructive and rehabilitation procedures

Unit 2: Disorders of the Cochlea

- a) Pathophysiology inner ear disorders: ototoxicity, Meniere’s, age related hearing loss, Sudden hearing loss, auto immune conditions, hearing loss due to systemic diseases
- b) Audiological profile in persons with above inner ear disorders
- c) Nonaudiological management options

Unit 3: Disorders of the Cochlea– NIHL &Traumatic Injury

- a) Pathophysiology inner ear disorders due toNIHL and other traumatic injuries
- b) Audiological profile in persons with NIHL and other traumatic injuries
- c) Hearing conservation: National and International guidelines
- d) Nonaudiological management options

Unit 4: Auditory Nerve and Brainstem

- a) Pathophysiology of space occupying lesions of auditory nerve and brainstem
- b) Audiological profile in persons with space occupying lesions
- d) Radiological findings and its correlations with audiological findings
- d) Challenges in diagnosis of space occupying lesion
- e) Management options for space occupying lesion

Unit 5: Auditory Neuropathy Spectrum Disorders

- a) Pathophysiology of ANSD
- b) Etiology of ANSD
- c) Audiological profile of persons with ANSD and its correlations with pathophysiology

- d) Speech perception in persons with ANSD
- e) Management of persons with ANSD: Aids strategies

Recommended Reading

- Berlin, C. I., Hood, L. J., & Ricci, A. (2002). Hair Cell Micromechanics and Otoacoustic Emissions. New York: Thomson Learning Inc.
- Chasin, M (2009) Hearing Loss in Musicians: Prevention and Management. San Diego: Plural Publishers
- Hall, J. W. (2000). Handbook of Otoacoustic Emissions. San Diego: Singular Publishing Company.
- Hall, J.W. (2007). New Handbook of Auditory Evoked Responses. Boston: Pearson.
- Hood, L.J. (1998). Clinical applications of auditory brainstem response. San Diego: Singular Publishing Group Inc.
- Moller, A. R. (2000). Hearing: Its physiology and pathology. San Diego: Academic Press.
- Rintleman, W.F. (1991). Hearing Assessment. Boston: Allyn and Bacon.
- Roeser, R. J., Valente, M., & Hosford-Dunn, H. (2007). Audiology: Diagnosis. New York: Thieme Medical Publishers.
- Sanbridge, S.A. (2009). Ear Disorders. San Diego: Plural Publishers
- Sininger, Y& Starr, A (2001). Auditory Neuropathy: A new perspective in hearing disorders
- Standring, S. (2008). Gray's Anatomy: The Anatomical Basis of Clinical Practice, Expert Consult. Livigstone: Churchill publishers.
- Wiley, T.L., & Fowler, C.G. (1997). Acoustic immittance measures in clinical audiology: A primer. San Diego: Singular Publishing Group Inc.

A 203 : Electrophysiological Assessment

60 hours: 100 marks

Objectives: After completing this course, the student will be able to

- a) describe and classify auditory evoked potentials,
- b) understand the technology for recording auditory evoked potentials,
- c) record and interpret exogenous and endogenous potentials,
- d) use appropriate protocols for recording exogenous and endogenous potentials for clinical and research purposes, and
- e) understand research needs in auditory evoked potentials

Unit 1: Foundations of Auditory Evoked Potentials (AEPs)

- a) Introduction and Classification of AEPs
- b) Neuroanatomy and neurophysiology related to AEPs; dipole orientation and scalp distribution of AEPs
- c) Stimuli for recording AEPs- generation, characteristics and types
- d) Electrodes for recording AEPs
- e) General principles of recording AEPs
- f) Overview to advanced analyses techniques such as independent component and time frequency analyses
- g) Maintenance and Calibration of instrumentation

Unit 2: Auditory Brainstem Responses

- a) Acquisition and analysis responses for different stimuli -clicks, tone bursts, chirps, complex stimuli such as speech
- b) New trends in ABR such as Cochlear Hydrops Analysis Masker Procedure (CHAMP) and stacked ABRs, and ABR for chained stimuli,
- c) Factors influencing ABR: Stimuli related, acquisition related, subject related
- d) Clinical applications

Unit 3: Middle Latency Auditory Evoked Potentials and Auditory Steady State Responses

- a) Acquisition and analysis of middle latency responses,
- b) Factors influencing middle latency responses: Stimuli related, acquisition related, subject related
- c) Acquisition and analysis of auditory steady state responses (ASSR)
- d) Factors influencing ASSR: Stimuli related, acquisition related, subject related
- e) Post auricular muscle responses
- f) Clinical applications

Unit 4: Cortical Auditory Evoked Potentials

- a) Overview of exogenous and endogenous cortical evoked potentials
- b) Acquisition and analysis of obligatory cortical auditory evoked potentials, acoustic change complex, T-complex, mismatch negativity, P300, N400, P600, CNV and other endogenous potentials
- c) Factors affecting exogenous and endogenous evoked potentials Stimuli related, acquisition related, subject related
- d) Clinical applications

Unit 5: Intraoperative monitoring

- a) Physiological tests useful in intraoperative monitoring of auditory function
- b) Effect of anesthetic agents on electrophysiological responses of the auditory system
- c) Recording auditory evoked potentials during surgery; requirements, patient preparation
- d) Guidelines for intraoperative monitoring
- e) Electroneurography

Recommended Reading

- Burkard, R.F., Don, M., & Eggermont, J.J. (Eds.) (2007). Auditory Evoked Potentials: Basic Principles & Applications. Baltimore: Lippincott Williams & Wilkins.
- Ferraro, J.A. (1997). Laboratory exercises in auditory evoked potentials. San Diego: Singular Publishing Group Inc.
- Hall, J.W. (1992). Handbook of Auditory Evoked Responses. Massachusetts: Allyn and Bacon.
- Hall, J.W. (2007). New Handbook of Auditory Evoked Responses. Boston: Pearson.
- Hall, J.W., & Mueller, H.G. (1997) Audiologists' Desk Reference. Volume 1: Diagnostic Audiology Principles, Procedures and Protocols. San Diego: Singular Publishing Group.
- Hood, L.J. (1998). Clinical applications of auditory brainstem response. San Diego: Singular Publishing Group Inc.
- Katz, J. (Ed.). (1994). Handbook of Clinical Audiology. Baltimore: Williams and Wilkins.
- Kilney, P.R. (2017). Audiologists handbook of intraoperative neurophysiological monitoring. San Diego: Plural Publishing Group
- McPherson, L.D. (1995). Late potentials of the auditory system. London: Singular Publishing Group.
- Picton, T. (2010). Human Auditory Evoked Potentials. San Diego: Plural Publishing Group.
- Rance, G (2008). Auditory Steady State Responses. San Diego: Plural Publishing Group

A 204: Advances in the Management of Hearing Loss

Hours - 60 : Marks - 100

Objectives: At the end of the course, the students should be able to

- a) understand the different amplification/assistive devices and their changing technology
- b) explain the strategies of device selection and optimization
- c) develop need-based programs and intervention strategies for persons with different types of hearing impairment across age groups, and
- d) to list specific needs and know psychosocial and communicative demands and strategies to solve these

Unit 1: Advances in Hearing Aid and Hearing Assistive Technology

- a) Application of recent advances in hearing aids and hearing assistive technology : Compression and expansion, directionality, advanced signal processing techniques including noise reduction algorithms, wireless technology, data logging, trainable hearing aids, occlusion reduction, application of nanotechnology in hearing aids, Personal amplification systems
- b) Techniques to control acoustic feedback, distortion, circuit noise: Electromagnetic interference – measurement, solutions; techniques to improve compatibility of hearing aids with mobile phones
- c) Application of LASER technology in ear mold production, ear mold modifications for enhancing listening comfort – physical and acoustic modifications
- d) Electroacoustic measurement of hearing aids: Variables affecting electroacoustic measurements and its implications
- f) International and Indian standards/legislations for hearing aids and ALDs.

Unit 2: Selection and Fitting of Hearing Aid and Hearing Assistive Devices

- a) Selection, verification and validation of hearing aids and hearing assistive devices: Pre-selection, selection and assessment of listening needs
- b) Objective procedures for hearing aid fitting (ABR, ALLR, ASSR and others):
- c) Hearing aid programming, optimization, verification and validation
- d) Hearing aid fitting for children : pre-selection, selection, verification and validation: Different protocols used
- e) Hearing aid fitting for persons with different types of hearing loss (Sudden hearing loss, unilateral hearing loss, High frequency hearing loss, Cochlear dead region)
- f) Future trends in hearing aids and HATs: Technology and fitting strategies

Unit 3: Speech Perception Through Hearing Aids

- a) Factors affecting speech perception through hearing aids and hearing devices: Auditory plasticity
- b) Methods to improve speech perception through hearing aids and hearing devices: Speech cue enhancement – spectral shape, duration, intensity, enhancement of CVR, speech simplification, re-synthesis, enhancement of perception of telephone speech
- c) Emerging technology for better speech perception
- d) Noise reduction algorithms and nanotechnology in hearing aids

Unit 4: Rehabilitation of Individuals with Hearing Impairment

- a) Counseling of users of hearing aid and hearing assistive devices: techniques: Realistic expectations, adjusting to hearing device, other management options
- b) Care and maintenance of hearing aid and hearing assistive devices
- c) Trouble shooting and fine tuning/optimization of hearing aids and assistive devices
- d) Management of children with hearing impairment: Criteria for selecting different auditory listening programs; criteria for transition from one method to the other as a child grows: Adapting AVT techniques for Indian languages and late identified children
- e) Providing group listening training activities for children having different listening skills
- f) Rehabilitation of adults and older adults: auditory listening / speech reading training for older adults: variables that affect the communication and the role of the communication partner: auditory plasticity: Planning training activities; assertiveness training
- g) Quality of life of hearing impaired and its enhancement: Outcomes of different management strategies across age groups: Methods and measures

Unit 5: Management of the children/adult with Multiple Disabilities and other Hearing Related Disorders

- a) Management of children and adults with multiply disability: hearing aid fitting considerations, strategies used and the outcome with different strategies for individuals with hearing impairment with visual problems; cognitive problems; neuro-motor problems: educational and vocational placement, role of caregivers and outcome measures
- b) Audiological management of tinnitus: characteristics, assessment of tinnitus, basis and theories of tinnitus, models related to tinnitus management: patho-physiological and neurophysiological model: overview to non-audiological management techniques for tinnitus
- c) Audiological management techniques for those with normal hearing and different degrees of hearing loss (TRT, counseling, others) and their outcomes
- d) Audiological management of persons with hyperacusis: Models related to hyperacusis management; overview to non-audiological management techniques for hyperacusis Audiological management techniques for normal hearing and different degrees of hearing loss and their outcomes

Recommended Reading

- Atcherson, S. R., Franklin, C. A., & Smith-Olinde, L. (2015). Hearing assistive and access technology. San Diego: Plural Publishing Inc.
- Dillon, H. (2012). Hearing Aids. 2nd Edn. Australia: Boomerang Press.
- Martini, A., Mazzoli, M., Read, A., & Stephens, D. (2001). Definitions, Protocols and Guidelines in Genetic Hearing Impairment. England: Whurr Publishers Ltd.
- Metz, M. J. (2014). Sandlin's textbook of hearing aid amplification. 3rd Edn. San Diego: Plural publishing Inc.
- Schaub, A. (2008). Digital hearing aids. New York: Thieme Medical publishers.
- Mueller, H. G., Rickettes, T. A., & Bentler, R. (2014). Modern hearing aids: Pre-fitting Testing and selection considerations. San Diego: Plural Publishing Inc.

- Sandlin, R.E. (1995). Handbook of Hearing aid amplification – clinical consideration and fitting practices. London: Singular Publishing Group.
- Tyler, R.S., &Schum, J. (1995). Assistive devices for persons with hearing impairment. United States of America: Allyn&Baccon.
- Cole, E.B., & Carol, F. (2007).Children with hearing loss- Developing Listening & Talking. United States of America: Plural Publishing Inc.
- Estabrooks, W. (2006). Auditory Verbal Therapy & Practice. United States: Alexander Graham Bell Association for the Deaf and Hard of Hearing Inc.
- Hull, R. H. (2014). Introduction to aural rehabilitation. 2nd edn. San Diego: Plural publishing Inc.
- Tye-Murray, N. (2015). Foundations of aural rehabilitation-Children, Adults & Their family members. 4th Edn. United States of America: Stamford, Cengage Learning.
- Baguley, D. M., &Andersson, G. (2007). Hyperacusis: Mechanisms, Diagnosis and Therapies. San Diego: Plural Publishing Inc.
- Hersh, M. A., & Johnson, M. A. (2003). Assistive Technology for the hearing-impaired, Deaf and Deaf-blind. Nottingham: Springer-Verlag London Ltd.
- Jastreboff, P.J., &Hazell, J.W.P. (2004). Tinnitus retraining therapy-implementing the Neurophysiological model. United Kingdom: Cambridge University Press.
- Johnson, C. E. (2012). Introduction to auditory rehabilitation: A contemporary issues approach. New Jersey: Pearson Education, Inc.
- Wong, L., &Hickson, L. (2012). Evidence-based practice in audiology: Evaluating interventions for children and adults with hearing impairment. San Diego: Plural Publishing Inc.

A 106 & A 205: Clinicals in Audiology

General considerations:

- a) The student should be able to carry out complete audiological evaluation and management of persons with hearing impairment.
- b) After completion of clinical postings, the student will have the ability to apply, show (in a clinical diary/log book), and perform the following on patients/clients:

Know-how

- a) Make appropriate changes in OAE protocols depending on the clinical / research needs
- b) Develop protocol for recording exogenous and endogenous auditory evoked potentials
- d) Integrate the results of audiological evaluation and correlate it to the possible pathophysiological/radiological findings
- e) Apply the latest technological advances available for persons with hearing impairment.
- f) Make appropriate modifications in hearing devices depending on the listening needs.
- g) Recommend appropriate aural rehabilitation program for persons with hearing impairment

Demonstrate

- a) Recording of exogenous and endogenous potentials
- b) Generation of stimuli for recording AEPs
- c) Analyze auditory evoked potential waveforms
- d) Electroacoustic measurement of different types of hearing aids
- e) Carry out ear mold modifications

Do

- a) Record OAEs, ABR for different stimuli and cortical auditory potentials on 5 persons with hearing loss
- b) Complete audiological evaluation on 5 persons with hearing loss and prepare a detailed report with appropriate recommendations
- c) Select and fit appropriate hearing devices to 10 individuals with different degree, configuration and type of hearing loss.
- d) Plan and carry out appropriate aural rehabilitation program for five children
- e) Evaluate and counsel/carry out appropriate audiological management for 5 persons with tinnitus.
- f) Carry out aided AEPs

Evaluation

- a) Internal evaluation shall be based on attendance, clinical diary, log book and learning conference.
- b) External evaluation: Spot test, OSCE, Record, Viva-voce, case work

Semester III

A 301 : Genetics of Hearing and Pediatric Audiology

Hours - 60 : Marks - 100

Objectives: After completing this course, the student will be able to

- a) understand the genetic basis for hearing loss
- b) understand the tests/procedures for identifying genes for hearing loss
- c) counsel parents or caregivers of children with genetic and non-genetic hearing loss
- d) carry out screening programs to identify hearing loss using appropriate protocols, and
- e) diagnose and manage hearing loss in children using appropriate tests/protocols and aural management procedures

Unit 1: Molecular Genetics for Audiologists

- a) Basic concepts of genetics
- b) Genes involved in hearing
- c) Gene localization methods, gene mapping

Unit 2: Genetic Hearing Loss

- a) Genetics of hearing impairment, gene database for hearing loss
- b) Genetic evaluation of persons/families with hearing loss, genetic screening
- c) Genotypes and phenotypes of non syndromic hearing loss
- d) Genotypes and phenotypes of syndromic hearing loss
- e) Genetic counseling

Unit 3: Hearing Screening

- a) Neonatal and infant hearing screening, international and national Protocols to identify middle ear disorders; sensory and neural hearing loss
- b) Screening for hearing loss in school children
- c) Screening for central auditory processing disorders in school children
- d) Issues related to hearing screening

Unit 4: Pediatric Hearing Evaluation

- a) Etiology of hearing loss in children
- b) Behavioral tests of hearing evaluation for children
- c) Physiological tests of hearing evaluation for children
- d) Assessing hearing in children with associated problems
- e) Speech audiometry in children
- f) Development of tests for speech audiometry in children
- g) Issues related to assessment and diagnosis of hearing loss in children

Unit 5: Team Approach in diagnosis of hearing loss in children

- a) Integration of results of behavioral and electrophysiological assessment of hearing
- b) Correlating results of audiological evaluation with those of otolaryngological, pediatric, psychological and speech-language evaluation
- c) Problems faced by children with hearing loss in preschool and school setup
- d) Challenges/problems faced by children with conductive hearing loss and auditory processing problems
- e) Counseling parents/caregivers regarding hearing impairment, sequel and management
- f) Counseling and management of children with unilateral hearing loss and mild hearing loss

Recommended Reading

- Bess, F.H. & Gravel, J.S. (2006). Foundations of Pediatric Audiology. San Diego: Plural Publishing Inc
- Driscoll, C. & McPherson, B (2010). Newborn Screening Systems: The complete perspective. San Diego: Plural Publishing Inc
- Martini, A, et al.(1996) Genetics and Hearing impairment, London: Whurr Publishers.
- McCreery, R.W. & Walker, E.A. (2017). Pediatric Amplification: Enhancing Auditory Access. San Diego: Plural Publishing Inc
- Northern, J. L. & Downs, M. P. (2014). Hearing in Children. San Diego: Plural Publishing Inc
- Shprintzen, R.J. (1997). Genetic, Syndromes and communication disorders. San Diego: Singular Publishing Group Inc.
- Willems P J. (2004). Genetic Hearing loss. USA: Marcel Deckeer Inc.
- Tharpe, A.M. & Seewald, R. (2016). Comprehensive Handbook of Pediatric Audiology. San Diego: Plural Publishing Inc
- Toriello H V., & Smith S D. (2013). Hereditary Hearing Loss and Its Syndromes. United Kingdom: Oxford University Press.
- Flexer C A (2008). Pediatric Audiology: Diagnosis, Technology, and Management. New York: Thieme Medical Publishers.

A 302: Implantable Auditory Devices

Hours - 60 : Marks - 100

Objectives: At the end of the course, the student should be able to

- a) identify and describe the types of implantable hearing devices,
- b) describe the purpose of different components of implantable hearing devices,
- c) determine candidacy for implantable hearing devices,
- d) assess benefits from implantable hearing devices and guide the clinical population, and
- e) understand and contribute to formulation Government policies and schemes relating to implantable hearing devices

Unit 1: Development of Technology, Criteria/ Candidacy and Program

- a) Candidacy for bone conduction implantable devices (BCID), middle ear implants (MEI), cochlear implant (CI), auditory brainstem implant (ABI) and mid brain implant (MBI): evidence from research
- b) Comprehensive Candidacy Assessment for implantable hearing devices (IHD- Audiological and non-audiological).
- c) Safety standards and regulation for IHD.
- d) State and central Government schemes for cochlear implants and other implantable devices.
- e) Pre-requisite to start aIHD program
- f) Comprehensive policy issues relating to IHD

Unit2: Bone Conduction Implantable Devicesand Middle Ear Implants

- a) Types of BCID and components (per-cutaneous, trans-cutaneous and intra-oral)
- b) Types of MEI and components
- c) Intra-operative and post-operative measurements/assessment for device function (troubleshooting) and performance outcomes
- d) Programming BCID and MEI
- e) Contra indications and management of device failures and poor performance.
- f) Limitations and future development/requirement

Unit 3: Cochlear Implants

- a) Concepts and types of ci : external components (sound processor- body worn, BTE, off the ear); internal component (electrode type/design, MRI compatibility & reliability);totally implantable cochlear implants.
- b) Expanding criteria- audiological and non-audiological assessment: single sided deafness, ski sloping SN hearing loss, bilateral asymmetric HL; cochlea/nerve anomaly(classification), auditory neuropathy spectrum disorder (ANSD) and multiple disabilities.
- c) Speech/Sound Coding Strategies: Within and across devices; Evidences from research and critical analysis of each strategy; Features for Enhancing Speech and Music perception.
- d) Surgical procedures: posterior tympanotomy, varia technique, hearing preservation technique; surgical complications and management

- e) Intra-operative measurement: device function (impedance/ voltage/ compliance telemetry); patient function (eCAP, eSRT, eABR and facial nerve monitoring); Special consideration in anomalous cochlear/nerve, ANSD and multiple disabilities.

Unit 4: Programming Cochlear Implants

- a) Psychophysics of programming: parameters (pulse width, rate of stimulation, frequency allocation/ re-allocation, map law); pre-requisites for mapping: pre-implant radiological report, post-implant radiological report; discharge report of surgeon; non-physiological objective measures (electrode impedance, compliance, electrode voltage); special considerations in cochlea/nerve anomaly, ANSD, multiple disabilities and SSD; Effect of map parameters on perception of loudness, pitch perception, gap,
- b) Programming technique: evidences from research: behavioral maps; objective maps (eCAP, eSRT&eABR based programming); evidence and target based programming (artificial intelligence); self-programming.
- c) Measuring performance and MAP optimization: assessment of benefit: speech and non-speech; electrophysiological measures (EABR and other evoked potentials); optimization of: hearing aid in the contralateral ear for bimodal implants; bilateral cochlear implants; electroacoustic stimulation and SSD.
- d) Complications: identifying and managing device failures; identifying and managing infection, magnet migration, electrode extrusion; identifying and managing poor performance; decision making in subjects with poor performance; special consideration in revision implantation; outcome audit.
- e) Limitations and future developments/requirements (device, techniques and procedures)

Unit 5: Auditory Brainstem Implant (ABI) and Auditory Midbrain Implant (MBI)

- a) Pre-op (ABI and MBI): candidacy for children and adult; audiological and non-audiological assessment; evidences from research for predicting outcome; counseling and expectations; device type and components
- b) Intra-op (ABI and MBI): Surgical procedures – overview; eABR, cranial nerve monitoring; decision making.
- c) Post-op: programming ABI (subjective and objective methods) and technique for pitch ranking, identifying auditory and non-auditory electrodes); MAP optimization (pitch, loudness, auditory and non-auditory sensation); techniques to identify auditory and non-auditory sensation; assessment of benefit: speech and non-speech; role of eABR, aided cortical potentials, PET and fNIRS in programming and monitoring outcomes.
- d) Managing and monitoring subject with ABI: rehabilitation strategy; identifying and managing complications (device failure, infection, trauma, device migration, radio imaging); identify poor performance- auditing outcome; decision making in complications and poor performance

Recommended Reading

- Boheim, K. (2010). Active middle ear implants. Basel: Karger.
- Clark, G., (2003). Cochlear implants - fundamentals & Applications. New York: Springer – AIP Press.
- Cooper, H. (1995). Cochlear Implants –A practical guide. Delhi: AITBS Publishers.
- Hughes, M. L. (2013). Objective measures in cochlear implants. San Diego: Plural Publishing Inc.

- Kirwin, S.H. (2014). Cochlear Implants: Technological advances, psychological/social impacts and long-term effectiveness. Ney York: Nova Biomedical.
- Kompis, M., &Caversaccio, M.D. (Eds.). (2011). Implantable Bone Conduction Hearing Aids. (New Delhi) Switzerland: Karger.
- Lim, H. H., Lenarz, M., &Lenarz, T., (2009). Auditory midbrain implant: A review. Trends in Amplification, Sept. 13(3), 149–180.
- Manenkar, G. (2014). Implantable hearing devices other than cochlear implants. New D Suzuki, J.I, Tokyo (1988). Advances in audiology-Middle ear implant: Implantable hearing aids. Switzerland: Karger. Delhi: Springer-Verlag.
- Niparko, J. K. (2009). Cochlear Implants: Principles and practices. 2nd Edn. Philadelphia: Lippincott: Williams & Wilkins.
- Wolfe, J., & Schafer, E. C. (2010). Programming Cochlear Implants. San Diego: Plural Publishing Inc.

A 303: Speech Perception

Marks -100: Hours - 60

Objectives: At the end of the course, the student should be able to

- a) explain coding of speech in the auditory pathway in normal hearing and hearing impaired individuals,
- b) critically evaluate theories of speech perception and methods to synthesis speech,
- c) explain speech perception in relation to short term memory,
- d) describe aspects of dichotic speech perception.

Unit 1: Theories of Speech Perception

- a) Basic concepts of speech perception; hearing, listening, perception and comprehension; acoustic cues of different classes of speech sounds
- b) Definition and concept of categorical and continuous speech perception
- b) Normalization in speech perception: Definition and methods used for normalization of vowels and consonants
- c) Coding of speech in the auditory pathway - cochlea, auditory nerve and the central auditory pathway
- d) Theories of speech perception (acoustic, neurological, auditory, motor, analysis-by-synthesis, dual stream, reverse hierarchy theory)

Unit 2: Perceptual Cues for Vowels and Consonants

- a) Perception of vowels and diphthongs in normal - major and minor cues
- b) Perception of consonants in normals: Major and minor cues to identify place, manner and voicing features of stops, fricatives, affricates, nasals
- c) Perception of vowels and consonants in the persons with hearing impairment
- d) Perception of vowels and consonants through amplification and implantable devices.

Unit 3: Speech Perception of Segmental and Suprasegmental Features

- a) Effects of co-articulation on speech perception:
- b) Perception of segmental features in normal hearing individuals
- c) Perception of suprasegmental cues in normal hearing individuals
- d) Perception of segmental and suprasegmental cues in persons with hearing impairment

Unit 4: Factors related to Speech Perception

- a) Memory and speech perception: Stages of memory, coding and capacity at the different stages; Models of short term memory: Dual coding Model, Modal model, A model for auditory memory and contrast, Working memory model; Role of short term memory in the perception of consonants and vowels
- b) Dichotic listening: Theories and physiological bases: Testing of dichotic listening and the clinical significance of the results; Factors influencing dichotic perception
- c) Music perception: Methods of study of perception of music; Perception of music through amplification and implantable devices.

Unit 5: General issues related to speech perception

- a) Infant perception: theories of infant speech perception (universal theory, attunement theory, perceptual learning theory, maturational theory, perceptual magnetic theory); methods of studying infant speech perception; perception of consonants and vowels in infants, and comparison with adults
- b) Speech perception in animals: methods of study of speech perception in animals; perception of consonants and vowels; categorical perception and normalization; animal vs. human perception; need for study of speech perception in animals
- c) Methods to study speech perception: EEG/electrophysiological and behavioral methods to study speech perception; study designs; role of cognition in speech perception.

Recommended Reading

- Raphael, L. J., Borden, G. J., & Harris K. S. (2011). *Speech Science Primer: Physiology, Acoustics, and Perception of Speech* (Sixth edition). Baltimore, MD: LWW.
- Greenberg, S., Ainsworth, W. A., & Fay, R. R. (Eds.). (2004). *Speech Processing in the Auditory System*. New York: Springer.
- Mildner, V. (2007). *The Cognitive Neuroscience of Human Communication* (1 edition). New York: Psychology Press.
- Pickett, J. M. (1998). *The Acoustics of Speech Communication: Fundamentals, Speech Perception Theory, and Technology* (1 edition). Boston: Pearson
- Pisoni, D. B., & Remez, R. E. (Eds.). (2005). *The Handbook of Speech Perception*. Blackwell Publishing Ltd.
- Studdert-Kennedy, M., & Mattingly, I. G. (Eds.). (1990). *Modularity and the Motor theory of Speech Perception: Proceedings of A Conference To Honor Alvin M. Liberman* (1 edition). Hillsdale, N.J: Psychology Press.
- Sanders, D.A (1977). *Auditory perception of speech - an introduction to principle and problems*. New Jersey: Prentice Hall
- Tatham, M., & Morton, K. (2011). *A Guide to Speech Production and Perception* (1 edition). Edinburgh: Edinburgh University Press
- Kent, R. D. (2002). *Acoustic Analysis of Speech* (2nd Revised edition edition). Australia ; United States: Delmar Cengage Learning.

A 304: Auditory Processing Disorders

60 hours: 100 marks

Objectives: At the end of the course, the students should be able to

- a) diagnose and differentially diagnose auditory processing disorders (APDs) and explain their physiological bases,
- b) administer different tests for diagnosis and interpret the findings including correlation with findings from imaging and cognitive studies,
- c) institute screening and public education programs in different setups on APDs,
- d) identify and explain factors influencing assessment of APDs,
- e) advise clinical clientele on management of APDS including guidance on aids and appliances, and
- f) advise and liaise with members of the management team like neurologists, neurosurgeons on the diagnosis as well as management of APDs.

Unit 1: Introduction to Auditory Processing Disorders (APDs)

- a) Terminologies and definitions of APD
- b) Underlying neurobiological and neurochemical (genetic) correlates
- c) Relationship between neural maturation - degeneration and auditory processing
- d) Models to explain auditory and spoken language processing: Relationship between the two
- d) Methods of studying auditory processing - Animal studies
- e) Various disorders that lead to APDs (Syndromes, TBIetc): Signs, symptoms and classification
- f) Developmental communication disorders and APDs

Unit 2: Assessment of APDs (Behavioral)

- a) Overview of behavioral assessment in APDs
- b) Screening for APDs: questionnaires, checklists and tests
- c) Dichotic test (linguistic and non-linguistic)
- d) Monaural tests (linguistic and non-linguistic)
- e) Psychoacoustic tests for assessment of APDs

Unit 3: Assessment of APDs (Electrophysiological)

- a) Electrophysiological measures and their clinical applications in diagnosing APDs
 - i. Endogenous potentials
 - ii. Exogenous potentials
- b) Correlation between behavioral and electrophysiological measures: implications for diagnosis
- c) Factors influencing assessment of APDs: behavioral and electrophysiological

Unit 4: Management of APDs

- a) Management of APDs in children and adults
- b) Direct remediation techniques and meta-cognitive and meta-linguistic approaches

- c) Auditory perceptual training and its methods, applicability and outcome.
- d) Evidence based approach and treatment efficacy
- e) Multidisciplinary approach
- f) Signal enhancement and room acoustics
- g) Aids and appliances - indication and outcome
- h) Factors affecting management of APDs

Unit 5: Team work in the diagnosis and management of APDs

- a) Electrophysiological and radiological correlates for APDs: implications in management
- b) Imaging and cognitive studies in APDs
- c) Diagnosis and differential diagnosis
- d) Development of APD test materials (linguistic and non-linguistic)
- e) Open source software for developing diagnostic tests and intervention modules

Recommended Reading

- American Speech-Language-Hearing Association. (2005). (Central) auditory processing disorder (technical report) Retrieved from <http://www.asha.org/members/default-journals/default>.
- Geffner, D., & Ross-Swain, D. (2013). Auditory Processing Disorders: Assessment, Management, and Treatment. 2nd Edn. San Diego, Plural Publishing Inc.
- Musiek, F. E., Baran, J. A., Shinn, J. B., & Jones, R. O. (2012). Disorders of the Auditory System. San Diego: Plural Publishing Inc.
- Katz J., .ndE ht7 .ygoIoiduA lacinilC fo koobdnaH .(2014) .K ,hsilgnE & .M nisahC snikliW & smailliW ,ttocnippiL :aihpledalihP.
- Musiek, F. E., &Chermak, G. D. (2014). Handbook Of Central Auditory Processing Disorder: Auditory Neuroscience And Diagnosis. 2nd Edn, Vol: 1. San Diego: Plural Publishing Group Inc.
- Chermak, G. D., &Musiek, F. E. (2006). Handbook of (Central) Auditory Processing Disorders – Comprehensive Intervention. Vol. II. San Diego: Singular Publishing Group Inc.
- Chermak, G. D., &Musiek, F. E. (2002). Auditory Training: Principles and Approaches for Remediating and Managing Auditory Processing Disorders. Seminars In Hearing, 23(4), 297-308.

A 305 : Vestibular System and its Disorders

60 hours: 100 marks

Objectives: After completing this course, the student should be able to

- a) describe the functioning of the balance and vestibular system
- b) explain the disorders of the vestibular system
- c) assess vestibular system using appropriate tests/protocols
- d) recommend appropriate management option for persons with vestibular dysfunction
- e) counsel and guide the clinical clientele with vestibular disorders on quality of life etc.

Unit 1: Anatomy and Physiology of the Vestibular System

- a) Peripheral vestibular system including semicircular canals, utricle, saccule and vestibular nerve
- b) Central vestibular pathway (brainstem, cerebellum, cortex)
- c) Reflexes involving vestibular system like vestibuloocular reflex, vestibulo spinal reflex and vestibulo colic reflex advise
- d) Other systems involved in maintenance of balance like proprioceptive system, visual system etc.

Unit 2: Assessment of the Vestibular System

- a) Techniques and Principles of electronystagmography / videonystagmography, Rotatory chair test, Video Head Impulse test, Sclera Coil search test, Vestibular Evoked Myogenic Potentials: cVEMP, oVEMP, Dynamic Posturography, Craniocorpography, Subjective visual vertical horizontal tests, Vestibular autorotation tests
- b) Screening for vestibular disorders
- c) Questionnaires to assess quality of life in persons with vertigo

Unit 3: Pathophysiology of Vestibular Disorders

- a) Peripheral Vestibular Disorders like Benign paroxysmal positional vertigo, Meniere's disease, Vestibular neuritis, Labyrinthitis, Ototoxicity, vestibular neuropathy
- b) Perilymph fistula, Superior semicircular canal dehiscence, Auditory neuropathy spectrum disorders, Vestibular schwannomas
- c) Central Vestibular disorders like Generalized neuropathy involving multiple systems, Multiple sclerosis, Cranial tumors, Cerebro-vascular accidents involving vestibular cortex and cerebellum, Vertebro-basilar insufficiency, Migraine, Meningitis and encephalitis
- d) Vestibular disorders in children
- e) Age related changes in vestibular system

Unit 4: Profiling Vestibular Disorders using Audio Vestibular Test Battery

- a) Benign paroxysmal positional vertigo, Meniere's disease, Vestibular neuritis, Labyrinthitis, Ototoxicity, Perilymph fistula, Superior semicircular canal dehiscence, Auditory neuropathy spectrum disorders, Vestibular schwannomas, Multiple sclerosis, Cranial tumors, , vestibular neuropathy
- b) Quality of life in persons with vestibular disorders

Unit 5: Management of Persons with Vestibular Disorders

- a) Medical management
- b) Surgical management
- c) Vestibular rehabilitation:
 - i. Repositioning Maneuvers
 - ii. Adaptation Exercises
 - iii. Habituation Exercises
 - iv. Imbalance Exercises
- d) Special considerations for rehabilitation of children with vestibular problems
- e) Vestibular implants

Recommended Reading

- Ackley, R. S., Decker, T. N., & Limb, C. J. (2007). An essential guide to hearing and balance disorders. New Jersey: Lawrence Erlbaum Associates Inc.
- Biswas, A. (2009). Clinical audio-vestibulometry for otologists and neurologists. 4th Ed. Mumbai, India: Bhalani Publishing House.
- Desmond, A. L. (2004). Vestibular function: evaluation and treatment. New York: Thieme Medical Publishers Inc.
- Hughes, G. B., & Pensak, M. L. (2007). Clinical Otology. New York: Thieme Publishers, Inc.
- Jackler, R. K., & Brackmann, D. E. (2005). Neurotology. 2nd Ed. Philadelphia: Elsevier Mosby.
- Jacobson, G. P., & Shepard, N. T. (2014). Balance function assessment and management. San Diego: CA: Plural Publishing Inc.
- Kaga, K. (2014). Vertigo and balance disorders in children. Tokyo, Japan: Springer.
- McCaslin, D. L. (2013). Electronystagmography and videonystagmography ENG / VNG. San Diego: Plural Publishing Inc.
- Murofushi, T., & Kaga, K. (2009). Vestibular evoked myogenic potential- its basics and clinical applications. Tokyo, Japan: Springer.
- Myers, B.L. (2011). Vestibular Learning Manual. San Diego: Plural Publishing Inc.
- O'Reille, R.C., Morlet, T. & Kushing, S.L (2013). Manual of pediatric balance disorders. San Diego: Plural Publishing Inc.
- Ruckienstien, M & Davis, S. (2014). Rapid interpretation of balance function tests. San Diego: Plural Publishing Inc.
- Shepard, N. T., & Telian, S. A. (1997). Practical management of the balance disorders patient. New York: Thomson Delmar Learning.

A 401 : Audiology in Practice

Marks - 100 : Hours - 60

Objectives: At the end of the course, the students should be able

- a) know the role of an audiologist in different set-ups.
- b) liaise with other professionals in setting-up an audiology clinic.
- c) audit audiology practices in existing set-ups.
- d) implement acts and legislations relating to persons with hearing impairment,
- e) advise Governments and other agencies on the formulation of policies and legislative acts relating to hearing disability
- f) understand the legal implications of practice in audiology.

Unit 1: Scope of Practice, Laws, Regulations and Professional Ethics

- a) Scope of practice in global and Indian scenario
- b) Professional ethics
- c) Existing acts, legislations, policies related to persons with communication impairment
- d) Role of audiologist in the formulation of acts, regulations and policies
- e) Implementation of acts, legislations, policies and welfare measures relating to persons with hearing impairment
- f) Advocacy groups and rights of citizens
- g) National and international standards related to audiology
- h) Welfare measures provided by State and Central Government for persons with hearing impairment

Unit 2: Specialized Programs in Audiology

- a) Need for specialized programs in audiology: Geriatric and persons with multiple disability
- b) Forensic audiology
- d) Health, wellness, and health care - Health promotion and disease prevention, quality of life and healthcare finances
- e) Disability-friendly environment including public education
- f) Prevention and early identification programs including societal participation

Unit 3: Service Delivery Models in Audiology

- a) Services in different medical / rehabilitation/ research /educational set ups
- b) School based services pertaining to regular and special schools
- c) Community based practice in rural and urban areas
- d) Family empowerment programs
- e) Home based delivery of services
- f) Autonomous practice in audiology
- g) Apps for hearing screening/assessment

Unit 4: Tele-practice in Audiology

- a) Information and communication technology in Audiology practice
- b) Infrastructure for video-conferencing and tele-practice in audiology
- c) Techniques/principles of remote testing for screening and diagnostic assessment for hearing, intervention and counseling
- d) Challenges and limitations of tele-practice in audiology in screening, assessment and evaluation, selection of aids and appliances, therapeutics and counseling.

Unit 5: Issues in Audiology Practice

- a) Medico-legal issues,
- b) Entrepreneurship and planning to set up private practice/clinic for audiology practice: Clinical ethics
- b) Documentation in audiology practice: clinical / demographic data, database management and storage
- c) ICF framework for documentation / reports
- d) Quality control and auditing in audiology practice
- e) Documenting and implementing evidence based practice in audiology
- f) Understanding team approach: Work in cohesion with other professionals
- g) Information resources in audiology including books and journals, both electronic and print - Databases

Recommended Reading

- College of Audiologists and Speech-Language Pathologists of Ontario.(2004). Use of Telepractice Approaches in Providing Services to Patients/Clients.
- Dobie, R.A (2015). Medico legal evaluation of hearing loss. San Diego: Plural Publishing Inc
- Dunn, H.H., Roeser, R.J., & Valente, M. (2000).Audiology- practice management. New York: Thieme Medical Publishers Inc.
- King, P.F. et al., (1993). Assessment of hearing disability- guidelines for medico-legal practice, London: Whurr Publishers.
- Ramachandran,V&Stach, B.A. (2013). Professional Communication Audiology. San Diego: Plural Publishing Inc
- Resource Guide for Educational/Pediatric Audiologists. Retrieved from <http://www.asha.org/aud/pediatric-ed>
- Rizzo, S.R., &Trudean, M.D. (1994).Clinical administration in audiology and speech language pathology. San Diego: Singular Publishing Group Inc.
- Rushbrooks, E & Houston, K.T. (2015).Telepractice in Audiology. San Diego: Plural Publishing
- Stephen, R.R., Jr., Trudeau, D.M. (Eds.) (1994). Clinical administration in audiology & speech language pathology. San Diego: Singular Publishing Group Inc.
- Taylor, B. (2015). Marketing in an Audiology practice.San Diego: CA: Plural Publishing Inc.
- www.rehabcouncil.nic.in (website of Rehabilitation Council of India)
- www.disabilityaffairs.gov.in (website of Department of Empowerment with Disabilities)
- Acts relating to disability, particularly hearing, enacted by the Indian Parliament.

A 306 & A 403 Clinicals in Audiology

General considerations

- a) The student should be able to carry out complete audiological evaluation and management of persons with hearing impairment.
- b) After completion of clinical postings, the student will have the ability to apply, show (in a clinical diary/log book), and perform the following on patients/clients:

Know-how

- a) Identify, manage and counsel persons with genetic hearing loss
- b) Choose/modify appropriate tests/protocols for evaluating children and multiply disabled
- c) Choose appropriate tests/protocols for evaluation and management of persons with giddiness
- d) Develop language / culture sensitive APD tests
- e) Advise clinical clientele on the latest implantable devices available for persons with hearing impairment.
- f) Set up audiology clinics / centers in different set ups
- g) Procedure for certification of persons with disability
- h) Financial planning and insurance policies

Demonstrate

- a) Administration of different tests for APD
- b) Plan management for 5 persons with APD/at risk for APD
- c) Administration of different tests for vestibular assessment
- d) Troubleshoot cochlear implants

Do

- a) Administer complete audiological test battery, behavioural and electrophysiological tests on 10 children with hearing loss and prepare a report explaining the results of the test and make appropriate recommendations
- b) Administer APD test battery on 5 persons with APD symptoms and prepare a report
- c) Administer complete vestibular test battery on 5 persons with giddiness
- d) Carry out pre-implant counseling for 5 persons with hearing loss
- e) Carry out mapping for 5 persons using cochlear implants
- f) Counsel 5 persons regarding use and maintenance of cochlear implants

Evaluation

- a) Internal evaluation shall be based on attendance, clinical diary, log book and learning conference.
- b) External evaluation: Spot test, OSCE, Record, Viva-voce, case work

Expert Committee for development of training programmes for the professionals/personnel, namely, Audiologists & Speech Pathologists, Hearing Aid and Earmould Technicians

Dr. M. Jayaram, Chairperson, Expert Committee, Department of Audiology NIMHANS, Hosur Road, Bangalore-560029
Dr. Manisha Aggarwal, House No.10, Sector-1, Ambala City, Haryana-134003
Dr. S R Savithri, Director, All India Institute of Speech & Hearing, Manasagangothri, Mysore-570006
The Dean/Nominee, Maulana Azad Medical College, Delhi Gate, New Delhi -110002
Dr. Ajith Kumar Uppunda, Reader, Department of Audiology, All India Institute of Speech and Hearing, Mysore-570006
Dr. A K Sinha, Director, Ali Yavar Jung National Institute for the Hearing Handicapped, K C Marg, Bandra (W), Mumbai-400 050
Dr. B. Rajashekhar, Dean, College of Allied Health Sciences, Manipal University, Manipal-576 119
Dr. Prakash Boominathan, Professor, Dept. of Speech Language & Hearing Sciences, Sri Ramachandra University, Porur, Chennai-600116
Dr. M.N. Nagaraja, 3588, 70th Cross, II Stage, Kumaraswamy Layout, Bangalore - 560078
Dr. C S Vaneja, Professor and HOD., Bharati Vidyapeeth Deemed University, School of Audiology and Speech Language Pathology, 4th Floor of Homeopathy Hospital, Dhankawadi, Pune - 411043
Dr. (Mrs.) Prathibha Karanth, # 224, 6th 'A' Main, II Block, HRBR Layout, Bangalore 560043
Mr. Nachiketa Rout, National Institute for Empowerment of Persons with Multiple Disabilities, East Coast Road, Muttukadu, Kovalam Post, Chennai – 603 112
Mr. Lanu W Aimol, Composite Regional Centre for PwDs, PMRT Building, Guwahati Medical College Hospital Campus, Guwahati ,781032
Shri Rajiv Jalvi, Ali Yavar Jung National Institute of Speech & Hearing Disabilities, K C Marg, Bandra (W)Mumbai-400050
Shri Indranil Chatterjee, AYJNISHD, ERC, B.T.Road, Bon Hooghly,Kolkata-700090
Shri Ranjith R, MERF Institute of Speech and Hearing, Old No. 1/1, New No.1, South Canal Bank Road, Mandavelipakkam, Chennai-600028
S K Srivastava, Member Secretary, RCI - Member(Ex-Officio)
Suman Kumar, Deputy Director (Prog.), RCI, Convener (Ex-officio)

Curriculum Framework

Master of Science (Speech-Language Pathology)-M.Sc. (SLP)

**Norms, Guidelines and
Course Content**

**Effective from Academic Session 2018-19
Two Years Duration**



Rehabilitation Council of India B-22,
Qutab Institutional Area,
New Delhi - 110 016

Email: rehabstd@nde.vsnl.net.in, rehcouncil_delhi@bol.net.in

www.rehabcouncil.nic.in

Master of Science (Speech-Language Pathology)

Regulations, norms, scheme of examination and curriculum - 2017

(Semester scheme)

1.0 Name of the course offered

The nomenclature of the program shall be Master of Science (Speech-Language Pathology). M.Sc. (SLP) shall be the short form.

2.0 Objectives of the M.Sc. (SLP) program

The objectives of the M.Sc. (SLP) program are to equip the students with knowledge and skills to

- function as teachers and researchers in institutions of higher learning,
- diagnose and manage disorders of speech, language, and swallowing across life span,
- counsel and guide persons with disorders of speech, language and swallowing as well as their family members,
- implement rehabilitation programs for persons with speech, language and swallowing disorders,
- to function as the disability certification authority in the field,
- liaise with professionals in allied fields and other stake holders,
- implement prevention and public education programs,
- undertake advocacy measures on behalf of and for persons with speech, language and swallowing disorders,
- advise government and other institutions on legal and policy issues related to persons with communication disorders, and
- to establish and administer institutions of higher learning.

3.0 Duration of the program

a) The program shall be of 4 semesters (2 academic years) and should be completed within 4 years from the date of admission.

b) An academic year consists of two semesters, and each semester shall extend over a minimum period of sixteen weeks excluding examination days. The semesters shall be spread out as follows:

Odd semesters – 1& 3

July – November

Even semesters – 2& 4

January – May

c) There shall be examination at the end of each semester. There shall be a vacation of minimum 2 weeks after the examinations at the end of odd semesters and 4 weeks after the examinations at the end of even semesters.

4.0 Medium of instruction

Medium of instruction shall be English

5.0 Eligibility for admission

- 5.1 Candidates with BASLP/B.Sc.(Speech & Hearing) degree of any recognised university by the Rehabilitation Council of India with a minimum of 55% aggregate marks. ¹
- 5.2 Relaxation in the qualifying marks for designated categories of students shall be as per rules and regulations of respective University / State / Union Territories or the Central Government.
- 5.3 No age bar.

6.0 Program Structure

Time structure of the program shall be as follows:

Semesters		4	
Weeks per Semester		16	
Days per week		5	80 days per semester
Hours per day		7	560 hours per semester
Semester 1	Theory	5 papers x 60 hours	300 hours
	Clinical		240 hours
	Others		20 hours
Semester 2	Theory	4 papers x 60 hours	240 hours
	Clinicals		240 hours
	Others		80 hours
Semester 3	Theory	5 papers x 60 hours	300 hours
	Clinicals		160 hours
	Dissertation		80 hours
	Others		20 hours
Semester 4	Theory	1 paper x 60 hours	60 hours
	Clinicals		160 hours
	Dissertation		320 hours
	Others		20 hours
Theory		300 + 240 + 300 + 60	900 hours
Clinicals		240 + 240 + 160 + 160	800 hours
Dissertation		0 + 0 + 80 + 320	400 hours
Others		20 + 80 + 20 + 20	140 hours
Total			2240 hours

7.0 Attendance

- 7.1 Minimum attendance shall be as stipulated by the respective University of the students. However, attendance shall not be less than 80% in theory and 90% in Clinicals in each semester for students to be eligible to appear for examination at the end of each semester.

¹ Modified as approved in 43rd General Council of Rehabilitation Council of India in its meeting held on 16th February 2021 vide notification no. 2-6/ASLP/2003/RCI dated 7 May, 2021.

7.2 Candidates who cannot appear for examination for want of attendance will be declared failed and will have to repeat the particular semester to be eligible to appear for exams subsequently.

7.3 Condonation of shortage of attendance in genuine cases to a maximum of 5% shall be from the Vice-Chancellor of the respective University where the candidates are studying.

8.0 Examination Pattern

8.1 The examination pattern and papers shall be as shown in the table below:

	Subject	Marks		
		Exam	IA	Total
SLP101	Research Methods, Epidemiology and Statistics	80	20	100
SLP102	Speech Science and Speech Production	80	20	100
SLP103	Augmentative and Alternative Communication	80	20	100
SLP104	Neurobiology of Speech-language and Cognition	80	20	100
SLP105	Clinical Linguistics & Multilingual Issues	80	20	100
SLP106	Clinicals (Internal)	80	20	100
SLP201	Advances in Speech Sound Disorders	80	20	100
SLP202	Voice : Science and Disorders	80	20	100
SLP203	Disorders of Fluency	80	20	100
SLP204	Language Disorders in Children	80	20	100
SLP205	Clinicals (External)	100	00	100
SLP301	Neurogenic Speech Disorders	80	20	100
SLP302	Dysphagia	80	20	100
SLP303	Aphasia	80	20	100
SLP304	Language and Literacy Disorders	80	20	100
SLP305	Cognitive Communication Disorders	80	20	100
SLP306	Clinicals (Internal)	80	20	100
SLP401	Practices in Speech-language Pathology	80	20	100
SLP402	Dissertation	80	20	100
SLP403	Clinicals (External)	100	00	100
		1640	360	2000

8.2 Course content shall be as in **Annexure 2**

8.3 Clinical examinations (for SLP106 and SLP306) shall be conducted by the designated internal faculty of the department at the end of 1st and 3rd semester. IA marks shall be awarded by all the faculty of the department on the basis of the assessment of the candidates' work throughout the particular semester.

8.4 Clinical examinations for SLP 205 and SLP 403 will be conducted by external examiner(s) at the end of the 2nd and 4th semester, respectively. Clinical examination shall be with clinical population like in medical profession. The

examiners shall also evaluate records of clinical and practical work of the students.

- 8.5 An internal faculty member can assist the external examiner(s) in SLP 205 and SLP 403 Clinicals (External), but shall not award marks.

9.0 Dissertation

- 9.1 Students shall complete a dissertation in the 3rd and 4th semester of the course and shall submit the same at the end of 4th semester before final examination. An external examiner shall assess the dissertation for 80 marks while the guide shall assess the performance of the candidate for 20 marks (internal assessment). The dissertation will be rated for a total of 100 marks (80 +20). Candidates who fail to submit their dissertation on or before the stipulated date shall not be permitted to appear for the final semester examination.

10.0 Criteria for passing

- 10.1 The student is required to obtain a minimum of 50% in each of the theory papers, internal assessment, and clinical exams, and dissertation for a pass.
- 10.2 Students will have to pass the clinical examination of the given semester to proceed to the next semester.
- 10.3 Carry-over of papers: Maximum number of attempts for any paper / clinical practicum / dissertation shall be three inclusive of first attempt. There shall be no supplementary examination.

11.0 Board of Examiners

- 11.1 There shall be a Board of Examiners for scrutinizing and approving the question papers as well as scheme of valuation
- 11.2 Fifty percent of the members in the Board of Examiners shall be from outside the institution.

12.0 Award of Degree

The University shall award the degree and issue certificate only after the candidates successfully complete all the examinations stipulated.

13.0 Infrastructure for starting the course

Only institutions who have conducted at least two batches of B.ASLP programs (5 years) and have the infrastructure as given in **Annexure 1** shall be permitted hereafter to offer Masters' program in Speech-Language Pathology, after due formalities.

14.0 Others

- 14.1 On all other issues not mentioned in these rules and regulations like the pattern of question paper, grading, award of grace marks, and declaration of rank, among others, the rules and regulations of the respective University shall prevail.
- 14.2 These revised regulations will apply to students admitted for the academic year 2018-19 and onwards.

**Infrastructure requirements for M.Sc (SLP) program
(Academic year 2018-19 onwards)**

The following are the minimum requirements for starting/continuing an M.Sc (SLP) program. This requirement is over and above the stipulated infrastructure (faculty, clinical staff, and physical) for other programs. This should be read and interpreted in conjunction with the guidelines of RCI for recognition of new/existing programs for recognition.

Human Resource Requirement

Requirement of scientific / technical / administrative staff exclusively for M.Sc. (SLP) program with an intake of 12 students per year shall be as follows:

Type	Designation	No.
Core Faculty	Professor - Speech Language Pathology	1
	Associate Professor - Speech Language Pathology	1
	Assistant Professors - Speech Language Pathology	2
Clinical Staff	Speech-Language Pathologist - Gr. I	1
Allied Faculty	Asst. Professor in Linguistics	1
	Asst. Professor in Statistics	1
Allied Clinical staff	Clinical Psychologist	1
	Oto-laryngologist	1
	Neurologist	1
Supporting staff – Technical	Electronics Engineer	1
	Bio-medical / Computer technician	1
	Library & Information Officer	1
	Library Assistant	1
Supporting staff- Admin.	Secretary - Academics	1
	Secretary - Clinic	1
	Secretary - Admin	1

Core faculty to student ratio should always be 1:3 (one faculty member for every 3 students)

Note 1: Allied faculty can be part time functionaries and their appointment can be guided by the requirements in a given semester. Besides, allied faculty can be the same for undergraduate as well as postgraduate courses if the institute also has an undergraduate course.

Note 2: The requirement shown here is exclusively for M.Sc. (SLP) program. There shall be proportionate increase in infrastructure with increase in intake.

Note 3: The M.Sc. (SLP) program can only be conducted by an independent institute/ college / department in a University / department in a hospital / rehabilitation unit, with a full-time Speech-language Pathologist, or Speech-language Pathologist& Audiologist as its head / coordinator (administrative / academic / clinical). The head of the program should possess a doctorate in the core field.

Faculty and Professional qualification in the core areas

Designation	Qualifications
Professor	<p>Essential</p> <p>a) M.Sc (Sp-Lang Pathology / M.Sc (Sp& Hg) / MASLP or its equivalent</p> <p>b) Ph.D (in the core area*)</p> <p>b) 10 years teaching experience at PG / UG level</p> <p>c) Minimum five publications with a cumulative impact factor of 5.</p> <p>d) Valid RCI registration</p> <p>Desirable:</p> <p>Experience of running under-graduate training programs</p>
Associate Professor	<p>Essential</p> <p>a) M.Sc (Sp-Lang. Pathology / M.Sc (Sp& Hg) / MASLP or its equivalent</p> <p>b) 8 years teaching experience at PG/UG level</p> <p>c) Minimum 5 publications with a cumulative impact factor of 5.</p> <p>d) Valid RCI registration</p> <p>Desirable:</p> <p>Ph.D (in the core area*)</p> <p>Experience of running under-graduate training programs</p>
Assistant Professor-Speech Language Pathology	<p>Essential</p> <p>a) M.Sc (Sp-Lang. Pathology / M.Sc (Sp& Hg) / M.ASLP or its equivalent</p> <p>b) 2 years teaching/ clinical / research experience</p> <p>c) Valid RCI registration</p> <p>Desirable:</p> <p>a) Ph.D (in the core area*)</p> <p>b) Publications</p>
Speech Pathologist Grade I	<p>Essential</p> <p>a) M.Sc (Sp -Lang Pathology / M.Sc (Sp& Hg) / MASLP or its equivalent</p> <p>b) Valid RCI registration</p> <p>Desirable: 1 year experience in the field</p>

*Speech-Language Pathology or Speech-Language Pathology & Audiology

Note 1 : Pay and emoluments for all faculty posts shall be on par with UGC norms.
RCI norms shall apply for all other clinical and technical posts

Clinical

The institution should have facility for diagnosis, management and rehabilitation of all types of speech, language, and swallowing disorders in clinical population across life span.

Size of clinical population: The participating institution must have a clinical load of a minimum of 960 new and 1920 follow up therapy cases in the first and second

semesters;and, in addition to this, 960 new and 1920 follow up therapy cases in the third and the fourth semester.

Library

Library should accommodate at least 30% of the staff and students of the institute at any given time.

Library should have internet and photocopying facilities.

At least 50% of books mentioned under ‘Recommended Reading’ under each paper must be available. The institution should add minimum one book every year for each subject of study.

There should be active subscription to at least 5 journals (3 international and 2 national journals in the core areas)

Library Staff*

- a) Library and Information Officer - 1
Qualification: B.LibSci with one year experience in managing a technical library
- b) Library Assistant - 1
Qualification: Diploma in Library Science

* Library staff can be common for all the courses at a given institute/college

Space

Sl.No.		Size	Number (For a batch of 12 students)
a)	Class Rooms	Space @ 10 sq. ft per student + 20 Sq. ft for the teacher: Room with a minimum area of 220 sq. ft.	1 class room for a batch of 12 students
b)	Seminar hall	Space to accommodate 50% of total student strength	1 hall for a batch of 12 students
c)	Computer lab/multipurpose hall	Space to accommodate 50% of total student strength	1 computer lab for a batch of 12 students
d)	Room for reception where patients are registered.	10' x 10'	1 room for a batch of 12 students
e)	Room for case history, diagnostic room and interviews	6' x 8'	4 rooms for a batch of 12 students
f)	Speech Lab (Quiet Room) for diagnostic purposes.	15' x 20'	1 room for a batch of 12 students
g)	Recording room (Sound proof)	8' x 10'	1 room for a batch of 12 students
h)	Speech Therapy Rooms/	6' x 8'	4 rooms for a batch of

	Cabins (completely partitioned/sound isolated)		12 students
i)	Staff Room	15' x 20'	1 room
j)	Individual work space (with provision for storage facilities)	10' x 10'	1 room for every 2 faculty/staff members
k)	Academic/administrative office	10' x 10'	1
l)	Principal's Office room	10' x 10'	1
m)	Sanitary facilities	Separate facility for males and females, staff/students and clinical population	
n)	Hostel	Separate hostel for Men and Women with dining facility. Accommodation for at least 50% of the student population.	
o)	Barrier free access		
p)	Space for recreation - both indoor and outdoor		

Equipment - Speech-Language Pathology (Minimum for a batch of 12 students)

Sl. No.	Equipment	For a batch of 12 students
a)	Speech and Language Tests (English and local languages)(Minimum two original test material per semester must be procured)	As per course requirement - See Table 1 for different tests
b)	Proformae	As per course requirement
c)	Speech Therapy material (in local language and English)	As per course requirement
e)	Digital voice recorders	2
f)	Video cameras for audio-visual recording	1
g)	Spirometer	1
h)	Computer PC-AT with VGA Color Monitor & printer for clinic administration	2
i)	Software for diagnosis/ therapy work	1
j)	Stroboscope (by possession in department or by access in the parent institution)	1
k)	Flexible scope for voice and swallowing assessment (by possession in department or by access in the parent institution)	1
l)	Electroglottograph	1
m)	System for aerodynamic assessment	1
n)	Tools for assessment of swallowing	

Audio-visual Instruments, Furniture in class rooms, clinical areas, labs and other administrative areas and internet access: Appropriately

Table 1 : List of original tests

- 1) WAB - Western Aphasia battery (English and Regional language/s)
- 2) BDAE-Boston diagnostic Aphasia Examination (English and Indian language)
- 3) LPT-Linguistic profile Test- (English and Regional language/s)
- 4) RTT-Revised Token Test – (English and Regional language/s)
- 5) MIRBI-Mini- Mini Inventory of Right Brain injured (English version)
- 6) PICA- Porch Index of communicative ability- (English and Regional language/s)
- 7) ABCD- Arizona Battery for communication disorders of dementia (English)
- 8) CLAP- Cognitive linguistic assessment protocol (English and Indian languages)
- 9) CLIP- Cognitive linguistic intervention program ((English)
- 10) CLQT-Cognitive linguistic quick test
- 11) BAT-Bilingual aphasia test- ((English and Regional language/s)
- 12) SSI- Stuttering severity Instrument
- 13) SPI- Stuttering predication instrument for young children
- 14) ABA- Apraxia Battery for Adult
- 15) FDA- Franchy Dysarthria Assessment
- 16) Perceptual Speech intelligibility rating (AYJNIHH, 2003)
- 17) Perceptual rating scale (SRMC, Chennai)
- 18) Consensus Auditory Perceptual Evolution of voice (CAPE-V)
- 19) Voice –Disorder Outcome Profile (V-DOP) (English, & Hindi) or Voice Handicap Index (Vernacular)
- 20) Indian Scale for Assessment of Autism (ISAA)
- 21) Early Reading Skills (ERS)
- 22) Reading Acquisition Profile in Kannada (RAP-K);
- 23) Early Literacy Screening Tool (ELST)
- 24) Attention Deficit Hyperactivity Disorder checklist
- 25) Autistic Behavior Composite Checklist Profile (ABCCP)
- 26) MAAT-6: Manual for Adult Aphasia Therapy
- 27) LEAP-IQ- Language Efficiency and Proficiency Indian Questionnaire
- 28) Treatment Manual in English for treatment of dyslexia
- 29) Dyslexia Assessment Profile for Indian Children (DAPIC)
- 30) Protocol for Appraisal of verbal Praxis in typically developing children
- 31) Comprehensive Language Assessment Tool for children (3-6 Years)
- 32) Articulation Test in regional language/ national language /English

M.Sc (Speech-Language Pathology)

**Course content
Semester I**

SLP 101: Research Methods, Statistics & Epidemiology

60 hours: 100 marks

Objectives: After completing this course, the student will be able to understand

- a) clinical research designs and statistical methods,
- b) epidemiological issues and its relevance in speech-language research,
- c) evidence based practice in speech and language pathology, and
- d) ethical practices in research

Unit 1: Experimental Designs and Their Applicability in Speech-language Research

- a) Types of research- post facto research, normative research, standard group comparison, experimental research, clinical and applied research, sample surveys, evaluation research
- b) Methods of observation and measurement, strategies and designs in research
- c) Experimental designs, single subject designs and group designs
- d) Critical analysis of the research methods employed in Speech-language Pathology.
- e) Documentation and research writing
- f) Ethical considerations in research – National and international guidelines

Unit 2: Epidemiology

- a) Epidemiology: Definition, basic concepts – scope and function of epidemiology
- b) Study designs in epidemiology: Cohort studies, case-control studies, cross-sectional studies, clinical trials
- c) Measures in epidemiology – Ratios, proportions, rates, relative risk, odds ratio
- c) Identify biases and their consequences in published literature.
- d) Describe criteria for characterizing the causality of associations.
- e) Application of epidemiology in evaluation and screening procedures employed in Speech-language Pathology
- f) Application and impact of epidemiology on national and local policy; influence of epidemiology on ethical and professional issues

Unit 3: Statistical Measures and their Features

- a) Review of data description and exploratory data analysis (Numerical summaries and graphical summaries)
- b) Probability concepts and models
- c) Statistical Inference – Estimation Confidence Intervals
- d) Statistical Inference – Basic concepts related to hypothesis testing –null hypothesis, alternative hypothesis, significance level, statistically significant, critical value,

acceptance / rejection region, p-value, power, types of errors: Type I (α), Type II (β), one-sided (one-tailed) test, Two-sided (two-tailed) test

- e) Parametric and non-parametric approaches to hypothesis testing
- f) Categorical data analysis - contingency tables, Chi-square test for independence of attributes,
- g) Measures of association (Contingency coefficient, Cramer's V), Kappa coefficient

Unit 4: Regression, Univariate and Multivariate Analysis

- a) Correlation, regression analysis and prediction including multiple regression; logistic regression; path analysis
- b) Analysis of Variance (ANOVA)- Basic models, assumptions, one way and two way ANOVA; Consequence of failure of assumptions underlying ANOVA; Tests for additivity, homogeneity, transformation; Post – hoc tests; Analysis of Covariance (ANOCOVA); Repeated measure ANOVA
- c) Multivariate analysis: Need for multivariate analysis, various methods including MANOVA, MANCOVA
- d) Introduction to principal component analysis, factor analysis, discriminant function, multidimensional scaling
- e) Evaluation of application of statistics to different research designs used in different publications
- f) Critical analysis of research articles in the field: Analysis of research designs in different areas of Speech-language Pathology

Unit 5: Evidence Based Practice

- a) Introduction to Evidence Based Practice (EBP) and Steps to EBP from formulating foreground question, finding best current evidence, critical appraisal of best current evidence, summarizing evidence, integrating evidence and tracking progress.
- b) Concepts related to practical significance (effect size) vs. statistical significance, precision of measurement (confidence intervals)
- c) Levels of evidence: For experimental and non-experimental designs; treatment efficacy-randomized control study, quasi experimental study, correlation and case study, single subject designs, expert committee report, consensus conference
- d) Measures of diagnostic accuracy – positive and negative likelihood ratios; positive predictive value, negative predictive value, diagnostic odds ratio
- e) Concepts related to randomized control trials: Comparative groups- allocation concealment / random allocation; importance of participation and follow up in understanding, evaluating and applying randomized controlled trial results
- e) Methods of carrying out therapy trials; execution, indexing and reporting of therapy trials – efficacy studies; Conventions to study outcomes - i) Absolute risk reduction, ii) Absolute benefit increase, iii) Absolute risk increase, and iv) Absolute benefit reduction
- f) Systematic review and meta-analysis; importance of research publications in terms of systematic review, meta-analysis, clinical practice guidelines, health technology assessments.
- g) Challenges in implementation of EBP in Speech-language Pathology in India and future directions

Recommended Reading

- Russell Carter, Jay Lubinsky (2016). *Rehabilitation Research: Principles and Applications*. Elsevier
- Robert E. Owens Jr., Dale Evan Metz, Kimberly A. Farinella (2014). *Introduction to Communication Disorders: A Lifespan Evidence-Based Perspective*. Pearson Education
- Laura M. Justice, Erin Redle (2013). *Communication Sciences and Disorders: A Clinical Evidence-Based Approach*. Pearson Education.
- Robert F. Orlikoff, Nicholas E. Schiavetti, Dale Evan Metz (2014). *Evaluating Research in Communication Disorders*. Pearson Education
- David L. Irwin, Mary Pannbacker, Norman J. Lass (2013). *Clinical Research Methods in Speech-Language Pathology and Audiology*. Second Edition. Plural Publishing
- Timothy Meline (2009). *A Research Primer for Communication Sciences and Disorders*. Pearson Education
- David L. Maxwell, Eiki Satake. (2006) *Research and Statistical Methods in Communication Sciences and Disorders*. Thomson/Delmar Learning.
- John C Reinard (2006). *Communication Research Statistics*. SAGE Publications
- Nicholas Schiavetti, Dale Evan Metz (2006). *Evaluating Research in Communicative Disorders*. Allyn & Bacon
- Tim Pring (2005). *Research Methods in Communication Disorders*. Wiley
- Donald G. Doehring (2002). *Research Strategies in Human Communication Disorders*. Pro-Ed
- Carole E. Johnson, Jeffrey L. Danhauer (2002). *Handbook of Outcomes Measurement in Audiology*. Singular
- David L. Maxwell, Eiki Satake (1997). *Research and Statistical Methods in Communication Disorders*. Williams & Wilkins

SLP 102: Speech Science and Speech Production

Hours - 60 : Marks - 100

Objectives: At the end of the course, the students will be able to

- a) describe the physiology of speech production,
- b) discuss acoustic theories of speech production,
- c) describe the acoustic characteristics of speech sounds, and
- d) know the application of acoustic analysis and speech synthesis.

Unit 1: Introduction to the Study of Speech Physiology

- a) Physiological aspects of speech production (respiration, laryngeal and articulatory subsystem)
- b) Aerodynamics of speech: mechanics of airflow – laminar, orifice and turbulent flow: maintenance of airway pressure for speech
- c) Speech breathing
- d) Lower air way dynamics: anatomy, laryngeal and lung activity in speech: conversational speech and loud speech; glottal activity in the production of speech sounds and whisper
- e) Upper airway dynamics: constrictors in upper airway; aerodynamics of speech sounds
- f) Measures of respiratory analysis and instrumentation: intraoral and sub glottal pressure; instrumentation

Unit 2 : Theories of Speech Production

- a) Acoustic theory of speech production: source and filter characteristics; output speech and its characteristics
- b) Critical evaluation of acoustic theory of speech production
- c) Aspects of speech acoustics
- d) Aspects of prosody and their realization
- e) Characteristics and production of vocal music: Contrast with speech production

Unit 3: Instrumentation for Studying Speech

- a) Acoustic analysis of speech - techniques of digital signal processing, Long Term Average Spectrum
- b) Software for acquisition and acoustic analysis – freeware and patented software
- c) Spectrogram: Identification of sounds and their acoustic features through spectrogram
- d) Physiological measurements: Techniques and instrumentation like Electromyography, Stroboscope, Electroglottography, Ultrasound, EMMA, evoked potentials, fMRI, PET

Unit 4 : Acoustic and Aerodynamic Characteristics of Speech Sounds

- a) vowels and diphthongs
- b) plosives
- c) nasal consonants
- d) fricatives
- e) other consonants - affricates, glides and liquids
- f) effects of context and speaker

Unit 5: Application of Acoustic Analysis and Speech Synthesis

- a) Applications of acoustic analysis in speech disorders
- b) Forensic applications: semiautomatic and automatic methods
- c) Infant cry analysis- characteristics of normal and abnormal cries, models, infant cry as a tool for early identification of high-risk babies
- d) Speech synthesis and its applications: articulatory, parametric synthesis and analysis by synthesis

Recommended Reading

- Borden, G. J., & Harris, K. S. (2011). *Speech Science Primer*, Philadelphia. Lippincott, William & Wilkins.
- Ferrand, C. T. (2007). *Speech Science – An Integrated Approach to Theory and Practice*. 2nd Edition, Boston, Allyn & Bacon.
- Hixon, T. J., Weismer, G., & Hoit, J. D. (2014). *Preclinical Speech Sciences; Anatomy Physiology Acoustics Perception*. San Diego, Plural Publishing.
- Hollien, H. (2002). *Forensic Voice Identification*. NY, Academic Press Inc.
- Kent, R. D., & Read, C. (2002). *The Acoustic Analysis of Speech*. New York, Delmar Learning.
- Ladefogd, P. (2001). *An Introduction to the Sounds of Languages; Vowels and Consonants*. Oxford, Black Well
- Raphael, L. J. (2007). *Speech Science Primer*. Philadelphia, Lippincott Williams & Wilkins.
- CIIL Publications on the production of sounds in different languages of India

SLP 103: Augmentative and Alternative Communication

Hours - 60 : Marks - 100

Objectives: At the end of the course, the student will be able to

- a) identify and describe various approaches and methods used in augmentative and alternative communication (AAC),
- b) select appropriate AAC strategies and assessment procedures for individuals with complex communication needs,
- c) describe the treatment plan for implementation of AAC with evidence based rationale,
- d) discuss the current status of the use of technology and practice of AAC for intervention in the Indian context, and
- e) identify issues for research.

Unit 1: Types, Classification and Description of AAC

- a) Definition, history, need and classification of AAC
- b) Team approach in AAC: Types, team members and their roles
- c) Aided systems and symbols in AAC: different types and their details
- d) Unaided systems and symbols in AAC: Different Types and their details
- e) Technology in AAC:
 - i) Communication Boards: Types
 - ii) Low and high tech aids & devices: Types, Interfaces

Unit 2: Assessment for AAC

- a) Assessment of AAC Candidates: Models for assessment
- b) Formal and informal assessment: Standard tests and scales
- c) Considerations in other domains - physical/ motor and seating requirements, cognition, vision and hearing, speech perception

Unit 3: AAC Intervention: Principles and Procedures

- a) General Principles and Strategies – Aided and unaided AAC
- b) Selection of vocabulary and symbol representation of the vocabulary: - types of vocabulary, factors affecting choice of vocabulary
- c) Strategies for selection of symbols in AAC, their types and factors affecting decision making: direct selection, scanning, encoding, word prediction
- d) Selection and decision making with reference to low and high tech aids and devices

Unit 4: Specific Intervention Strategies with Different Populations

- a) Specific intervention strategies for children with cognitive communication needs: (intellectually challenged, cerebral palsy, children with language disorders and children with dual and multiple disabilities).
- b) Specific intervention strategies for adults with cognitive communication need:
 - i) Temporary conditions: laryngectomy, voice disorders
 - ii) Neurological conditions: Degenerative and non-degenerative conditions, Aphasia, traumatic brain injury

- iii) Structural disorders and disorders affecting speech intelligibility
- c) Measuring outcomes in using AAC and evidence based practices

Unit 5: Contemporary Issues in AAC

- a) Use of technology: Hardware and software (applications) in intervention for children and adults with communication disorders
- b) Current status of AAC in India and scope for research
- c) Adaptation of AAC in different set ups: home, schools, work place, and other social situations
- d) Training in the use and application of AAC for parents and caregivers

Recommended Reading

- Beukelman, D., &Mirenda, P. (2012). Augmentative and Alternative Communication: Supporting Children and Adults with Complex Communication Needs, Fourth Edition. Baltimore: MD.Paul Brookes Publishing.
- Bryant, D. P., & Bryant, B. R. (2011). Assistive technology for people with disabilities.Pearson Higher Ed.
- Light, J. C., Beukelman, D. R., &Reichle, J. (2003).Communicative Competence for Individuals Who Use AAC – From Research to Effective Practice. Baltimore, H.Brookes Publishing Co.
- Lloyd, L., Fuller, D., &Arvidson, H. (1997).Augmentative and alternative communication: Handbook of principles and practices.Boston, MA: Allyn& Bacon.
- McNaughton, D. &Beukelman, D.R. (2010).Transition strategies for adolescents & young adults who use AAC. Baltimore, MD: Paul H. Brookes Publishing Co.
- Reichle, J., Beukelman, D.R., & Light, J.C. (2002) Exemplary practices for beginning communicators: Implications for AAC. Baltimore, MD: Paul H. Brookes Publishing
- Soto, G., &Zangari, C. (2009).Practically Speaking Language Literacy & Academic Development for Students with AACNeeds.Baltimore: MD.Paul Brookes Publishing.
- Mani, M.N.G., Gopalkrishnan, V., &Amaresh, G. (2001).Indian Sign Language Dictionary. Germany, CBM International.
- Vasishta, M., Woodward, J., &Desantu, S. (1980). An Introduction to Indian Sign Language.New Delhi: All India Federation of the Deaf.

SLP 104: Neurobiology of Speech-Language and Cognition

Hours - 60 : Marks - 100

Objectives: At the end of the course, the student will be able to

- a) explain the anatomy and physiology of nervous system and role of neurotransmitters in relation to speech-language and its disorders,
- b) know the laboratory - based procedures in understanding neural bases of speech-language,
- c) discuss and interpret the neuro-diagnostic findings,
- d) describe the neural bases of speech-language,
- e) know the effect of aging on CNS structures, and
- f) discuss research relevant to neuroscience of speech-language.

Unit 1: Anatomy and Physiology of the Nervous System Related to Speech-language

- a) Review of central nervous system and peripheral nervous system, cortical and subcortical pathways
- b) Blood supply to CNS
- c) Neurotransmitters – types and classification, major location, functions and synthesis / chemical composition; signal propagation in the nervous system
- d) Neurotransmitters in neuropathological conditions influencing speech, language and related disorders
- e) Brain plasticity
- f) Functional organization of brain – lateralization of functions
- g) Evidence from neuroimaging studies on speech perception, comprehension and production

Unit 2 : Methods of Understanding the Neurological Status of Speech-language Mechanisms

- a) Clinical examination of neurological status - history, physical examination, reflexes
- b) Neuro-diagnostic procedures for routine clinical examination – cranial nerve examination, sensory & motor examination, examination of mental functions
- c) Neuro-imaging procedures: X-Ray, CT scan, MRI, fMRI, TcMS, PET, SPECT, and others - advantages and disadvantages
- d) Neuro-physiological procedures - Evoked potentials (visual, auditory and somato-sensory), eye-tracking, electromyography (EMG), [magnetoencephalography](#) (MEG) - Advantages and disadvantages
- e) Neuro-behavioral procedures - neurolinguistic investigation, priming and its types, reaction time measures and other related procedures

Unit 3: Cognitive Process Models and Implications of Information Processing for Speech-language

- a) Types and Models of Attention - Broadbent's Bottleneck Model, Norman and Bobrow's Model, Treisman model, Deutsch and Deutsch model.
- b) Types and Models of memory (Atkinson and Shiffrin's multistore Model, Craik and Lockhart's Levels of Processing model, Baddley's Working Memory model)

- c) Role of attention and memory in the development of speech and language - models of cognitive-linguistic process (hierarchical, process, interactive, computational, neural network); bilingual models (simultaneous and sequential processing)

Unit 4: Neural basis of Speech-language and Cognition

- a) Neural network of speech perception, semantic processing and sentence comprehension - Spoken word recognition, auditory word recognition, visual word recognition, sentence processing and discourse comprehension
- b) Neural basis of speech production (sound, syllable, word and sentences)
- c) Evidence from research studies - behavioral, neuroimaging and evoked potentials studies in normals and persons with neurological disorders
- d) Neural basis for cognitive processes and its relation to language processes
- e) Neural network for reading, writing and spelling
- f) Representation of languages in the brain – Monolingual, bilingual and multilingual

Unit 5: Neuroscience of Aging and its Effect on Speech-language

- a) Aging - definition, types- (senescence and senility, primary and secondary aging, biological and psychological aging), phenomenon of aging (neurological, cognitive and behavioral correlates, structural changes with age, brain weight, ventricular size, microscopic changes and atrophy).
- b) Theories of aging - cellular, genetic, cumulative, random cell damage, programmed cell death, high level control of aging, cellular theories, geriatric theories and other theories
- c) Neurophysiological / functional changes with age: accuracy, speed, range, endurance, coordination, stability and strength; neurobehavioral correlates of aging -lateralization of functions across life span, cerebral asymmetry, electrophysiological and behavioral evidences
- d) Effects of aging on speech and language across life span: in typical and pathological conditions.
- e) Effect of aging on cognitive dimension and speech perception

Recommended Reading

- Arslan, O. E. (2015). Neuroanatomical Basis of Clinical Neurology.2nd Edition, New York, CRC Press.
- Benarroch, E. E., Daube, R. J., Flemming, D. K. & Westmoreland, F. B. (2008).Mayo Clinic Medical Neurosciences.5th Edition, USA, Mayo Clinic Scientific Press.
- Bhatnagar, S. C. (2008). Neuroscience for the Study of Communicative Disorders.3rd Edition, New York, Wolters Kluwer Publisher.
- Duffy, J. R. (2013). Neurological Bases of Motor Speech and its Pathologies, In Motor Speech Disorders: Substrates, Differential Diagnosis and Management. 3rd Edition, Missouri, Mosby Publisher.
- Handy, T. C. (2005).Event-Related Potentials: A Methods Handbook. MIT press, London
- Kemmerer, D. (2015). Cognitive Neuroscience of Language. New York, Psychology Press.
- Zigmond, M. J., Rowland, L. P. & Coyle J. T. (2015).Neurobiology of Brain Disorders: Biological Basis of Neurological and Psychiatric Disorders. Academic Press, New York.

SLP 105: Clinical Linguistics and Multilingual Issues

Hours - 60: Marks - 100

Objectives: At the end of the course, the student will be able to

- a) understand aspects of clinical linguistics relevant to speech-language pathology,
- b) discuss the acquisition process and related disorders pertaining to various components of language,
- c) discuss general concepts, theoretical background and issues related to socio-linguistics,
- d) discuss the multilingual and multicultural issues in rehabilitation with reference to India, and
- e) undertake research in the area of clinical linguistics related and relevant to speech-language pathology.

Unit 1: Introduction to clinical linguistics; Phonological, semantic and syntactic acquisition and related disorders

- a) Introduction to clinical linguistics and scope of linguistics in clinical field.
- b) Principles of general linguistics and their clinical relevance.
- c) Phonological acquisition and disorders
- d) Semantic acquisition and disorders
- e) Grammatical acquisition and disorders

Unit 2: Pragmatics and sociolinguistic concepts

- a) Pragmatics – Theoretical background: Discourse, deixis, anaphora, maxims and truth relations
- b) Discourse comprehension
- c) Discourse analysis/Narrative analysis in neurotypical adults and persons with disorders
- d) Development of pragmatics in children
- e) Pragmatic disorders with respect to some clinical disorders
- f) Sociolinguistic concepts relevant to speech-language pathologists (language and dialects issues, various types and dialects, diglossia, stylistic variation of language-registers, Language contact-Creoles, Pidgins, language maintenance, language shift and language death, language deficiency)

Unit 3: Psycholinguistics and language acquisition

- a) Issues involved in language acquisition – Motherese /child directed speech
- b) Models of second language acquisition
- c) Language acquisition in bi- and multi-lingual environments – concepts related to proficiency, dominance etc; issues and implications for assessment and intervention
- d) Psycho linguistic models of language pathology

Unit 4: Neurolinguistics

- a) Introduction to neurolinguistics
- b) Language and lateralization – left brain and right brain differences
- c) Coding and decoding
- d) Neuroanatomical and neurophysiological bases of language learning and dysfunction
- e) Mechanism and bases of recognition of spoken and visual word, sentence processing and discourse comprehension.

Unit 5: Multilingual and multicultural issues in communication

- a) India as a multilingual nation– A brief introduction to the major language families of India
- b) Relation between language and culture, language and thought relationship in view of Sapir-Whorf hypothesis: linguistic determinism and linguistic relativity
- c) Cultural issues in verbal and non-verbal communication
- d) Multicultural and multilingual issues in rehabilitation with special reference to India

Recommended Reading

- Allan, B. (2014). The guidebook to sociolinguistics.UK: Wiley Blackwell.
- Ball, M., J., Perkins, M., R., Müller, N. & Howard, S. (2008). The handbook of clinical linguistics. (Eds). Oxford: Blackwell Publishing.
- Bishop, D. V. M., & Leonard, L. B. (2007).Speech and language impairments in children. USA: Psychology
- Bonvillian, N. (2011). Language, culture and communication.New Jersey: Pearson Education.
- Pressacy, D. P. (2007).The Cambridge handbook of phonology. Cambridge: Cambridge University Press..
- Wei, L. (2014). Applied linguistics.UK: Wiley Blackwell.

Semester II

SLP 201: Advances in Speech Sound Disorders

Hours - 60 : Marks - 100

Objectives: At the end of the course, the students will be able to

- a) describe recent theories and concepts related to phonological development and its disorders,
- b) diagnose and manage children with speech sound disorders,
- c) provide comprehensive care including speech therapy for persons with CLP as a member of the cleft palate team, and
- d) guide and counsel families of children with CLP.

Unit 1: Phonological Development and Disorders

- a) Recent concepts in theories of phonological development: Generative phonology, natural phonology, non-linear phonology, optimality theory
- b) Application of phonological theories in evaluation and management of phonological disorders
- c) Co-articulation – Types (anticipatory, carryover); Models of co-articulation - feature based, syllabic, allophonic, target, physiological and degree of articulatory constriction models); Physiological / Acoustical / Perceptual studies in co-articulation
- d) Current concepts in taxonomy of speech sound disorders in children

Unit 2: Assessment and Management of Children with Phonological Disorders

- a) Comprehensive phonological assessment procedures – Formal and informal; Independent and relational analyses; dynamic assessment
- b) Assessment of phonological awareness and phonological processing in children with speech sound disorders
- c) Critical appraisal of test material in Indian context - Specific issues in phonological assessment in multilingual environments
- d) Determining need for intervention and intervention decisions

Unit 3: Management of Children with Speech Sound Disorders

- a) Evidence based approaches to intervention – Motor based approaches, linguistic based approaches; use of non-speech oro-motor activities
- b) Motor learning principles – applications to interventions
- c) Considerations in intervention: methods to measure clinical change and determining progress in therapy and generalization
- d) Specific considerations in intervention within multilingual contexts.
- e) Use of software applications (Apps) in intervention; Use of tele-health for intervention of speech sound disorders

Unit 4: Cleft Lip and Palate

- a) Phonological development in children with CLP
- b) Development of other language attributes (morphology, semantics, syntax, pragmatics)
- c) Velopharyngeal Closure- normal physiology, parameters affecting velopharyngeal closure and nature of velopharyngeal dysfunction in persons with CLP
- d) Perceptual assessment protocols for speech characteristics in children with repaired CLP
- e) Instrumental assessment of velopharyngeal closure- Imaging techniques, acoustic measurements, aerodynamic measurements

Unit 5: Management of Persons with CLP

- a) Surgical, orthodontic and prosthodontic management in CLP.
- b) Early intervention for children with CLP – Methods and studies related to efficacy
- c) Speech and language therapy for persons with velopharyngeal dysfunction
- d) Current evidence based practices in assessment and management of CLP

Recommended Reading

- Bernthal, J.E., Bankson, N.W., &Flipsen, P. (2013).Articulation and phonological disorders (7th Ed.).Boston, MA: Pearson.
- Dodd, B. (2013). Differential diagnosis and treatment of children with speech disorder (2nd Ed). NJ: Wiley.
- Vasanta, D. (2014). Clinical applications of phonetics and phonology.ISHAMonograph.Vol 14, No. 1.Indian Speech & Hearing Association.
- Velleman, S. L (2003). Resource guide for Childhood Apraxia of Speech.Delmar/Thomson Learning.
- Williams, A., McLeod, S., & McCauley, R. (2010). Interventions for speech sound disorders in children. Baltimore: Brookes.

SLP202: Voice: Science and Disorders

Hours - 60 : Marks - 100

Objectives: At the end of the course, the student will be able to

- a) understand the bio-mechanics of voice production in normal individuals and in those with voice disorders,
- b) explain and assess the roles of breathing mechanism, vocal fold vibration, vocal tract resonance and enunciation in voice production,
- c) delineate the varying roles and responsibilities of a SLP in a trans-disciplinary (medical) team to assess and treat voice disorders in children, adults, geriatrics and specific population including professional voice users, and
- d) appraise different service delivery models and procedures to run a voice clinic

Unit 1: Voice Science

- a) Vocology – scope and objectives
- b) Breathing and voicing: lungs and airways, breathing mechanism as an interactive sound generating system: breathing oscillator & valving oscillator, combining the breathing and valving oscillators with voicing
- c) Vocal folds and voice: Biology of vocal fold tissue and lamina propria, muscular properties and vocal behaviours, biomechanics and voice control/modulation, voice fatigue, vocal injury and recovery, wound healing
- d) Resonance and voice: concepts of acoustic impedance, reactance, inertance, and compliance, acoustic impedance of the vocal tract, the effect of vocal tract reactance on self-sustained vocal fold oscillation, idealized vocal tract shapes and voice quality, modulating phonation with articulation and prosody

Unit 2: Voice Assessment and Voice Disorders

- a) Vocometry: assessing vocal ability: principles, methods and procedures: General assessment principles, evaluation procedures, tools of measurement, purpose of measurement, measurement scales, auditory perceptual evaluation- speech breathing, voice quality, resonance, and overview of instrumentation for voice assessment: visualization techniques, acoustic analysis, aerodynamic analysis, glottography, nasometry and electromyography
- b) Voice disorders: issues in definition, incidence and prevalence, occupational risks and voice disorders
- c) Classification of voice pathologies, characteristics and pathophysiology: Structural, neuropathologic, idiopathic, functional/behavioral - pathologies related to mechanical stress, tissue elasticity, fluid transport, airway environment and abnormal muscle activation
- d) Voice disorders in specific populations: Laryngectomy, pediatric voice disorders, aging voice, professional voice, vocal cord dysfunction/paradoxical vocal fold motion, transgender and trans-sexual voice

Unit 3: Voice Habilitation

- a) Voice management team, roles and functions
- b) Pharmacological and surgical effects on voice: Current trend in medical and surgical management: Medications for bacterial and other infections, allergies, edema, pain, asthma, cough, gastric and laryngopharyngeal reflux, stage fright, spasmodic dysphonia, mood conditions, sleep disturbance, hormone imbalances, etc. Voice surgeries – pre-operative and post-operative care and precautions
- c) Voice habilitation: Current views and approaches; EBP for voice and its disorders; Voice therapy methods for children and adults.
- d) Voice exercise principles and procedures: Physiological voice therapy methods Vs. Behavioral voice therapy methods, role of vocal hygiene and voice rest, basics of exercise physiology, general principles, types of exercises, exercise prescription and progress, vocal exercise techniques – vocal function exercises, resonant voice exercise, confidential voice therapy, and other voice exercises including psychological approaches, relapse and restoration
- e) Habilitation of persons with laryngectomy: Speech and medical considerations in laryngectomy, voice restoration in laryngectomees, counseling and quality of life

Unit 4: Voice Needs and Problems in Professional Voice Users

- a) Vocal professionals and voice disorders: classification, pathologies affecting voice – frequency, personal and social impacts, occupational hazards and issues, nature of voice problems: repetitive strain injuries, acute injuries and chronic problems – presentation, assessment and treatment
- b) Laryngeal rest, modified voice rest/conservative voice use, vocal hygiene; laryngeal rest versus exercise: effects on wound healing, general wound healing processes
- c) Voice habilitation for singers and other elite vocal users: Demands on voice, nature of vocal training and use, voice fatigue and assessment, basic principles of motor learning, awareness training, and vocal exercises, concept of professional voice care team – role of medical and non-medical team players
- d) Voice habilitation for teachers: voice problems in teachers: nature and manifestation, use of voice in classroom and factors influencing, vocal loading and assessment, vocal fatigue, techniques to improve the speaking voice and delivery, voice projection techniques, vocal education and counseling

Unit 5: Service Delivery and Other Professional Issues

- a) Scope of practice in the area of voice – training in endoscopy, documentation, telepractice – trends across globe and in India (practice guidelines, technical reports, position statements, knowledge and skills document relevant to voice as per RCI, ASHA, European Laryngological Society, and other relevant professional/statutory body).Issues in adopting and implementing the same in India.
- b) Patient compliance and concordance to voice management: Relevance of voice problems/voice problems as a public health concern, measuring severity of voice condition, measurement of compliance to management options, treatment variables and effects, patient-clinician interactions, socio cultural and economic considerations
- c) Voice clinics: SLP led clinics Vs. SLP in a medical team, space and other infrastructural requirements, specialty clinics considering needs of specific population such as singers, transgenders, transsexuals, non-native speakers, broadcasters, etc

- d) Research and ethics in clinical practice: overview of basic and applied research in voice, ethics in clinical research, informed consent, clinical trials, methods to popularize services- roles of associations, conferences, working groups, awareness movements/drives like world voice day, camps, public awareness programs, role of media, prevention of voice problems.

Recommended Reading

- American Speech-Language- Hearing Association. (2004a). Vocal tract visualization and imaging: Position statement. Available from www.asha.org/policy.
- American Speech-Language- Hearing Association. (2004b). Vocal tract visualization and imaging: Technical report. Available from www.asha.org/policy.
- Behrman, A. (2013). *Speech & Voice Science* (2nd Ed.). San Diego: Plural publishers.
- Hixon, T. J., Weismer, G., &Hoit, J. D. (2014). *Preclinical Speech Science: Anatomy, Physiology, Acoustics, Perception* (2nd Ed.). San Diego: Plural publishers.
- Sapienza, C.M., & Ruddy, B. H. (2013). *Voice Disorders*. (2nd Ed.). San Diego: Plural publishers.
- Sataloff, R. T. (2006). *Vocal Health & Pedagogy: Advanced Assessment and Treatment*. Vol. II. (2nd Ed.). San Diego: Plural publishers.
- Sataloff, R. T. (2006). *Vocal Health & Pedagogy: Science and Assessment*. Vol. I. (2nd Ed.). San Diego: Plural publishers.
- Sataloff, R. T. (2005). *Voice Science*. San Diego: Plural publishers.
- Scope of practice document – SLPA (2015) – Rehabilitation Council of India
- Stemple, J. C., Glaze, L. E., &Gerdeman, B. K. (2014). *Clinical Voice Pathology: Theory & Management* (5th Ed.). San Diego: Plural publishers.
- Titze, I. R., &Verdolini Abbott, K. (2012). *Vocology: The Science and Practice of Voice Habilitation*. Salt Lake City: National Center for Voice and Speech.

SLP 203: Disorders of Fluency

Hours – 60: Marks - 100

Objectives: At the end of the course, the students will be able

- a) explain the nature, types and bases of fluency and its disorders,
- b) discuss the theories and models of stuttering,
- c) describe, diagnose and manage persons with different types of fluency disorders,
- d) implement a team of professional for evaluation and management of fluency disorders,
- e) counsel the clinical clientele, their family members and others to manage the problem, and
- f) evaluate research output in the area of fluency and its disorders

Unit 1: Overview of Fluency and its Disorders

- a) Dimensions of fluency disorders- recent advances; Supra segments
- b) Development of fluent speech: Factors affecting fluency of speech
- c) Theories of stuttering - linguistic, articulatory, audiological, laryngeal and genetic predisposition
- d) Neuro anatomical, neuro-physiological bases of fluency disorders
- e) Cortical activation patterns in stuttering - neuromotor problem
- f) Stuttering as a timing disorder
- g) Feedback and feed-forward models of stuttering.

Unit 2: Types of Non-fluencies and Dysfluencies

- a) Normal non-fluency and developmental stuttering
- b) Cluttering- causes and characteristics
- c) Neurogenic, Psychogenic and other types of fluency disorders
- d) Stuttering in persons with multiple disability

Unit 3: Assessment of Fluency and Dysfluency

- a) Objective tools for assessment of fluency and its disorders
- b) Subjective and perceptual assessment
- c) Electrophysiology in the evaluation of fluency disorders
- d) Functional radiological studies of stuttering
- e) Cognitive dimension of stuttering
- f) Diagnosis and differential diagnosis

Unit 4: Management of Disorders of Fluency

- a) Spontaneous recovery and relapse
- b) Principles of therapy; skill training
- c) Approaches to management of fluency disorders in adults and children
- d) Group therapy
- e) Input from allied professionals in the management of fluency disorders
- f) Behavioral and work-place management

- g) Counseling - including parents and teachers
- h) Social help and advocacy groups
- i) Apps based and other innovative modes including telemode.

Unit 5: Recovery and Related Issues

- a) Relapse and recovery pattern in fluency disorders
- b) Efficacy and outcome measures of fluency therapy
- c) Evidence based practice
- d) Bilingualism / multilingualism relating to stuttering and cultural sensitivity
- e) Ethics in research and management of stuttering

Recommended Reading

- Bloodstein, O., & Ratner, N. B. (2008). A Handbook on Stuttering (6th Ed.). Clifton Park, NY, Thomson Demer Learning.
- Conture, E., Curlee, R., & Richard F., (2007). Stuttering and Related Disorders of Fluency. 3rd Ed. N Y, Thieme Publishers.
- Corder, Akingham, R.J. (1998): Treatment efficacy for stuttering. Singular Publishing Group, San Diego.
- Curlee (1993): Stuttering and related disorders of fluency. Thieme Medical Publisher, New York.
- Ham, R.E. (1990): Therapy of stuttering pre-school through adolescence. Prentice Hall, Englewood-Cliffs.
- Manning, W. H. (2010). Clinical Decision Making in Fluency Disorders. 3rd Ed. NY, Delmer Language Learning
- Myers, (1992): Cluttering. Kibworth, Far Communication.
- Onslow, M., & Packman, A. (1999). The Handbook of Early Stuttering Intervention. USA, Singular Publishing Group.
- Peters, H.F.M. and others (Ed.) :(1991). Speech motor control and stuttering. Excerpta medica, Amsterdam.
- Riley (1986). Stuttering severity instrument for children and adults. Pro. Ed. Austin.
- Rustin, L. and others (1996). Assessment and therapy for young dysfluent children. Whurr Publishers, London.
- Starkweather, C.W. and others (1990): Stuttering prevention. Inglewood Cliffs, Prentice Hall.
- Webster, R. L. (2014). From Stuttering to Fluent Speech, 6300 Cases Later: Unlocking Muscle Mischief Create Space. South Carolina, Independent Publishing Platform
- Wells (1987). Stuttering treatment. Prentice-Hall, New Jersey.

SLP 204: Language Disorders in Children

Hours - 60 : Marks - 100

Objectives: At the end of the course, the student will be able to

- a) know various theories and models of language acquisition in monolingual /bi/ multilingual children,
- b) describe developmental and acquired language disorders in children,
- c) discuss issues related to differential diagnosis and assessment of child language disorders,
- d) describe various management approaches for child language disorders, and
- e) critically evaluate research articles in the area of child language disorders

Unit 1: Theories of Language Acquisition

- a) Critically evaluate theories of language acquisition- biological maturation, linguistic, cognitive, information processing and social theory - implications of theories for assessment and intervention)
- b) Types of bi / multilinguals; Nature of bi/multilingualism in India;
- c) Language acquisition in bilingual / multilingual / atypical children
- d) Normal process of second language acquisition
- e) Variables in second language acquisition: cognitive-linguistic and affective

Unit 2: Classification of language abnormalities based on etiology

- a) Genetic and chromosomal abnormalities
- b) Motor and sensory deficits
- c) Language disorders associated with pre-maturity and or high risky infancy
- d) Prenatal exposure to alcohol and other drugs
- e) Intellectual disabilities
- f) Acquired language disorders: causes, incidence and prevalence of acquired language disorders globally and in India; defining characteristics - cognitive communication deficits
- g) Specific Language Impairment - causes, incidence and prevalence of primary language disorders/ specific globally and in India and defining characteristics, differential diagnosis - cognitive communication deficits

Unit 3: Autism Spectrum Disorders / Pervasive Developmental Disorders

- a) Introduction and classification (ICD10; DSM V)
- b) Etiology, warning signs, defining characteristics, incidence and prevalence of Autism – national and international
- c) Symbolic abilities and social aspects of communication
- d) Language outcome in autism management – theoretical issues
- e) Theory of mind – second order representation
- g) Other diagnosis on the autism spectrum and associated disorders
- h) Assessment and diagnosis of autism spectrum disorders- norm-referenced and criterion referenced tools; checklists and informal assessment tools used in India (ASIA, MISIC, INCELN tool etc.) and globally

- i) Prognosis and treatment – applied behavioral analysis, peer mediated interactions, floor time / developmental individual difference relationship based model, social-communication, emotional regulations abilities and transactional supports, responsive teaching, relationship development intervention, Hanen approach, Treatment And Education of Autistic and Related Communication Handicapped Children, Picture exchange communication system, Com-DEAL and diet management.

Unit-4 Attention Deficit Hyperactivity Disorder

- a) Introduction and classification (ICD 10, DSM V)
- b) Causes, incidence and prevalence of ADHD globally and in India
- c) Characteristics of different types
- d) Relationship of ADHD to language and or learning disabilities
- e) ADHD and other labels, adolescents with ADHD
- f) Assessment and diagnosis of ADHD - norm-referenced and criterion referenced tools; checklists and informal assessment tools used in India and globally
- g) Treatment of ADHD- areas of treatment – communication deficits academic issues, memory deficits, behavioral, medical and social issues

Unit 5: General Consideration in the Assessment and Management of Child Language Disorders

- a) Critical review of developmental scales and norm-referenced tools for language development for Indian languages
- b) Differential diagnosis of child language disorders
- c) General principles and approaches to management in child language disorders.
- d) Evidence-Based Practice and Response-to-Intervention in child language disorders
- e) Team approach, guidance and counseling
- f) Presence of comorbid features like swallowing / apraxia etc. and their assessment
- g) Parent empowerment/ Parent implemented intervention for language delay/disorders
- h) Use of AAC in the management of child language disorders
- i) Rights of children with language disability

Recommended Reading

- Bhatia, T. K. & Ritchie, W. C. (2014). Handbook of Bilingualism and Multilingualism. 2nd Ed. East Sussex, Wiley Blackwell.
- Gregg, N. (2009). Adolescence & Adults with Learning Disabilities and ADHD - Assessment and Accommodation. New York, Guilford Publications, Inc.
- Hegde, M. N. (1996). [A Course Book on Language Disorders in Children](#). San Diego, Singular Publishing Group.
- Kaderavek, J. N. (2015). Language Disorders in Children: Fundamental Concepts of Assessment and Intervention. 2nd Ed. USA, Pearson Education Inc
- Nelson, N. W. (1998). Childhood Language Disorders in Context: Infancy through Adolescence. 2nd Ed. USA: Allyn & Bacon Inc.
- Owens, J. R., Metz, D.E., & Farinella, K.A. (2011). Introduction to Communication Disorders - A Lifespan Evidence Based Perspective. Upper Saddle River; NJ, Pearson Education Inc.

- Paul, R. &Norbury, C. (2012).*Language disorders from infancy through adolescence: Listenig, speaking, reading, writing, and communicating* (4th Ed.). St. Louis, MO: Elsevier.
- Vinson, P.B (2012). *Language disorders across life span*, Delmar, Cengage learning.

SLP 106 and SLP 205: Clinical Practicum

Know how

- a) Perform acoustic analysis of speech including FFT, LPC, cepstrum and inverse filtering; acoustic analysis of vowels, diphthongs, plosives, nasals, fricatives, Affricates and other speech sounds using spectrograms on PRAAT
- b) Vowel synthesis using parametric and analysis by synthesis; demonstration of articulatory synthesis
- c) Observation of stroboscopic evaluation of persons with voice disorders as part of team assessment
- d) Observation of endoscopic examination of persons with cleft lip and palate as part of team assessment
- e) Differential diagnosis of conditions relevant to speech and hearing as per DSM-V and ICD 10 classifications

Demonstrate

- a) Measurement of aerodynamic parameters using spirometer and instrumentation for aerodynamic analysis
- b) Record language samples of 5 typically developing children and 5 children with language disorders, transcribe the samples using International Phonetic Alphabet (IPA) and perform analysis of language in terms of different components of language
- c) Carry out and interpret the acoustic measures of voice on two recorded samples and correlate with the perceptual analysis
- d) Complete perceptual analysis of speech samples of persons with CLP.
- e) Demonstration of therapy techniques for disorders of speech sound, voice, and fluency.
- f) Practice and learn to use the strategies of direct selection, scanning, encoding and word prediction in a communication board/book or aided AAC system in simulated situation
- g) Practice and learn to use finger spelling and signs for functional vocabulary
- h) Learn to operate AAC devices, aids and software

Do

- a) Complete evaluation, write detailed evaluation report, counsel persons with communication disorder and their families as required for the following:
 - 1) five children with language disorders using appropriate tests/protocols: Autism Spectrum Disorders, Attention Deficit Hyperactivity Disorder (ADHD), cognitive impairment and global developmental delay.
 - 2) five persons with stuttering using standardized tests (SSI, SPI etc.), including assessment of rate of speech, type, percent of dysfluencies, and quality of life measures.
 - 3) five persons with voice disorders including perceptual assessment using different scales, acoustic analysis of voice and patient reported outcome measurement.
 - 4) five children with speech sound disorders – record and transcribe speech samples (word and connected speech), carry out error analysis – pattern analysis, calculate percentage consonant correct, mean length of utterance.
- b) Plan and carry out appropriate intervention program for children and adults with voice and fluency disorders, children with language disorders and children with speech sound disorders.
- c) Plan and carry out intervention program for a child with language disorder using AAC

Semester III

SLP 301 Neurogenic Speech Disorders

Hours - 60 : Marks - 100

Objectives: At the end of the course, the student will be able to

- a) describe the neuroanatomical bases of speech motor control,
- b) explain the models relevant to speech motor control, and
- c) know the methods for assessment and management of neuromotor speech disorders.

Unit 1: Neuroanatomical and Physiological Substrates of Speech Motor Control

- a) Review of neuroanatomical substrates of speech motor control- motor and sensory cortex, subcortical, cerebellar and brain stem structures and their pathways; cranial nerves and peripheral nervous system, types of mechanoreceptors and their topography in speech
- b) Early models of speech motor control: Closed Loop, Open Loop, Associative Chain and Serial Order Model, Schema Theory, Task Dynamic Model, Mackay's Model, Gracco's Model,
- c) Recent Models of Speech Motor Control: DIVA Model
- d) Other speech control models related to development of speech motor control in children
- e) Age related changes in speech motor control

Unit 2: Assessment and Management of Dysarthria in Adults

- a) Perceptual methods: Rating scales and tests for speech parameters, prosody, speech intelligibility, comprehensibility and naturalness.
- b) Recent advances in use of aerodynamic and acoustic analysis of speech among persons with dysarthria
- c) Other physiological analyses of speech subsystems in persons with dysarthria
- d) Behavioural approaches for treatment of speech subsystems affected in persons with dysarthria
- e) Evidence based practice guidelines for management of dysarthria in adults

Unit 3: Assessment and Management of Dysarthria in Children

- a) Behavioral approaches to correct posture, tone, and strength and sensori-motor treatment techniques
- b) Specific behavioral approaches in developmental dysarthria: McDonald's Approach and Hardy's Approach
- c) Application of facilitatory approaches (neurodevelopmental approach and methods for reflex inhibition) in the management of developmental dysarthrias– evidence base for facilitatory approaches

Unit 4: Assessment and Management of Apraxia of Speech (AOS) in Adults

- a) Assessment for suspected apraxia of speech, apraxia of speech and non-speech apraxia: Perceptual assessment protocols; physiological assessment of speech in adults with AOS
- b) Intervention methods for non-verbal apraxias

- c) Intervention for AOS in adults: specific, programmed and nonspecific approaches – Evidence based practice
- d) Motor learning principles – applications in intervention of AOS

Unit 5: Assessment and Management of Childhood Apraxia of Speech (CAS)

- a) Current status of nature of CAS as primary disorder and CAS as co-morbid condition in other neurodevelopmental disorders
- b) Assessment protocols for CAS and differential diagnosis from other speech sound disorders
- c) Intervention approaches for CAS – Evidence based practice
- d) Motor learning principles – applications in intervention of CAS

Recommended Reading

- Burda, A. N. (2011). Communication and Swallowing Changes in Healthy Aging Adults. Chapter 7 & 8. MA, Jones & Barlett Learning.
- Murdoch, B. E. (2010). Acquired Speech and Language Disorders: A Neuroanatomical and Functional Neurological Approach (2nd Ed.). New Delhi, India: John Wiley
- Guenther F. H., & Perkell, J. S. (2004). A Neural Model of Speech Production and its Application to Studies of the Role of Auditory Feedback in Speech. UK, Oxford University Press.
- Maassen, B., Kent, R., Peters, H., Lieshout, P.V., & Hulstijn, W. (Eds.) (2009). Speech Motor Control in Normal and Disordered Speech. NY, Oxford University Press.
- Maassen, B., & Lieshout, P. V. (Eds.) (2010). Speech Motor Control: New Developments in Basic and Applied Research. NY, Oxford University Press.
- McNeil, M. R. (2008). Clinical Management of Sensorimotor Speech Disorders (2nd Ed.). New York, NY, Thieme.
- Perkell, J. S., & Nelson, W.L. Sensorimotor Control of Speech Production: Models and Data. Cambridge, Massachusetts Institute of Technology.
- Caruso, A. C., & Strand, E. A. (1999). Clinical Management of Motor Speech Disorders in Children. New York. Thieme.
- Crary, M. A. (1993). Developmental Motor Speech Disorders. San Diego, Singular Publishing Group.
- Dodd, B. (2005). Differential Diagnosis and Treatment of Children with Speech Disorders. London, Whurr Publishers.
- Duffy, J. R. (2013). Motor Speech Disorders: Substrates, Differential Diagnosis, and Management (3rd Ed.). University of Michigan, Elsevier Mosby.
- Halpern, H., & Goldfarb, R. (2013). Language and Motor Speech Disorders in Adults (3rd Ed.). Chapters 8 and 9. MA, Jones & Barlett Learning.
- Love, R. J. (2000). Childhood Motor Speech Disability (2nd Ed.). USA, Allyn & Bacon.
- Manasco, M. H. (2014). Introduction to Neurogenic Communication Disorders. MA, Jones & Barlett Learning.
- Weismer, G. (2007). Motor Speech Disorders: Essays for Ray Kent. San Diego, Plural Publishing Inc.
- Yorkston, K. M., Beukelman, D. R., Strand, E. A., & Hakel, M. (2010). Management of Motor Speech Disorders in Children and Adults (3rd Ed.). Austin, Texas; Pro-Ed Inc.

SLP 302: Dysphagia

Hours - 60 : Marks - 100

Objectives: At the end of the course, students shall be able to

- a) understand the neuroanatomical and neurophysiological bases of normal and abnormal swallowing in children and adults,
- b) appreciate the varying roles and responsibilities of a SLP in an interdisciplinary team to assess and treat swallowing disorders across the lifespan (neonates, infants, children, adults and geriatrics),
- c) appraise different service delivery models, and
- d) understand ethical, cultural and professional considerations in the management of dysphagia.

Unit 1: Neuroanatomical and Neurophysiological Bases of Swallowing

- a) Structures involved in three phases of swallow and peripheral nervous system control of mastication and swallowing (anatomy & physiology of three phases & cranial nerve innervation)
- b) Central nervous system control for mastication and swallowing
- c) Etiologies for dysphagia in adults (structural anomalies, neurological conditions, mechanical & motility)
- d) Age-related changes in eating & swallowing.

Unit 2: Assessment of Swallowing and its Disorders

- a) Clinical assessment of swallowing: Clinical bedside evaluation, various published protocols for clinical examination, cervical auscultation for clinical examination
- b) Visual examination of swallowing and its disorders: modified barium swallow/videofluoroscopic study of swallow, flexible endoscopic examination of swallowing – team for conducting assessment, procedure and interpretation
- c) Other instrumental evaluation (e.g., X Ray, Scintigraphy, Manometry, Transnasal esophagoscopy, acoustic analysis of swallowing)
- d) Self-report questionnaires and quality of life assessment for dysphagia
- e) Differential diagnosis - oral vs. pharyngeal dysphagia, prognostic variables and recommendations for oral/non-oral options for nutritional intake/ management.

Unit 3: Management of Dysphagia in Adults

- a) Behavioral management - Compensatory and facilitatory strategies in detail
- b) Other behavioral management strategies (e.g., neuromuscular electrical stimulation)
- c) Pharmacological and surgical management of dysphagia
- d) Specific management strategies for mechanical causes of dysphagia (tracheostomy, glossectomy, mandibulectomy, oral/ pharyngeal cancer, trismus etc.)
- e) Evidence Based Practice (EBP) - levels of evidence, strengths and weaknesses, evidence base for various management approaches, evaluation of patient progress and treatment efficacy - when to continue treatment, when to terminate and when referrals are appropriate)

Unit 4: Pediatric Dysphagia

- a) Anatomical differences in neonatal and pediatric upper aero digestive tract with reference to adults, Oral-motor and swallow development of infants and children
- b) Clinical manifestations of feeding and swallowing difficulties in children
- c) Motor and sensory issues in feeding/ swallowing among developmental conditions- Sensory based feeding disorders and special populations
- d) Specific considerations for clinical and instrumental evaluation of swallowing in children
- e) Direct and indirect strategies to facilitate safe swallow in children (including motor and sensory issues)
- f) SLP in Neonatal Intensive Care Unit: Etiology of feeding delay/disorders in neonates; assessment of primitive reflexes, suck-swallow coordination among neonates, management of feeding delay/disorders in neonates

Unit 5: Service Delivery and Other Issues Related to Management

- a) Scope of practice in the area of dysphagia: training in endoscopy, documentation, tele-practice
- b) Trends across the world and in India: Review of practice guidelines, technical reports, position statements, knowledge & skills document relevant to dysphagia in India and other countries - issues in adopting and implementing the same in India.
- c) Dysphagia clinics: SLP led clinics vs. SLP in a medical team, space and other infrastructural requirements within hospital setup, private clinics, schools and other centers.
- d) Esophageal dysphagia – etiologies, symptoms, differential diagnosis and role of SLP in management.
- e) Ethical and cultural considerations in dysphagia management

Recommended Reading

- Groher, M. E., & Crary, M. A. (2015). Dysphagia: clinical management in adults and children. Elsevier Health Sciences.
- Logemann, J.A. (1998). Evaluation and treatment of swallowing disorders. Second Edition. Pro-Ed. Austin, Tx.
- Fraker, C., & Walbert, L. (2003). Evaluation and treatment of pediatric feeding disorders: From NICU to childhood. Speech Dynamics.
- Cichero, J. A., & Murdoch, B. E. (Eds.). (2006). Dysphagia: foundation, theory and practice. John Wiley & Sons.
- Arvedson, J. C., & Brodsky, L. (2002). Pediatric Swallowing and Feeding: Assessment and Management. (2nd Edition). Canada, Cengage Learning.

SLP 303: Aphasia

Hours - 60 : Marks - 100

Objectives: At the end of the course, the student will be able to

- a) describe the history and classification systems in aphasias,
- b) acquire skills in understanding the linguistic and non-linguistic impairments in aphasias,
- c) acquire skills in differential diagnosis and assessment of different types of aphasias,
- d) acquire skills in management of persons with aphasia, and
- e) critically analyze scientific articles related to aphasia.

Unit 1: Aphasia: Neuroanatomical Basis and Impairments

- a) Neuroanatomical basis of major types of aphasias, key brain regions, aphasia case studies - lesion-deficit relationships, different types of agnosias.
- b) Classification of aphasic syndromes
- b) Phonological aspects of aphasia: sound structure of language: A theoretical framework; speech production; speech perception
- c) Lexical deficits in aphasia: functional architecture of the lexical system; aspects of the internal structure of the functional components
- d) Syntactic deficits in aphasia: sentence production; conceptions of normal production; models to understand syntactic deficits in aphasia; sentence comprehension: a framework for normal comprehension, sentence comprehension Impairment in Aphasia

Unit 2: Assessment in Aphasia

- a) Formal and informal assessment tools both Indian and western their logic, purpose, test constructs, rationale, scoring, procedures and interpretation. Do's and don'ts in assessment procedures
- b) Methods for studying language and the brain- neuroimaging and cortical potentials electroencephalography, magnetoencephalography, positron emission tomography, functional magnetic resonance imaging, N400 and T-complex
- d) Differential diagnosis of different types of aphasia

Unit-3 Spontaneous recovery in Aphasia

- a) Anagraphical, neurological and Speech Language therapy and recovery
- b) Plasticity and recovery in aphasia: concepts of plasticity and recovery
- c) Prognostic factors; bio-chemical and physiologic mechanisms of recovery
- d) Structural mechanisms; behavioral mechanisms and language recovery in brain
- e) Link between plasticity, behavior and therapy; re-conceptualizing aphasia and aphasia therapy
- f) Recovery pattern in monolingual, bi/multilingual aphasia

Unit 4 : Disorders of Reading and Writing in Aphasia and Aphasia in Varied Population

- a) Introduction to acquired disorders of reading: dual route models; connectionist models
- b) Acquired alexia; assessment and intervention of acquired reading disorders
- c) Written language and its impairments: classification of written language disorders
- d) Neuroanatomical substrates of writing

- e) Assessment of writing disorders and intervention approaches to writing disorders
- f) Aphasia in bilinguals/multilingual population- definition and features
- g) Aphasia in illiterates, left handers and sign language users- definition and features

Unit 5: Management of Persons with Aphasia

- a) Introduction to language intervention strategies in adult aphasia
- b) Psychosocial/functional, traditional, specialized, life participation approach to aphasia, social approaches to aphasia, quality of life approach to aphasia, team and partnerships in aphasia intervention, treatment manuals in Indian context.
- c) Computer applications in the treatment of aphasia, tele-rehabilitation and constant therapy
- d) Treatment of swallowing, use of AAC in aphasia
- f) Medical aspects of rehabilitation and rights of persons with aphasia

Recommended Reading

- Ardila, A. (2010). A Proposed Reinterpretation and Reclassification of Aphasic Syndromes. *Aphasiology*, 24 (3), 363–394.
- Chapey, R. (2008). *Language Intervention Strategies in Aphasia and Related Neurogenic Communication Disorders*. Philadelphia, Lippincott Williams & Wilkins.
- Davis, G.A. (2007). *Aphasiology - Disorders and Clinical Practice*. Boston. Pearson & Allyn & Bacon.
- Goswami, S. P., Shanbal, J. C., Samasthitha S., Navitha U., Chaitra S. & Ranjini M. (2011). *Manual for Adult Aphasia Therapy in Kannada (MAAT-K)*. The publication of All India Institute of Speech and Hearing, Mysore. ISBN No. 978-93-81-854-17-0
- Goswami, S. P. & George A. (2006). *ISHA monograph. Adult Aphasia: Language Intervention*. A publication of Indian Speech and Hearing Association
- Goswami, S. P. (2012). *Disability Act and Dementias: Sociological issues*. Proceeding of the pre-conference continuing Education programme. A publication of the 44th ISHACON, Hyderabad.
- Papathanasiou, I. Coppens, P., & Potagas, C. (2013.). *Aphasia and Related Neurogenic Communication Disorders*. Burlington: Jones & Bartlett.
- Sarno, T.M (1998). *Acquired Aphasia*. San Diego: Academic Press.
- Ward, J. (2010). *The Student's Guide to Cognitive Neuroscience*. New York: Psychology Pres

SLP 304: Language and Literacy Disorders

Hours - 60 : Marks - 100

Objectives: At the end of the course, the student will be able to

- a) explain the relationships among language, literacy, and cognition and specifically the role of oral language in acquisition of literacy skills,
- b) discuss the development and related disorders pertaining to language and literacy among children,
- c) discuss evidence based assessments of language and literacy skills, and
- d) plan evidence based intervention for children with a focus on oral language based interventions

Unit 1: Reading: Development and Relationship with Language

- a) Concepts related to reading and its acquisition – Decoding, reading accuracy, reading fluency, reading comprehension;
- b) Differences among writing systems for languages; Importance of phoneme-grapheme correspondence for reading
- c) Foundations for development of reading in languages with different writing systems (Phonological processing, phonological awareness, orthographic skills, visual processing skills, oral language skills);
- a) Role of oral language in the acquisition of literacy – Aspects of oral language contributing to decoding (e.g., vocabulary and morphosyntax) and reading comprehension (e.g., syntax, syntactic awareness etc.) and spelling (e.g., morphological awareness)
- b) Stages of reading and writing development – emergent literacy to proficient reading comprehension; Models of reading development in English /alphabetic script and other writing systems.

Unit 2: Disorders Related Language and Literacy

- a) Definition and differences among underachievement in school, learning disability, reading disability, dyslexia, dysgraphia, dyscalculia, language learning disability, language impairment/ specific language impairment; DSM V and ICD 10 classifications; challenges in use of classifications.
- b) Linguistic characteristics of students with reading/language/learning disabilities
- c) Issues related to co-morbidity and overlap among phonological disorders, specific language disorders, reading disability and auditory processing disorders with relation to development of reading
- d) Genetics of literacy disorders (family risk, molecular genetics etc.).

Unit 3: Assessment

- a) Screening of children for language disorders in schools; Standardized tests to assess language and (English and other languages) in children 5-18 years
- b) Other forms of assessments to identify children with language/learning disabilities - Criterion referenced assessments, language sampling, portfolio, dynamic assessment, curriculum-based assessment etc.
- c) Specific assessment tools for learning disability in India (e.g., NIMHANS battery, Dyslexia Assessment for Languages in India and other published tests)

- d) Informal assessment of different domains – Tasks and stimuli in specific languages for phonological awareness, orthographic skills, phonological processing, oral language skills etc.
- e) Brief overview of assessment of associated areas (auditory processing, visual processing, memory etc.)

Unit 4: Evidence based Intervention for Literacy Development

- a) Intervention approaches to promote emergent literacy
- b) Intervention approaches to promote decoding and early reading skills
- c) Intervention approaches to promote development of reading comprehension
- d) Intervention approaches to promote spelling and written language output
- e) Research on cross-linguistics issues in intervention; intervention for children with Bilingual / multilingual background and reading intervention

Unit 5: Issues related to Service Delivery and Related Laws/Policies

- a) Modes of service delivery for school-aged children (clinical, consultative, collaborative, language-based classroom, peer-mediated)
- b) Team members working children with literacy disorders; Response to Intervention– tiers and their role in instruction for poor readers; role of SLP in Response to Intervention
- c) Acts, regulations and policies relevant to education and children with special needs in India (e.g., Right to Education Act, Sarva Siksha Abhiyan, regulations related to language exemption in examination, National Open School system).
- d) Dyslexia associations/groups in India

Recommended Reading

- C. A. Stone, E. R. Silliman, B. J. Ehren, & G. P. Wallach (Eds.), (2016). *Handbook of language and literacy: Development and disorders* (2nd ed.), pp. 339-357. New York, NY: Guilford Press.
- Clarke, P. J., Truelove, E., Hulme, C., & Snowling, M. J. (2013). *Developing reading comprehension*. John Wiley & Sons.
- Nag, S., & Snowling, M. J. (2012). School underachievement and specific learning difficulties. *IACAPAP e-Textbook of Child and Adolescent Mental Health*. Geneva: International Association for Children and Adolescent Psychiatry and Allied Professions.
- Paul, R. & Norbury, C. (2012). *Language disorders from infancy through adolescence: Listening, speaking, reading, writing, and communicating* (4th Ed.). St. Louis, MO: Elsevier.
- Carroll, J. M., Bowyer-Crane, C., Duff, F. J., Hulme, C., & Snowling, M. J. (2011). *Developing language and literacy: Effective intervention in the early years*. John Wiley & Sons.
- Turnbull, K. L. P., & Justice, L. M. (2011). *Language development from theory to practice*. Pearson Higher Ed.
- Hulme, C., & Snowling, M. J. (2009). *Developmental disorders of language learning and cognition*. John Wiley & Sons.
- Cabell, S. Q., Justice, L. M., Kaderavek, J., Pence, K. L., & Breit-Smith, A. (2008). *Emergent literacy: Lessons for success*. Plural Publishing.
- Justice, L. M. (2006). *Clinical approaches to emergent literacy intervention*. Plural Publishing.

SLP 305: Cognitive-Communication Disorders

Marks - 100: Hours - 60

Objectives: At the end of the course, the student will be able to

- a) describe various conditions in adults leading to cognitive communication disorders,
- b) acquire skills in issues related to assessment of cognitive communication disorders,
- c) acquire skills in management of cognitive communication disorders, and
- d) critically evaluate research articles related to cognitive communication disorders.

Unit 1: An Overview of Cognitive Communication Disorders - Aphasia Related, Traumatic Brain Injury (TBI) and Right Hemisphere Damage (RHD)

- a) Cognition- description of cognitive processes, mapping, mechanisms, concept, schema and properties
- b) Models of memory, cognitive-linguistics processes
- c) Cognitive communication disorders associated with TBI, disability following TBI- WHO-ICF classification, assessment and principles of cognitive rehabilitation of TBI
- e) Nature, assessment and management of various cognitive communication deficits in RHD

Unit 2: Dementia and Related Cognitive Disorders

- a) Neuropathology in Alzheimer's Disease (AD), evaluation and intervention of cognitive communication disorders in AD and other dementias
- b) Cognitive communicative aspects in primary progressive aphasia (PPA), evaluation and management of PPA
- c) Role of speech-language pathologist working with persons with dementia

Unit 3: Alcohol Induced Language Disorders and Metabolic Disorders of Language

- a) Cognitive communication deficits in alcohol induced and metabolic language disorders
- c) Assessment and management of body structure and function: quantifying and qualifying cognitive communication disorders of alcohol induced and metabolic disorders
- d) Assessment of swallowing in persons with cognitive communication disorders
- e) Differential diagnosis of cognitive communication disorders in adults

Unit 4: Physiology, Pathology and Cognitive Communication Changes in young ageing with Aging

- a) Theories aging, and age related changes of the organ system, and cognition
- b) Psychological- death and bereavement, personality development and quality of life
- c) Physical changes and performance- range of motion, strength, endurance praxis, performance work
- d) Aging speech- voice, resonance and articulation and swallowing
- e) Language and cognitive aging: primary, secondary and tertiary aging factors

Unit 5: Ethno-Cultural Dynamics in Cognitive Communication Disorders and Cognitive Communication Approaches.

- a) Language as socio-cultural phenomena in aging
- b) Role of supportive relationships in cognitive communication disorders
- c) Cognitive communication approaches in rehabilitation
- d) Role of AAC in the intervention of cognitive communication disorders
- e) Team and partnerships in cognitive communication disorders
- f) Rights of persons with cognitive communication disorders

Recommended Reading

- Chapey, R. (2008). Language Intervention Strategies in Aphasia and Related Neurogenic Communication Disorders. Philadelphia, Lippincott Williams & Wilkins.
- Chop, C. W & Robnett, H. R (2015.). Gerontology for health care professional. MA: Jones and Bartlett Learning Burlington.
- Gazzaniga, S., Ivry, M. S., Mangun, R. B., & George, R. (2014). [Cognitive Neuroscience: The Biology of the Mind](#). New York, W. W. Norton & Company Inc.
- Laura, L. M., & Heather, M. C. (2006). Neurogenic Disorders of Language: Theory Driven Clinical Practice. New York, Thomson Delmar Learning.
- Sarno, T.M (1998). Acquired Aphasia. San Diego, Academic Press.
- Papathanasiou, P. Coppens, & C. Potagas (2013), Aphasia and Related Neurogenic Communication Disorders. Burlington, Jones & Bartlett.
- Morris, J. C. (1994). Handbook of Dementic Illnesses. NY, Marcel Dekker Inc.
- Murray, L.L. & Clark, M.H (2015). Neuro-genic Disorders of Language and cognition. Austin, Texas, Pro-Ed Inc.

Semester IV

SLP 401: Speech-Language Pathology in Practice

Marks - 100 : Hours - 60

Objectives: At the end of the course, the students should be able

- a) know the role of an speech-language pathologist in different set-ups.
- b) liaise with other professionals in setting-up an speech-language clinic.
- c) audit speech-language practices in existing set-ups.
- d) implement acts and legislations relating to persons with speech-language impairment,
- e) advise Governments and other agencies on the formulation of policies and legislative acts relating to speech-language disability
- f) understand the legal implications of practice in speech-language pathology.

Unit 1: Scope of Practice, Laws, Regulations and Professional Ethics

- a) Scope of practice in global and Indian scenario
- b) Professional ethics -
- c) Existing acts, legislations, policies related to persons with communication impairment
- d) Role of speech-language pathologists in the formulation of acts, regulations and policies
- e) Implementation of acts, legislations, policies and welfare measures relating to persons with speech-language impairment
- f) Advocacy groups, NGOs
- g) Rights of citizens
- h) National and international standards related to Speech-language pathology

Unit 2: Specialized Programs in Speech-language Pathology

- a) Need for specialized programs in Speech-language pathology: Geriatric and persons with multiple handicaps
- b) Other specializations (medical speech language pathology, forensic speech science)
- b) Health, wellness, and health care - Health promotion and disease prevention, quality of life and healthcare finances
- c) Disability-friendly environment including public education
- e) Culture and religion sensitive practice in speech-language practice
- e) Multilingual and multicultural sensitivity in therapeutics and management
- f) Prevention and early identification programs including societal participation

Unit 3: Service Delivery Models in Speech-language Pathology

- a) Services in different medical / rehabilitation/ research /educational set ups
- b) School based services pertaining to regular and special schools
- c) Community based practice in rural and urban areas
- d) Family empowerment programs
- e) Home based delivery of services
- f) Autonomous practice in speech-language pathology
- g) Services for other groups of professionals (professional voice users)

Unit 4: Tele-practice in Speech-language Pathology

- a) Information and communication technology in speech-language pathology practice

- b) Infrastructure for video-conferencing and tele-practice in Speech-language Pathology
- c) Techniques/principles of remote testing for screening and diagnostic assessment for speech-language, intervention and counseling
- d) Challenges and limitations of tele-practice in Speech-language Pathology in screening, assessment and evaluation, selection of aids and appliances, therapeutics and counseling.

Unit 5: Issues in Speech-Language Pathology Practice

- a) Entrepreneurship and planning to set up private practice/clinic for speech-language pathology practice: Clinical ethics
- b) Documentation in speech-language pathology practice: clinical / demographic data, database management and storage
- c) ICF framework for documentation / reports
- d) Quality control and auditing in speech-language pathology practice
- e) Documenting and implementing evidence based practice in speech-language pathology
- f) Understanding team approach: Work in cohesion with other professionals
- g) Information resources in speech-language pathology including books and journals, both electronic and print - Databases - Evidence based practice: Changed scenario

Recommended Reading

- Acts relating to disability, particularly hearing, enacted by the Indian Parliament.
- ASHA.2007. Scope of Practice in Speech-Language Pathology [Scope of Practice]. Available at: <http://www.asha.org/policy>.
- ASHA. 2009a. Audiology and Speech-Language Pathology Outside the United States. Available at: http://www.aasha.org/members/international/intl_assoc.
- ASHA.2009b. Telepractices for SLPs and Audiologists. Available at: <http://www.asha.org/practice/telepractice>
- Cari M. Tellis, Orlando R. Baron (2015). Counseling and Interviewing in Speech-Language Pathology and Audiology
- College of Audiologists and Speech-Language Pathologists of Ontario.(2004). Use of Telepractice Approaches in Providing Services to Patients/Clients.
- David L. Irwin (2007). Ethics for speech-language pathologists and audiologists : an illustrative casebook
- Position paper Speech and language therapy in adult critical care.Royal college of Speech-language therapists. (2014), London
- Rizzo, S.R., &Trudean, M.D. (1994).Clinical administration in audiology and speech language pathology. San Diego: Singular Publishing Group Inc.
- Rosemary Lubinski and Melanie W. Hudson. (2013), Professional Issues in Speech-Language Pathology and Audiology 4th Edition
- Sarah Ginsberg; Jennifer Friberg; Collenn F. Visconti (2011). Scholarship of Teaching and Learning in Speech-Language Pathology and Audiology
- Speech-Language Pathology Medical Review Guidelines (2015). American Speech-Language-Hearing Association
- Stephen, R.R., Jr., Trudeau, D.M. (Eds.) (1994). Clinical administration in audiology & speech language pathology. San Diego: Singular Publishing Group Inc.
- Todd K Houston (2013). Telepractice in Speech-Language Pathology
- TriciSchraeder (2013). A Guide to School Services in Speech-Language Pathology 2nd Edition
- www.disabilityaffairs.gov.in (website of Department of Empowerment with Disabilities)
- www.rehabcouncil.nic.in (website of Rehabilitation Council of India)

SLP306 and SLP 403: Clinical Practicum

Knowhow

- a) Observation of modified barium swallow and/or flexible endoscopic examination of swallowing as part of team assessment
- b) Observe and identify reports of persons with neurogenic communication disorders in tests such as EEG, CT Scan, MRI etc.
- c) Reversible and irreversible conditions that cause neurogenic communication disorders.
- d) Certification procedures
- e) Rights and privileges of persons with communication disorder
- f) Ethics in clinical practices

Demonstrate

- a) Perform assessment on typically developing child using assessment protocols for learning disability
- b) Demonstrate process of differential diagnosis for persons with adult language and cognitive communication disorders.
- c) Use of AAC for adults with communication disorders (e.g., alphabet supplementation board, software applications)
- d) Perform assessment of phonological awareness, visuospatial skills, orthographic skills on typically developing children.

Do

- a) Complete evaluation, write detailed evaluation report, counsel persons with communication disorder and their families as required for the following:
 - 1) Three persons with aphasia using appropriate screening, diagnostic (WAB/ BDAE etc.) and performance tool
 - 2) Bed side screening for five adults with communication disorders.
 - 3) Three persons with adult cognition communication disorders using appropriate screening (ACE/MMSE/CLQT etc.), diagnostic (ABCD/CLAP etc.) and performance tool
 - 4) Three persons with motor speech disorders including perceptual evaluation of speech subsystems, speech intelligibility assessment, instrumental assessments for respiration or phonology and quality of life assessment
 - 5) Clinical swallow examination for five persons with concerns in swallowing
 - 6) Three children at risk for language learning disability
- b) Plan and carry out intervention program for adults with neurogenic speech disorders, aphasia, cognitive communication disorders and dysphagia
- c) Prepare a report for persons with communication disorders for medico-legal purposes.

Expert Committee for development of training programmes for the professionals/personnel, namely, Audiologists & Speech Pathologists, Hearing Aid and Earmould Technicians

Dr. M. Jayaram, Chairperson, Expert Committee, Department of Audiology NIMHANS, Hosur Road, Bangalore-560029
Dr. Manisha Aggarwal, House No.10, Sector-1, Ambala City, Haryana-134003
Dr. S R Savithri, Director, All India Institute of Speech & Hearing, Manasagangothri, Mysore- 570006
The Dean/Nominee, Maulana Azad Medical College, Delhi Gate, New Delhi -110002
Dr. Ajith Kumar Uppunda, Reader, Department of Audiology, All India Institute of Speech and Hearing, Mysore-570006
Dr. A K Sinha, Director, Ali Yavar Jung National Institute for the Hearing Handicapped, K C Marg, Bandra (W), Mumbai-400 050
Dr. B. Rajashekhar, Dean, College of Allied Health Sciences, Manipal University, Manipal- 576 119
Dr. Prakash Boominathan, Professor, Dept. of Speech Language & Hearing Sciences, Sri Ramachandra University, Porur, Chennai-600116
Dr. M.N. Nagaraja, 3588, 70th Cross, II Stage, Kumaraswamy Layout, Bangalore - 560078
Dr. C S Vaneja, Professor and HOD., Bharati Vidyapeeth Deemed University , School of Audiology and Speech Language Pathology, 4th Floor of Homeopathy Hospital, Dhankawadi, Pune - 411043
Dr. (Mrs.) Prathibha Karanth, # 224, 6th 'A' Main, II Block, HRBR Layout, Bangalore 560043
Mr. Nachiketa Rout, National Institute for Empowerment of Persons with Multiple Disabilities, East Coast Road, Muttukadu, Kovalam Post, Chennai – 603 112
Mr. Lanu W Aimol, Composite Regional Centre for PwDs, PMRT Building, Guwahati Medical College Hospital Campus, Guwahati ,781032
Shri Rajiv Jalvi, Ali Yavar Jung National Institute of Speech & Hearing Disabilities, K C Marg, Bandra (W)Mumbai-400050
Shri Indranil Chatterjee, AYJNISHD, ERC, B.T.Road, Bon Hooghly,Kolkata-700090
Shri Ranjith R, MERF Institute of Speech and Hearing, Old No. 1/1, New No.1, South Canal Bank Road, Mandavelipakkam, Chennai-600028
S K Srivastava, Member Secretary, RCI - Member(Ex-Officio)
Suman Kumar, Deputy Director (Prog.), RCI, Convener (Ex-officio)

Post Graduate Diploma Course
in
Auditory Verbal Therapy (PGDAVT)

Regulations, Norms and Course Content



June, 2015

Rehabilitation Council of India

B-22, Qutab Institutional Area,

New Delhi - 110 016

Email: rehabstd@nde.vsnl.net.in, rehcouncil_delhi@bol.net.in

www.rehabcouncil.nic.in

1 Preamble

The ratification of the UN Convention on the Rights of Persons with Disabilities (Article 24) in 2007 by the Indian government and the passing of the 'The Right to Education Act (2009)' subsequently has brought a new direction to the field of management of deaf and hard of hearing individuals in the country. Professionals offering services to the deaf and hard of hearing must acquire the skills to adopt and use modern technology for the benefit of persons with hearing impairment. Rehabilitation Council of India (RCI) is India's apex body entrusted with the responsibility to regulate and monitor training of professionals in the area of disability. The Council has been designing, from time to time, training programs for the manpower generation in different areas of disability. The RCI is in the process of implementation of the forward thinking concept of a barrier free environment for persons with disabilities as enunciated in the United Nations Convention on the Rights of Persons with Disabilities (UNCRPD) 2006.

The significant change that the UNCRPD (2006) has brought about is that issues regarding persons with disabilities will no longer be a medical or health care issue. On the other hand, they will be viewed as a human rights issue. However, majority of the training programs tend to focus more on disability than on the needs of differently abled children. The RCI has been designing training programs to accommodate this changed shift. One such program is the institution of a Post Graduate Diploma Course in Auditory Verbal Therapy for the training professionals in the fields of Speech & Hearing and Special Education. By its very definition, Auditory Verbal Therapy, highlights the similarities between hearing children and their deaf and hard of hearing peers and therefore uses normal patterns of development on which to base the habilitation of deaf and hard of hearing children. Inclusion / inclusive education lie at the very heart of Auditory Verbal Therapy and therefore, the new program is justified.

RCI plays a key role in linking tradition to modernity and its training courses for professionals are the bridges that enable the link. Post Graduate Diploma Course in Auditory Verbal Therapy will allow the professionals serving the deaf and hard of hearing in India to build on their knowledge and skills from their masters, graduation and diploma programs and to upgrade their knowledge.

Systematic and intensive training of the existing re/habilitation professionals is critical if India is to keep pace with international trends in the habilitation of deaf and hard of hearing children. International protocol recommends that training in Auditory Verbal therapy be given only by professionals who are themselves certified as LSLS Cert. AVT® by the A.G. Bell Academy, an international organization. Therefore, this Post Graduate Diploma in Auditory Verbal Therapy should preferably follow the same modules of theory, guided observation and practice of Auditory Verbal Therapy as taught in the training of LSLS Cert. AVT®.

Across the world, all countries are working towards implementing the position statement of the Joint Committee on Infant Hearing, 2007. This 1-3-6 protocol specifies that with the help of universal newborn infant screening babies with hearing loss be identified by one month of age and be appropriately provided amplification facility by three months of age so that effective intervention begins at six months of age at the latest. By instituting this Post Graduate Diploma in Auditory Verbal Therapy, India will demonstrate through her apex regulatory body of RCI that she recognizes the need for focused training of re/habilitation

professionals who serve deaf and hard of hearing babies in listening, learning and spoken language skills in order to comply with the 1-3-6 protocol and so become members of the global community.

2 Aims and Objectives

The aim of the Post Graduate Diploma Course in Auditory Verbal Therapy is to train and equip professionals in the fields of Speech & Hearing and Special Education with knowledge and skills to practice auditory verbal therapy with young children with deafness and hard of hearing as a part of the early intervention program. The course further aims to facilitate professionals in setting up of early intervention centers staffed by therapists who have the requisite skills to work with deaf and hard of hearing children.

The objectives of this program are to

- a) impart knowledge in modern technology and its significance in the practice of educating children with hearing impairment
- b) identify the principles and practices of auditory verbal therapy and related services
- c) develop skills and competencies for practicing auditory verbal therapy as a part of the early intervention services for young children with hearing impairment,
- d) promote speech-language development and education of young hearing impaired children, and
- e) promote parent - teacher empowerment
- f) develop skills and competencies in students for practicing AVT as a part of early intervention for young hearing impaired children, and
- g) to teach the need and significance of practice of AVT in India

4. Duration of the Course

The duration of the course is one academic year (2 semesters)

5. Medium of Instruction

The medium of instruction shall be English

6. Eligibility for Admission

Any candidate with a graduate degree in Audiology /Speech-Language Pathology/ Speech and Hearing, or Special Education (HI), or equivalent degree from any other University and who is registered with the Rehabilitation Council of India will be eligible to seek admission for the course. Foreign nationals should produce evidence of professional registration in their home country.

7. Teacher – student ratio

The teacher student ratio is 1: 5

8. Intake capacity

Considering infrastructural facilities needed and the dearth of certified AV therapists in India, a maximum of 10 candidates may be admitted for the course.

9. Type of institutions that can offer the program

Only those institutions that fulfil the following criteria are eligible to conduct the program:

- a) Institutions offering RCI approved graduate programs in Speech & Hearing or Special Education in the area of hearing impairment or institutions with RCI affiliation for more than 4 years.
- b) Institutions having surgical facility for cochlear implantation and post implant habilitation facility, or having MOU with institutions having surgical and post implant habilitation facility.

10. Theory and practical work

Semester 1*

Semester	Title	Theory** Hours	Practical Hours	Clinical Hours
1	Auditory Verbal Techniques	50	40	--
	Spoken Language and Communication Development	50	40	--
	Child Development	50	40	--
	Clinical work			290
Total		150	120	290
2	Hearing and Amplification Technologies	50	40	--
	Parent Empowerment and Curricular Support	50	40	--
	Clinical work			380
Total		100	80	380

* Calculated on the basis that each semester will have 16 weeks with 5 working days, and each working day will have 7 hours. It means each semester will be of 560 hours (16 weeks x 5 days x 7 hours). This is in addition to examinations, preparatory holidays for exam, vacation etc.

** There shall be 5 units in each paper and each unit shall be taught for 10 hours.

Minimum Practical work: 1 and 2 semesters (Clinical examination)

S.No.	Activity	Sessions / Children	Hours
1	Unsupervised observations	50	50
2	Supervised observation of teaching sessions with Teacher Practicum Supervision Form	20	20
3	Practice sessions with Teacher Behavior Rating Scale (TBRS)	20	30
4	Assessed sessions (TBRS)	10	20
5	Practice of Phonetic Level Evaluation and Speech Strategies of Dr. Ling	30	10
6	Observation and practice –Audiograms 15 observations and 5 practice sessions	15	20
7	Practice – Hearing evaluation	5	10
8	Observation of Hearing aids fitment	10	20
9	Observations of Mapping sessions	10	20
10	Observation of Speech Perception Tests	5	10
11	Case studies including case history	5	10
12	Clinical work with Children with Hearing impairment		450*

* Auditory verbal therapy + Speech therapy

11. Scheme of Examination

Examination (theory papers) can be either by internal or external examiners. Clinical examination shall be by external examiner only. Internal assessment and practical examination shall be by only the faculty teaching a given paper. Preparatory leave of 2 weeks will be granted to the trainees prior to the external theory examination.

The scheme of examination shall be as follows:

Paper	Title	Theory	IA	Practical	Total
1.1	Auditory Verbal Techniques	50	20	30	100
1.2	Spoken Language and Communication Development	50	20	30	100
1.3	Child Development	50	20	30	100
1.4	Clinical*	80	20	--	100
2.1	Hearing and Amplification Technologies	50	20	30	100
2.2	Parent Empowerment and Curricular Support	50	20	30	100
2.3	Clinical*	80	20	--	100
	Total	410	140	150	700

12. Standard of Passing

The minimum percentage of marks required for passing is 50%, separately in theory, IA, practical and clinical examination. Class will be declared based on the aggregate of marks of both the semesters. The candidates will be declared to have passed the examination as follows:

First Class with Distinction	≥ 75%
First Class	≥ 60%
Second Class	≥ 50%

13. Reappearing Facility

A candidate has to pass each examination in not more three attempts including the first attempt. The candidate to appear for the examination at the end of second semester must have passed all the papers of the first semester. The entire course itself should be completed in not more than 2 years.

14. Infrastructure facilities

The institution conducting the training course should have a Model Centre practicing auditory verbal therapy or should have a Memorandum of Understanding Auditory Verbal therapy center near to the institution. The teacher student ratio (therapist – cochlear implanted children) of the model center should be 1 : 4 and the center should have a minimum strength of 10 young hearing impaired children with cochlear implants.

The minimum infrastructure required for offering this Post graduate Diploma program for an intake of 10 students, shall be as given below. The requirements for infrastructure shall double for an additional intake of 10 students or part thereof.

a) Space: Exclusively for this program

Class room	1 room	15' x 10'	150 Sq. ft
Laboratory	1 room	20' x 10'	200 Sq. ft
Therapy rooms	5 rooms	8' x 8' each	320 Sq. ft

Space for staff, library, waiting hall,
child care, office & other facilities ~ 500 Sq. ft

b) Staff

Audiologist / Speech Language Pathologist*	1	Full time
Lecturer in Special Education [@]	1	Full time
Lecturer in Auditory Verbal Therapy [§]	1	Part time/Full time
Lecturer in Clinical Psychology/Clinical Psychologist [#]	1	Visiting

* MASLP or MSc (Audiology) or M.Sc (Speech-language Pathology), or its equivalent as recognize by RCI

@ Master's Degree in Special Education (HI) or its equivalent as recognized by RCI

- \$ a) MASLP or MSc (Audiology), or MSc (Speech-language Pathology), or Master's Degree in Special Education (HI), or M.Ed (Special Education) with LSLS Cert. in AVT, or its equivalent as recognized by RCI
b) Must have worked with 50 children with cochlear implants in the last 5 years.
M.Phil in Clinical Psychology or its equivalent as recognized by RCI

c) Equipment/ Material

Digital Hearing Aids - Minimum 6 nos.

Therapy material like toys & play materials, toys for informal hearing screening such as bells and noise making toys

Material for auditory verbal training

Models of Ear and cochlear implant

d) Clinical infrastructure

Teacher: Children with cochlear implants 1 : 5

Teacher: Children with hearing aids 1 : 5

e) Library

Books and Journals listed under each paper are essential.

15. University Affiliation

University affiliation is required for PG Diploma in Auditory Verbal Therapy programme.

16. Certification as a Registered Professional

It is mandatory as per Section 13 of RCI Act for every teacher of special education to obtain a "Registered Professional Certificate" from the Rehabilitation Council of India to work in the field of special education in India. As continuous professional growth is necessary for the renewal of the certificate, the teachers as well as educators in special education should undergo in-service programme periodically to update their professional knowledge. Amendments, if any, to the regulations of the course will be made periodically by the Rehabilitation Council of India. Any deviation from the above regulations should have the prior approval of the Rehabilitation Council of India.

The candidates with Post Graduate Diploma in Auditory Verbal Therapy (PGDAVT) will be eligible for addition of qualification for registration in CRR as Auditory Verbal Therapist (AVT) in addition to their existing categories of registration under any other category (Sl. No.17).

**Course curriculum for the
Post Graduate Diploma in Auditory Verbal Therapy**

Paper 1.1 Auditory Verbal Techniques

Objectives

At the end of the course, students should be able to

- 1) describe the history and development of auditory verbal therapy
- 2) understand the rationale, principles, strategies, techniques and procedures in auditory verbal method of teaching.
- 3) develop skills to practice AVT to facilitate normal integration of hearing impaired children
- 4) provide support to parents in an auditory verbal setting
- 5) develop skills in writing an auditory verbal treatment plan, and
- 6) understand the history and development of auditory verbal Teaching and its implications

Unit 1: History, Philosophy and Principles of AVT

10 hours

- 1.1 History of Auditory Verbal Practice and contributions of the pioneers
- 1.2 Evidence based practice and professional development requirements
- 1.3 Principles and procedures of Auditory Verbal Training
- 1.4 Pre-requisites of Auditory Verbal Training and the factors that affect the outcomes
- 1.5 Importance and system of documentation of diagnostic, clinical and referral reports

Unit 2: The auditory verbal treatment plan

10 hours

- 2.1 Base line assessment and short term goals based on normal development
- 2.2 Planning and execution of weekly session plans and recording diagnostic information
- 2.3 Age appropriate activities and instructional material for AVT sessions
- 2.4 Listening strategies and Techniques of AVT
- 2.5 Analysis of language samples to evaluate outcomes

Unit 3: Listening skills development and assessments

10 hours

- 3.1 Need and importance of developing auditory skills and guiding and coaching parents to develop auditory skills at home
- 3.2 Stages of auditory hierarchy and sequential planning through hierarchy of listening skills
- 3.3 Importance and need for assessments in four areas of audition, language, speech and cognition
- 3.4 Formal and informal assessment of functional listening skills and the use of six sounds test
- 35 Test results to make recommendations to parents about management of their child with deafness/ hard of hearing including development of auditory skills

Unit 4: The auditory verbal therapy plan**10 hours**

- 4.1 Planning long- and short-term goals: Working with babies below the age of two years
- 4.2 The importance of singing and early learning to listen sounds: Importance of home training activities
- 4.3 Introduction to parent counselling, facilitation of parent participation and transfer of skills
- 4.4 Importance of neural plasticity subsequent to auditory stimulation
- 4.5 Recognition of red flags and action plan

Unit 5: The role of parents in Auditory Verbal Technique**10 hours**

- 5.1 The role of parents in auditory verbal plan and the team approach
- 5.2 Sharing goals and diagnostic evaluation with parents in every session
- 5.3 Coaching Parents during the session and to encourage participation
- 5.4 Transfer of goals from therapy to home
- 5.5 Management and realistic expectations of children with additional issues

Practical

- 1.1.1 Observe and write listening strategies used in one to one session (4 sessions)
- 1.1.2 Write 3-months AVT plan for a child with cochlear implant
- 1.1.3 Plan short term and long term goals for a child (2 children)
- 1.1.4 Role plays of reading stories to children of different age group of 2 years to 5 years (4 children)
- 1.1.5 Observe and record the behavior and language of normal hearing children of the age of 2 to 5 years (4 children)

References

Estabrooks, W. (2006). Auditory Verbal Therapy and Practice, AG Bell Association for the Deaf and Hard of Hearing, Inc.

E. Cole., & C. Flexer. (2007). Children with Hearing :Loss Developing Listening and Talking Birth to Six, Plural Publishing

Estabrooks, W. (1998). Cochlear Implants for Kids, AG Bell Association for the Deaf and Hard of Hearing, Inc.

Estabrooks, W., & Marlowe J, The Baby is Listening, A G Bell Association for the Deaf and Hard of Hearing, Inc, Washington DC

Pollack, D.(1970). Educational Audiology for the Limited Hearing Infant, Charles C. Thomas

Simser, J. (1993). Auditory-Verbal Intervention: Infants and Toddlers, Volta Review 95(3), 217-229

D. Ling., & A.G. Bell. (1989). Foundations of Spoken Language for Hearing-Impaired Children

D. Ling., A. Ling., & A.G. Bell. (1978). Aural Habilitation: The Verbal Foundations of Learning in Hearing-Impaired Children

Estabrooks, W. (1994). Auditory Verbal Therapy for Parents and Professionals, A.G. Bell Association for the deaf and hard hearing

Flexer, C. (1994). Facilitating Hearing and Listening in Young Children. Singular Publishing Group, Inc. San Diego

Paper 1.2 Spoken Language and Communication Development

Objectives

At the end of the course, students should be able to

- 1) explain the anatomy of the speech mechanism and its role in the development of age appropriate speech
- 2) describe the normal development of phonology in hearing babies and young children (birth to age 5 years)
- 3) describe normal development of language, hearing, cognition, and pragmatics list and explain the types and stages of play and how to assess play in children
- 4) describe the impact of additional difficulties (sensory integration/attention difficulties) on the rate of progress in children with deafness/ hard of hearing.

Unit 1: Speech and Hearing Development

10 hours

- 1.1 Anatomy and physiology of the speech mechanism
- 1.2 Speech acoustics and its application: Fundamentals of acoustic phonetics
- 1.3 Emergence of speech sounds and phonological development (birth to age 5 years)
- 1.4 Typical errors in the emerging speech of hearing children
- 1.5 Formal speech assessment: tests and techniques

Unit 2 Language Development

10 hours

- 2.1 Aspects of language (phonology, morphology, syntax, semantics & pragmatics) and theories of language development
- 2.2 Acquisition of spoken language development (0-6 years)
- 2.3 Development of complex conversational competence
- 2.4 Development of divergent/convergent thinking
- 2.5 Development of second language, bilingualism
- 2.6 Factors affecting language development

Unit 3 Methods of Developing Language

10 hours

- 3.1 Principles of language teaching
- 3.2 Methods of language development – natural, structural and combined methods
- 3.3 Techniques and strategies used in the development
- 3.4 Spoken language modelling, prompting techniques, responsive teaching
- 3.5 Teaching meaningful and interactive conversation
- 3.6 Computer aided language teaching techniques

Unit 4 Language Disorders and Assessment

10 hours

- 4.1 Factors influencing language development
- 4.2 Characteristics of language disorders
- 4.3 Need, relevance and challenges in the assessment of language
- 4.4 Formal and informal tests of language and communication
- 4.5 Emergent literacy development

Unit 5: Children with Associated Disorders

10 hours

- 5.1 Sensory integration: what it is and its implications
- 5.2 Attention difficulties: what it is and its implications
- 5.3 Perception – Development and disorders
- 5.4 Red flags: what they are, identification, implications and management
- 5.5 The team approach
- 5.6 Case studies

Practicals

- 1.2.1 Obtain and analyze a language sample
- 1.2.2 Obtain and analyze a speech sample
- 1.2.3 Record the language used in daily routine activities of a family (4 children)
- 1.2.4 Track the progress of a hearing impaired child for six months and language

References

- Paul R. (2007). Language disorders from infancy through adolescence. Mosby; Elsevier.
- Riper C. V. (1996). Speech correction: An introduction to speech language pathology. Allyn and Bacon.
- Robertson I. (2009). Literacy and deafness. Plural Publishing.
- Shulman, B. B., & Capone, N. C. (2010). Language development: Foundations, processes and clinical applications. Jones and Barlet Publishers
- Haynes, W. O. (2008). Diagnosis in Speech-Language Pathology. Pearson Education, Inc.
- Hulit L. M. (2002). Born to talk : An Introduction to Speech and Language Development. Allyn and Bacon.
- Mc. Laughlin, S. F. (2006). Introduction to Language Development. Thomson.
- Riper, C. V. (1996). Speech Correction: An Introduction to Speech Language Pathology. Allyn and Bacon.
- Zemlin, W. R. (1998). Speech and Hearing Science. Allyn and Bacon.

Paper 1.3 Child Development

Objectives

At the end of this course, the students should

- 1) have knowledge on the normal development in hearing, language (receptive and expressive), cognition, communication or pragmatics,
- 2) be able to list and explain the type, stages and assessment of play in children,
- 3) be able to understand normal development and its disruption because of hearing impairment
- 4) be able to understand the auditory brain development and its implications
- 5) know and understand the integration of development in four areas of audition, language, speech and cognition, and
- 6) should be able to facilitate incidental learning in young children with hearing impairment

Unit 1: Child development stages and learning style

10 hours

- 1.1 Developmental milestones (birth to age 5 years) in audition, language (receptive and expressive), cognition and communication in hearing babies and young children
- 1.2 Developmental milestones in cognition and the role of cognition in language development
- 1.3 Influence of associated factors on child development—culture, community, family and associated problems
- 1.4 Theories of learning and factors affecting learning
- 1.5 Multiple Intelligence and learning style of children

Unit 2: The significance of play

10 hours

- 2.1 Types of play in hearing children
- 2.2 The role of play in child development
- 2.3 Assessing and encouraging play in children
- 2.4 The role of play in language development
- 2.5 Role of the Auditory Verbal Therapist in developing play in children who are deaf or hard of hearing.

Unit 3: Understanding behavior of children

10 hours

- 3.1 Techniques and strategies of behavior management
- 3.2 Rules and adaptation for discipline in young children
- 3.3 Parents guidance in behavior management and techniques of behavior modification
- 3.4 The relationship between learning and behavior
- 3.5 Management of children with delayed milestones

Unit 4: Children with additional difficulties**10 hours**

- 4.1 Sensory integration: what it is and its implications
- 4.2 Attention deficit, causes and implications
- 4.3 Conditions related to hearing impairment--sensory integration deficit, autism spectrum and learning disability
- 4.4 Red flags: What they are, identification, implication and management
- 4.5 The team approach to help children with additional issues

Unit 5: Assessments and procedure**10 hours**

- 5.1 Importance and need for assessments
- 5.2 Informal and formal assessments in language and speech of the children between 0 to 5 years
- 5.3 Relevant standardized assessments for the children from 0 to 5 years
- 5.4 Listening: from simple to complex and how to develop it
- 5.5 Managing disruptive behavior of children in a session

Practicals

- 1.3.1 A case study: to track the progress of a hearing impaired child for nine months
- 1.3.2 Write action plan for a Red Flag case
- 1.3.3 Observe and track development of normal hearing and hearing impaired children
- 1.3.4 Observe and record the behavior of a 3-years old normal hearing child in a group of hearing impaired children
- 1.3.6 Write a behaviour modification plan for a child with behaviour issues
- 1.3.7 Assessment of play in children and role of AVT in developing play in children with hearing impairment

References

Cole, E., & Flexer, C. (2007) Children with Hearing Loss Developing Listening and Talking Birth to Six, Plural Publishing

Flexer, C. (1994) Facilitating Hearing and Listening in Young Children. Singular Publishing Group, Inc. San Diego

Meaningful Auditory Integration Scale (MAIS) and Infant-Toddler Meaningful Auditory Integration Scale (IT-MAIS)

Boehm, A. (1986). Boehm Test of Basic Concepts-3; The Psychological Corporation, San Antonio, TX

Bracken, B. (1984). Bracken Basic Concept Scale-revised. The Psychological Corporation, San Antonio

TXWadsworth, B. J. (1979) Piaget's Theory of Cognitive Development. Longman, NY

Paper 2.1 Hearing and Amplification Technologies

Objectives

At the end of this course, the students should acquire knowledge of

- 1) the auditory mechanism and its working,
- 2) the audiometric tests and differential diagnosis,
- 3) implantable and non-implantable devices
- 4) the benefits and limitations of different types of amplification systems,
- 5) candidate selection and programming,
- 6) auditory assessment in children for cochlear implantation, and
- 7) the knowledge of the factors that determine the outcome of implantable devices.

Unit 1: Anatomy and Physiology

10 Hours

- 1.1 Anatomy of the ear
- 1.2 Physiology of hearing
- 1.3 Classification of hearing loss
- 1.4 Causes of hearing loss (congenital and acquired: Syndromic and non-syndromic)
- 1.5 Auditory plasticity

Unit 2: Applied Audiology

10 Hours

- 2.1 Hearing evaluation (pre and post implantation): Protocol for infant hearing screening (formal as well as informal): High risk register
- 2.2 Auditory verbal international audiological protocol and techniques for neonatal hearing screening
- 2.3 Different types of auditory tests: Tympanometry and middle ear acoustic reflex: Evoked potentials in hearing assessment
- 2.4 Trans tympanic electrically evoked ABR: Oto acoustic emission and new born hearing screening
- 2.5 Need for test battery approach: Importance and limitations of different tests/approaches of hearing evaluation: Linking audiological findings to management

Unit 3: Technology

10 Hours

- 3.1 Technology for hearing restoration using cochlear implant
- 3.2 Surgical issues and methods
- 3.3 Candidacy for cochlear implant and realistic expectations (Pre-lingual and post –lingual)
- 3.4 Application of intra-operative and post-operative measures (Aided audiogram., electrically evoked ABR (eABR), trans-tympanic eABR, electrically evoked compound action potential, electrically evoked stapedial reflex, cortical auditory evoked potentials (electrically evoked and acoustically evoked).
- 3.5 CI programming: device activation: Mapping and re-mapping

Unit 4: Technology for hearing restoration**10 Hours**

- 4.1 Hearing aids
- 4.2 Middle ear implant
- 4.3 Implantable bone conduction devices
- 4.4 Auditory brainstem implant
- 4.5 Assistive listening devices: Nature and benefits
- 4.6 Benefits and limitations and different amplifications and their selection / fitting
- 4.7 Care and maintenance of the devices including CI

Unit 5: Challenges and issues relating technology**10 Hours**

- 5.1 Challenges and issues related to candidacy and outcome
- 5.2 Medical and radiological
- 5.3 Hard failures and soft failures
- 5.4 Recent advances in hearing restoration
(Bilateral hearing, bi-modal hearing, electro acoustic hearing, cochlear implantation in single sided deafness)
- 5.5 Care and maintenance of different systems: Trouble shooting and counselling

Practicals

- 2.1.1 Cochlear Implant Programming (10 sessions)
- 2.1.2 Should prepare a clinical practicum which should include different ways of establishing “T” levels (threshold level) and “M” or “C” levels (comfort levels).
- 2.1.3 Importance of impedance field telemetry / impedance telemetry
- 2.1.4 Care and maintenance of the device
- 2.1.5 Switch on programs and change volume levels.
- 2.1.6 Counseling and decision making session: The students should acquire knowledge on realistic expectation on the outcome of CI relating to bilateral severe to profound sensory neural hearing loss, auditory neuropathy spectrum disorder, single sided deafness, congenital inner ear or auditory nerve anomalies, ski sloping sensory neural hearing loss, subject with congenital atresia
- 2.1.7 Troubleshooting of cochlear implants and hearing aids.

References

- Arthur, S. (2008). Digital Hearing Aids. Thieme Publishers
- Brad, A. S. (1998). Clinical Audiology: An Introduction. Singular
- Frederick, N. M., & John, G. C. (2014). Introduction to Audiology: Global Edition. Pearson, 12 Edition
- Jace, W., & Erin, S. (2010). Programming Cochlear Implants (Core Clinical Concepts in Audiology). Plural Publishers, California
- John, K. N. (Editor) (2009). Cochlear Implants: Principles and Practices. LWW.

Kompis, M. B., & Caversaccio, M. D.(Editors) (2015). Implantable Bone Conduction Hearing Aids. Karger

Michael J. R. (2012). Cochlear Implants and Other Implantable Hearing Devices. Plural Publishers, California

Zemlin W. R. (1998). Speech and Hearing Science. Allyn and Bacon.

Paper 2.2 Parent Empowerment and Curricular Support

Objectives

At the end of the course, students should be able to

- 1) list the factors that determine readiness for inclusive education.
- 2) develop skills in reading books to babies and young children so as to maximize development of their auditory memory and receptive and expressive language skills.
- 3) prepare the parents for school readiness and inclusive education
- 4) guide and coach the parents to develop auditory skills in their children, and
- 5) be able to facilitate normal integration of hearing impaired children

Unit 1: School Readiness and Inclusive Education

- 1.1 Concepts of school readiness and transition and the role of transition period in preparation of integration
- 1.2 Recommendations for mainstreaming and the factors influencing recommendations
- 1.3 Parents readiness for integration in regular schools and to develop parents' Advocacy
- 1.4 Formal and informal assessments of child readiness for integration in regular schools
- 1.5 Strategies of pre-teaching and post-teaching language needed for academic assessments

Unit 2: Integration in Mainstreaming

- 2.1 The importance of reading and strategies for the development of reading
- 2.2 Curricular objectives that meet local standards in areas of instruction
- 2.3 Process of developing individualized educational plans
- 2.4 Development of social interaction skills in children
- 2.5 Importance and development of experience books

Unit 3: Emergent Literacy

- 3.1 Using language to communicate and developing vocabulary and categories
- 3.2 The role of the Auditory Verbal Therapist in the development of pre-reading skills: Techniques of reading to babies and young children
- 3.3 Emergent reading and writing skills
- 3.4 Role of executive functions in reading: Guiding and coaching parents in reading
- 3.5 Phonemic awareness and sight word recognition
- 3.6 Using numbers in daily experiences: Understanding simple mathematical operations

Unit 4: Impact of hearing impairment on family

- 4.1 The Grieving process and stages of grief
- 4.2 Coping mechanism and stress management
- 4.3 Family system and impact of hearing impairment on family
- 4.4 Understanding of the diversity of culture, language and family
- 4.5 Different structures of family system and family counselling techniques

Unit 5: Development of skills of parents as partners

- 5.1 Adult learning styles to develop skills of parents
- 5.2 Skills of parents in behaviour management technique
- 5.3 Skills of parents in developing language of their children through daily routine
- 5.4 Parental interactions and conversations with their children
- 5.5 Planning and execution of auditory verbal techniques

Practicals

- 2.2.1 Observe role play of parent guidance
- 2.2.2 Undertake field trips for environmental studies and write a report of language & knowledge enhancement opportunities
- 2.2.3 Observe parents guidance sessions
- 2.2.4 Guide and coach the parents in strategies, techniques and procedures in AVT
- 2.2.5 Make the parents understand their role in the education of their children
- 2.2.6 Prepare picture stories for development of verbs – categories
- 2.2.7 Prepare an arithmetic kit for developing mathematical concepts

References

Anderson.P.S & Labb.D (1988) *Language skills in elementary education*. (4th Edition). New York

Luterman, D. (2002). *When your Child is Deaf. A Guide for Parents*, New York Press

Di-EL Cochlear - Inventory of Early Language

Rossetti, L. (1990). *The Rossetti Infant-Toddler Language Scale: A Measure of Communication and Interaction*. LinguiSystems, Inc., East Moline, Il.

Flexer, C. (1994) *Facilitating Hearing and Listening in Young Children*. Singular Publishing Group, Inc. San Diego

Madell, J.R. (1998). *Behavioral Evaluation of Hearing in Infants and Young Children* Thieme Medical Publishers, Inc. New York, N.Y.

Robertson, L. (2000). *Literacy Learning for Children Who Are Deaf or Hard of Hearing*. The Alexander Graham Bell Association, Washington, DC.



सत्यमेव जयते



भारतीय पुनर्वास परिषद्

Diploma in Education-Special Education (Hearing Impairment)

D.Ed.Spl.Ed. (HI)

July, 2021

(w.e.f. 2021-22)

REHABILITATION COUNCIL OF INDIA

(Statutory Body of the Ministry of Social Justice & Empowerment)

Department of Empowerment of Persons with Disabilities (Divyangjan)

Government of India

B-22, Qutab Institutional Area

New Delhi – 110 016

www.rehabcouncil.nic.in

Foreword

Change is said to be the only constant in life that assures progress in all fields including educational practices. Historically education is seen as a short, but most influential bridge to transform approaches and strategies for attaining progress. This helps in achieving national goals as well as reducing the gaps between the haves and have-nots' and also accomplish social harmony. All children typical and special, who are the citizens of tomorrow form the hope and aspirations for fulfilling the national and global development and peace. Therefore the Sustainable Development Goal (SDG) 4 calls for ensuring inclusive and equitable education for life-long learning opportunities for all.

The Rehabilitation Council of India (RCI) is mandated by an Act of RCI 1992 to develop professionals and maintain standards so that educational needs and supports to persons with disabilities are ensured. The RPWD Act 2016 and the National Education Policy 2020 have also upheld inclusive practices for which reasonable accommodations, capacity building of teachers and their professional development is implied. Keeping the provisions of these Acts, policies and provisions of UNCRPD framework, RCI fulfils its obligation and accountability by revising its curricula of programmes.

The present revised Diploma Special Education is being offered as convergence of various disabilities as mentioned in the RPWD Act 2016 as well as the provisions of NEP 2020, of catering to foundational years in children with disabilities to facilitate appropriate elementary education. Besides acquiring competencies to focus on various disability related needs, the student-teachers undertaking this programme would gain knowledge and develop competencies in areas such as child development, family and community involvement and also curriculum development and implementation strategies. It has built a foundation of the emerging Indian society as well as that of inclusive practices in all areas of pedagogical practices, assessments and undertaking the Universal design of learning, which in a way will help in education of all children which is the need of the hour.

Ms. Anjali Bhawra, IAS
Secretary DEPwD & Chairperson, RCI
MSJE, Govt. of India

Preface

The Rehabilitation Council of India (RCI) is a statutory body functioning under the Department of Empowerment of Persons with Disabilities (Divyangjan) (DEPwD), of the Ministry of Social Justice & Empowerment (MSJ&E), Govt. of India. RCI has the mandate for human resource development to facilitate rehabilitation of persons with disabilities. Established as a registered society in 1986, RCI was accorded a legal status as 'The RCI Act' 1992. The Act has been amended in 2000 to enhance the professional development programmes in the field.

RCI develops, monitors and regulates both the pre-service and the in-service programmes by offering a gamut of training programmes. These include formulating and standardizing norms, regulations and content of syllabi for programmes ranging from Certificate to Master's and also the Continuing Rehabilitation Education (CRE) programmes for in-service trainings. The programmes aim to develop professionals, catering to the different requirements of disabilities such as assessment, early intervention, inclusion, education, and therapeutics as well as community participation of persons with disabilities. These programmes are affiliated to various institutes and Universities across the country and are conducted through both modes, face to face as well as by distance mode through Open Universities. RCI also maintains registrations of qualified personnel and professionals in its Central Rehabilitation Register (CRR) which provides an authorization to work in the field of Rehabilitation and Special Education.

RCI constantly endeavours to upgrade and update its training programmes so as to contribute towards the achievement of national goals for a sustainable development. The Diploma in Special Education offered in various disabilities is one of the most popular programmes of RCI creating a cadre of special teachers to work in elementary schools. The course content of the programme are revised from time to time so as to fulfill the provisions of various Acts and educational policy for students with disabilities at different levels of school education. The present programmes developed with convergence of disabilities are also intended to develop special teachers for fulfilling the national educational goal of 'education for all.' It is developed by experts from various fields of disabilities, academicians, researchers and persons with disabilities themselves. The courses under each disability have been well deliberated and designed and have a good blend of classic fundamentals as well as the modern trends.

Dr Subodh Kumar
Member Secretary, Rehabilitation Council of India

INDEX

	TITLES	Pg.No.
1.0	PREAMBLE	5
2.0	NOMENCLATURE AND OBJECTIVES OF THE PROGRAMME	6
3.0	SCOPE OF THE PROGRAMME	6
4.0	GENERAL FRAMEWORK OF THE PROGRAMME	7
5.0	DURATION OF THE PROGRAMME	7
6.0	ELIGIBILITY	8
7.0	MEDIUM OF INSTRUCTION	8
8.0	METHODOLOGY	8
9.0	STAFF REQUIREMENT	8
	9.1 CORE FACULTY	8
	9.2 VISITING FACULTY	10
	9.3 “ SPECIAL REQUIREMENT”	11
	9.4 STAFF(NON TEACHING)	11
10.0	INTAKE CAPACITY	11
11.00	MINIMUM ATTENDANCE	11
12.00	EXAMINATION SCHEME	11
13.0	REQUIREMENT OF PHYSICAL INFRASTRUCTURE AND MATERIALS	11
	13.1 MINIMUM REQUIREMENT FOR LABS, TOOLS AND EQUIPMENTS	11
	13.2SPACE FOR CONDUCTING THE PROGRAMME	13
	13.3 FURNITURE FOR STAFF	14
	13.4 FURNITURE AND EQUIPMENTS FOR OFFICE	15

	13.5 FURNITURE AND EQUIPMENTS FOR CLASSROOM	15
	13.6 MATERIAL FOR PSYCHOLOGY	16
	13.7 FURNITURE FOR LIBRARY	16
14.0	LIBRARY MATERIAL	16
15.0	CERTIFICATION AS REGISTERED PERSONNEL	16
16.0	MINIMUM REQUIREMENTS FOR PRACTICE TEACHING SCHOOLS INFRASTRUCTURE	17
17.0	CALCULATION OF TOTAL NUMBER OF HOURS AND MARKS PER YEAR	17
18.0	SCHEME OF COURSES (THEORY AND PRACTICAL) FOR BOTH THE YEARS	18
19.0	FIRST YEAR – THEORY PROGRAMME STRUCTURE	19
20.0	PROGRAMME STRUCTURE AND EVALUATION SCHEME FOR PRACTICAL FOR BOTH THE YEARS	23
21.0	DETAILS OF PRACTICAL WORK (FIRST YEAR)	30
22.0	DETAILS OF PRACTICAL WORK (SECOND YEAR)	36
23.0	COURSE WISE SYLLABUS OF 12 COURSES	45
	Annexure I (Alternate course for Course II for candidate with DHH)	83
	Annexure II (Alternate course for Course V for candidate with DHH))	86

1.0 Preamble

The fundamental aim of education is to generate learners who are motivated, effective and are increasingly responsible and contributory citizens. The 21st century additionally requires that the learners also match the global requirements by being creative, communicative, critical thinkers and collaborative. While the obligation of developing these abilities in learners rests on all stakeholders, the teachers' invariably form the pivot. So teacher preparation and development has a significant role in the national and global development.

The 21st century learning has also seen a change in the perspectives towards the learners. It is increasingly recognized that they are diverse and diversity is valuable. The United Nations Convention of rights of persons with disabilities (UNCRPD) 2006, to which India is a signatory notably views 'disability has a human diversity'. So the educational Acts and policies in India such as Right to free and compulsory education (RTE) 2009 amended in 2012, The Rights of persons with disabilities (RPWD) 2016 and the National Education Policy (NEP) 2020 have provided special attention and made provisions for education of students with disabilities and has stressed the need to standardise and promote Indian Sign Language (ISL). The changing perspective endorses inclusive education for which early identification, interventions of children with disabilities and school readiness becomes vital for higher education.

The Rehabilitation Council of India (RCI) mandated for the professional development of training programmes in all aspects of education and rehabilitation of persons with disabilities is a pivot for facilitating rehabilitative services. RCI's role in standardization of curricula and its timely up gradation has helped to provide a uniformed support for children with disabilities especially both for special and inclusive education along with other aspects of rehabilitative services.

The present Diploma in Special Education (Hearing Impairment) is formulated to prepare special teachers to work with children with disabilities in general with a special focus on those with deaf and hard of hearing (DHH) and speech disabilities. The programme is designed in way that would help the teachers to work in varying set ups such as early intervention centres, preschools and elementary schools enrolling children with disabilities. These centres or schools could be in special and inclusive set ups. The programme will also prepare the teachers that they could provide home training or if the need arises undertake blended form of teaching.

A special provision has been made in the syllabus to facilitate DHH individuals becomes teachers. Towards this two alternate courses as annexed in Annexure I & II have been designed if the DHH student-teachers wish to opt them in place of Course II and Course V.

2.0 Nomenclature of the programme: Diploma in Education-Special Education (Hearing Impairment) i.e. D.Ed.Spl.Ed.(HI)

Objectives of Programme:

The Programme of Diploma in Special Education (Hearing & Speech disabilities) is developed with following objectives:

- To develop an understanding of varying disabilities and their implications.
- To have knowledge of typical growth and development of learners and realize the psychological aspects influencing learning and education.
- To be aware of the underlying philosophies, evolutionary practices and the policy provisions facilitating education of children with disabilities.
- To undertake assessments or use assessment outcomes for planning educational and other related interventions.
- To undertake need based curricular adaptations and strategies.
- To apply various pedagogical approaches for teaching at elementary level.
- To develop an understanding about the concept, construct and facilitators of inclusive education.
- To realize the importance and role of family and community as a catalyst in the education of children with disabilities.

3.0 Scope of the programme:

The D.Ed. Special Education (Hearing Impairment) programme will especially help the student trainees develop following competencies:

Knowledge based competencies:

- Child growth, development and deviations.
- Various disabilities and their associated conditions.
- Educational needs of children with disabilities.
- Differential needs of learners with Hearing and Speech disabilities.
- Legislative provisions & policy guidelines for education and other rehabilitations aspects.

Skills based competencies:

- Assessment and identification of learners with Hearing and Speech disabilities using multidisciplinary approach
- Interventional strategies of addressing learning styles and preferences.
- Curricular strategies of pedagogical approaches, adaptations and assessments.
- Methods and techniques of teaching of various school subjects in varying settings of special and inclusive schools and home learning programmes.

Values or Behaviour based competencies:

- Promoting school culture and ethos for inclusive educational practices
- Nurturing equity and quality in educational practices
- Fostering the belief that every child matters, matters equally and can learn.
- Empowering families for equal partnership and advocacy of children
- Involvement of community for resource mobilization and support

Employment opportunities

It is envisaged that such a programme would widen the horizon for teaching in special schools, regular inclusive schools at elementary level, work in early intervention and preschool set up or undertake home based teaching of children with disabilities in general and those with hearing and speech disabilities in particular. In all such set ups, the successfully passed trainee can practice both online and in blended teaching with confidence.

4.0 General frame work of the programme:

The programme is organized in such a manner that the content on the disabilities is spirally integrated in all courses as per requirement to prepare a cadre of special educators who develop competencies to meet the educational needs of children with different developmental disabilities. It comprises of theory, practice teaching and practical papers.

5.0 Duration of the programme:

The duration of the programme will be two years (four semesters). Each semester will have at least 225 hours of theory papers (75 hours /paper) and 375 hours of practicals. On completion

of four semesters, the total theory hours would be 900 hours and 1500 hours would be practicals. Details are given in a Table on course structure at 16.0.

6.0 Eligibility:

Students who have passed 10+2 or equivalent with 50% of marks in any stream are eligible for the course.

7.0 Medium of Instructions:

The medium of instruction will be English / Hindi / Regional language. Need based ISL if required for DHH trainee(s) .

8.0 Methodology

The transactional methodology of the programme includes lectures, demonstration, project work, and discussions, visits to different schools / rehabilitation projects, practice teaching, participation in community meetings, medical camps and community development programmes.

9.0 Staff Requirements

The programme should have two faculty at the level of Lecturer/Assistant Professor for each year (as mentioned under teaching faculty) of the course, and one of the faculty will assume the charge of course coordinator / head, thus requiring a total teaching staff of four. In addition to this, guest faculty may be invited to handle specific topics.

Teaching Faculty

9.1. Core faculty: The core faculty for first year will consist of the following staff:

Position: Faculty for Special Education (Full-time): 01 Posts

Essential qualifications:

- a. Masters in Social Sciences, Humanities & Sciences
- b. M.Ed.Spl.Ed.(HI) or its equivalent with two years of experience (post qualification) of teaching in special school for children with hearing impairment or teaching in RCI approved long term programmes.

Or

B.Ed.Spl.Ed.(HI) or its equivalent with five years of experience (post qualification) of teaching in special school for children with hearing impairment or teaching in RCI approved long term programmes.

Or

D.Ed.Spl.Ed.(HI) or its equivalent with 10 years of experience (post qualification) of teaching in special school for children with hearing impairment or teaching in RCI approved long term programmes.

c. The candidate must have valid registration certificate with RCI

*** Faculty shall also supervise the trainees.**

Position: Faculty for Audiology and Speech Language Pathology (Full-time): 01

Essential qualifications:

a. Masters in Audiology and Speech Language Pathology (MASLP) or M.Sc.(Audiology)/ M.Sc.(Speech Language Pathology) or its equivalent with two years of experience (post qualification) of clinical/teaching.

Or

B.ASLP or its equivalent with five years of experience (post qualification) of clinical/teaching.

b. The candidate must have valid registration certificate with RCI

*** Faculty shall also supervise the trainees.**

The core faculty for second year will consist of the following staff:

Position: Faculty for Special Education (Full-time): 02 Posts

Essential qualifications:

a. Masters in Social Sciences, Humanities & Sciences

b. M.Ed.Spl.Ed.(HI) or its equivalent with two years of experience (post qualification) of teaching in special school for children with hearing impairment or teaching in RCI approved long term programmes.

Or

B.Ed.Spl.Ed.(HI) or its equivalent with five years of experience (post qualification) of teaching in special school for children with hearing impairment or teaching in RCI approved long term programmes.

Or

D.Ed.Spl.Ed.(HI) or its equivalent with 10 years of experience (post qualification) of teaching in special school for children with hearing impairment or teaching in RCI approved long term programmes.

c. The candidate must have valid registration certificate with RCI

*** Faculty shall also supervise the trainees.**

NOTE:

Whosoever from the full-time faculty position is the senior most by appointment will function as the Programme Coordinator.

Instructor (Technical): 02 instructors should be appointed having a qualification of Bachelor's degree in any subject with D.Ed.Spl.Ed.(HI) or its equivalent with three years classroom teaching experience with valid RCI registration.

Or

B.Ed.Spl.Ed.(HI) or its equivalent and having valid registration certificate with RCI with valid RCI registration.

Both instructors should not be from one area of disability. In case of new institution, one full time instructor must be appointed before commencement of 3rd semester.

9.2. Visiting Faculty

The experts in their respective specialization area and working in hospitals/ institutions or schools would be requested to deliver lectures, demonstrations and to conduct practicals.

1. Psychologist {M.Phil. (Clinical Psychology)/ M.Phil. (Rehabilitation Psychology)}

(Experience in the area of hearing impairment would be preferable) **Or**

Masters in Psychology with special paper on Clinical Psychology/Educational Psychology with five years' post qualification experience of working with persons having HI or teaching in RCI approved long term programmes

2. Occupational Therapist (Bachelor degree in occupational therapy with minimum 2 years' experience)

3. Physiotherapist (Bachelor degree in physiotherapy with minimum 2 years' experience)

4. Social Worker (Master's degree in Social Work with minimum 2 years' experience)

6. Yoga Therapist (Diploma in Yoga with minimum 2 years' experience)

7. Physical Education Teacher (certified Coach of Special Olympics with minimum 2 years of experience)
8. Music and Dance Teacher (Diploma or Degree in Performing Art with minimum 2 years of experience)

9.3. SPECIAL REQUIREMENT:

- a) **Sign Language Instructor** : Deaf instructor with Level A, Level B and Level C ISL Training + 2 years teaching experience or Diploma in Teaching Indian Sign Language (DTISL) as guest faculty.
- b) **Interpreter** A hearing person with DISLI
- c) **Communication Options Instructor**

9.4. Staff (Non teaching)

1. Librarian/Library Assistant (01)
2. Multi-Tasking Staff (for typing, record keeping and accounts)
3. Peon
4. Watchman

10.0 Intake capacity:

The intake for each year of the course will be 35 maximum.

11.0 Minimum Attendance:

Eighty per cent minimum attendance is required both in theory and practical to be eligible to appear in the semester end examination.

12.0 Examination Scheme

The programme shall follow the RCI's Scheme of Examination from time to time.

13.0. Requirements of Physical Infrastructure and Materials

13.1 Minimum Requirement for Labs, Tools and Equipments

Speech and language Pathology

Essentials:

1. Mirrors, soft boards
2. Speech trainer

3. Vibrotactile aids
4. Digital Recorder
5. Toys, games, pictures, story books
6. Models and charts of larynx and brain
7. Chart Courses and flash cards
8. Speech kit
9. Photo Articulation Test (PAT)
10. Standard language test 3 DLAT, REELS, SECS PPV (Peabody Picture Vocabulary Test), screening tests, HRR check list, etc
- 11) ISL teaching learning material

Optional

- 1) Software for speech / language assessment and training

Audiology

Essentials

- 1) Single channel Portable Diagnostic Audiometer
- 2) One set of Tuning Forks (256 Hz, 512 Hz, 1024 Hz) – can be deleted
- 3) A set of noise makers for paediatric assessment
- 4) Conditioning materials
- 5) Hearing Aids -Body level – Monaural / Pseudo binaural / Binaural (Optional)
- BTE for Mild, Moderate, and Strong (Programmable/ non programmable)
- 6) Different types of ear moulds
- 7) Models of the ear
- 8) Case history sheets, audiogram sheets, paediatric assessment forms, hearing aid trial forms
- 9) Hearing aid repair kit

Optional

- 1) ITC, ITE hearing aids
- 2) Hearing aid analyzer
- 3) Tools / equipments and materials required for ear mould making

Education / Language

Essentials

- 1) T.V.
- 2) LCD Projector
- 3) Educational toys and games
- 4) Soft boards
- 5) Science models, geographical models, maps
- 6) Chart stands
- 7) Flash cards, word cards
- 8) Books, textbooks (all concerned languages, minimum 3 sets, from pre- primary to VII standard), story books etc.

Optional

Teacher made story cards

- 1) Teacher made aids for teaching subjects
- 2) Slide projector
- 3) Educational tapes and CDs
- 4) Software for programmed learning
- 5) Language assessment tests

Psychology

Essentials

1. Vineland Social Maturity Scale
2. Gessel's Drawing Test
3. Seguin Form Board
4. Developmental Screening Test
5. Draw a Man Test - If possible, Centres may procure –Coloured Progressive Matrices Meadow-Kendall Social Emotional Maturity Scale)

13.2 Space for Conducting the Course

Sl. No	Types of Facilities	Area	Remarks
1	Class Room-2	40 sq. m. each	
2	Class Room – 2	25 sq. m. each	

3	Multipurpose Room/Hall -1	60 sq. m.	
4	Library-1	60 sq. m.	6 Computers & Internet
5	Toilet (Male-1, Female-1)	04 sq.m. each	
6	Principal's Room -1	15 sq. m.	
7	Resource Room- 1	60 sq. m.	
8	Staff Room-1	40 sq. m.	
9	Office Room-1	25 sq. m.	
10	Store Room-1	25 sq. m.	
11	Lab. for Psychology/ICT-1	60 sq. m.	
12	Hostel for Boys and Girls (Separately)	-	Optional
13	Playground for Outdoor games like football, cricket, etc. If not available, then collaboration with nearby Institute/ University -	500 sq. m	

13.3 Furniture for Staff:

Sl. No.		Type of Furniture	No. of Furniture
1	Full time staff	Table	4
		Chairs	4
		Cupboards(Steel)	4
2	Visiting Staff	Tables	2
		Chairs	2
3.	Computer Typist-cum-Accountant	Table	1
		Chair	1
4	Librarian	Table	1
		Chair	1
5	Peon/MTS	Chair	1
		Stool	1

13.4 Furniture and Equipment for Office

Sl. No.	Type of Furniture/Equipment	No. of Furniture
1	Cupboards (Steel)	04
2	Filing Cabinet	01
3	Computer with Printer	01
4	Phone	01
5	Photocopier Machine	01
6.	Wall Clock	one each in every room
7	Fans	two each in every room
8	Electrical fittings (lights etc)	two each in every room

13.5 Furniture and Equipment for Classroom

Sl. No.	Type of Furniture/Equipment	No. of Furniture/Equipment	
1	Tables (for students)	30	
2	Chairs (for students)	30	
3	Audio Visual equipments	02	
4	White Board/Smart Board	02	
5	Teaching material (Demonstration)	Montessori set	01
		- Kindergarten set	01
		- Nursery set	01
		- TLM as per requirement	01
6	Psychological test material set (for demonstration) (VSMS, Bhatia Battery, BKT, SFB, RPM, and WISC)		01
7	Play therapy equipment set (for demonstration)		01

13.6 Materials for Psychology

Sl. No.		No. of Material
1	Psychological test material set (for demonstration) -VSMS, Bhatia Battery, BKT, SFB, RPM, and WISC	01 Set each
2	Play therapy equipment set (for demonstration)	01 Set
3	Cupboard	01

13.7 Furniture for Library

Sl. No.	Type of Furniture	No. of Furniture
1	cupboards	10
2	Library tables (large)	05
3	Library chairs	30

14.0. Library Material

1. Minimum eighty percent of the prescribed books as mentioned in suggested readings at the end of each course should be available in the library. Those books that are given as suggested readings in more than one course, must have more than one copy to facilitate access to a number of students. At least twenty percent of the books should be in Hindi or regional language.
2. Journals (at least 2) peer reviewed journals on related disability should be available in the library.

15.0 Certification as Registered Personnel

It is mandatory for every rehabilitation professional / personnel to obtain a “Registered Personnel/ Professional Certificate” from the Rehabilitation Council of India to work in the field of special education in India. As continuous professional growth is necessary for the renewal of the certificate, the rehabilitation professional / personnel should undergo in-service programme periodically to update their professional knowledge. Each registered professional/personnel will be required to get himself /herself re-registered periodically. The periodicity will be decided by the council from time to time. The activities for enrichment

training programmes in the form of Continuous Rehabilitation Education (CRE) is decided by the RCI.

16.0 Minimum Requirements for Practice Teaching Schools Infrastructure

- 1) Special school with a minimum of 75 students with hearing impairment varying in grades and age groups for exposure of student trainees for early intervention, preschool and elementary classes. In addition MOU could be signed with other special centres/schools and inclusive schools in nearby areas for practicals if the special school has fewer children.
- 2) Classroom with group amplification system/ children appropriately fitted with individual hearing aids.
- 3) Classrooms well equipped with appropriate furniture, teaching aids, black board, proper cupboards, shelves etc.
- 4) One sound treated audiometric assessment room with necessary equipments.
- 5) Noise-free room for speech therapy with necessary equipment, furniture and therapy material.
- 6) Adequate drinking water and disabled friendly toilets
- 7) Play ground with adequate indoor and outdoor play equipments
- 8) Multipurpose hall for celebrations, functions, parent meeting etc.
- 9) Trained teachers - D.Ed.Spl.Ed/B.Ed.Spl.Ed (HI) as per State govt. requirements
- 10) Arts and crafts teachers as per State govt. Requirements.

17.0 Calculation of total number of hours and marks per year:

10 academic months per year - 10 months X 4 weeks = 40 weeks/year

Hours per week = 30 hours. (Mon.-Fri.=6 hrs per day x 5=30 hrs)

Total academic hours: = 40 weeks X 30 hours/week

= 1200 hours per academic year

= 2400hours for 2 yrs.

Total marks for Theory & Practical: =

-Theory - 450 marks per academic year

- 900 marks for both the years

- Practical: 750 marks per academic year

- 1500 marks for both the years.

First semester: **Theory**, 3 Courses, - 225 marks; **Practical** - 375 marks
 Second semester: **Theory**, 3 Courses - 225 marks; **Practical** - 375 marks
 Third semester: **Theory**, 3 Courses - 225 marks; **Practical** - 375 marks
 Fourth semester: **Theory**, 3 Courses - 225 marks; **Practical** - 375marks

18.0 Scheme of courses (Theory and Practical) for both the years:

Courses	Title	Hours & credits	Marks
Core courses			
1	Introduction to Disabilities	75 (05)	75
2	Child development and Learning	75(05)	75
3	Education in the emerging Indian society and school administration	75(05)	75
4	Inclusive Education	75 (05)	75
5	Family, Community and the child Deaf & Hard of Hearing	75 (05)	75
Disability Specific courses			
5	Education of children with hearing and speech disability	75 (05)	75
6	Language and communication	75 (05)	75
7	Fundamentals of Hearing, Deafness and Audio-logical Management	75 (05)	75
8	Fundamentals of Speech and Speech Teaching	75 (05)	75
9	Curricular Strategies & Adaptations of lessons for children with hearing impairment	75 (05)	75
School Subjects (Content Cum Methodology)			
11	Content and methodology of teaching Science & Mathematics	75 (05)	75
12	Content and methodology of teaching Social Science	75 (05)	75

Practical Work

- School visits
- Observation of lessons, Report writing, Teaching practical (disability & non disability area)
- Communication options (Oralism/Educational Bi-lingualism including ISL/Total Communication)
- Skill development (Study of Grammar, Text adaptation, Introduction to Indian Sign System(ISS), Indian Sign Language (ISL) Finger spelling (FS) , Community based rehabilitation (CBR)
- Clinical practicum (Audiology, Speech, Psychology)
- Content test (text books from I to VIII STD.)
- Full time teaching practice

Full time teaching practice

- In special school for the hearing impairment &
- Inclusive set ups with children with hearing and speech disabilities.

Note: A student-trainee will be allowed to appear for the final theory as well as the practical examinations only after he/she has produced the certificate of completion of 2 weeks of full time teaching practice from the school authority as well as the training coordinator of the course.

19.0 FIRST YEAR -THEORY Programme Structure –

Total 6 Courses: 2 Core& 4 Disability specific

Sl.No.	Course No.	Title	Theory Hrs. & credits	Internal Marks	Final External Exam.	Total Marks
Common Courses						
1.	I	Introduction to Disabilities	75 (05)	30	45	75
2.	IV	Child development and Learning	75(05)	30	45	75
Disability Specific Courses						
3.	II	Fundamentals of Hearing, Hearing Impairment & Audio-logical Management	75(05)	30	45	75

4.	III	Language and Communication	75(05)	30	45	75
5.	V	Fundamentals of Speech and Speech Teaching	75(05)	30	45	75
6.	VI	Curricular Strategies and Adaptations for children with hearing impairment Education of children with hearing and speech disability	75(05)	30	45	75
		Total	450 Hrs	180	270	450 marks

SECOND YEAR -THEORY Programme Structure –

Total 6 Courses: 3 Core, 1Disability specific &2 Content cum methodology of school subjects

Sl.No.	Course No.	Title	Theory Hrs.	Internal Marks	Final External Exam.	Total Marks
Core Courses						
1.	VII	Education in the emerging Indian society and school administration	75 (05)	30	45	75
2.	X	Inclusive education	75(05)	30	45	75
3.	XI	Family, Community and the children with hearing impairment	75 (05)	30	45	75
Disability Specific Courses						
4.	VIII	Education of Children with hearing impairment	75 (05)	30	45	75
School Subjects (Content cum Method)						
5.	IX	Content and Methodology of Teaching Science and Mathematics	75 (05)	30	45	75
6.	XII	Content and Methodology of Teaching Social Science	75 (05)	30	45	75
		Total	450 hrs	180	270	450 marks

Semester wise– 1st year

1st Semester Theory & Practical

Sl no.	Title	Theory Hrs.& credits	Internal Marks	Final Written Exam.	Total Marks
1.	Introduction to Disabilities	75 (05)	30	45	75
2.	Fundamentals of Hearing, Hearing Impairment & Audio-logical Management	75(05)	30	45	75
3.	Language and Communication	75(05)	30	45	75
4.	Practical	375(15)	225	150	375

2nd Semester – Theory & Practical

Sl no.	Title	Theory Hrs. & credits	Internal Marks	Final Written Exam.	Total Marks
1.	Child development and learning	75 (05)	30	45	75
2.	Fundamentals of Speech and Speech Teaching	75(05)	30	45	75
3.	Curricular strategies and adaptations of lesson for Children	75 (05)	30	45	75
4.	Practical	375(15)	225	150	375

Distribution of hours and credits per course

Each Course	Item wise Hours for work	Total hours	Credits	Total Credits Per year

Per Course	Lectures : 50 hrs Tutorials : 10 hrs Library time : 05 hrs Assignments And Discussions : 10 hrs	75 (05)	5	30 (For 6 theory Courses of the first semester)
------------	--	---------	---	--

(Tutorials and discussions may be held in small groups as per the need)

Semester wise – 2nd year

3rd Semester -Theory & Practical

Sl no.	Title	Theory Hrs.	Internal Marks	Final Written Exam.	Total Marks
1.	Education in the emerging Indian society and school administration	75(05)	30	45	75
2.	Education of Children with hearing impairment	75(05)	30	45	75
3.	Content and methodology of teaching Science and Mathematics	75(05)	30	45	75
4.	Practical	375(15)	225	150	375

4th Semester – Theory & Practical

Sl no.	Title	Theory Hrs.	Internal Marks	Final Written Exam.	Total Marks
1.	Inclusive education	75(05)	30	45	75
2.	Family, Community and the children with hearing impairment	75(05)	30	45	75
3.	Content and methodology of teaching Social Science	75(05)	30	45	75
4.	Practical	375(15)	225	150	375

Distribution of hours and credits per course

Each course	Item wise Hours for work	Total hours	Credits	Total Credits Per year
Per course	Lectures : 50 hrs	75	(05)	30

Tutorials : 10 hrs Library time : 05 hrs Assignments And Discussions : 10 hrs			(For 6 theory Courses of the first semester)
--	--	--	--

(Tutorials and discussions may be held in small groups as per the need)

20.0 PROGRAMME STRUCTURE AND EVALUATION SCHEME FOR PRACTICAL FOR BOTH THE YEARS

Total Marks: 1500

Practical Area	Title	Hrs.	Internal Marks	Final External Exam.	Total Marks
Practical Area 1	Teaching Practice				
	- School Visits	100	20	-	20
	- Observation and Reports on routine classroom teaching	60	60	-	60
	-Observation and reports on model/demo lessons	120	40	-	40
	-Text book Content test	60	20	40	60
	-Practical lessons	60	90	160	250
	Total of area I	400	230	200	430
Practical Area 2	1. Communication options a. Oral-Aural 150 hrs b. Total Communication 150 hrs c. Educational Bilingualism 150 hrs	450	190	100	290
Practical Area 3	Skill development	150	190	150	340
Practical Area 4	Clinical practicum				
	1) Audiology	150	75	75	150
	2) Speech	150	75	75	150
	3) Psychology	100	90		90
Practical Area 5	Full time Teaching Practice	100	50	-	50
	Total	1500	900	600	1500

(External – 600: Internal – 900)

Scheme of Examination - Practical -First year -AT A GLANCE

Sr. no.	Practical Area	Items (For 1st and 2nd semesters)	Hours	Internal marks	External marks	Marks
1.	Practical area I	Teaching Practice 1. School visits & report (Minimum 8).	60	10		10
		2. Observation of routine classroom teaching at preschool/ Std - I To IV and report (40)	40	30		30
		3. Observation of Demonstration cum discussion of model lessons and reports (10 lessons = 5 in preschool and 5 in 1st To 4th std.)	40	20		20
		4. Study of textbook content – Std I To IV: Written Content test in Science, Mathematics, Social science, language (test)	50	10	20	30
		5. Practice teaching for 20 lessons (15 lessons – Disability area, and 5 lessons Non-disability area)	125	45	80	125
		Total of Area I	315	115	100	215
2.	Practical area II	1. Communication options a. Oral-Aural b. Total Communication c. Educational Bilingualism	75	100	50	150
3.	Practical area III	Skill Development 1. Grammar – Project Work (60 marks) – Test (60 marks)	60	60	60	120
		Preparation of TLM for language teaching	50	50		50
		Total of area III	110	110	60	170
4.	Practical area IV	a) Audiology i) Journal to be prepared (25 marks) (based on the above) (Clinical) ii) Internal (30 marks) iii) External Viva (marks)	125	55	60	115

	b) Speech and Language i) Journal to be prepared (based on the (2above.) (Clinical) (30marks) ii) Internal (30 marks) iii) Auditory Verbal Approach (AVA) (Demo or CD) Report of 2 pages (10marks) iv) External Viva including AVA	125	70	30	100
		750	450	300	750

(External – 300: Internal – 450)

Practical -Second Year -AT A GLANCE (3rd & 4th semesters)

No.	Practical	Items for both 3rd and 4th semesters	Hours	Internal marks	External marks	Marks
1.	Practical Area I	Teaching Practice				
		1. Observation of routine classroom teaching at Std V–VII (10 lessons each in any 3 classes on different subjects, total 30) - Report on observations	(60)	50		(50)
		2. Observation of Demonstration cum discussion on model lessons - Report on observations (No.10)	(45)	50		50
		3. Study of textbook content – Std V–VII): Written Content test in Science, Mathematics, Social science and language	(30)	20	10	30
		4. Teaching Practical i) 20 lessons ii) One Final teaching lesson (External)) (May check previous lessons records / files.)	(90)	60	25	85
		Total	225	180	35	215
2.	Practical Area II	1. Communication options a. Oral-Aural b. Total Communication c. Educational Bilingualism (ITP lessons)	90	70	70	140
3.	Practical Area III	Skill Development in : 1. Text adaptation for subject teaching (5 lesson in different	135	30	20	50

		subjects)				
		2. CBR activities (activity + report writing	60	30	20	50
		3.i) Indian Signing System – (ISS) (Including Indian Manual Alphabet-IMA) -External Viva For All Three -	50	20	50	70
		Total of area III		80	90	170
4.	Practical area IV	1. Psychology - -Journal to be prepared -Internal	100	30	60	90
		2. Audiology 3. Speech (For both Audio. and Speech -Internal viva, &Internal test will be for the portion covered in the 1st year. Tests & viva may be taken latest by Dec.	(90)	15 25	20 25	35 50
		Total of area IV		60	105	175
5.	Practical Area V	Full time Teaching Practice a) Classroom Teaching b) Other school activities	100	50		50
			750	450	300	750

SEMESTER WISE DISTRIBUTION OF PRACTICAL WORK

First year – First Semester Practical

Sr. no	Practical Area	Item	Hours	Internal	External	Total Marks
1.	Practical area I	Teaching Practice				
		1. School visits & report (This semester 4 centres)	50	10		10
		2. Observation & reports of routine class- room teaching at preschool (12 lessons), Std -I To IV (8 lessons), (20 lessons)	40	15		15
		3. Observation of Demonstration cum discussion of model lessons and report (10 = 5 in preschool and 5 in std. 1 to 4,preferably with a follow up lesson in the same class)	40	25		25

		4. Study of textbook content -Std 1 - 4 : and the Content test in Science, Mathematics, Social Science, and Language.	50	10	20	30
		5. Practice teaching of 10 lessons– 5 in Disability, and 5 in Non-disability area	30		30	30
		Total of area I	210	60	50	110
2.	Practical area III	Skill Development ISL – Indian Sign Language	100	130	10	140
3.	Practical area IV	a) Audiology				
		i) Journal to be prepared (based on the above) (Clinical) ii) Internal	30	35	30	65
		iii) External	35		60	60
		Total of area IV	65	35	90	125
		Grand Total	375	225	150	375

First Year – Second Semester

Sr. no.	Practical Area	Item	Hours	internal	External	Marks
1.	Practical area I	Teaching Practice				
		1. School visits & report (This semester 4 centres)	50	40	-	40
		2. Observation of routine classroom teaching at preschool/ Std -I To IV and report (20)	40	40	-	40
		3. Practice teaching of 10 lessons (Disability area)	15	-	25	25
		Total of area I	105	80	25	105
2.	Practical area II	1. Communication options a. Oral-Aural b. Total Communication c. Educational Bilingualism	90	50	-	50

3.	Practical area III	Skill Development				
		1. Grammar – Project Work (15 marks) – Test (25 marks)	20	15	25	40
		2. Basic skill of Finger spelling – One Handed Finger spelling (OHFS) – Two Handed Finger spelling (THFS) – Indian Manual Alphabets (IMA)	40	20	20	40
		3. Indian Signing System (ISS) (Manual Code for spoken Indian languages)	40	20	20	40
		Total of area III	100	55	65	120
4.	Practical area IV	Speech and Language				
		i) Journal and Language (based on the above.)(clinical)	20	10	15	25
		ii) Internal	20	10	15	25
		iii) Auditory Verbal Approach (AVA) (CD or Demonstration). (Report on main points of the CD or the Demonstration)	40	20	30	50
		Total of practical area IV	80	40	60	100
		Total	375	225	150	375

Second Year – Third Semester

Sr. no	Practical Area	Item	Hours	Internal	External	Marks
1.		Teaching Practice				
	Practical area I	1. Observation of routine classroom teaching at Std V–VII) and report (This semester -total 20 lessons in any 6 classes on different subjects, - with at least one follow up lesson)	30	50		50
		2. Observation of Demonstration cum Discussion of model lessons - Report on observations (No.10)	50	25		25
		3. Study of textbook content - Std 5 - 7 : Content test in Science, Mathematics, Social science, and language. (Test to be given later)	30			30

		by August end)		10	20	
		Total of area I	110	85	20	105
2.	Practical area II	1. Communication options	60	60	40	100
3.	Practical area III	Skill Development in : 1. Text adaptation for subject teaching (5 lessons in different subjects)	50	15	30 (viva presentation)	45
		2. i) . Basic skill of Finger spelling – One Handed Finger spelling (OHFS) – Two Handed Finger spelling (THFS) – Indian Manual Alphabets (IMA)	30	10		10
		ii) Indian Signing System – (ISS)	35	25		25
		Total of area III	105	50	30	80
4.	Practical area IV	Psychology - -Journal to be prepared Internal	90	30	60 (viva)	90
			375	225	150	375

Second Year – Fourth Semester

Sr. no	Practical Area	Item	Hours	Internal	external	Marks
1.	Practical area I	Teaching Practice				
		1. Observation of routine classroom teaching at Std V–VII) and report (This semester - total 20 lessons in any 6 classes on different subjects, - with at least one follow up lesson)	30	30		30
		2. Observation of Demonstration and follow up lesson cum Discussion of model lessons - Reports (No.10) (Std V–VII)	30	30		30
		3. Teaching Practical i) 20 lessons (Std V–VII) ii) One Final teaching	35	20	30	50

		lesson (External)				
		Total of area I		80	30	110
2.	Practical area II	Lesson Plan(five on each communication of area n options)	70	20	20	40
3.	Practical area III	- CBR activities	50	10	40	50
		- External Viva for all 1, 2, 3 of the 3rd and 4th semester	20	20	20	40
		Total of area III	70	30	60	90
4.	Practical area IV	1. Audiology,	40	15	20	35
		2. Speech (For both Audio. and Speech – Internal viva, & Internal test of the portion covered in the 1st year - tests & viva may be taken by Dec.)	40	30	20	50
				45	40	85
5.	Practical Area V	Full time Teaching Practice	60	50		50
		a) Classroom Teaching b) Other school activities	75			
			375	225	150	375

21.0 DETAILS OF PRACTICAL WORK - FIRST YEAR –1st and 2nd semester

Practical Area I – Teaching practice. All records to be maintained and report to be submitted in the prescribed format prepared by the centre.

Activities	
1	School visits - a) Inclusive school set up or Integrated school set up with resource unit / resource teacher – minimum 1 centre

	<p>b) Inclusive school set up or Integrated school set up without resource unit – minimum 1 centre</p> <p>c) Vocational Training Centre – minimum 1 centres</p> <p>d) Special school visit other than that of the training centre</p> <p>Special schools for children with Hearing Impairment – minimum 2 centres and other disabilities –minimum 1 centre</p> <p>Report on school visits by either:</p> <p>Physically visiting school or studying the institute website/ /Virtual visit/ Online meet and report via email/Google drive.</p>
2	<p>Observation of routine classroom teaching practices</p> <p>Physical class room placement of trainees at preschool/ Std –I to Std IV (4 weeks – approx. – total 40 lessons)</p> <p>Observations of online classes or pre recorded teacher’s videos</p> <p>- Prepare report</p>
3	<p>Observation of demonstration cum model lessons</p> <p>10 lessons (5 in preschool and 5 in primary classes). These would be both language and school subjects with follow up lessons. Language lessons should cover techniques such as conversation, story, directed activity, poem and visit</p> <p>Physical observation / Observations of online or recorded lessons</p> <p>- Prepare reports</p>
4	<p>Study of content of school textbooks from Std I - IV</p> <p>After studying the content of each textbook, students have to appear for a content test in science, mathematics, social science and language.</p> <p>Content test can be undertaken physically or also in online mode.</p>
5	<p>Practice teaching</p> <p>20 lessons: Including planning and execution of lessons. These have to be under the guidance of the supervisor. Student trainees may undertake one lesson of 40 to 45 minutes per day and remaining hours need to be utilised for observation of routine classroom teaching.</p> <p>In case of on-line teaching, the session could be of shorter and adjusted for appropriate duration.</p>

Break up of lessons

Number of language lessons in inclusive school: 4

Number of language lessons in special school (pre-school, std I to IV): 10

No. of school subject teaching lessons in special school (pre-school, Std. I to IV):6

Disability area :

Sr.no	Classes	Topics	Lessons
1	Pre- school	Conversation / News	2
		Directed Activities	2
		Stories 2	4
		Rhymes	2
		Number work	2
2	Standard I & IV	Text book (language)	4
		Math	2
		Environment	2
		Total No. of Lessons	20

Practical Area II – Communication Options – FIRST YEAR**Activities:**

- i) Observation of (minimum three observation) one school/centre practicing each communication options by Physically visiting school or institute website/ Virtual visit
- ii) Observation of communication among two deaf individuals

Report by either:**Writing observation report in Journal or via email/Google drive.**

- iii) Observation and Practicing Indian Sign Language - (ISL)
- iv) Observation and Practicing Finger spelling (FS) - one handed and
- v) Observation and Practicing Finger spelling (FS - two handed

Visiting websites of AYJNISHD(D), ISLRTC or watching YouTube video

Report by either:**Writing observation report in Journal or via email/Google drive.**

- vi) Observation and Practicing Indian Manual Alphabet (IMA) for the Indian languages.

	<p>vii) Observation and Practicing Indian Sign System - Total Communication (ISS-TC)</p> <p>viii) Observation of session on <i>Auditory Verbal Approach (minimum three sessions)</i></p> <p>Visiting websites of AYJNISHD(D) or watching YouTube video</p> <p>Report by either:</p> <p>Writing observation report in Journal or via email/Google drive.</p> <p><i>(Note :Use of Auditory Verbal Approach, Aural-oral approach, reading & writing, FS, ISS-TC or ISL by trainees, for teaching in classrooms depending upon the education policy of the model school.)</i></p>
--	---

1	<p>Practical Area III Skill Development</p> <p>Project work in grammar</p> <p>Grammar of the language (regional language) that is used for practice teaching.</p> <ul style="list-style-type: none"> • Parts of speech • Person number gender-concord • Case markers & tenses • Question forms • Types of sentences & Transformations • Idioms & Proverbs <p>Report by -</p> <p>Preparing a Grammar Diary on above aspects with appropriate illustrations /</p> <p>Examples</p> <p><i>The purpose of this project is to develop competency and understanding of basic grammar</i></p>
2	<p>Preparation of TLM for Language Teaching</p> <p>i) Prepare TLM either making Three Dimensional Model or Tactile aid</p> <ul style="list-style-type: none"> • Picture cards, / Flash cards of (Fruits, Vegetables, Vehicles, Clothes, Colors, Animals, Birds, Family members, Common Objects) • Tactile cards • Cutouts,

	<ul style="list-style-type: none"> • Photographs • Charts, • Three Dimensional Models • Sequencing of Picture cards • Sentence strips, • Videos • GIFs <p>Report by either Submitting prepared TLM or arranging an Exhibition or making Album & submitting online.</p>
--	--

Practical area IV – FIRST YEAR

Activities

Audiology

1. Understanding parts of Ear and Audiometer

- 1.1 Understanding Ear and Audiometer
- 1.2 Identifying parts of the ear from the model of ear
- 1.3 Identifying different sounds/ noise makers
- 1.4 Identifying parts of the audiometer
- 1.5 Paediatric Assessment (observation)
- 1.6 Conditioning and Play Audiometry (observation)
- 1.7 Audiogram interpretation (25 audiograms) (Journal)

A) Orientation to aided audiograms of 5 children.

2. Understanding Hearing Aids – Types / Earmould

- 2.1 Identifying & handling types /parts of individual hearing aids
- 2.2 Making harness for hearing aid
- 2.3 Getting familiar with group amplification systems.
- 2.4 Observation of these 5 children for Hearing aid selection.
- 2.5 Observation of ear mould making.
- 2.6 Troubleshooting/minor repairs of hearing aids

3. Observation and Case History of CWHI

- 3.1 Case history taking a Child with Hearing Impairment

4. Auditory training (planning and execution with supervision)

- 4.1 Checking the hearing aid & Six-sound test on 10 children
- 4.2 Auditory training (observation)

A) 5 individual lessons (20 minutes each)

B) 5 group lessons (30 minutes each)

4.3 Individual & Group sessions

A) 2 individual children X 5 sessions 20 minutes (each)

B) 5 group lessons (planning, discussion, execution - 30 min. each)

Journal to be prepared based on the above Speech and Language

Speech and Language

2.1 Recording speech of non impaired children (2 samples)

2.2 Identifying various parameters of speech by listening to tapes (10 samples)

2.3 Intelligibility rating (5 samples)

2.4 Varying own speech parameters/recording

2.5 Labeling parts of speech systems

2.6 Making diagrams of sagittal sections of sounds in own language

2.7 Word-lists for sounds (in Initial, Medial & Final Positions) of own language (use pictures)

2.8 Identifying errors in speech samples of HI children (tapes)

2.9 Observation of speech assessment of 5 children

2.10 Planning activities of group speech teaching – only with respect to Non-Segmental/ segmental / supra-segmental (duration control, loudness control, pitch control)

2.11 Making speech kit

2.12 Speech assessment using speech kit (5 children)

2.13 Handling aids & equipment (observation and supervised work)

2.14 Observation (Group speech teaching) 5 lessons (30 minutes each)

2.15 Planning and executing 5 sessions of group speech teaching.

2.16 Planning and executing 5 sessions of individual Speech teaching for 2 children (30 minutes each) – Total 10 Individual plans

2.17 Role play (amongst the trainees) – teaching and activities for correction of different speech sounds

2.18 Auditory Verbal Approach (AVA) Use of CD or Demonstration if possible

Journal to be prepared based on the above

22.0 DETAILS OF PRACTICAL WORK - SECOND YEAR

Practical Area I – Teaching Practice.

All records to be maintained and report to be submitted in the prescribed format prepared by the centre.

	Activities
1	Observation of routine classroom teaching practices <ul style="list-style-type: none">- Physical class room placement of trainees at preschool / Std – V to Std VIII (4 weeks approximately – Total 20 lessons)- Observations of online classes or pre recorded teacher’s videos- Prepare reports by writing Observation Journal
2	Observation of demonstration cum model lessons <ul style="list-style-type: none">- Observation of 10 lessons (5 in preschool and 5 in primary classes) on both language and school subjects with follow up lessons.- Language lessons should cover techniques such as conversation, story, directed activity, poem and visit- Physical observation / Observations of online or recorded lessons Prepare reports by making Journal
3	Study of content of school textbooks from Std V - VIII <ul style="list-style-type: none">- Students have to appear for a content test in science, mathematics, social science and language.- Content test can be undertaken physically or in online mode.
4	Practice teaching <ul style="list-style-type: none">- Planning and execution of lessons plans (minimum 20 lessons + 1 Final Lesson) under the guidance of the supervisor. (Follow the distribution of lesson plans given below)- Student trainees must execute one lesson of 40 to 45 minutes per day and remaining hours need to be utilised for observation of routine classroom teaching.- In case of on-line teaching, the session could be of shorter and adjusted for

<p>appropriate duration.</p> <ul style="list-style-type: none"> - Planning and execution for one final practice teaching lesson,; language / subjects <p>Distribution of lessons</p>		
Classes	Topics	Lessons
V to VIII Standard 1 Language Teaching	Poems	2
	News / Conversation	2
	Picture Description	2
	Language Text Books with Adapted Teaching	2
	Language Text Books without adapted Teaching	2
	Second Language	2
2, Subject Teaching	History	2
	Geography	2
	Science	2
	Maths	2
	Total	20

Practical Area II Communication Options - Second Year

<p>Activities</p> <ul style="list-style-type: none"> - Observation of teaching lessons (minimum two each) in different communication options either live classroom teaching or recorded classroom teaching - Practicing each communication options. <p>Report by:</p> <ul style="list-style-type: none"> - Making one video recording (minimum three) by using each communication options. <p>(Note: 1. While making video using Oralism, use oral aural mode and appropriate Suprasegmental aspects of speech</p> <p>2. While making video using Total communication, use all the modes of communication i.e. speech, Indian signing system (ISS),gestures and captioning</p> <p>3. While making video using Educational Bilingualism, use Indian Sign language (ISL) and captioning in video recording</p> <p>iii) External Viva should be conducted based on both the years</p> <p>Note: Activity and submission of report must be done in both the years separately.</p>
--

Practical Area III Skill Development Second Year

	Activities
1	<p>Text book Adaptations</p> <p>i) Trainee should learn Text Adaptation for language/subject teaching in the following areas</p> <ul style="list-style-type: none"> • Knowledge • Language • Illustrations • Presentation styles • Evaluation <p>ii) Trainee should use his/her ICT skill for text book adaptations. 5 lessons in different classes with deferent subject. A trainee can use adaptation for execution of the practice teaching lesson in the class room</p> <p>Report by Submitting physical file or in online mode</p> <p>iii) External Viva</p>
2	<p>CBR activities</p> <p>i) Participating or Conducting Parents Meeting Each teacher trainee must prepare and discuses one issue for 5 to 10 minutes during parent meeting and submit the report.</p> <p>ii) Conducting awareness programme in slums or rural area involving following areas</p> <ol style="list-style-type: none"> 1) Prevention 2) Identification 3) Intervention <p>Report by: Submitting physical file or in online mode</p> <p>iii) External Viva</p>
3	<p>ICT skill</p> <p>i) Trainee must prepare lessons using ICT comprised of work sheets. (minimum 5 out of 20 lesson plans from Area-I)</p> <p>ii) A trainee must conduct a class with the use of computer / Smart board / PPT presentation</p> <p>iii) A trainee must prepare educational video recording for teaching subject (minimum 2 video recording of 10 to 15 minutes)</p> <p>Report by: Submitting physical file or in online mode</p> <p>iv) External Viva</p>

Practical Area IV – Psychology - Second Year

	Activities
1	<p>Psychology</p> <p>Preparing case history using interviewing techniques</p> <p>Select and administer independently screening - appropriate to the child - tests from the following:</p> <ul style="list-style-type: none"> *Vineland Social Maturity Scale *Gessel’s Drawing Test *Seguin Form Board *Developmental Screening Test *Draw a Man *Coloured Progressive Matrices *Mendow-Kendall Social Emotional Maturity Scale <p><i>(Some of these tests may not be available. Centres should try to get at least the first 4tests, - minimum 4 tests.)</i></p> <ul style="list-style-type: none"> *Record, analyze and report test data and findings efficiently and effectively *Communicate effectively with parents of child regarding: <ul style="list-style-type: none"> *Test findings *Further referrals *Placement programming *Psycho educational and perceptual training *Submit a journal of the year’s placement. General guidelines for the journal are: <ul style="list-style-type: none"> -Content -Introduction -Broad areas of testing -Commonly used screening tests -Observation and recommendations of 3 case reports <p>-Journal to be prepared based on above</p>
2	<p>Audiology / Speech -3rd semester by end of Dec.</p> <p>Internal viva, and Internal test of the portion covered in the 1st year as part at asuitable</p>

	<p>time before December. It may be treated as assignment for one theory Course. It will be done separately for both the subjects.</p> <p><i>(This is a sort of revision of the portion learnt last year, which is found to be necessary by the training coordinators for the benefit of the trainees and the HI children.)</i></p>
--	--

Practical Area V – Second Year 4th semester

Activities -Full time teaching practice

1. The trainees will be placed in special schools for full time for 2 weeks.

They will be involved in the following activities of the school:

a) Other school activities:

The trainees will be involved in the following activities: **(1 week)**

Working as a teacher helper in activities like writing homework, making exercise sheet, planning educational activities etc.

- o Organization and Management of classes
- o Preparation of teaching aids
- o Use of aids and appliances
- o Involvement in co-curricular activities
- o Involvement in school examination
- o Involvement in parents meeting

(This will be followed by classroom teaching)

b) Classroom teaching:

This will involve actual classroom teaching where trainees cover the school portion as per the routine of the school. They may not write the elaborate lesson plans used for earlier 40 lessons. However they maintain regular diary or record of what has to be taught like the schoolteachers. The model schoolteachers of the concerned classroom will supervise this teaching. Two classes (one pre-school (3 days) and one primary (2 days) may be selected per trainee for classroom teaching. **(1 week)**

Format for Practical marks for the 1st Semester

Practical Area	Items -1st Semester	Total Marks	Marks Obtained
Practical Area I	Teaching Practice		
	1. School visits & report (This semester 4 centres)		
	2. Observation and reports of routine classroom teaching at preschool (12 lessons), Std -I To IV (8 lessons), (20lessons)		
	3. Observation of Demonstration cum discussion of model lessons and report (10 = 5 in preschool and 5 in std. 1 to 4 , preferably with a follow up lesson in the same class)		
	4. Study of textbook content - Std 1 - 4 :and the Content test in Science, Mathematics, Social Science, and Language. – (Test by end of August)		
	5. Practice teaching of 10 lessons– 5 each) (Disability and Non-disability area		
Practical Area III	Skill Development in ISL – Indian Sign Language		
Practical Area IV	a) Audiology i) Journal to be prepared (based on the above) (Clinical) ii) Internal iii) External Viva		

Format for Practical marks for the 2nd Semester – 1st year

Practical Area	Items -2nd Semester	Total Marks	Marks Obtained
Practical	Teaching Practice		

Area I	1. School visits & report (This semester 4 centres)		
	2. Observation of routine classroom teaching at preschool/ Std -I To IV and report (20)		
	3. Practice teaching of 10 lessons (Disability area)		
Practical Area II	Individualized Teaching -Attending Lectures and observation (5 lessons) -Teaching one child (30 lessons)		
Practical Area III	Skill Development 1. Grammar – Project Work (15 marks) – Test (25 marks)		
	2. Basic skill of Finger spelling – One Handed Finger spelling (OHFS) – Two Handed Finger spelling (THFS) – Indian Manual Alphabets (IMA)		
	3. Indian Signing System (ISS) (Manual Code for spoken Indian languages)		
Practical Area IV	Speech and Language i) Journal and Language (based on the above.) (clinical)		
	ii) Internal		
	iii) Auditory Verbal Approach (AVA) (Demonstration or viewing the CD and writing the main points of AVA.)		
	iv) External Viva		

Format for Practical marks for the 3rd Semester – 2nd year

Practical Area	Items -3rd Semester	Total Marks	Marks Obtained
Practical Area -I	Teaching Practice 1. Observation of routine classroom teaching		

	at Std V–VII) and report (This semester - total 20 lessons in any 6 classes on different subjects, - with at least one follow up lesson)		
	2. Observation of Demonstration cum Discussion of model lessons - Report on observations (No.10)		
	3. Study of textbook content -Std 5 - 7 : Content test in Science, Mathematics, Social science, and language. (Test to be given latest by August end)		
Practical Area -II	Individualized Teaching -Execution of Individualized Teaching lessons : (30 lessons)		
Practical area III	Skill Development in : 1. Text adaptation for subject teaching (5 lessons in different subjects) 2. i) . Basic skill of Finger spelling – One Handed Finger spelling (OHFS) – Two Handed Finger spelling (THFS) – Indian Manual Alphabets (IMA) ii) Indian Signing System – (ISS)		
Practical area IV	Psychology - -Journal to be prepared -Internal		

Format for Practical marks for the 4th Semester – 2nd year

Sr.No	Practical Area	Items -4th Semester	Total Marks	Marks Obtained
1	Practical Area -I	Teaching Practice 1. Observation of routine classroom teaching at Std V–VII) and report (This		

		semester - total 20 lessons in any 6 classes on different subjects, - with at least one follow up lesson)		
		2. Observation of Demonstration and follow up lesson cum Discussion of model lessons - Reports (No.10) (Std V–VII)		
		3. Teaching Practical i) 20 lessons (Std V–VII) ii) One Final teaching lesson (External)		
2	Practical Area –II	Final External Viva for Individualized Teaching (including a few revision lessons)		
3	Practical Area -III	- CBR activities - External Viva for all 1, 2, 3 of the 3rd and 4th semester		
4	Practical Area –IV	1. Audiology, 2. Speech 9 (For both Audio. and Speech – Internal viva, & Internal test of the internal portion covered in the 1st year - tests & test viva may be taken as test by Dec.)		
5	Practical Area -V	Full time Teaching Practice a) Classroom Teaching b) Other school activities		

23.0 COURSE WISE SYLLABUS OF 12 COURSES

COURSE - I

INTRODUCTION TO DISABILITIES

Total Marks: 75

Total hours: 75

Learning outcomes:

On the completion of this course, the student-teachers will be able to:

- Explain the historical perspectives and paradigm shift in the models of disabilities
- Demonstrate knowledge about various causes and preventive aspects about different disabilities.
- Describe the educational needs, implications and challenges in the management of various types of disabilities.
- Describe the importance of early identification and intervention of children with disabilities and twice exceptional (2e) children.
- Explain the importance of different agencies in human resource development

Unit 1: Understanding Disability

1.1 Historical perspectives of Disability - National and International & Models of Disability;

1.2 Concept, Meaning and Definition - Handicap, Impairment, Disability, activity limitation, habilitation and Rehabilitation;

1.3 Definition, categories (Benchmark Disabilities) & the legal provisions for PWDs in India;

1.4 An overview of Causes, Prevention, prevalence & demographic profile of disability: National and Global;

1.5 Concept, meaning and importance of Cross Disability Approach and interventions;

Unit 2: Definition, Causes & Prevention, Types, Educational Implication, and Management of

2.1 Locomotor Disability-Poliomyelitis, Cerebral Palsy/Muscular Dystrophy;

2.2 Visual Impairment-Blindness and Low Vision;

2.3 Hearing Impairment-Deafness and Hard of Hearing;

- 2.4 Speech and language Disorder;
- 2.5 Deaf-blindness and multiple disabilities;

Unit 3: Definition, Causes & Preventive measures, Types, Educational Implications, and Management of-

- 3.1 Intellectual Disability;
- 3.2 Specific Learning Disabilities;
- 3.3 Autism Spectrum Disorder;
- 3.4 Mental Illness, Multiple Disabilities;
- 3.5 Chronic Neurological conditions and Blood Disorders;

Unit 4: Early Identification and Intervention:

- 4.1 Concept, need, importance and domains of early identification and intervention of disabilities and twice exceptional children;
- 4.2 Organising Cross Disability Early Intervention services;
- 4.3 Screening and assessments of disabilities and twice exceptional children;
- 4.4 Role of parents, community, ECEC and other stakeholders in early intervention as per RPD- 2016 and NEP 2020;
- 4.5 Models of early intervention-(home-based, centre-based, hospital-based, combination) with reference to transition from home to school;

Unit 5: Human Resource in Disability Sector:

- 5.1 Human resource development in disability sector – Current status, Needs, Issues and the importance of working within an ethical framework;
- 5.2 Role of international bodies (International Disability Alliance (IDA) UNESCO, UNICEF UNDP, WHO) in Disability Rehabilitation Services;
- 5.3 International conventions and Policies such as UNCRPD, MDGs and SDGs;
- 5.4 Role of National Institutes (AYJNISLD, ISLRTC, NIEPID, NIEPMD, NIEPVD, NILD, NIMHR, PDUNIPPD, SVNIRTAR) in Disability Rehabilitation Services;
- 5.5 Role of Information and Communication Technology (ICT) in disability inclusive services and development programmes;

Suggested readings:

- Abhi-Prerna (n.d.) Screening and identification. Ahmedabad, India: Sense International (India), Resource and Information Unit on Deaf blindness
- Agrawal, A., Shukla, D. (2006). Handbook of Neuro-Rehabilitation., (1st Ed.). Hyderabad, Paras Medical Publication.
- Ashman, A. & Elkins, J. Eds. (2009). Education for Inclusion and Diversity. French's Forest: Pearson Education Australia
- Bala, J.M., Rao, D.B., (2012). Hearing Impaired Student, (2nd Ed.). New Delhi, Discovery Publishing House.
- Banerjee, G. (2004). Legal rights of persons with disabilities. New Delhi, India: Rehabilitation Council of India
- Dunn, L.M., (1963). Exceptional children in the school special: Education in transition. Holt Rinehart and Winston, USA.
- Fox, A. M. (2005). An introduction to neuro-developmental disorders of children. New Delhi: The National Trust
- Gense, M. & Gense, D. (2005). Autism spectrum disorders and visual impairment. New York: AFB Press
- GOI.(2016). The Rights of persons with Disabilities Act, 2016. New Delhi: Commercial Law Publishers (India Pvt. Ltd
- Hinchcliffe, A. (2003). Children with cerebral palsy: A manual for therapists, parents and community workers. New Delhi, India: Vista.
- Huebner, K. M., Prickett, J. G., Welch, T. R., & Joffe, E. (Eds.). (1995). Hand in hand: Essentials of communication and orientation and mobility for your students who are deaf-blind (Vol. 1). New York: AFB Press.
- Kusuma, A., Reddy, L., Ramar, R., (2000). Education of Children with Special Needs, (1st Ed.). New Delhi, Discovery Publishing House.
- Lim, Levan & Quah, M.M. (2004). Educating Learners with diverse abilities. Singapore: McGraw-Hill Education Asia
- Menon, S & Feroze, V.R. (2014). Gifted: Inspiring Stories of people with disabilities. India: Random House publishers.

- Miles, B., & Riggio, M. (Eds.). (1999). Remarkable conversations: A guide to developing meaningful communication with children and young adults who are deafblind. Watertown, MA: Perkins School for the Blind
- Narsimhan, M.C. & Mukherjee, A. K. (1986). Disability: A continuing Challenge, New Delhi: Willy Eastern Limited
- Rao, D.B., Kumari, A.R., Sundari, S.R., (2004) Deaf Education, (1st ed.). New Delhi, Sonali Publication.
- Rozario, J., Karanth, P., (2003). Learning Disability in India: Willing the Mind to Learn, (1st ed.). New Delhi, Saga Publications India Pvt. Ltd.
- Sharma, H. & Sobti, T (2018). An Introduction to Sustainable Development Goals. Asia: PEP
- Sharma, M.C. & Sharma, A.K. Eds (2004). Discrimination based on sex, caste, religion and Disability: Addressing through educational challenges. New Delhi: NCTE
- Singh, D., (2014). Disability and Special Needs-Dimensions and Perspectives (1st Ed.). New Delhi: Kanishka Publication.
- Singh, J.P., Dash, M.K. (2006). Disability Development of India Rehabilitation Council of India, (2nd Ed.). New Delhi: Kanishka Publication.
- United Nations Educational, Scientific, and Cultural Organization.(n.d.). It's about ability: An explanation of the Convention on the Rights of Persons with Disabilities. Geneva, Switzerland: UNESCO
- Watkins, S. (Ed.). (1989). INSITE model: A model of home intervention for infants, toddlers and preschool aged multihandicapped sensory impaired children. (Vols. 1 & 2). Logan: Utah State University.
- Werner, D., Alkazi, R., Mirchandani, V. (1994). Disabled Village Children, (1st Ed.). New Delhi. Voluntary Health Association of India

COURSE - II
FUNDAMENTALS OF HEARING, DEAFNESS AND AUDIOLOGICAL
MANAGEMENT

Total Marks 75

Total Hours 75

Learning outcomes:

On the completion of this course, the student-teachers will be able to:

- Describe the anatomy of ear and physiology of hearing
- Explain the causes, prevention and classification of hearing loss
- Describe the amplification devices and their optimum utilization
- Interpret the Audiological information and its use in education
- Describe the basic working, operation & maintenance of hearing aids & Cochlear implants.

Unit 1: Hearing & Deafness

- 1.1 Importance of hearing
- 1.2 Parts of the ear and process of hearing
- 1.3 Introduction to physics of sound, production and propagation of sound
- 1.4 Physical and psychological attributes of sound
- 1.5 Hearing Impairment – Definition, Classification in terms of age of onset, type, degree, nature

Unit 2: Causes, Prevention and Effects of Deafness

- 2.1 Causes and prevention of hearing loss
- 2.2 Effects of Hearing impairment on various domains of development, education and employment
- 2.3 Hearing loss impacting speech perception
- 2.4 Early identification and critical period for learning language and hearing
- 2.5 Developmental milestones of auditory behaviour

Unit 3: Identification of Deafness and Assessment of Hearing

- 3.1 Formal and informal assessment of hearing
- 3.2 Conditioning for auditory assessment

- 3.3 Audiometry for children
- 3.5 Audiograms and its interpretation
- 3.5 Speech banana and its interpretations

Unit 4: Amplification Devices

- 4.1 Hearing aids – Parts, functioning and types
- 4.2 Importance of binaural hearing aid amplification
- 4.2 Classroom amplification system and Assistive Listening Devices
- 4.3 Hearing aid care, maintenance and troubleshooting
- 4.5 Orientation to Cochlear implants

Unit 5: Auditory Learning

- 5.1 Listening for daily living and learning
- 5.2 Pre-requisites and Audiological information for auditory training and learning
- 5.3 Stages of auditory training
- 5.4 Auditory verbal approach; principles and strategies
- 5.5 Activities for auditory training group and individual.

Suggested readings:

- Graham, J., & Martin, M. (2001). *Ballantyne's Deafness*. New Jersey: Wiley.
- Cormick, B. M. (1993). *Pediatric Audiology 0 to 5 years*. London: Whurr Publishers.
- Madell, J.R., Flexer, C., Wolfe, J., & Schafer, E.C. (2019). *Pediatric Audiology: Diagnosis, Technology, and Management*. New York: Thieme Medical Publishers Inc
- Erber, N. (1982). *Auditory Training*. Washington D. C.: A. G. Bell Association for Deaf.
- Katz, J. (2014). *Handbook of Clinical Audiology*. Philadelphia: Lippincott Williams & Wilkins.
- Martin, F. N., & Clark, J. G. (2019). *Introduction to Audiology (Ed - 13)*. New Jersey: Pearson.
- Pollack, D. (1974). *Education Audiology for the Infant with Limited Hearing*. USA: Thomas Publisher.
- Pollack, D., Goldberg, D.M., & Caleffe-Schenck, N. (1997). *Educational Audiology for the Limited-Hearing Infant and Preschooler: An Auditory-Verbal Programme*. Springfield: Charles C Thomas Pub Ltd.
- Johnson, C.D., & Seaton, J.B. (2020). *Educational Audiology Handbook*. San Diego: Plural Publishing

- Metz. M.J.(2014).*Sandlin's Textbook of Hearing Aid Amplification: Technical and Clinical Considerations*. San Diego: Plural Publishing Inc
- Kusuma, A., G., Reddy, G. L., & Ramar, R.(2010). *Hearing Impairment: An Educational Consideration*. New Delhi: Discovery Publishing House Pvt. Ltd.
- Tye-Murray, N.(2020). *Foundations of Aural Rehabilitation Children, Adults, and Their Family Members*. San Diego: Plural Publishing

COURSE III
LANGUAGE AND COMMUNICATION

Total hours: 75

Theory hours: 75

Learning outcomes:

On undergoing the course the student teachers will be able to:

- Describe the concepts of communication and language
- Explain the various modes and methods of linguistic communication
- Assess language formally and informally
- Explain and use the methods and techniques of developing language
- Undertake activities for developing literacy skills in DHH students

Unit 1: Communication & Language

- 1.1 Communication: Definition, Meaning and Scope
- 1.2 Classification of Communication: Linguistic and Non-linguistic
- 1.3 Language: Definition, Characteristics and Functions
- 1.4 Phases of language developmental in typical children
- 1.5 Pre-requisites for language development & impact of deafness

Unit 2: Modes and methods of Linguistic Communication:

- 2.1 Oralism: Principles, Justification, Limitations
- 2.2 Educational Bilingualism: Principles, Justification, Limitations
- 2.3 Total Communication: Principles, Justification, Limitations
- 2.4 New Trends in Oralism – Auditory Verbal Approach (AVA): Principles, Pre requisites & Stages
- 2.5 Sign Language & Signing System- distinguishing features

Unit 3: Assessment of Language

- 3.1 Assessment: Meaning, Definition & Scope
- 3.2 Formal Assessment: Standardized language tests
- 3.3 Informal Assessment: Importance, types and documentation
- 3.4 Teacher Made Test (TMT): Development & implementation
- 3.5 Basic Language Competence: Concept & use in assessing specific language aspects

Unit 4: Methods and techniques of language development in DHH students

- 4.1 Principles of teaching language
- 4.2 Methods of teaching language; Natural, Structural & Combined
- 4.3 Techniques of teaching language: News conversation, Directed activity, Visits, Storytelling
- 4.4 Dramatization, play and activities for language development
- 4.5 Poems and rhymes for developing language and supra-segmental

Unit 5: Literacy for DHH children

- 5.1 Meaning and types of literacy skills (reading, writing, numeracy, digital, financial, health and civic)
- 5.2 Pre-requisites of literacy and impact of deafness
- 5.3 Importance and development of foundational literacy
- 5.4 Reading; stages, types and activities for developing and scaffolding
- 5.5 Writing; stages, types and activities for developing and scaffolding

Suggested readings

- Blackwell, P. M., Engen, E., Fischgrund, J. E. and Zarcadoolas, C.(1978), *Sentences and Other Systems*, The Alexander Graham Bell Association for the Deaf, Inc. First Edition, U.S.A.
- Chomsky, N. (1975), *Reflections on Language*, Pantheon Books, A Division of Random, New York.
- Das, A., (2010). *The Cognitive Science of linguistics: How Language Work*, (1st ed.), New Delhi, Omega Publication.
- Evans, L., (2002). *Total Communication: Structure and Strategy*, (1st ed.), Washington. Gallaudet Colleges Press.
- Lou, M.W., (1988), *The History of language use in the education of the Deaf in the United States*, Michael Strong (Ed.) Language Learning and Deafness, Sydney: Cambridge University Press.
- Makodia, V. V., (2009). *Role of Language in Communication*, (1st ed.), Jaipur, Paradise Publishers.
- McAnally, P. L., Rose S. and Quigley S. P. (1987), *Language Learning Practices with Deaf Children*, Boston: College Hill Press.
- Meadow, K. P., (1976), P. Henderson (Ed.), *Methods of Communication Currently Used in the Education of Deaf Children*, London: Royal National Institute for the Deaf.
- Narayanswami, S., (2011), *Communication Options and Students with Deafness*, Rehabilitation Council of India, New Delhi.
- Pinker, S., (1995), *The Language Instinct*,
Website:[https://monoskop.org/images/2/20/Pinker Steven The language instinct 1995.Pdf](https://monoskop.org/images/2/20/Pinker_Steven_The_language_instinct_1995.Pdf)
Downloaded 5/19/2017

- Randhawa, S., (2011), *Communication Options and Students with Deafness*, Rehabilitation Council of India, New Delhi.
- Shreemal, N., (2008). **भाषाविज्ञान**, (1st ed.), Jaipur, Shruti Publication.
- Streng, A. H., Kretschmer, Jr. R. R., and Kretschmer L. W., (1978), *Language Learning and Deafness*. Orlando: Grune& Stratton.

COURSE IV
CHILD DEVELOPMENT AND LEARNING

Total Marks: 75

Total Hours: 75

Learning outcomes:

On the completion of this course, the student-teachers will be able to:

- Describe the developmental milestones and identify variations among children.
- Explain the process of development in infancy and childhood.
- Apply the knowledge of theories and factors affecting learning.
- Transfer the knowledge of psychological processes in class while working with a child with special needs.
- Demonstrate skills of classroom managing skills and behavior problems.

Unit 1: Growth and Development

- 1.1 Definition and meaning of growth and development
- 1.2 Principles and factors affecting development
- 1.3 Nature vs. Nurture
- 1.4 Domains of development; Physical, social, emotional, cognitive, moral and language
- 1.5 Developmental milestones and identifying deviations and giftedness

Unit 2: Ages and stages of development (Birth to Childhood)

- 2.1 Prenatal (conception to birth)
- 2.2 Infancy (Birth to 2 year)
- 2.3 Toddler (2 to 4 years)
- 2.4 Early childhood (Up to 7 years)
- 2.5 Late childhood (7 to 14 years)

Unit 3: Psychology and Learning

- 3.1 Educational Psychology; relevance and scope for educators
- 3.2 Basic principles of learning given by Thorndike, Pavlov, Skinner, Bandura, Piaget and Vygotsky
- 3.3 Learning styles and types of learners
- 3.4 Socio-cultural factors affecting learning

3.5 Implications for children with special needs

Unit 4: Psychological processes and their Implications for Children with different Disabilities

- 4.1 Attention; concept and factors affecting attention in classroom
- 4.2 Perception; concept and factors affecting perception
- 4.3 Memory; types and strategies to enhance memory of children
- 4.4 Intelligence; definition, meaning and significance of IQ, Gardner's theory of Multiple Intelligences
- 4.5 Motivation intrinsic, extrinsic, factors affecting motivation

Unit 5: Classroom Management

- 5.1 Stimulating learning environment; physical and emotional
- 5.2 Common behaviour problems in children
- 5.3 Functional analysis of behaviour
- 5.4 Behaviour management techniques: Cognitive and behavioural
- 5.5 Modifying behaviours of children with special needs in inclusive and special classroom

Suggested readings:

- Bhan S. (2014) Understanding Learners, A Handbook for Teachers, publishers; Prasad Publications, N. Delhi, ISBN 978-93-84764-01-2
- Freeman, J., (1985). The psychology of gifted children: Perspectives on development and education. John Wiley & sons, New York.
- Panda, KC (2001) Elements of Child Development (Sixth Revised Edition), Ludhiana Kalyanam Publishers.
- Sharma, P (1995) Basics on Kaul, V (1993) Early Childhood Education Programme, New Delhi, NCERT
- Madhavan, T. Kalyan, M. Naidu, S. Peshawaria, R and Narayan, J (1989) Mental Retardation – A Manual for Psychologists,
- Muralidharan R (1990) Early Stimulation Activities for Young Children, New Delhi NCERT Development and Growth of a Child. New Delhi: Reliance Publishing House.
- Sharma, R and Sharma, R (2002) Child Psychology Atlantic: New Delhi.
- Mohan Mathew (1972) Child Psychology in Indian Perspective

- Jan Borms (1984) Human Growth and Development
- Wallace, P.M. and Goldstein, J.M. (1944) An Introduction to Psychology (3rd Edition)
Madison: Brown and Benchmark Publishing
- Lindgren H (1988) Educational Psychology in the Classroom, Harper and Raw
- Panda, KC (1997) Education and Exceptional Children, Vikas Publishing House, New Delhi
- Arthur E. Dell Orto, Paul W. Power (2007) The Psychological and Social Impact of Illness and
Disability
- Vicki L. Schwean, Donald H. Saklofske (1999) Handbook of Psychosocial Characteristics of
Exceptional Children

COURSE V
FUNDAMENTALS OF SPEECH AND SPEECH TEACHING

Total Marks -75

Total hours -75

Learning outcomes

On the completion of this course, the student-teachers will be able to:

- Describe the nature and characteristics of human speech and speech production
- Describe the development of speech and its evaluation
- Explain the methods of teaching speech
- Use of aids and equipments
- Suggest appropriate home and school environment for the development of speech.
- Plan and execute lessons for developing speech in children

Unit 1: Introduction to speech and speech production

- 1.1 Definition of speech characteristics of normal speech and functions of speech
- 1.2 Parameters of speech
- 1.3 Mechanism of speech production – structure and function of Respiratory, Phonatory, Articulatory, Resonatory and Regulatory system
- 1.4 Speech as an overlaid function
- 1.5 Introduction to Speech and Language Disabilities

Unit 2: Description of speech sounds

- 2.1 Non segmental: Intensity, pitch and quality
- 2.2 Segmental aspects of speech: Definition of consonants, vowels, diphthong and blends
- 2.3 Classification of consonants – place, manner, voicing
- 2.4 Classification of vowels
- 2.5 Supra-segmental: Intonation, stress, pause, etc.

Unit 3: Development of speech

- 3.1 Stages of development of speech in children with normal hearing (typically developing children)
- 3.2 Prerequisites for normal speech and language development

- 3.3 Stages of development of speech in children with hearing impairment
- 3.4 Factors influencing development of speech in children with hearing impairment
- 3.5 Language development in pre and post lingual children with hearing impairment

Unit 4: Speech problems in children with hearing impairment

- 4.1 Speech problems: Articulation errors, Voice problems, Errors in supra-segmental
- 4.2 Speech intelligibility
- 4.3 Evaluation of speech
- 4.4 Evaluation of speech in terms of voice, articulation and Supra-segmental
- 4.5 Profiling in speech of the students in classrooms

Unit 5: Teaching speech to the children with hearing impairment

- 5.1 Different methods used for teaching speech – Auditory Global, Multisensory syllable unit, Association phoneme unit method, Cued speech, Auditory Verbal Therapy (AVT)
- 5.2 Introduction to Ling's approach
- 5.3 Individual and group speech teaching - advantages and limitations
- 5.4 Aids and equipments for development of speech: Auditory aids (speech trainer), Visual aids (mirror etc.), tactile aids (Vibrotactile aids), software etc.
- 5.5 Role of family in stimulation of speech and language and home training

Suggested readings:

- Bench, R. J. (1992). *Communication Skills in Hearing Impaired Children*. London: Whurr Publishers.
- Bunkar, S. (2011). *Fundamentals of Linguistics*. Jaipur: Prism Books.
- Calvert, D. R., & Silverman, S. R. (1983). *Speech and Deafness*. Washington D. C.: A. G. Bell Association for the Deaf.
- Chaturvedi, M. G. (1973). *A Contrastive Study of Hindi - English Phonology*. New Delhi: National Publishing House.
- Ling, D. (2002). *Speech and the Hearing-impaired Child: Theory and Practice*. Washington D. C.: Alexander Graham Bell Association for the Deaf.
- Lyons, J. (1981). *Language and Linguistics*. New York: Cambridge University Press.
- Markides, A. (1983). *The Speech of Hearing Impaired Children*. Manchester: Manchester University Press.

- Riper, C.V., & Erickson, R.L.(1995).*Speech Correction: An Introduction to Speech Pathology and Audiology*. London: Pearson.
- Shipley, K.G., McAfee, J.G. (2009). *Assessment in Speech-Language Pathology: A Resource Manual*. New York: Delmar Cengage Learning
- Rout, N., & Kamraj, P. (2014). *Developing Communication - An Activity Book*. Chennai: National Institute for Empowerment of Persons with Multiple Disabilities.
- Paul, P.V., & Whitelow, G.M.(2011). *Hearing and Deafness An Introduction for Health and Educational Professionals*. Massachusetts: Jones & Bartlett Publishers.

COURSE VI
CURRICULAR STRATEGIES AND ADAPTATIONS FOR
CHILDREN WITH HEARING IMPAIRMENT

Total marks -75

Total hours -75

Learning Outcome:

After completing the course, the student-teachers will be able to:

- Describe the concept of curriculum and explain the importance of designing it for children with hearing impairment
- Explain the strategies in differentiated instruction and curricular adaptations
- Describe the need for curricular evaluation and tools and methods for evaluating it
- Distinguish between various types of evaluations
- Explain provisions of NEP-2020 and its significance for education of children with disabilities
- Describe the curricular strategies of universal design of learning

Unit 1: Introduction to Curriculum and Curricular Strategies

- 1.1 Definition and principles of curriculum.
- 1.2 Types of curriculum – Need based and Skill based
- 1.3 Stages of curriculum planning
- 1.4 Curricular strategies- Teaching and Learning
- 1.5 Curricular needs of children with hearing impairment

Unit 2: Curriculum and Adaptations

- 2.1 Curricular adaptation- Meaning and Principles
- 2.2. Study of existing curricula at pre-school level (Montessori and Kindergarten)
- 2.3 Need for curriculum adaptation at pre-school level
- 2.4 Curriculum adaptation at elementary level
- 2.5 Adaptation of teaching strategies as per children's need

Unit 3: Techniques of Evaluation for Curricular Activities

- 3.1 Meaning and scope of evaluation
- 3.2 Types of evaluation: Formative and Summative

3.3 Evaluation based on knowledge and language

3.4 Execution of evaluation

3.5 Co-curricular activities: Planning and execution of sense training, physical Education
Arts Craft and Dance & Music

Unit 4: Role of Language in Education and Teaching Strategies with Necessary adaptations for the children with hearing impairment

4.1 Role of motherese in education of young children with hearing impairment

4.2 Curricular strategies in enhancing language in varying philosophies of deaf education
deaf education and subject teaching.

4.3 Role and importance of languages as per NPE-2020

4.4 Importance of educational bilingualism, classical languages and foreign language
learning for the deaf

4.5 Importance and capacity building of sign language for inclusive education and
curricula

Unit 5: Universal Design for Learning (UDL)

5.1 Concept of diversity and its importance for curricular strategies

5.2 Need and principles of curricula based on UDL

5.3 Principles of curricula based on UDL (Multiple means of representation, engagement
and representation)

5.4 Vertical orientation of UDL framework and guideline (access, build, internalise and
goal)

5.5 Planning and assessing curricula the based on UDL

Suggested readings

Aggarwal, J. S. (2005). Curriculum Development: Towards Learning without Burden and
Quality of Education and Evaluation. New Delhi: Shipra Publications.

Bunch, G.O. (1987). The Curriculum and the Hearing Impaired student: Theoretical and
practical considerations. Boston, MA: College-Hills Press.

Culliman, B.E. (2000). Read to Me: Raising Kids Who Love to Read. New York:
Scholastic. Delhi, India (2019)

- Dalton, E. and Gronseth, S. (2020). Universal access through inclusive instructional design. Routledge, New York 10017
- Fontas, I. (2001). Guiding reader and Writers (Grades 3-6): Teaching comprehension, Genre and Context Literacy. Portsmouth, NH: Heinemann.
- Gathoo, V. (2006). Curricular Strategies and Adaptations for children with Hearing Impairment New Delhi: Kanishka Publishers
- Marsh, C.J. (2004). Key concepts for understanding curriculum. Routledge Falmer.
- Meyer, A., Rose, D., Gordon, D.: Universal Design for Learning: Theory and Practice. Cast Professional Publishing, Wakefield (2014)
- MHRD.: The Right of Children to Free and Compulsory Education Act. New Delhi, India (2009)
- Moore, D.F., Martin, D.S. (2006). Deaf Learner: developments in curriculum and Instruction. Gallaudet University Press.
- Narayana, P. V. (2011). Curriculum Development and Management. Delhi: Pooja Books Suppliers.
- Pandey, M. (2008). Concepts of Curriculum. Delhi: Saujanya Books.
- Pisha, B., & Coyne, P. (2001). Smart from the start: The promise of universal design for learning. Remedial and Special Education, 22(4), 197-203.
- Posner, G.J., Rudnitsky A.N. (2005). Course Design: A Guide to curriculum Development for Teachers. Pearson. Professional Publishing, Wakefield (2014)
- Ralabate, P. K. (2011, August 30). Universal Design for Learning: Meeting the Needs of All Students. The ASHA Leader.
- UNESCO.: State of the Education Report for India 2019: Children with Disabilities. New Delhi, India (2019)
- Vashista, S. R. (2007). Classroom Administration. New Delhi: Anmol Publications Pvt. Ltd.

COURSE VII
EDUCATION IN THE EMERGING INDIAN SOCIETY AND SCHOOL
ADMINISTRATION

Total Marks: 75

Total Hours: 75

Learning outcomes:

On the completion of this course, the student-teacher will be able to:

- Define Education, describe functions of education and aims of education;
- Describe relationship between Education and Philosophy;
- Appreciate the role of various agencies in educational development of children—both non-disabled and disabled;
- Understand various education commissions and policies of Education;
- Describe the importance of School Administration and documentation

Course Content:

Unit 1: Nature of Education:

- 1.1. Meaning and definition of education
- 1.2. Aims of Education: character building, education as means of livelihood, for social efficiency social aim, cultural development and transmission
- 1.3. Education in 21st century in India
- 1.4. Formal, Informal and Non-Formal Education
- 1.5. Functions of Education—Nation Building, National Integration, Social Integration bringing about peace and harmony in the society and inculcating values and ethos

Unit 2: Philosophical Foundations of Education

- 2.1. Meaning and definition of philosophy, Relationship of philosophy with educational practices
- 2.2. Different Educational philosophies—Idealism, Naturalism Pragmatism and Humanism—an overview
- 2.3. Prominent Educational Philosophers— John Dewey, Kilpatrick, Rousseau, —their principles and aims of education

- 2.4. Indian Educational Philosophers— Gandhi, Aurobindo, Rabindra Nath Tagore and Vivekanand—their principles and aims of education
- 2.5. Teacher and the learner: ancient ideals of a teacher, teacher in modern education; roles, functions and traits of a teacher

Unit 3: Agencies of Education

- 3.1. Different agencies of education: Formal, Informal and Non-formal
- 3.2. Modes of Education: Regular, Open, Distance & Online, Blended learning
- 3.3. Regular School, Inclusive School and Special School, Home Education, Home-based Programme, Family Community and Mass Media
- 3.4. Roles of Governmental Organizations—NCERT, SCERT, NCTE, UGC, Ministry of Education
- 3.5. Roles of various national and international Non-Governmental Organizations (NGOs) in promoting of educational opportunities for children with disabilities

Unit 4: Educational Provisions in India

- 4.1. Indian constitutional and education: Directive Principles, Fundamental Rights and Duties, Constitutional Provisions on Education
- 4.2. Acts and Provisions: Free and compulsory education as fundamental rights (article 21A of 2002) and RTE Act 2009 and Amendments; Educational provisions enshrined in RPWD Act, 2016
- 4.3. Various Education Commissions since Independence: The University Education Commission (1948-49), the Secondary Education Commission 1952 -53, Kothari Commission report 1964- 66
- 4.4. National Education Policy 1986, Plan of Action 1992 and National Education Policy 2020
- 4.5. Equality of opportunity in educational institution and inclusive education at different levels: elementary, secondary and higher education

Unit 5: School Administration:

- 5.1. Meaning, definition and principles of School Administration and School Organization
- 5.2. Organization of Special School and Inclusive School
- 5.3. Code and conduct of teacher, duties and responsibilities of the head of school

5.4. Annual school plan and Preparation of time-table, Continuous and Comprehensive Evaluation (CCE)

5.5. Maintenance of school-record--progress report, cumulative record, case histories

Suggested readings:

Bhatia K. and Bhatia B.D. (1994). Theory and Principles of Education. Doaba House

Chandra, S.S. (2003) Indian Education Development, Problems, Issues and Trends, Meerut: R.

Lall Book Depot.

Dash B. N. (1993). Teacher and Education in the Emerging Indian Society, Dominant Publishers and Distributors

Dash, M & Dash, N. (2017). School Management. New Delhi. Atlantic Publishers and Distributors Pvt Ltd; 1st edition.

Ghosh, Sunanda & Mohan, Radha (2015). Education in Emerging Indian Society: The Challenges and Issues. New Delhi, PHI Learning Private Limited.

Kochhar S.K. (2011). School Administration and Management. New Delhi, Sterling Publications Pvt Ltd,

NCERT. Teacher and Education in Emerging Indian Society

Pearson series in Education (2012). Teacher in Emerging Indian Society. New Delhi, Pearson Education India.

R.P. Pathak (2013). Bhartiya Samaj men Shiksha. New Delhi, Pearson Education India.

Samuel, R. S. (2015). Education in Emerging India. New Delhi, PHI Learning Private Limited.

Saxena, N.R.S., Gupta, M. (2020). Philosophical Foundations of Education, R. Lall Publishers

Taneja. V. R (1990). Educational Thoughts and Practices. Sterling Publishers, New Delhi

COURSE VIII
EDUCATION OF CHILDREN WITH HEARING AND SPEECH
DISABILITIES

Total marks -75

Total hours -75

Learning outcomes

On the completion of this course, the student-teachers will be able to:

- List the facts and explain the concepts about education of children with hearing and speech disabilities
- Explain the Importance of early identification and Intervention of hearing and speech disabilities
- Describe the educational trend for children with hearing and speech disabilities
- Use suitable tools for education of children with hearing and speech disabilities
- Describe about the school climate and education children with hearing and speech disabilities
- Describe the policies, legislation, schemes and provisions for education children with hearing and speech disabilities

Unit I: Educational trends

- 1.1. Evolution of education for children with hearing and speech disabilities
- 1.2. Early identification and intervention- concept, need and importance
- 1.3. Intervention strategies- Meaning, Types and role of multidisciplinary team
- 1.4. Educational requirements of children with hearing and speech disabilities
- 1.5. Need and importance of school readiness

Unit II: Educational options

- 2.1. Special education – types, levels, merits and demerits
- 2.2. Mainstreaming and integrated education- meaning, types, merits and demerits
- 2.3. Inclusive education- meaning, need and importance, merits and demerits, UDL- Universal design for learning
- 2.4. Community based rehabilitation- meaning, need, merits and demerits
- 2.5. Role of stakeholders and significant others

Unit III: Tools and devices facilitating education

- 3.1. Assessment tools for students with hearing and speech disabilities

- 3.2. Assistive devices
- 3.3. Augmentative and alternative communication devices
- 3.4. ICT tools and techniques
- 3.5. Types of educational evaluation

Unit IV: School climate facilitating education:

- 4.1. Meaning nature and concept of school climate
- 4.2. Dimensions of school climate
- 4.3. Factors influencing school climate
- 4.4. Fostering positive school climate-need and ways
- 4.5. Barrier free environment-attitudinal, physical, educational,societal.

Unit V:Policies, legislation, schemes and provisions

- 5.1. Salient features of NPE 1986 and NEP 2020-Education of hearing impaired
- 5.2. NEP2020-Enrolment, Retention-Remediation and Reentry to reduce dropout of students with hearing impairment- assessment for learning and improvement-paradigm shift in teaching and learning
- 5.3. Salient features of RCI ACT-1992, PWD ACT-1995, RPWD ACT-2016
- 5.4.Samagra Shiksha :Objectives and implementation
- 5.5. Government welfare schemes and provisions for student with hearing impairment and e-content guidelines

Suggested readings:

- Alice, M., Raj, k., & Rao, D. B. (2004). Deaf Education New Delhi: Sonali publications.
- Alur, M., & Timmons, V. (2009). Inclusive Education across Cultures. New Delhi: sage publications.
- Bhattacharjea, S., Wadhwa, W., & Banerji. R. (2011). Inside primary schools. A study of teaching and learning in rural India. ASER. [http://img.asercentre.org/docs/Publications/Inside_Primary_School/ Report/tt-study_print_ready_Version_oct_7_2011.pdf](http://img.asercentre.org/docs/Publications/Inside_Primary_School/Report/tt-study_print_ready_Version_oct_7_2011.pdf).
- Bandhapadhyay, D.M. (2015). Present status of infrastructure facilities in schools in India: Fromnational and state level perspective, New Delhi: National.
- Brelje, W. (1999), Global Perspective on the Education of the Deaf in Selected Countries, Hillsboro: Butte Publications.

- Dash, M. K. & Singh, J.P. (2005). Disability Development in India. New Delhi: Kanishka publication.
- Goldstein, D. (1989). The Hearing-Impaired Child. England: NFER- Nelson Publication.
- Jone, V.F., & Jones, L.S. (2003). Comprehensive Classroom Management. Boston: Allyn& Bacon.
- M., Sateesh & Sekhar, T V. (2014) . Factors leading to school dropouts in India: an analysis of National Family Health Survey -3 data. International journal of research & method in Education .4 75-83 .10.9790/7388-04637583
- Mehdiratta, M. (2002). Dictionary of Special Education. Raleigh: IVY Publishing House.
- Northcott, W.H, (1973). The Hearing-Impaired Child in a Regular Classroom, Washington: The Alexander Graham Bell Association for the Deaf Inc.
- Ramar, L. R., & Kusuma, A. (2004). Hearing Impairment an Educational Consideration. New Delhi: Discovery Publishing House.
- Reddy, G, L. (2010). Education of Children with Special Needs. Delhi: Pooja books Supplier.
- Reddy, G. L., Ramar, R., & Kusuma, A. (2004). Special Education Series: Hearing Impairment an Educational Consideration. New Delhi: Discovery Publishing House.
- Reed, M. (1984). Education of Hearing Children. Milton Keynes: open University press.
- Sajjad, H., Iqbal, M., Siddiqui, M. & Siddiqui, L. (2012) . Social - Economic Determinants of Primary School Dropout: Evidence from South East Delhi, India. European journal of social sciences.30.1450-2267.
- Sharma, M. (2009). Vishishth Balak: Avdharana, Vikash Evan Shiksha. New Delhi: Kanishka publication.
- Singh, V. P. (2004). Concepts and Method of Special Education. New Delhi: Sarup & Sons Publishers.
- UDISE+Booklet, Ministry of Human Resource Development. <http://164.100.77.133/information/Details.action?field=4#>[2019, April]
- Vittachi, S., Raghavan, N., & Raj, K. (2007). Alternative Schooling in India. New Delhi: Sage Publications.

COURSE IX
CONTENT AND METHODOLOGY OF TEACHING SCIENCE AND
MATHEMATICS

Total marks -75

Total hours -75

Learning Outcomes:

On the completion of this course, the student-teachers will be able to:

- Explain the concept, nature and objectives of Science and Mathematics to children with deafness;
- Demonstrate understanding of the problems and limitations faced by children with deafness in learning various concepts included in Science and Mathematics;
- Describe various methods and techniques of teaching Science/Mathematics and their use for learners with deafness;
- Explain the concept of Branches of Science & Mathematics like Biology, Physics & Chemistry, Arithmetic, Algebra, Geometry with reference to the historical context;
- Explain the concept, objectives, importance and types of Evaluation and also adjustment in evaluation due to limitations of deafness;

Unit1:Introduction to Science &Mathematics

- 1.1 Science: Definition, Aims and Objectives;
- 1.2 Mathematics: Definition, Aims and Objectives;
- 1.3 Fundamental understanding of Basic Science; Animals, Vegetation, Human body, Food, Health etc.
- 1.4 Basic Mathematical Calculations & Concepts;
- 1.5 Correlation of science and mathematics within &with other subjects;

Unit 2: Educational Implications of Hearing Impairment for Organization of the Classroom

- 2.1 Educational implications of hearing impairment for teaching Science & Mathematics;
- 2.2 Planning to overcome problems and limitations in teaching - learning Process;

- 2.3 Adaptations, Accommodations and Modifications in Science & Mathematics;
- 2.4 Aids and equipment in the teaching of Science & Mathematics;
- 2.5 Role, responsibilities & qualities of a good Science & Mathematics teacher;

Unit 3: Methods of Teaching and Skills of Teaching Science & Mathematics

- 3.1 An overview of Methods of teaching: Source Method, Discovery Method, Project Method, Problem Solving Method, Play way Method, Field Study Method, Observation Method, Pendulum Method, Correlation Method and Discussion method;
- 3.2 An overview of Maxims of teaching: Simple to complex, Whole to part, Empirical to rational, Concrete to abstract, Known to Unknown, Particular to General;
- 3.3 Skills: Dramatization, Narration, Explanation, Story Telling, Role Play;
- 3.4 Importance of Laboratory, Library, Science fairs and Exhibitions;
- 3.5 Unit Planning and Lesson Planning in Science & Mathematics;

Unit 4: Branches of Science & Mathematics

- 4.1 Domains of Biology, Physics & Chemistry;
- 4.2 Domains of Arithmetic, Algebra, Geometry;
- 4.3 Understanding of Mathematical language & Terminology in Science;
- 4.4 Implementation of Science & Mathematics in daily life;
- 4.5 Science & Mathematics in India: The historical context;

Unit 5 Evaluation in Science and Mathematics

- 5.1 Concept, objectives and significance of Evaluation;
- 5.2 Techniques of Evaluation;
- 5.3 Formative, Summative and Continuous and Comprehensive Evaluation;
- 5.4 Adjustments in evaluation due to limitations of deafness;
- 5.5. Designing teacher-made tests (TMT) in Science and Mathematics;

Suggested readings

- Aggarwal, S.M. (1990). *Teaching of Modern Mathematics*. Delhi: Dhanpat Rai Publishing Co. Pvt. Ltd.
- Fleming, C.M. *Teaching the Elements of Science & Mathematics*. London: Ginn and Company Ltd.
- Joseph, S. (2003). *Science Teaching in Elementary and Middle School Classrooms*.

Columbus:McGrawHill.

Kapur,J.N.(1967).*Some Aspects of School Mathematics*. Delhi: Arya Book Depot.

Kochhar, S.K.(1967). *Methods & Techniques of Teaching*. New Delhi: Sterling Publishers Pvt. Ltd.

Rahman,Z.U.(2004).*Modern Teaching Methods and Techniques*. New Delhi: Anmol Publications Pvt. Ltd.

Rao,S.N.(2004).*Methods and Techniques of Teaching*. Delhi: SonaliPublications.

Sharma,R.C.(2000).*Modern Science Teaching*. Delhi: Dhanpat Rai Publishing Co. Pvt. Ltd.

Sidhu,K.(1984).*The Teaching of Mathematics*.New Delhi:StarlingpublishersPvt.Ltd.

Tweed,A.(2009).*Designing Effective Science Instruction: What Works in Science Classrooms*. Wilson Boulevard-Arlington: National Teachers Association.

COURSE X
INCLUSIVE EDUCATION

Total Marks: 75

Total Hours: 75

Learning Outcomes:

On completion of this course, the student-teachers will be able to:

- Describe importance of diversity
- Explain the concept of inclusive education
- Describe various supports needed for inclusive education
- Explain the curricular strategies for inclusive education
- Enumerate the curricular strategies for inclusive education
- Explain the role of agencies for collaborating for inclusion

Unit I: Diversity and Inclusivity

- 1.1 Meaning and concept of diversity
- 1.2 Learner diversity
- 1.3 Disability as a human diversity
- 1.4 Diversity for sustainability
- 1.5 Strength of diversity for inclusivity

Unit II: Concept and Meaning of Inclusive Education:

- 2.1 Meaning and defining inclusion
- 2.2 Principles of inclusion
- 2.3 Integration vs. Inclusive education
- 2.4 Barriers and facilitators of inclusive education
- 2.5 Framework, Acts, Policy provisions for inclusive education

Unit III: Creating supports for inclusive education

- 3.1 Early identification and intervention for inclusion
- 3.2 Foundational literacy for inclusive education
- 3.3 Empowering families for inclusion
- 3.4 Sensitizing stakeholders and schools for inclusive education

3.5 Teacher preparation for inclusive education

Unit IV: Curricular strategies for inclusive education

4.1 Curricular challenges for students with disabilities and twice exceptional children

4.2 Need for curricular adaptations

4.3 Inclusive practices; Adaptations, accommodations and modifications

4.4 Types of curricular adaptations

4.5 Differentiated instructions and Universal design of learning

Unit V: Collaborations for inclusive education

5.1 Special schools and inclusive schools

5.2 Special educators and general teachers

5.3 Social welfare dept and Dept of education

5.4 Special and general teacher education programmes

5.5 Voluntary organizations and Govt. agencies

Suggested readings:

Alur, M., Timmons, V., (2012). Inclusive Education Across Cultures, (3 rd ed.), New Delhi, Saga Publication India Pvt Ltd.

Alur, M., & Bach, M. (2012). The Journey for Inclusive Education in the Indian Sub-Continent, New York: Routledge (Taylor&Francis). <https://www.routledge.com/The-Journey-for-Inclusive-Education-in-the-Indian-Sub-Continent/Alur-Bach/p/book/9780415654500>

Banerjee, R. & Mehendale, A. (2006) Understanding Inclusive Practice and Community Initiatives to Make Education Accessible to All, SSA Karnataka

Bela, K., (2017), Creating Inclusive Education: समावेशीशिक्षा, (2nd ed.), Agra, Shri Vinod Pustak Mandir.

Dash, N., (2012), Inclusive Education for Children with Special Need, (1st ed.), New Delhi, Atlantic Publishers.

Gross, M.U.M., (1993). Exceptionally gifted children. Routledge, New York.

Julka, A, (2014). Including children with special needs, Primary stage, New Delhi: NCERT <https://ncert.nic.in/pdf/publication/otherpublications/SpecialNeeds.pdf>

- Panigrahi, S.C., Biswal, A.,(2012). Teaching Education, (1st ed.). New Delhi, APH Publication Corporation.
- Puri, M. & Abraham, G. (2004) Handbook of Inclusive Education for Educators, Administrators and Planners: Within Walls, Without Boundaries. New Delhi: Sage Publication <https://us.sagepub.com/en-us/nam/handbook-of-inclusive-education-for-educators-administrators-and-planners/book227266>
- Sharma,P and Singh, R. (2007) Gearing up for inclusive Education, New Delhi: SCERT. <http://14.139.60.153/bitstream/123456789/4082/1/Gearing%20Up%20for%20Inclusive%20Education%20SCERT.pdf>
- Singh, A.J., Vrik, K.A., (2014)., Inclusive Education, (1st ed.), Patiala, Twenty First Century Publication.
- Tilstone, C and Rose, R. (2003) Strategies to promote Inclusive Practice, London: Routledge (Taylor&Francis).<https://www.routledge.com/Strategies-to-Promote-Inclusive-Practice/Rose-Tilstone/p/book/9780415254854>
- UNDP (2000) Beyond Tokenism - A Guidebook for Teacher's on How to Implement Inclusive Education in the Regular Class, New Delhi: The National Trust & UNDP
- Vlachou, D. A. (1997) Struggles for Inclusive Education: An Ethnographic Study Disability, human rights, and society, Open University Press
- Vrik. J., Arora, A., Sood, R.S., (2010)., Fundamentals of Inclusive Education, (1st ed.), Patiala, Twenty First Century Publication

COURSE XI
FAMILY AND COMMUNITY

Total Marks: 75

Total Hours: 75

Learning outcomes

On completion of this course the student teacher shall be able to:

- Explain the basic nature and role of family in development of a child
- Describe the ways and means of involving and empowering families of children with disabilities.
- Explain the role of family in education of children with disabilities
- Discuss the role of community in disability rehabilitation
- Enumerate the community role in education of children with disabilities.

Unit 1: Understanding family

- 1.1 Family; meaning, definition and characteristics - Families in the Indian context
- 1.2 Structure, types of families and its impact on children's development.
- 1.3 Family culture and practices & its influence on children's mental and physical well-being.
- 1.4 Parenting and its types and its impact on children's education.
- 1.5 Challenges of parents of 21st century modern day learners.

Unit 2: Family and disability

- 2.1 Stages of reaction and impact and coping of having a child with disability.
- 2.2 Involving parents in diagnosis, fitment of aids and acceptance of disability by family.
- 2.3 Importance of family involvement and advocacy in interventional practices.
- 2.4 Concept, components and strategies of family empowerment.
- 2.5 Partnering for interventional practices.

Unit 3: Role of family in early childhood care and education (ECCE)

- 3.1 Parents as first teachers and family as first school.
- 3.2 Role of family in developing and executing IFSP and IEPs
- 3.3 Family's role in developing foundational literacy in young children.
- 3.4 Supporting learning at home, school and in after school activities.

3.5 Role of family in facilitating inclusive education

Unit 4: Community for disability rehabilitation

4.1 Concept and types of communities

4.2 Role of community in prevention early identification, and intervention of disability

4.3 Community based inclusive development – need, importance and strategies

4.4 Creating enabling environments- mobilising local community resources towards the rehabilitation of persons with disabilities.

4.5 Issues and challenges in rehabilitation of child with disability in the community

Unit 5: Role of community in education of children with disabilities.

5.1 Community awareness about disabilities - early identification, intervention and education.

5.2 Community support for home based education and in times of disasters.

5.3 Collaboration with Anganwadis and other Governmental agencies for education of children with disabilities

5.4 Community as a stakeholder in special and inclusive education

5.5 Safeguarding children with disabilities and their families in the communities.

Suggested Readings

Chen, D. and Haney, M. (1999) Promoting learning through Active interaction. Project PLAI, Final report. ERIC Document Reproduction Service No. ED 432118.

Hanson, M. J., & Lynch, E.W. (2004). *Understanding Families: Approaches to diversity, disability, and risk*. Baltimore, MD: Paul H. Brookes.

Harris. K.R., & Graham,S. (2010).*Working with families of young children with special needs*. New York, Guilford publications

Hurlock E. B. (1981), Child Development, Newyork: Mc Graw- Hill

Hyun,E (1998) Making Sense of Developmentally and Culturally Appropriate Practice in Early Childhood education. New York: Peter Lang.

Kaul, V (1993) Early Childhood Education Programme, New Delhi: NCERT

Millington, M. and Marini,I.(2015) Families in Rehabilitation Counselling: A community based rehabilitation approach. Singapore: Springers Publishing Company.

Muralidharan R (1990). Early Stimulation Activities for Young Children, New Delhi: NCERT

- Nagar, S. B., (2016). Essentials of Community Based Rehabilitation. New Delhi: Jaypee brothers.
- Peshawaria.R, Menon, D.K , Ganguly R. Roy, S. Pillay R.P.R.S. & Gupta A (1995):*Family needs schedule*, Secunderabad: NIEPID.
- Pruthvish, S. (2006). Community Based Rehabilitation. New Delhi: Jaypee Brothers.
- Sharma, P (1995). Basics on Development and Growth of a child. New Delhi: Reliance Publishing House.
- Webster, E. J. V (1993) Working with parents of young children with disabilities, California: Singular Publishing Group
- WHO (2010). Community Based Rehabilitation: CBR guidelines,
- WHO (2015) Capturing the difference we make. CBR indicator manual.
https://apps.who.int/iris/bitstream/handle/10665/199524/9789241509855_eng.pdf?sequence=1

COURSE XII
CONTENT AND METHODOLOGY OF TEACHING EVS &
SOCIAL SCIENCE

Total marks -75

Total hours- 75

Learning Outcomes:

On the completion of this course, the student-teachers will be able to:

- Explain the concept, nature and objectives of EVS and Social Science to children with deafness
- Demonstrate understanding of the problems and limitations faced by children with deafness in learning various concepts included in EVS and Social Science;
- Describe various methods and techniques of teaching EVS and Social Science and their use for learners with deafness
- Explain the concept of History, Geography and Civics with significance of pre-independence and post-independence developments;
- Explain the concept, objectives, importance and types of Evaluation and also adjustment in evaluation due to limitations of deafness.

Unit 1: Introduction to Environment Science (EVS) and Social Science: (15 Hours)

- 1.2 Environment Science (EVS) and Social Science-- Concept, Scope and Nature;
- 1.3 Understanding EVS as an integrated area of Science, Social Science and Environmental Education;
- 1.4 Environment Science as Science- Water, air, soil, source of energy, eco system, response and adaption in plants and animals;
- 1.5 Environment (EVS) as a Social Science- Difference between Social Science and Social Studies, Human Population and the environment, Agriculture and Industry, Environment Degradation and Concerns, Disaster Management;
- 1.6 Scope, nature and objectives of Teaching EVS and Social Science to children with deafness;

Unit 2: Educational Implications of Hearing Impairment for Organization of the Classroom

- 2.1 Educational implications of deafness for teaching EVS and Social Science;

- 2.2 Problems and limitations faced by learners with deafness in learning EVS and Social Science;
- 2.3 Adaptations, Accommodations, and Modifications in EVS and Social Science Curriculum for students with deafness
- 2.4 Aids and equipment needed for EVS and Social Science concepts for children with deafness
- 2.5 Qualities of a good EVS and Social Science Teacher

Unit 3: Methods and Skills of Teaching Social Science:

- 3.1 An overview of methods of teaching: Source Method, Discovery Method, Project Method, Problem Solving Method, Play way Method, Field Study Method, Observation Method, Pendulum Method, Correlation Method and Discussion method;
- 3.2 Skills: Dramatization, Narration, Explanation, Story Telling, Role Play;
- 3.3 Importance of community resources and current affairs in EVS and Social Science;
- 3.4 Laboratory, Library, Museum and exhibition;
- 3.5 Unit Planning and Lesson Planning in EVS and Social Science with use of TLM;

Unit 4: History, Geography and Civics:

- 4.1 Rise of various dynasties through early and middle ages;
- 4.2 Establishment and expansion of the British Empire;
- 4.3 India's Freedom struggle from 1857 to 1947;
- 4.4 Concept of democracy and secularism with salient features of the Indian Constitution;
- 4.5 Understanding globe, earth, solar system and concept of day night and seasons;

Unit 5: Evaluation in EVS and Social Science

- 5.1 Concept, objectives and significance of Evaluation;
- 5.2 Techniques of evaluation;
- 5.3 Formative, Summative and Continuous and Comprehensive Evaluation;
- 5.4 Adjustments in evaluation due to limitations of deafness;
- 5.5 Designing teacher-made tests (TMT) in EVS and SS;

Suggested readings

- Aggarwal, J.C. (2000). *Principles, Methods & Techniques of Teaching*. Delhi: Vikas

Publishing House.

- Aggrawal, J. C. (2006). *Teaching Social Studies*. Delhi: Vikas Publishing.
- Bhatia, K., & Bhatia, B. D. *The Principles and Methods of Teaching*. Delhi: Doaba House.
- Denis, L., & Barry, D. (1973). *New Social Studies: Handbook for Teachers in Primary, Secondary and Further Education*. Heinemann Educational.
- Hanson, W. J. (Introducing Social Studies). 1966. Longmans.
- Jha, P. K. (2007). *Modern Methods of Teaching of Geography*. Delhi: Rajat Publications.
- Kochhar, S. K. (2000). *Evaluation in Social Studies*. Delhi: Sterling Publishers Pvt. Ltd.
- Kochhar, S. K. (1967). *Method and Techniques of Teaching*. Delhi: Doaba House.
- Preston, R. C. (1958). *Teaching Social Studies in Elementary School*. Rinehart.
- Selvam, S. K. *Teaching Strategies*. Delhi: APH Publishing Corporation.
- Siddiqui, M. H. (2005). *Techniques of Teaching (2 Vol. set)*. Delhi: APH Publishing Corporation.
- Yoakam, G. A., & Simpson, R. G. (1950). *Modern Methods and Techniques of Teaching*. London: McMillan.

Annexure I & II

Students who are DHH enrolling for the Diploma in Special Education (HI) may wish to opt for Alternate papers for Course II and Course V which are annexed as Annexure I and Annexure II. The concerned institute could arrange to provide inputs and inform RCI and the examination body for the needful.

- Annexure I: Alternate Course to Course II
- Annexure II: Alternate Course to Course V

Annexure I
Alternate to COURSE - II
FUNDAMENTALS OF HEARING, DEAFNESS AND MANAGEMENT
THROUGH SIGN LANGUAGE

Total Marks 75

Total Hours 75

Learning outcomes:

On the completion of this course, the student-teachers will be able to:

- Describe the anatomy of ear and physiology of hearing
- Explain the causes, prevention and classification of hearing loss
- Describe the amplification devices and interpret the Audiological information
- Explain the concept of Deaf gain and identity
- Discuss the role of sign language in educational bilingualism

Unit 1: Hearing & Deafness

- 1.1 Parts of the ear and hearing mechanism
- 1.2 Hearing Impairment; Definition, Types and Classification
- 1.3 Deafness and its implications
- 1.4 Cultural aspects of deafness
- 1.5 Reframing deafness as a diversity

Unit 2: Causes, Prevention and assessment of hearing loss

- 2.1 Causes and prevention and early identification of hearing loss
- 2.2 Auditory milestones
- 2.3 Effects of Hearing impairment on various domains of development, education and employment.
- 2.4 Conditioning and Audiometry for children
- 2.5 Audiograms and its interpretations

Unit 3: Amplification Devices

- 3.1 Hearing aids – Parts, functioning and types
- 3.2 Importance of binaural hearing amplification

3.3 Classroom amplification system and Assistive Listening Devices

3.4 Hearing aid maintenance and troubleshooting

3.5 Orientation to Cochlear implants

Unit 4: Deaf gain and Identity

4.1 Deaf gain; meaning and concept

4.2 Deaf identity

4.3 Deaf as linguistic minority

4.4 Indian Sign Language

4.5 Disability studies

Unit 5: Sign Languages in Education

5.1 Use of sign languages in schools and communities: Global and Indian context

5.2 Cyclic trends in education of the deaf

5.3 Bilingual Education for hearing children and sign bilingual education for deaf children:
Differences and Similarities

5.4 Sign Language as first language for deaf

5.5 Role of Sign Language in educational bilingualism models

Suggested readings:

Graham, J., & Martin, M. (2001). *Ballantyne's Deafness*. New Jersey: Wiley.

Cormick, B. M. (1993). *Pediatric Audiology 0 to 5 years*. London: Whurr Publishers.

Madell, J.R., Flexer, C., Wolfe, J., & Schafer, E.C. (2019). *Pediatric Audiology: Diagnosis, Technology, and Management*. New York: Thieme Medical Publishers Inc

Erber, N. (1982). *Auditory Training*. Washington D. C.: A. G. Bell Association for Deaf.

Katz, J. (2014). *Handbook of Clinical Audiology*. Philadelphia: Lippincott Williams & Wilkins.

Martin, F. N., & Clark, J. G. (2019). *Introduction to Audiology (Ed - 13)*. New Jersey: Pearson.

Pollack, D. (1974). *Education Audiology for the Infant with Limited Hearing*. USA: Thomas Publisher.

Pollack, D., Goldberg, D.M., & Caleffe-Schenck, N. (1997). *Educational Audiology for the Limited-Hearing Infant and Preschooler: An Auditory-Verbal Programme*. Springfield: Charles C Thomas Pub Ltd.

- Johnson, C.D., & Seaton, J.B.(2020). *Educational Audiology Handbook*. San Diego: Plural Publishing
- Metz. M.J.(2014).*Sandlin's Textbook of Hearing Aid Amplification: Technical and Clinical Considerations*. San Diego: Plural Publishing Inc
- Kusuma, A., G., Reddy, G. L., & Ramar, R.(2010). *Hearing Impairment: An Educational Consideration*. New Delhi: Discovery Publishing House Pvt. Ltd.
- Tye-Murray, N.(2020). *Foundations of Aural Rehabilitation Children, Adults, and Their Family Members*. San Diego: Plural Publishing
- Peter, P., Quigley, V., & Stephen, P. (1994). *Language and Deafness*. California: Singular Publishing.
- Streng, A. H. (1978). *Language Learning and Deafness*. New York: Harcourt Brace Jovanovich Publishers.
- Strong, M. (1998). *Language Learning and Deafness*. New York: Cambridge University Press.
- Parasnis, Ila. 1997. *Cultural identity and diversity in deaf education*. American Annals of the Deaf 142.2: 72-79.
- Senghas, Richard J. and Leila Monaghan. 2002. *Signs of Their Times: Deaf Communities and the Culture of Language*. Annual Review of Anthropology 31: 69-97.
- Grosjean, Francois. 2010. *Bilingualism, biculturalism, and deafness*. International Journal of Bilingual Education and Bilingualism 13.2: 133-145.
- Johnson, Robert, Scott K. Liddell, and Carol J. Erting. 1989. *Unlocking the curriculum: Principles for achieving success in deaf education*. Gallaudet Research Institute Working Paper 89-3. Washington, DC: Gallaudet University.
- Mellon, Nancy K., John K. Niparko, Christian Rathmann, Gaurav Mathur, Tom Humphries, Donna Jo Napoli, Theresa Handley, Sasha Scambler, John D. Lantos. 2015. *Should all deaf children learn sign language?* Pediatrics 136.1: 170-176.
- Nussbaum, Debra Berlin, Susanne Scott, and Laurene E. Simms. 2012. *The 'why and 'how' of an ASL/English bimodal/bilingual programme*. Odyssey Spring 2004: 14-19.
- Ulrike, Z. *Language - Sign Language - Indian Sign Language Common Wrong Beliefs about Sign Language*. AYJNIHH, Mumbai: Publication of ISL Cell.

Annexure II
Alternate to COURSE V
DEVELOPMENT OF RECEPTIVE AND EXPRESSIVE LANGUAGE IN
DEAF CHILDREN

Total Marks -75

Total hours -75

Learning outcomes

On the completion of this course, the student-teachers will be able to:

- Describe various forms of receptive and expressive language
- Explain the stages development of speech and the speech mechanism
- Describe the speech problems and aids and equipments used in speech teaching
- Explain the role of family for developing Sign language
- Discuss the ways of promoting Sign Language for inclusive education

Unit 1: Receptive and expressive language

- 1.1 Receptive language ; meaning and importance
- 1.2 Forms of receptive language (Visual, listening and reading)
- 1.3 Expressive language; meaning and importance
- 1.4 Forms of expressive language (Signing, speaking, writing, performing)
- 1.5 Myths and realities of receptive and expressive language of DHH students

Unit 2: Introduction to speech and speech production

- 2.1 Definition and characteristics of speech
- 2.2 Speech as an overlaid function
- 2.3 Parameters of normal speech
- 2.4 Mechanism of speech production – structure and function of Respiratory, Phonatory, Articulatory, Resonatory and Regulatory system
- 2.5 Introduction to Speech Disabilities

Unit 3: Description of speech sounds and development

- 3.1 Segmental and supra-segmental aspects of speech

- 3.2 Stages of development of speech in children with normal hearing
- 3.3 Speech problems in children with hearing impairment
- 3.4 Speech intelligibility and its evaluation
- 3.5 Aids and equipments for development of speech: Auditory aids (speech trainer), Visual aids (mirror etc.), tactile aids (Vibrotactile aids), software etc.

Unit 4: Development of Sign language in children with hearing impairment

- 4.1 Early Intervention and critical period for developing sign language
- 4.2 Deaf vs. Hearing parents role in developing sign language
- 4.3 Stages of development of Sign language acquisition (milestones)
- 4.4 Family centred practices for development of sign language
- 4.5 Incidental and activity based approach for developing Sign Language

Unit 5: Sign language for inclusive education

- 5.1 Provisions of NEP 2020 for Sign Language
- 5.2 Teaching Sign Language to hearing students
- 5.3 Role of teachers in promoting sign language for inclusion
- 5.4 Promoting Sign language through co-curricular activities
- 5.5 Assessment of Sign language as a school subject

Suggested readings:

- Bench, R. J. (1992). *Communication Skills in Hearing Impaired Children*. London: Whurr Publishers.
- Bunkar, S. (2011). *Fundamentals of Linguistics*. Jaipur: Prism Books.
- Calvert, D. R., & Silverman, S. R. (1983). *Speech and Deafness*. Washington D. C.: A. G. Bell Association for the Deaf.
- Chaturvedi, M. G. (1973). *A Contrastive Study of Hindi - English Phonology*. New Delhi: National Publishing House.
- Ling, D. (2002). *Speech and the Hearing-impaired Child: Theory and Practice*. Washington D. C.: Alexander Graham Bell Association for the Deaf.
- Lyons, J. (1981). *Language and Linguistics*. New York: Cambridge University Press.
- Markides, A. (1983). *The Speech of Hearing Impaired Children*. Manchester: Manchester University Press.

- Riper, C.V., & Erickson, R.L.(1995).*Speech Correction: An Introduction to Speech Pathology and Audiology*. London: Pearson.
- Shipley, K.G., McAfee, J.G. (2009). *Assessment in Speech-Language Pathology: A Resource Manual*. New York: Delmar Cengage Learning
- Rout, N., & Kamraj, P. (2014). *Developing Communication - An Activity Book*. Chennai: National Institute for Empowerment of Persons with Multiple Disabilities.
- Paul, P.V., & Whitelow, G.M.(2011). *Hearing and Deafness An Introduction for Health and Educational Professionals*. Massachusetts: Jones & Bartlett Publishers.
- Communication Options and Students with Deafness*. (2011). Rehabilitation Council of India, New Delhi.
- Ulrike, Z. *Language - Sign Language - Indian Sign Language Common Wrong Beliefs about Sign Language*. AYJNIHH, Mumbai: Publication of ISL Cell.

Steering Committee:

Smt. Anjali Bhawra, IAS,
Secretary, DEPwD, MSJ&E, Govt. of India & Chairperson, RCI

Dr Subodh Kumar,
Member Secretary, RCI

Development Committee:

Core Courses:

Prof. S.R. Mittal - Chairperson
Delhi University

Expert members:

Mr. Akhil Paul
Director, Sense International India

Prof. Amitav Mishra
Professor, IGNOU

Mrs. Anuradha Bagchi
Helen Keller Institute, Navi Mumbai

Dr. Apoorva Panshikar
S.N.D.T. University, Mumbai

Dr. Jayanthi Narayan
Ex-Dy. Director, N.I.M.H. (NIEPID), Secunderabad

Mrs. Nisha Grover
Akshar Trust, Vadodara

Mr. Rajesh Ramachandran
N.I.E.P.M.D., Chennai

Dr. Shilpa Manogana
N.I.E.P.I.D., Secunderabad

Prof. Sujata Bhan
HOD Special Education, S.N.D.T., Mumbai

Prof. Sushma Sharma
Dept. of Education, Kurukshetra University, Haryana

Dr. Varsha Gathoo
HOD Education, AYJNISHD, Mumbai

Specialization courses (Hearing Impairment & Speech Disorders):

Dr. Varsha Gathoo - Chairperson
HOD Education, AYJNISHD(D), Mumbai

Expert members

Mr. B. Nageshwar Rao

Assistant Director AYJNISHD(D), RC, Kolkata

Mr. Harish Soni

Asst. Prof., ISLRTC

Mrs. Hema kale

Principal, Akshar Trust, Vadodara

Dr. Jignya Shah

Faculty, Amar Jyoti Rehabilitation and Research Centre, Delhi

Dr. Kaushal Sharma

Associate Professor, DSMNRU, Lucknow

Mr. K.N. Mishra

Lt. Sh. Jagat Narayan Training College, Allahabad

Mrs. Monica Punjabi

Director, ISL Department, IDBA (MBS), Indore

Dr. Nigam B. Pandya

Asst. Prof., BAOU, Ahemdabad

Mrs. Nisha Grover

Akshar Trust, Gujarat

Mrs. S. N. Hamsapriya

R.K.M.V.U., Coimbatore

Prof. S. P. Goswami

Professor & Head, Dept of Speech-Language Pathology, AIISH

Dr. Sharmishtha Oak

Academic Associate, Coordinator, B.Ed.Spl.Ed.YCMOU

Mr. Suman Kumar

Assistant Director AYJNISHD(D), RC, Noida

Mr. Sunil Sahasrabudhe

Independent Deaf Consultant in special Education (HI) & ISL/ Educational Bilingualism

Prof. T. G. Amuthavalli

Sri Padmavati Mahila Visvavidyalayam, Tirupati

Compilation credit

Dr. Sharmishtha Oak

Academic Associate, Coordinator, B.Ed.Spl.Ed.YCMOU

Mr. Suman Kumar

Assistant Director AYJNISHD(D), RC, Noida

Convener

Dr. Sandeep Tambe

Assistant Director, RCI

**MASTER OF AUDIOLOGY &
SPEECH LANGUAGE PATHOLOGY (MASLP)**

SEMESTER SCHEME

**REGULATIONS, NORMS, SCHEME OF EXAM
AND CURRICULUM**

REHABILITATION COUNCIL OF INDIA

(Statutory body under Ministry of Social Justice & Empowerment)

B-22, Qutab Institutional Area, New Delhi – 110 075

E-mail: rehabstd@nde.vsnl.net.in

www.rehabcouncil.nic.in

2009

RULES REGULATIONS AND NORMS FOR MASLP

- 1.0 Nomenclature:** Master of Audiology and Speech Language Pathology [MASLP]
- 2.0 Admission criteria:** BSLPA/ B. Sc (Sp & Hg)/BASLP degree or equivalent from any recognized University with minimum pass percentage required as per University norms
- 3.0 Medium of instruction:** English
- 4.0 Duration of the course:** 4 Semesters
- 5.0 Course work:** Each student will pursue the course as in the enclosed course of studies
- 6.0 Award of Degree:** The respective Universities, on successful completion of the requirements, will award the degree.
- 7.0 Criteria of passing:** As per university rules
- 8.0 Attendance:** Each semester shall be taken as a unit, for purpose of calculating attendance and a student shall be considered to have put in required attendance for the semester, if he/she has attended not less than 80% of the number of working periods (lectures, seminars) and 90% of clinics during each semester. Failure to put in / meet the required attendance by any student render him / her disqualified to appear in the university examination. The candidate who will not be able to take the examination for want of attendance will be declared as Failed and will have to repeat the exam subsequently by putting in required attendance. Shortage of attendance can be condoned in genuine cases of absenteeism as per rules and guidelines of respective universities.
- 9.0 Appearance for the Examination:** A candidate shall apply for all papers of a semester when he/she appears for the examination of that semester for the first time.
- 10.0 Scheme of Examination**
 - 10.1 There shall be a University examination at the end of each semester. The duration of the theory exam is 3 hours.
 - 10.2 Every theory question paper shall ordinarily consist of five questions with one question for each unit, subject to the concerned universities regulation.
 - 10.3 In case of theory papers the continuous evaluation (IA) will be for 20 marks. This covers a maximum of 5 marks for attendance & 15 marks for tests, seminars, assignments etc.
 - 10.4 For clinical practicum, continuous evaluation (IA) will be based on performance of the candidate during the semester. Examination for clinical practicum will be internal in 1st and 3rd semester the marks of which are included as marks for Clinical semester Work. At the end of 2nd and 4th

semester Clinical Practicum examination will be held along with theory papers by the university.

- 10.5 The concerned department shall notify in the first week of each semester, scheme of continuous evaluation for theory & practicals.
- 10.6 At least one week prior to the last working day, continuous evaluation (IA) marks secured by the candidates shall be displayed on the notice board.
- 10.7 The Department council may decide to give test/seminar to candidates who absent themselves for the above, only if the council is convinced that the absence of the candidate is on valid grounds. However, the council will allow the candidate to avail this provision within the duration of that semester.
- 10.8 The statement of continuous evaluation (IA) shall be sent to the Registrar (Evaluation) at least one week prior to the commencement of the particular semester examination.

11.0 Practical

- 11.1 In the 1st and 3rd semesters internal viva voce exam will be carried out by 2 internal examiners for 20 marks & 80 marks shall be awarded for continuous evaluation (IA) of clinical work for whole semester including clinical records.
- 11.2 In the 2nd and 4th semesters, external viva voce exam will carry 50 marks (one external examiner and one internal examiner) and 50 marks shall be awarded for clinical work for whole semester.

12.0 Dissertation

In the 4th semester, there are only 3 papers, one external viva voce examination and one dissertation prepared under supervision. This has to be assessed by one internal and one external examiner for 100 marks each (or otherwise as per concerned university rules) the average of which shall be awarded to the candidate.

The candidates shall submit four copies of dissertation before the commencement of the theory examination of that semester. Candidates who fail to submit their dissertation on or before the stipulated date shall not be permitted to appear for the final semester examination.

13.0 Scheme of Instruction

- 13.1 In each semester there shall be five papers. The detailed scheme of examination and paper titles are as given in Annexure 1
- 13.2 Dissertation shall be in lieu of a theory paper
- 13.3 The syllabus of every paper shall be as far as possible, divided into five UNITS
- 13.4 Hours of instruction (contact hours) per week

Theory	:	4 hours per subject per week
Practical	:	15 hours per week

14.0 Board of Examiners, Valuation

- 14.1 There shall be a Board of Examiners for scrutinizing and approving the question papers and scheme of valuation
- 14.2 About 50% of the examiners for scrutinizing and approving the question papers and scheme of valuation shall be from outside the institution.
- 14.3 Double valuation for the theory; dissertation and the average of the marks awarded by the internal and external examiners shall be taken as the final award.
- 14.4 In case of 20% or more deviation in the marks awarded by the internal and the external valuer, the scripts shall be referred to the third valuer and his evaluation will be final.
- 14.5 Grace marks to the candidate will be awarded based on University rules.

15.0 Classification of Successful Candidates

- 15.1 Minimum for a pass in each paper shall be as per the concerned university regulations.
- 15.2 Grading:

$\geq 40 < 50\%$	Pass Class
$\geq 50 < 60\%$	Second Class
$\geq 60 < 75\%$	First Class
75% and above	Distinction

OR

As per rules of the respective universities.
- 15.3 Announcement of result, classes and ranks for the course as a whole will be as per the concerned university regulations.

16.0 Provision for Repeaters

The provision will be as per the concerned university regulations.

17.0 Miscellaneous

Any other issue not envisaged above shall be resolved by RCI / the Vice Chancellor in consultation with the appropriate body of the University which shall be final and binding.

18.0 Norms for Minimum Infrastructural Facilities:

1.	Faculty/Personnel	BASLP (20 seats) (Column 1)	BASLP (20 + 20 seats) (Column 2)	BASLP + MASLP (20 + 10 seats) (Column 3)	BASLP + MASLP/ M.Sc. (Aud.)/M.S c. (SLP) (40 + 15 seats) (Column 4)	M.Sc (Aud.)/M.Sc. (SLP) as addition to BASLP (40 seats) and MASLP (15) with 10 seats for each specialized M.Sc (Column 5)
a.	Full time					
	Professor			1 Professor or 2 Readers	1 Professor or 3 Readers	1 Professor or 1 Reader in each PG specialization in addition to that given in Column 4
	Reader or equivalent	1	1	1	1	1
	Lecturer	3	3 + 1	5	6	+2 in addition to that given in Column 4
	Speech Pathologist/Audiologist (Grade I) (Clinical Supervisor)	1	1 + 2	4	6	+2 in addition to that given in Column 4
	Speech Pathologist/Audiologist (Grade II)	2	2 + 1	2	4	4
	Lecturer in Clinical Psychology – Part time	1	1	1	1	1
	One Medical faculty as per requirement of the paper – Part time	1	1	1	1	1
	Lecturer in Linguistics – part time	1	1	1	1	1
	Electronic Engineer	1	1	1	1	1
	Ear Mould Technician	1	1	1	1	1
	Librarian/staff	1+1	1+1	1+1	1+1	1+1
b.	Visiting faculty for Anatomy and Physiology	1	1	1	1	1

NOTE :

1. Minimum of 2 faculty members in core areas will be required for giving recognition for the first year.
2. Before the commencement of second academic year one more lecturer must be appointed.

3. Before the commencement of third academic year one Reader must be appointed.
4. Only on completion of three batches of BASLP, an Institution becomes eligible to increase the intake provided infrastructure is increased as per laid down norms of RCI. Institute will be eligible to apply for starting MASLP course after the 1st batch of BASLP passes out, i.e; after 4 years of starting BASLP course subject to recommendation of Inspection Team/Visiting Expert.
5. In case of Professor not being available, 2 Readers are appointed to accommodate research guidance and administrative work.
6. All reservations in admission will apply as per Govt. rules for aided and Govt. institutions. The infrastructure will have to be enhanced as per the the seats getting increased under reservation policy.

Designation	Qualification		Experience		Publications
	Essential	Desirable	Essential	Desirable	
Professor	Ph.D. (Sp & Hg)		10 years teaching experience in the field		Essential
Reader/ Associate Professor	Ph.D. (Sp & Hg) or M.Sc. (Sp&Hg) with equivalent work by publications and research	Ph.D. (Sp. & Hg)	5 years of teaching / research/ clinical experience with graduate/ post graduate courses		Essential
Lecturer/ Assistant Professor	M.Sc.(Sp& Hg)	Ph.D. (Sp& Hg)	2 years clinical / research experience	Teaching experience	
Speech Pathologist/ Audiologist Grade I	M.Sc. (Sp& Hg)				
Speech Pathologist/ Audiologist Grade II	B.Sc. (Sp& Hg)	M.Sc. (Sp& Hg)			

18.1. Clinical Facilities

Facilities for diagnostic evaluation of speech, language, voice, hearing and associated disorders, both functional and organically based. Clients of all age groups with hearing impairment and clients with speech and language disorders.

Load and variety of clients should be commensurate with number of courses conducted and also to meet the clinical practicum requirement of each year of the course.

18.2. Library Facilities:

Library should accommodate at least, 30% of the institution’s students and staff total strength. Library should have internet and photocopying facilities.

- a) **Reading room :** Two reading rooms should be there
 - (i) Reference room with CBTIV and internet provisions
 - (ii) General Reading room
- b) **No. of books:** Books listed for each paper under “essential” should be available.
- c) **No. of Journals:** There should be atleast 5 most essential journals (2 each in Speech & Audiology and 1 general) for BASLP and 8 at MASLP levels (4 each for Speech & Audiology).
- d) **Staff :**
 - (i) Library and Information Officer – One No.
Qualifications: B.Lib with two years of experience in handling technical library using Information Technology.
 - (ii) Library Assistants: One
Qualifications: SSLC + Diploma in Library Sciences or SSLC + JOC in Library Sciences.

All the facilities may be increased to meet the requirements in a phased manner.

18.3. Audiovisual Instruments: Appropriate instruments as per No. and level of course should be provided.

18.4. Space:

Sr. No.		Size (Sq. Ft.)	Graduate	Graduate and PG
a)	Class Rooms	Size should be adequate to accommodate (9 sq. ft. per student)	Half the No. of total batches/ course (Min. 2 class room)	Half the No. of total batches/ course (Additional 1 room for each PG course)
b)	Room for reception where patients are registered.			

c)	Room for case history, Speech Diagnostic Room and Interviews	(6 x 6)	5 for 20 intake and 8 for 40 intake	With one PG course 12 and with each additional PG 2 extra
d)	Speech Lab (Quiet Room) for diagnostic purposes.	(15 x 20)	1	1+1
e)	Recording room (Sound proof)	(10 x 10)	1	1
f)	Speech Therapy Rooms/ Cabins	(6 x 6)	12 *to accommodate 50% of the students)	12
g)	- Single sound treated room. - Two Room Audiometric suite with control and test room situation. (Sound Proof. ANSI 1977)	(10 x 18)	For 20 intake one room and for 40-two rooms	For each of PG program i.e., MASLP –one room extra
h)	Room for hearing aid trial combination purpose.	(10 x 15)	1	1+1
i)	Earmould Lab	(15 x 20)	1	1
j)	Staff Room	As per staff strength (min size 15x20)	1	-
k)	Individual work space (with provision for storage facilities)	(10 x 10)	4	12
l)	Hearing aid repair lab	(10 x 10)	1	1
m)	Principal's Office room	(12 x 16)	1	1
n)	Sanitary facilities	As per requirement separate facilities for girl and boy students and staff		
o)	Hostels for Men and Women to accommodate at least 50% of the student population.			
p)	Administrative staff room.			

18.5. Equipment (Minimum Requirement):

Sr. No.		Graduate	Graduate and PG
Audiology			
a)	2 channel Diagnostic Audiometer with Accessories such as earphone, ear cushion combination with adjustable headband, B.C. vibrator, transducers like microphone and matching loud speakers	1	1+1 and for Audiology specialization course one extra
b)	Portable Audiometer with provision of A.C. and B.C. testing : desirable screening audiometer	1 for each batch	1 + 1
c)	Clinical Immittance Audiometer (Desk model) with accessories.	2 instruments essential preferably one with screening type for field work. For 40 – three are required	1 more for MASLP and extra one for M.Sc. (Audio.)
d)	Portable/Screening impedance, audiometer	1	1 + 2
e)	Clinical BSEAR	1	1 + 1 (For M.Sc. [Audio.] stacked ABR and VEMP) are additions]
f)	Otoacoustic emission	1	1 more (one screening and two table models)
g)	Calibration equipment for AC, BC and free field (by possession or access)		
h)	Different types of Hearing Aids of mild moderate and strong categories body level and ear level, canal and spectacle hearing aid (1 each), FM, Digital, Programmable aids, ILS Assistive listening devices.	A representative sample of hearing aids and assistive devices	Software programs for HAT
i)	IGO and HAT for hearing aid trial and	1	1

	making electroacoustic measurements.		
j)	Stop watch	2	2 more
k)	Oto scope	2	2 more
l)	Proformae		
m)	Auditory training and Screening material		
n)	Ear Mould Lab-fully equipped	UV Labs for Soft mould for PG course	

Speech Pathology			
a)	Speech and Language Tests (Tests for differential diagnosis) (English and local language)	As per course requirement	As per course requirement
b)	Proformae		
c)	Speech Therapy material (Indian, Language and English)		
d)	Toys and Books		
e)	Mirrors - size 2' x 3'	4	6
f)	Speech Trainer	1	2
g)	Portable and Digital tape recorders	4	6
h)	Hi-Fi Ampli Deck with speakers and good microphone	1	2
i)	Expirograph/Aerophone	1	1+1 (for M.Sc – SLP)
j)	Computer PC-AT with VGA Color Monitor	1	3
k)	Software for diagnostic/therapeutic use	1	1
l)	Endostroboscope	-	One for M.Sc (SLP)
m)	EGG	1	1

n)	Stop Watch	2	4
o)	Audio cassettes for training/CDs		
p)	Pitch pipe		
q)	Tongue depressors	3	5

COURSE CONTENT

I Semester

Code no.	Paper Title	Theory Hrs/wk	Total (Theory+ IA)
SH 101	Statistics & Research methods	04 Hrs	80 + 20
SH 102	Technology - Application and Instrumentation in Speech & Hearing	04 Hrs	80 + 20
SH 103	Speech, Language Processing	04 Hrs	80 + 20
SH 104	Neuro-cognition and Language	04 Hrs	80 + 20
SH 105	Speech Science and Production	04 Hrs	80 + 20

II Semester

Code no.	Paper Title	Theory Hrs/wk	Total (Theory+ IA)
SH 201	Clinical Linguistics	04 Hrs	80 + 20
SH 202	Voice disorders and Dysphagia	04 Hrs	80 + 20
SH 203	PsychoPhysics	04 Hrs	80 + 20
SH 204	Auditory Physiology	04 Hrs	80 + 20
SH 205	Clinical Practicum (Internal + External)	15 Hrs	50 + 50

III Semester

Code no.	Paper Title	Theory Hrs/wk	Total (Theory+ IA)
SH 301	Language Acquisition and Language Disorders in Children.	04 Hrs	80 + 20
SH 302	Clinical Phonology and Motor Speech Disorders	04 Hrs	80 + 20
SH 303	Speech Perception and its Disorders	04 Hrs	80 + 20
SH 304	Diagnostic Audiology	04 Hrs	80 + 20
SH 305	Hearing Devices	04 Hrs	80 + 20

IV Semester

Code no.	Paper Title	Theory Hrs/wk	Total (Theory+ IA)
SH 401	Adult Language Disorders	04 Hrs	80 + 20
SH 402	Fluency Disorders	04 Hrs	80 + 20
SH 403	Advances in Management of Persons With Hearing Disorders	04 Hrs	80 + 20
SH 404	Dissertation	04 Hrs	80 + 20
SH 405	Clinical Practicum (Internal +	15 Hrs	50 + 50

	External)		
--	-----------	--	--

I SEMESTER

SH 101 STATISTICS AND RESEARCH METHODS (60 hrs)

Objectives

1. To orient the student on the basics of statistics, and its application to the field of speech and hearing.
2. To enable the student to select and carry out appropriate statistical calculations as required for research in the field of speech and hearing.
3. To equip the students with necessary knowledge to be able to interpret the analysed statistical related data to the field of speech and hearing.
4. To familiarize the students on the importance and applications of research methods and techniques applicable to the field of speech and hearing.

SECTION 1

A. STATISTICS

UNIT 1 (12 hrs)

- Statistics – purpose – approach – methods – measures of central tendency – Dependability of these measures – research applications.
- Measures of variability – types and meaning of various measures – research applications.
- Standard score – normal distribution deviations – skewness and Kurtosis – conditions of applications – limitations in interpretation.

UNIT 2 (12 hrs)

- Theory of probability – principles and properties of normal distribution – binominal distribution – interpretation of data using the normal probability curve – causes of distribution – deviations from the normal forms.
- Correlation – meaning – coefficient of correlation – linear correlation – product moment correlation – rank correlation, biserial correlation, tetracoric correlation partial and multiple correlations – regression equation.
- Variance – concept – foundations – assumptions – one way classification. ANOVA MANOVA, ANCOVA, MANCOVA.

UNIT 3 (12 hrs)

- Item analysis – item pool – its selection – item difficulty item variance – item conduction – time validity – difficulty index.
- Non – parametric statistics – its nature and condition and application – non parametric analysis of variance and measures of association – tests of difference with correlated and uncorrelated data – tests of similarity.
- Selection appropriate statistics methods in the research, receivers operating characteristics

SECTION 2

B. RESEARCH METHODS

UNIT 4

(12 hrs)

- Methods of research in behavioural sciences – research designs – measuring purpose – principles – needs – applications between group designs and single subject research designs.
- Basic of research – science scientific approach – problems – hypothesis – constructs – variables.
- Types of research- empirical rationale-experimental and export-factor research laboratory experiments - field studies – survey research - fundamental research epidemiology-clinical and applied research.

UNIT 5

(12 hrs)

- Technique of sampling – sampling and randomness-principles of randomization – random assignment – methods – random sampling-stratified sampling, incidental sampling – purposive samples of one to tone matched sampling – size of sample.
- Measurement – foundations – types – reliability – validity.
- Variance – implication to research – variance control.
- Techniques of equation – experimental and control groups – matching and randomization – advantages, disadvantages and limitations.
- Research designs – various types of group designs – various types of single subject research designs.
- Analysis and interpretation – principles, indices – cross breaks – factor analysis – multivariate statistics – time series analysis.
- The research report – cardinal characteristics – purpose – structure presentation and writing style.

LIST OF BOOKS

SH 101 STATISTICS AND RESEARCH METHODS

Hegde, M. N. (2006). Clinical Research in Communicative Disorders [2nd Edition] Principles and strategies. Singular Publishing.

Mary & Grace. Introduction to Clinical Research in Communication Disorders.

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

Maxwell, D. L., & Satake, E. (1997). Research and Statistical Methods in communicative disorders. Baltimore: Williams and Wilkins.

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

Portney, L.G. and Walkins, M. P. (1993). Foundations of Clinical Research. Connection: Appleton and Lange. ISBN 0-8385-1065-5

Woods, A. Fletcher, P and Hughes, a (1986). Statistics in Language studies. Cambridge: University Press ISBN 0-521-253268.

XXXXXXX

SH 102: TECHNOLOGY - APPLICATION AND INSTRUMENTATION IN SPEECH & HEARING
(60 hours)

Objectives

1. To orient the student on the technological bases of instrumentation used in the field of speech and hearing.
2. To enable the student to carry out calibration, understand the working principles of instrumentation applicable to the field of speech and hearing

UNIT 1: Fundamentals of electronics and computers (12 hrs)

1. Basic principle of operation and working of
 - Diodes, Transistors, LED's, LCDs, ICs
 - D. C. Power supplies, A. C. voltage stabilizers and UPS
2. Fundamentals of Digital Electronics
3. Binary number system, Hex code, ASCH code, bit, byte, etc
4. Logic gates, counters, flip-flops etc
5. Fundamentals of computers
6. Block diagram of a computer and its working
7. Hardware, memory devices and other peripherals
8. Operating system languages, application software
9. Programs, flow charts
10. Internet and networking computers and its application in tele-rehabilitation and speech and hearing clinics.

UNIT 2: Fundamentals of Digital Signal processing and communication system (12 hrs)

1. Analogue and digital systems
 - Analogue signal and digital signals
 - Analogue to digital and digital to analogue converters
 - Need and advantages of digital systems and digital signal processing
2. Principles of digital signal processing
 - Digital signal processor – how it works?
 - Basics of IIR and FIR filters and their applications in speech and hearing
3. Fundamentals of communication systems
 - AM transmission and reception and its application in diagnostic equipments
 - FM transmission and reception and its application in FM hearing aids
 - Digital modulation techniques such as delta modulation, PCM,PPM, PWM and their application in speech analysis
 - Satellite communication and its application in tele-rehabilitation

UNIT 3: Technology of hearing aids and speech processing and analysis (12 hrs)

1. Principles and working of
 - Analog, programmable and DSP based hearing aids.
 - Technology of channel separation
 - Techniques of non linear amplification and their implementation in hearing aids
 - Noise reduction using microphone technology
2. Evaluation of hearing aids
 - Electro acoustic characteristics
 - National and international standards
 - Hearing aid evaluation systems
3. Techniques of speech processing and analysis
 - Short time speech analysis techniques, speech coding techniques
 - Voice response system.
 - Speaker recognition system and speech recognition system
 - Speech synthesis methods

UNIT 4: Biomedical signals and signal processing (12 hrs)

1. Principles of generation and calibration of acoustic stimuli
 - Pure tone, tone bursts, clicks, filtered clicks and warble tones
 - Acoustic / physical characteristics of all stimuli
 - Generation, gating and filtering of stimuli
 - Calibration of pure tones
2. Electrodes and transducers
 - Signal acquisition technique from electrodes and transducers
 - Signal processing techniques such as differential application
 - Common mode rejection, artefact rejection, filtering, signal averaging, etc.
 - Addition and subtraction of waves

UNIT 5: Advanced technology for speech language disorders (12 hrs)

1. Electro physiological methods in diagnosis
 - Fundamental principles of EEG
 - Fundamental principles of EMG, ENG & EGG
2. Neuro radiological methods in diagnosis
 - Working principles of X-ray imaging, C-Arms, CT Scan etc.
3. Tools/ studies to understand the organisation of speech and language disorders and function
 - Cortical blood flow studies, magnetic resonance imaging
 - Functional MRI
 - Application of tools in studying genetic bases of speech language disorders.
4. Tele-rehabilitation

LIST OF BOOKS

SH 102 Technology - Application and Instrumentation in Speech & Hearing

- Ainsworth, W.A. (1988). Speech recognition by machine, London Peter Pen prints
- Ainsworth W. A. (Ed.). (1990). Advances in Speech, Hearing and Language Processing Research Annuals: Vol. 1, London, Jaipress
- Baber. C., & Noyes. J. M. (1993). Interactive Speech Technology Human latest technique with Application of Speech input output to computers. London Taylor and Francis
- Bapat (1993). Electronic circuits and syntax, New Delhi: Mc. Graw Hill
- Beraneck (1954). Acoustical Engineering, New York: Mc. Graw Hill
- Daniloff. R. G. (1985). Speech Sciences: Recent advances. London: Taylor and Francis
- Gottingen. M. R. S. (Ed.). (1985). Speech and Speaker Recognition, Basel: Kager
- Greme (1973). Application of Opamps. New York: Mc. Graw Hill
- Grob (1982). Electronic circuits and applications. London: Mc. Graw Hill
- Hall. Microprocessor and interfacing programming hardware. New Delhi: Mc. Graw Hill
- Hall. J. W. (1992) Handbook of Auditory evoked responses. Masschusettes Allyn & Bausen
- Haton. J. P. (Eds) (1981) Automatic speech analysis & Recognition. USA. D. Reidel Publishing Company
- Hawley. M. E. (1977) Speech intelligibility & Speaker Recognition. Pennsylvania Dowden Hutchinson & Ross Inc.
- Hillburn (1973). Manual of active filter design. New York Mc. Graw Hill
- Jacobson, J. T (Ed) (1994) Auditory brainstem response. Taylor & Francis. London
- Johnson (1992) Introduction to digital signal processing. New Delhi. Mc Graw Hill
- Johnson K & Mullenmin. J. W. (Eds) (1997) Talker Variability in Speech processing San Diego: Academic Press.
- Jowens, F. (1993) Signal processing of speech. The Macmillan Press. Ltd.
- Keller. E (Ed) (1994) Fundamentals of Speech Synthesis and Speech Recognition Basic concepts. State of the and future challenges, New York. John Wiley & Sons.
- Kingsler & Fray (1962) Fundamentals of Acoustics. New York

- Malvino. A. P. (1979) Electronic principles, New Delhi. Tata McGraw Hill
- Markowitzm, J. A. (1996) Using Speech Recognition. New Jersey: Prentice Hall
- Mathur (1980) Electronic devices. Application and integrated circuits. Delhi: Delhi –Umesh Publications
- Mathur (1992) Introduction to Microprocessor. New Delhi: Tata McGraw Hill
- Millman. II (1972) Integrated Electronics. Tokyo McGraw Hill
- Morgan D. P. & Scofield C.I (1991) Neural Networks and Speech processing. Boston. Kluwer Academic Press.
- Nakagawa. S & etal (1995) Speech, Hearing and Neural Network Models. Oxford: IOS. Press
- Nolon, F (1983) The phonetic basis of SPEker recognition; Cambridge. Cambridge University Press
- Oppenheim & Schafer (1989) Digital signal processing. New Delhi. Prentice Hall of India
- Potter. R. R. Kopp G. A. & Green. H. G. (1966) Visible Speech. New York. Dover Publications.
- Rabinet, L. R. & Schaffer. R (1978) Digital processing of speech signals. New Jersey. Prentice Hall Inc.
- Rabinet & Gold (1989) Theory & applications of digital signal processing. New Delhi. Prentice Hall of India.
- Rabinette, M. S. & Slanke. L. L. (Eds) (1997) Otoacoustic emissions. Clinical applications Thicme, New York.
- Ryder (1978) Electronic fundamentals and applications. Integrated and discrete systems. New Delhi. Prentice Hall of India.
- Sanders D. A. (1993) Management of the hearing handicapped from infants to elderly. Prentice Hall inc. NJ
- Sawashuma M & Cooper E. S. (1977) Dynamic aspects of speech production. Japan University of Tokyo Press.
- Shansessy W. D. Computers in communication disorders.

SH 103 SPEECH LANGUAGE PROCESSING

[60 hours]

Objectives

To equip the student to understand the basics of various aspects of speech and language processing.

UNIT 1 (12 hrs)

- Phonetic perception
- Perception of vowels - formants, F0, band width, duration, factors affecting vowel perception, static and dynamic cues, effect of co articulation.
- Consonant perception, cues for different consonants, static and dynamic cues, factors affecting consonant perception, effect of co articulation.

UNIT 2 (12 hrs)

- Spoken word recognition- Word under noise, filtered, truncated words, lexical decision, word spotting, phoneme triggered lexical decision, speeded repetition of words, continuous speech, tokens embedded in words and non words, rhyme monitoring, word monitoring, cross modal priming Issues

UNIT 3 (12 hrs)

- Stages and word recognition -lexical concept, lexical access, phonological encoding, production.
- The input to the lexicon-lexical access from spectra, constraints of temporal structure- Cohort models, interactive models of spoken word recognition – Logogen model lexical and phonetic processing-phonetic characterization task, phoneme restoration studies, phoneme monitoring task, sentence and word processing, Neighbourhood activation model.

UNIT 4 (12 hrs)

- Visual word recognition - models and theories; word and non word naming, acquired dyslexia and role of phonology in word recognition.
- Sentence comprehension and processing of components of language - parallel and serial models of processing, modularity and information sources, accounts of parsing, parsing issues, ambiguity in parsing, strategies for disambiguation. Reference and anaphora. Discourse comprehension and expression.

UNIT 5 (12 hrs)

- Sentence processing – basic capacities for perceiving phonetic contrasts - native language contrasts, foreign language contrasts, coping with variability in speech signal.

- Role of memory and attention
- Prosodic organization in native language
- Related developments in speech perception
- Processing of phonological, morphological, syntactic, semantic and pragmatic aspects of language.

LIST OF BOOKS

SH 103: SPEECH LANGUAGE PROCESSING.

Arbib, M.A., Caplan, D., & Marshall, J.C., (Ed) (1982). *Neural Models of Language Processes*, Academic Press, New York.

Durrand, J., and Laks, B., (Ed) (1999). *Phonetics, Phonology and Cognition*. Oxford University press, US.

Hardcastle, W.J., & Laver, J., (Ed) (1999). *The Handbook of Phonetic Sciences*. Blackwell Publishers, Oxford.

Kroeger, R.P., (2004). *Analyzing Syntax*. Cambridge University Press, UK.

O' Shaughnessy, D., (2nd Edition) (2001). *Speech Communication, Human and Machine*. Universities Press, India.

Saeed, I.J., (1997). *Semantics*. Blackwell Publishers, Massachussets.

Objectives

1. To equip the student to understand the theoretical basis of neurobiological attributes as related to speech, language and hearing abilities.
2. To enrich the knowledge related to cognition and language processing.

UNIT 1: Neuroanatomical correlates**(12 hrs)**

- Anatomy of the Central Nervous system
- Focus on speech, language and hearing related areas; cerebral hemispheres, cerebellum, cranial nerves, brainstem, spinal cord (surface as well as deep structures) and circuits, pathways and blood supply to Central Nervous system.
- Neuronal organization (area as well as function) in human beings and animals.

UNIT 2: Neurophysiological correlates**(12 hrs)**

- Concepts and studies related to : Hemispheric lateralization, Hemispheric Asymmetry
- (Structural + Functional) cerebral plasticity, cerebral maturation & its significance in development.
- Physiology of nerve conduction, Types of synapses, Types of neurotransmitters, Synthesis and activation of neurotransmitters; neurotransmitters in normal and disordered population.
- Neuroanatomical organization in bilinguals and multilinguals.

UNIT 3 – Neurological investigative procedures**(12 hrs)**

- Neurohistological procedures, Radiological imaging, Magnetic imaging (MRI, FMRI, MEG), Electrophysiological procedures (evoked potentials, EEG, EMG etc), Imaging of brain metabolism (RCBF, SPECT, PET etc), CSF studies, Behavioural measures (Dichotic listening) Tachistoscopic presentation, Dichaptic studies etc)

UNIT 4: Neurobiology of Ageing**(12 hrs)**

- Neuroanatomical changes with aging, structural changes, morphological changes, microscopic anatomic changes, neurochemical changes.
- Neurophysiological changes with aging: cerebral blood flow, EEG changes, Evoked Potential changes, Sleep studies.

UNIT 5: Neurocognition**(12 hrs)**

- Neurocognitive models
- Role of attention and memory – STM, LTM
Other processes – Abstraction, Reasoning, Logical aspects, organization, planning and executive processes

LIST OF BOOKS

SH 104: NEURO-COGNITION AND LANGUAGE

Arbib,M.A., Caplan,D., & Marshall, J.C., (Ed) (1982). Neural Models of Language Processes, Academic Press, New York.

Gerber,S.E., (ED) (1995). The Handbook of Genetic Communicative Disorders. Academic Press, California.

Kirshner, S.H., (ED) (1995). Handbook of Neurological Speech And Language Disorders. Marcel Dekker Inc, New York.

Kolb,B & Wishaw,Q.I., (W.H. Freeman & Company). Fundamentals of Human Neuropsychology.

Kuehn, Lemme, & Baumbartner,(Ed) (1989). Neural Bases of Speech, Hearing, and Language. Bodton, College-Hill Press.

Lecours, A. et al., (1982). Aphasiology. Tindall.London.

Miller,J.L., & Eimas, P.D., (Ed) (1995). Speech, language and Communication. Academic Press, New York.

Ripich.D.,(Ed) (1991). Handbook of Geriatric Communication Disorders. Pro-ed Inc, Texas.

Stevenson,R.E., Schwartz ,C.E., & Shroer,R.J.,(2000).X-Linked Mental Retardation. Oxford University Press, New York.

Whitaker, A.H., & Stemmer, B., (Ed) (1998) Handbook of Neurolinguistics. Academic Press, US.

Objectives

1. To equip the student with theoretical knowledge and operational skills required for understanding the speech production mechanism.
2. To sensitize the students on various methods of analysis of various parameters of speech.

UNIT 1 (12 hrs)

- Physiology of speech – physiology of respiration, purpose of respiration, description of respiratory movements, types of respiration, methods of respiratory analysis
- Physiology of laryngeal function – muscles of larynx, laryngeal movement.
- Neurophysiological bases of speech – neuromotor mechanism of the articulatory, phonatory and respiratory systems, electrophysiology of larynx

UNIT 2 (12 hrs)

- Acoustics of speech – Acoustic theory of speech production, Acoustic phonetics, Basics, acoustics of vowels and consonants, review and state of the art.

UNIT 3 (12 hrs)

- Spectrography – various types of spectrograms, spectrographic cues for vowels and consonants, identification of place, manner, voicing and aspiration using wide band bar type spectrogram.
- Application of spectrography in basic and applied research.
- Speech analysis in forensic sciences.
- Speech synthesis by analysis
- Speech recognition and speaker identification

UNIT 4 (12 hrs)

- Infant cry – History, studies on infant cry analysis, features of infant cry, spectrographic patterns of normal cry and cry in clinical population
- Analysis of laughter, features of laughter, spectrographic patterns of laughter.

UNIT 5 (12 hrs)

- Aerodynamics of speech production, Upper airway dynamics, lower airway dynamics. Aerodynamics of vowels, aerodynamics of consonants: stops, fricatives and nasals.

LIST OF BOOKS

SH 105 SPEECH SCIENCE AND PRODUCTION

Baer, T et al., (Eds) (1991). Laryngeal function in phonation and respiration. Singular Publishing Group, San Diego.

Baken, R.J and Daniloff, R.G. (1991). Reading in Clinical spectrography of speech. Singular Publishing Group, San Diego.

Code, C. & Ball, M. (1984). Experimental Clinical Acoustics. College Hill Press. Houston.
Kent, R.D., & Read, C. (1992). Acoustic analysis of speech. Singular Publishing Group, San Diego.

Keller E. (1994) Fundamentals of Speech synthesis and speech recognition Basic concepts, state of the art and future challenges John Wiley and Sons New York

Kent R.D & Read C 1995. The acoustic analysis of speech, A.I.T.B.S Publishers &

Lass, N.J (1976). Contemporary issues in experimental phonetics. Academic Press, New York.

Lieberman, P., & Blustein, S. (1988). Speech Physiology, speech perception and Acoustic phonetics. Cambridge University press. Cambridge.

Murry, T. & Murry, J (1980). Infant communication: Cry and early speech. College – Hill Press, Houston.

Nolon, F. (1983). The phonetic basis of speaker recognition. Cambridge. University press, Cambridge.

Potter, R.K., Kopp, G.A., & Green, H.G. (1966). Visible speech. Dover Publications, New York.

II SEMESTER

SH 201 CLINICAL LINGUISTICS

[60 hrs]

Objectives

1. To equip the student to understand the linguistic basis of different speech language disorders.
2. To train the students to record, analyse and transcribe clinical samples

UNIT 1

(12 hrs)

- Language acquisition, semantics, syntax pragmatics, theoretical issues, theoretical issues, Deixis and anaphora, definiteness, discourse [focus on understanding normal and disordered language].

UNIT 2 (12 hrs)

- Neuro linguistics – Language and the brain – localization – left brain - right brain differences – coding and decoding – Neuro anatomical and Neuro physiological bases of language learning and dysfunction – linguistic and Psycho – neuro linguistic models of language pathology

UNIT 3 (12 hrs)

- Psycho linguistics and language acquisition – issues involved in language acquisition – motherese / Child directed speech – second language acquisition – language acquisition in bi- and multi-lingual environments.

UNIT 4 (12 hrs)

- Issues in Socio-linguistics-Standard and Non-standard Dialects, Regional and Social Dialects Stylistic Variation of Language, Gender and Language, Registers, Creole, Pidgins, relation between language culture, religion, politics etc. Language Deficiency.

UNIT 5 (12 hrs)

- Multilingual and cultural issues. A brief introduction to the major language families of the world – Language Families and Major Languages of India. Linguistic Determinism Linguistic relatively, Sapir-Whorf Hypothesis. Cultural diversity of India, Cultural issues in Verbal and non-verbal communication. Multicultural and multilingual issues in Rehabilitation with special reference to India.

LIST OF BOOKS

SH 201: CLINICAL LINGUISTICS

Crystal,D.,(1981). Clinical Linguistics. Wien, Springer-Verlag.

Geoffrey Finch (1997) How to Study Linguistics. Palgrave Macmillan

Grundy,K.,(1981).Linguistics in Clinical practice. Whurr Publishers Ltd. London.

Grunwell,O.,(1975). The Phonological Analysis of Articulation Disorders. BJDC,10,31-42.

Lawrence D Shriberg & Raymong D Kent (2003).Clinical Phonetics .Pearson Education Inc.

Perkins,M., & Howard,S.,(ED) (1995). Case Studies In Clinical Linguistics. Whurr Publishers Ltd. London.

Reni Dirven & Marjolijn Verspoar. Cognitive Exploration of language & Linguistics (2004). John Benjamin Publishing Company.

Ziegler, W., & Deger, K., (1998). Clinical Phonetics and Linguistics. Whurr Publishers Ltd. London.

Whitaker, A.H., & Stemmer, B., (Ed) (1998) Handbook of Neurolinguistics. Academic Press, US.

XXXXXXXXXXXXXXXXXXXX

SH 202 VOICE DISORDERS AND DYSPHAGIA [60 hrs]

Objectives

1. To equip the student to understand the characteristics, diagnosis and rehabilitation aspects of voice and related disorders.
2. To equip the student to understand the characteristics, diagnosis and rehabilitation aspects of swallowing disorders

UNIT 1 (12 hrs)

- Vocal fold physiology, neurophysiology of the larynx, vibratory modes of vocal folds.
- Models of vocal fold vibration – one mass model, two mass model, multiple mass model, EGG Model, simple Unitary mass model, triangular Unitary mass model.
- Development of the vocal fold
- Mechanical properties of the vocal fold vibration (stress strain relation, whip like motion, effects of impact stress).
- Issues related to professional voice and its care

UNIT 2 (12 hrs)

Recent advances in measurement, assessment and management of voice and its disorders

- Voice Evaluation; perceptual and instrumental.
- Aerodynamic tests - vital capacity, mean airflow rate, maximum duration of sustained blowing.
- Tests for assessing functions of the resonatory system; acoustic analysis, psychoacoustic evaluation and tests for laryngeal measurements (modal frequency, frequency range, F0 perturbation, intensity, intensity range, Amplitude perturbation, glottogram, harmonic analysis) and other measures (LTAS, nasality measurements etc using instruments)
- Measurement of vocal fold vibration - invasive procedures - stroboscopy, videokymography; noninvasive procedures - EGG, inverse filtering.

UNIT 3 (12 hrs)

- Pathophysiological changes in different voice disorders.
- Acoustic, aerodynamic and perceptual aspects of pathological voices
- Paediatric voice disorders
- Effects of ageing in voice
- Neurogenic voice disorders- Differential diagnosis and management.
- Endocrinal Voice disorders and voice disorders related to transsexuals.

UNIT 4

(12 hrs)

- Laryngectomy
- Pathophysiology of larynx
- Treatment-medical, surgical and therapeutic (including radiation therapy, chemo therapy, pre-postoperative counseling)
- Rehabilitation team of laryngectomee.
- Considerations in rehabilitation – adjustment to disability, reaction to alaryngeal speech etc
- Acoustical, perceptual and physiological aspects of alaryngeal speech
- Factors influencing intelligibility of alaryngeal speech

UNIT 5

[12 hrs]

- Dysphagia – Anatomical & Maturational considerations, Role of respiration. Physiology of suck- swallow- breath sequence, overview of phases of swallowing, Development of feeding skills, Alternate methods of nutritional intake.
- Disorders of swallowing in children and adults
- Etiological classification: Medical, GI tract, respiratory, CNS/PNS damage, cardiac effects, structural, abnormalities and iatrogenic.
- Assessment – Clinical examination, subjective evaluation of swallow function, feeding skills, GERD. Objective methods - Radiological and Instrumental evaluation
- Multidisciplinary management of dysphagia - Issues and concerns, Medical and Non-medical treatment.

LIST OF BOOKS

SH 202 VOICE DISORDERS AND DYSPHAGIA

Vocal Fold Physiology – Frontiers in Basic Science [1993]. Titze, I.R. [ed] San Diego: Singular Publishing Group, Inc.

Principles of Voice Production [1994] Titze, I. R. NJ: Prentice Hall, Inc.

Neurolaryngology: Recent Advances [1991] Hirano, M. Kirchner, J. A. and Bless, D. M. {Eds} California: Singular Publishing Group, Inc.

Diagnosis and Treatment of Voice Disorders [1995], Rubin J. S. Sataloff R. T. Korovin, G. S and Gould, W. J. NY:IGAKU-SHOIN Medical Publishers, Inc.

Medical Speech-Language Pathology – A Practitioner's Guide [1998] Johnson, A. F. and Jacobson, B H NY: Thieme, Inc.

Clinical Measurement of Speech and Voice [1996] Baken, R J California: Singular Publishing Group, Inc.

Professional Voice – The Science and Art of Clinical Care [1991] Sataloff, R T NY: Raven Press.

Clinical Manual for Laryngectomy and Head and Neck Cancer Rehabilitation [1993]. Casper, J. K. and Colton, R. H. California: Singular Publishing Group, Inc.

Atlas of Laryngoscopy [2007]. Sataloff, R. T. Eller, R. T. and Hawkshaw, M. California: Plural Publishing, Inc.

Voice and Voice Therapy [2005] Boone, D R Mc Farlane S C and Von Berg S. L Boston: Allyn and Bacon.

Laryngeal Electromyography [2006] Satalof, R. T. Mandel S, Abaza, M California: Plural Publishing, Inc.

Vocal Care in Medical Setting [1997] Koschkee, D. L. Rammage, L. California: Plural Publishing Group, Inc.

DYSPHAGIA

Bruce E Murdoch, Deborah G Theodoros, 2001, Traumatic Brain Injury: Associated Speech Language and Swallowing Disorders, Singular Publishers.

Michael E Groher, 1992, Dysphagia: Diagnosis and Management, 2nd Edition, Butterworth – Heinemann, USA.

Kim Coxbin – Lewis, Julie M Liss, Kellie L, Sciortino 2005, Clinical Anatomy and Physiology of the swallow mechanism, Thomson Delmar Learning, USA.

Objectives

1. To equip the student with acoustical and psycho acoustical parameters of speech
2. To familiarize the students on psycho acoustic approaches to measurement and analysis.

UNIT 1

(12 hrs)

- Theory of signal detection,
- Concept and application including ROC
- Methods in psychophysics- classical & adaptive
- MAP & MAF underwater hearing, relation to calibration Loudness perception, equal loudness level contours loudness and loudness level, scaling
- Factors affecting loudness, Theories, models of loudness
- Weber's Law, Differential sensitivity for intensity, absolute and relative DL,
- Loudness perception in pathological ears, recruitment, dynamic range, loudness adaptation
- Florentine theory of softness imperceptions,
- Relevance in clinical Audiology

UNIT 2

(12 hrs)

- Critical band concept,
- equivalent rectangular band concept,
- frequency resolution, excitation pattern,
- Masking, PTC, using simultaneous and non simultaneous maskers, central masking, pulsation threshold, profile analysis, MDI
- Clinical application

UNIT 3

(12 hrs)

- Temporal perception,
- Temporal acuity, temporal DL, temporal order,
- Gap detection (in broad band noise, in narrow band noise, sinusoid) temporal integration
- Duration discrimination
- Temporal modulation transfer function
- Factors affecting temporal perception
- Clinical application.
- Adaptation and fatigue,
- Levels of adaptation & physiology
- Methods to study
- Parameters affecting
- Clinical applications
- Path physiology of fatigue

UNIT-4

(12 hrs)

- Pitch perception, factors affecting
- Ohm's law, Neurophysiologic basis
- Theories and models, consonance
- Dissonance, pitch of complex tones
- Differential sensitivity for frequency, Absolute and relative DLF's, methods to study,
- Timbre perception - Factors affecting
- Object perception – Object identification, , auditory scene analysis,
- Clinical application

UNIT 5

(12 hrs)

- Binaural hearing
- MLD
- Lateralization, binaural integration, binaural advantage
- Binaural DLF, DLI, DLT, squelch, beats, rotating tones
- Time intensity trade
- Durlach and Jeffress models
- Clinical application
- Space perception
- Localization
- Minimal audible angle
- Role of pinna
- Cone of confusion
- Monaural localization
- Clinical application

LIST OF BOOKS

SH 203 PSYCHO PHYSICS

Yost, WA & Neilson DW – “Fundamentals of Hearing” Holt Rinehart & Winston 1977

Yost; W.A Popper A. N, Fay R.R – “Human Psychophysics” – Springer Verlag – 1993

Gelfand. S A “Hearing, An Introduction to Psychological & Physiological acoustics” Marcel Dekker Inc. 1990 & 1981

Pickles, J.O “An Introduction to the physiology of hearing” Academic Press London, 1984

Zwicker E. Fastl H. “Psychoacoustics – Facts & Models” Springer – 1999

Durrant – Lovrinic 1997 “Basics of Hearing Sciences” – Williams & Wilkins 3rd Edition
Maore B C J (Eds) 1995 Hearing – Academic Press, San Diego

Gullick W.C 1971. Hearing Physiology & Psychophysics, Oxford University Press N.Y

Palmer A.R. Rees A, Summerfield AQ Meddis K “Psychophysical and physiological advances in hearing – Whurr Publication 1998

Syka Joel. “Acoustical Signal Processing in the Central Auditory System” Plenum Press 1997.

Bekersy G.Von “Experiments in Hearing” Mc Graw Hill 1960

Hanghton Piter “Acoustics for Audiologists” Academic Press 2002

Warren R.M 1999. Auditory Perception-A new Analysis and synthesis U

Rosenthal DF & Okiano H G “Computational Auditory Scene Analysis” Lawrence Erlbaun Associates, Publishers 1998.

Hawkins H L, Mc Muller TA, Popper A N, Fay R R “Auditory Computation” Springer Verlag 1996.

Yost “Directional Hearing” – Wiley 2000

Hirsh S K, Eldredge DH, Hirsh F J & Silverman R. “Hearing & Davis”. Washington University Press 1976. K: Cambridge University Press, U.K.

Objectives

1. *To equip the student to understand the physiological basis of auditory system, inter-relation and dependency of structure and function with nervous system.*

UNIT 1

(12 hours)

1) External ear:

- Anatomy & Physiology of lower animals and humans. Role of Pinna & external auditory meatus in hearing. Resonance properties of external ear & auditory canal
- Non auditory physiology of external ear
- Developmental changes
- Application to clinical audiology
- Temporal bone anatomy - role in hearing

2) Middle ear:

- Anatomy & Physiology.
- Middle ear transformer action
- impedance
- Acoustic and non acoustic reflex pathways
- Anatomy and physiology of the Eustachian tube

UNIT 2 – Cochlea: Anatomy in lower animals and humans

(12 hrs)

- Macro & Microanatomy
- Blood supply
- Innervations
- Cochlear fluids – origin, absorption, composition, dynamics and functions
- Cochlear models

– Physiology of the Cochlea

- Modes of bone conduction
- Cochlear mechanics – basilar membrane mechanics - historical and current status
- Cochlear transduction
- Cochlear electrophysiology
- Cochlear non-linearity-two tone suppression, otoacoustic emission & other recent advances
- Proteins in the cochlea
- Pathophysiology & perception
- Repair, regeneration, protection in the cochlea
- Theories of hearing
 - Historical aspects
 - Place theory – resonance & non-resonance
 - Frequency theory

- Travelling wave theory
- Other recent advance like motor theory etc

UNIT 3 – Auditory nerve (12 hrs)

- Structure and tonotopic organization
- Structure and contents of internal auditory meatus
- Refractory period, adaptation, firing rates, types of responses
- Electrophysiology – action potential, generation and properties
- Stimulus coding, frequency, intensity, time, complex signals, speech
- Non linearity

Vestibular System

- Anatomy and physiology of vestibular structures and vestibular nerve
- Integration of senses in balance
- Vestibule ocular reflex
- Vestibule spinal reflex

UNIT 4 - Brain stem (12 hrs)

- Anatomy of CN, types of cells distribution
- Anatomy of SOC, LL,IC,MGB
- Non classical pathway
- Tonotopic organization
- Neurophysiology at different levels
- Localization
- Stimulus coding, neurotransmitters
- Medial and lateral efferent effect on cochlear physiology ,Auditory Nerve and CN Plasticity

UNIT 5 – Auditory cortex (12 hrs)

- Anatomy and tonotopic organization of primary and secondary auditory areas and efferent pathways, neurotransmitters
- Neurobiological relationship between auditory cortex and other areas
- Neurophysiology of auditory areas
- Stimulus coding – frequency, intensity and time
- Role of auditory cortex in localization
- Plasticity

LIST OF BOOKS
SH 204 Auditory Physiology

Berlin C.I; Weyand T.G (Eds) 2003 – The Brain & sensory plasticity: Language acquisition and hearing. Thomson/Delmer Learning

Bellies T.J 2003 – Assessment & Management of central auditory processing disorders in the educational setting from science to practice. Singular Publishing Group. USA

Ehret G. Romand R (Eds) 1997: The central auditory system. Oxford University Press, New York

McPherson D.L 1996 – Late potentials of the auditory system. Singular Publishing Group. Inc

Palmer A.R; Rees A; Summerfield A Q; Meddis R (Eds) 1998, Psychophysical & Physiological advances in hearing. Whurr Publishers Ltd, London

Parks T.N; Rubel E.W; Fay R.R; Popper A.N (Eds) 2004. Plasticity of the auditory system. Springer, New York

Popper A.N; Fay R.R (Eds) 1992: The mammalian auditory pathway: Neurophysiology. Springer – Verlag, N.Y.

Rerben E.W; Popper A.N; Fay R.R (Eds) 1998. Development of the Auditory System. Springer – Verlag, N.Y.

Sahley T.L; Nodar R.H; Musiek F.E 1997, Efferent auditory system structure and function - Singular Publishing Group. USA

Syka. J(Ed) 1997 – Acoustical signal processing in the central auditory system Plenum Press

Wada. H; Tukasade T; Ikeda. K; Ohyama K; Koiki T (Eds) 2000. Recent developments in auditory machines World Scientific Publishing Co.

Webster D.B; Popper A.N; Fay R.R (Eds) 1992. The Mammalian Auditory Pathway – Neuroanatomy Springer – Verlag, N.Y

Auw. W.L., Popper.A.N. Fay.R.R (Ed) 2000: Hearing by whales & Dolphins. Springer- Verlag, New York, USA.

Berlin.C.I. (Ed) 1996: Hair cells & Hearing aids, Singular Publishing group. Inc., USA.

Bekey.G.V. (1960): Experiments in hearing McGraw-Hill Book Company.

Dallos.P. Popper.A.W., Fry.R.R (Ed) 1996: The Cochlea, Springer-Venlag, New York, USA.

Davis (1990): Hearing, Washington University.

Durant, J.D & Lovrinic.J.H (1977): Bases of hearing Sciences. Williams & Wilkins.

SH 205 CLINICAL PRACTICUM – I & II SEMESTERS

SPEECH LANGUAGE PATHOLOGY

[15 hrs/week]

Objectives

- 1. The student should be able to assess, diagnose, plan and execute therapy for children and adults with various communication disorders.*
- 2. To maintain clinical record.*

1. Assessment of 10 clients with voice / dysphagic disorders.
2. Use of instrumentation in 10 clients with voice / dysphagic disorders.
3. Plan and execute therapy in 5 clients with voice / dysphagic disorders.
4. Maintain clinical records.

AUDIOLOGY

[15 hrs/week]

Objectives

- 1. To give practical bases for interpretation of test results and test battery approach in different conditions and relate it to structural anatomy, physiology and alterations in diseased auditory mechanism.*
1. To test a minimum of 10 cochlear hearing loss cases using test battery approach.
2. To test 10 clients of retro cochlear pathology using special and conventional auditory test battery
3. To prescribe and set hearing aid in at least 10 clients (5 children and 5 adults) as per their hearing need.

III SEMESTER

SH 301 LANGUAGE ACQUISITION AND LANGUAGE DISORDERS IN CHILDREN

[60 hrs]

Objectives

1. To equip the student with thorough knowledge of acquisition of language.
2. To equip the student to differently diagnose various child language disorders.
3. To understand the current advances in assessment and intervention for child language disorders.

UNIT 1 [12 hrs]

Critical review of current theories of language acquisition and its applications to assessment and intervention. Overview of genetic, neuro anatomical and neurophysiological correlates of language development.

UNIT 2 [12 hrs]

Language development in exceptional circumstances extreme deprivation, bilingual language acquisition, visual handicap, Mental retardation, Williams's syndrome, hearing loss, language learning disabilities and dysphasia and acquired childhood aphasia.

UNIT 3 [12 hrs]

Contemporary concept and issues in Autism Spectrum disorders, SLI, and LD.

UNIT 4 [12 hrs]

- Cross cultural consideration in assessment and management of developmental language disorders
- Specific assessment and intervention approaches for various developmental language disorders

UNIT 5 [12 hrs]

Dyslexia, Neurobiology of reading and writing, Metalinguistics - Phonological awareness, reading etc. Evaluation and treatment approaches.

LIST OF BOOKS

SH 301 LANGUAGE ACQUISITION AND LANGUAGE DISORDERS IN CHILDREN

Intervention Planning for Children with Communication Disorders – A Guide for clinical practicum and professional practice (1994). Prentice – Hall, Inc. New Jersey.

Cross Cultural Perspective in Language Assessment and Intervention. Topics in Language Disorder series. Butler, K.G. (1994). U.S.A.: Aspen Publication.

Differential Diagnosis in Speech Language Pathology – Philips, B.J. and Scello, D. (1998). Butterworth- Heinimann,

Language Development in Exceptional Circumstances. Bishop, D and Mogord, K. (EDs.) (1993). U.K.: Erlbaum Associates Ltd., Publishers

Language Disorders: A functional Approach to Assessment and Intervention. Owens, R.E. (Jr.) (1991). U.S.A.: Macmillan Publishing Company

Development disorders of language (2nd ed.) Adams, c., Browns, B and Edwards, M (1999). London: Whurr Publishers Ltd.

Evaluating Theories of Language - Evidence from disordered communication. Dodd, B., Campbell. R. and Worrall, L (Eds). (1996). London: Whurr Publishers.

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

XXXXXXXXXXXXXXXXXXXXXXXXXXXX

SH 302 CLINICAL PHONOLOGY AND MOTOR SPEECH DISORDERS

[60 hrs]

Objectives

1. To equip the student with knowledge as required for theoretical and practical understanding of disorders of phonology, specific requirements in different languages and different disorders.
2. To train the student in differential diagnosis and management of motor speech disorders.

UNIT 1

[12 hrs]

- Phonological processes- review and recent advances, different types, its analysis, phonological process patterns in various communication disorders, International Phonetic Alphabet transcription.

- Phonological awareness - development, assessment and clinical implications. Recent studies.
- Phonotactics and metalinguistic abilities in phonological disorders.
- Co-articulation – nature, definitions and kinds. Models – feature based, syllabic and allophonic based, target based, phonologically based.
- Physiological studies on co-articulation- effects of co-articulation (position and juncture effect, transition effect, direction effect); Co-articulation in Speech Disorders.

UNIT 2 (12 hrs)

- Application of phonological theories in evaluation and management of phonological disorders
- Metaphon theory and therapy
- Management of co-articulation in speech disorders and remediation.

UNIT 3 (12 hrs)

- Neurophysiology and functional development of sensori-motor control
- Sensory motor processing in speech / correlates of oral sensori-motor dynamics – (a) Neural substrates and findings in dysarthria and apraxia.

UNIT 4 [12 hrs]

- Recent advances in diagnosis, assessment and management of Dysarthria

UNIT 5 [12 hrs]

- Recent advances in diagnosis, assessment and management of Apraxia.

LIST OF BOOKS

SH 302 - CLINICAL PHONOLOGY AND MOTOR SPEECH DISORDERS

Perspectives in applied phonology. (1997). Hodson, B.W and Edwards, M.L. Mayland: An Aspen Publication.

Clinical phonology. Assessment of articulation disorders in children and adults. (1996) Klein, E.S. California: singular publishing group Inc.

Phonological theory and the misarticulation child. ASHA monographs. (1984). (number 22 Ed) Elbert, M Dinnsen, D.A. and Weismer, G.

Phonological disability in children (2nd edition) studies in disorders of communication. (1989) Ingram. Cole and Whurr Limited.

Clinical management of motor speech disorders in children. (1999). Caruso. F.J. and Strand, E.A. New York: Thieme.

Motor speech disorders – A treatment guide. (1991). Dworkin, P.J. St. Louis: Mosby Year Book. Inc.

Clinical management of Neurogenic communication disorder. (1985). Johns, D.E. Boston: Allyn Bacon.

Motor speech disorders: substrates, Differential diagnosis and management. (1995). Duffy, J.R. St. Louis: Mosby

Neuromotor speech disorders – nature, assessment and management. (1998). Cannito, M.P., Yorkston, K.M. and Beukelman, D.R.

Evaluation and treatment of swallowing disorders. (1983). Logemann, J.

Medical Speech Language Pathology: a practitioner's Guide. (1998). Johnson, A.F. and Jacobson, B.H. NY: Thieme

XXXXXXXXXXXXXXXXXXXX

SH 303 SPEECH PERCEPTION AND ITS DISORDERS [60 hrs]

Objectives

- To sensitize the student on normal and abnormal attributes of perception of speech.*
- To familiarize the students on differences in perceptual attributes in clients with auditory disorders.*

UNIT 1

(12 hrs)

- Theories and models of speech perception (motor, neurological, auditory, acoustic, analysis by synthesis and TRACE)
- Basic Issues in speech Perception-linearity, segmentation. Lack of invariance. Variability or perceptual constancy in speech. Invariant feature and cue based approaches.
- Speech processing in the auditory system. Overview of the anatomy of the auditory system, peripheral and central mechanisms in the analysis of speech – place representation, intensity model, multistage representation and categorical perception.

UNIT 2

(12 hrs)

Speech intelligibility and perception of supra-segmentals

1. Methods: Subjective (perceptual tests), Objective (Articulation Index, Speech intelligibility index. Speech transmission index)
2. Comparison of two methods

3. Factors influencing – stimulus based, subject based, transmission based factors
4. Clinical application – in evaluation , rehabilitation and research
5. Perception of segmental and supra-segmental cues through
 - a. The visual modality
 - b. The tactile modality

UNIT 3

(12 hrs)

1. Perception of vowels, semivowels, and diphthongs in individuals with hearing impairment
2. Perception of consonants in individuals with a hearing impairment
3. Effect of type, degree and audiogram configuration in perception of vowels and consonants
4. Speech perception through hearing aids using signal enhancing features
5. Dichotic listening- Theories, Factor affecting, Clinical application
6. Infant Perception, perception of consonants and vowels, suprasegmentals in infants, comparison of adult and infant perception, universality in perception, word perception, lexical neighbourhood.

UNIT 4

(12 hrs)

1. Perception of segmental and suprasegmental cues through cochlear implants
 - a. Effect of number of channels,
 - b. Effect of coding strategy,
 - c. Effect of implant model
 - d. Effect of number of electrodes and stimulation rate
2. Perception of segmental and suprasegmental cues through auditory brainstem implants
3. Perception of segmental and suprasegmental cues through Middle ear implant and BAHA
4. Comparison of perception through different devices

UNIT 5

(12 hrs)

1. Speech perception in noise (Effect of types of noise, different signal-to-noise ratio, different degrees of hearing impairment)
 - a. Effect on children, adults, geriatrics, peripheral hearing impairment, (C)APD
2. Effect of reverberation on speech perception - Effect of different levels of reverberation times, Degrees of hearing impairment.
3. Combined effect of noise and reverberation
4. Effect of non-native accent on speech perception
5. Short term memory and speech perception, stages of memory, theories, perception of consonants and vowels in short term memory, animal perception, consonant and vowel perception,
6. Animal versus human perception.

LIST OF BOOKS

SH 303 SPEECH PERCEPTION AND ITS DISORDERS

- Ainsworth W.A(1976) Mechanism of Speech Recognition, International series in natural philosophy. Vol. 85, Oxford: Pergamon Press
- Ainsworth W.A(1990) Advances in Speech, hearing and language processing Vol. 1, London Jai Press Ltd.
- Berlin C(1984) (Ed.) Hearing Science. San Diego: College-Hill Press
- Borden G.J and Harris K.S(1980). Speech Science primer: Physiology, acoustics and perception of speech, London: Williams and Wilkins
- Cohen,A & Nooteboom, S.G (Eds) (1975) Structure and process in speech perception. New York: Springer-Verlag
- Clark G.M, Cowan R.S C and Richard C D(1997) : Cochlear Implantation for infants and Children –Advances, Singular publishing Group, London.
- Fant , G; Speech acoustics Phonetics – Klumer Academic Publication 2004
- Gold & Morgan N “Speech & Audiological Processing. “Wiley & Son Inc. 2000
- Goodman J.C and Nusbaum(1994) (Eds) The development of speech perception: The transition from speech sounds to spoken words, MIT Press London
- Hardcastle & Laver J. “The Handbook of Phonetic Sciences” Blackwell Publishers Ltd. 1997 (Delgutte)
- Hish. S.K; Eldredge. D.H. Hish .J; Silveman S.R. & Davis 1976 “Hearing” Washington University Press”
- Lass N.J (Ed) 1976. Contemporary issues in experimental phonetics. Academic Press N.Y
- Mendel, L.L., & Danheur, L.J., (Ed) (1997). Audiologic Evaluation and Management and Speech Perception Assessment. Singular Publishing Inc, CA.
- Nakagawa S Shikanok K, Tohkura. Y (1995) Speech hearing and neural network models. Ohmshia IOS Press Amsterdam
- Pisoni D 2005 “Handbook of Speech Perception” Blackwell Publishing Ltd U.S.A
- Pickett JM, Ravolie SG (1979) Feature Discrimination by persons with sensorineural impairment, in B Lindblom and S. Ohman EDs “Frontiers of Speech Communication Research, AP Londons.
- Sanders. D.A 1977. Auditory Perception of Speech – An introduction to principle & problems,
- Schrveda MR “Speech & Speaker Recognition” Karger 1985

Schouten MEH 1992. The Auditory processing of speech from sounds to sounds. Morten de Grugter. Berlin

Tatham M & Mortin K “ Development in Speech Synthesis” Wiley – 1998

The XIIIth International congress of phonetic sciences – Stockholm 13 – 19 August 1995, Volumes 1 – 4.

SH 304 DIAGNOSTIC AUDIOLOGY

[60 hrs]

Objectives

1. To familiarise the student on auditory manifestations of different disorders and clinical features exhibited.
2. To give theoretical rationale for various auditory tests and their findings in different auditory pathology, correlating different auditory and non auditory findings in different disorders.

UNIT 1

[12 hrs]

1. Installation and calibration Audiological diagnostic instruments
2. Hearing screening
 - Cost benefit analysis
 - Sensitivity vs specificity,
 - Efforts of WHO and Govt of India,
 - Genetic counseling,
 - Public awareness programs
3. OAE
 - Origin, classification, principles in recording of OAEs,
 - Protocols for infants, protocols for cochlear pathology
 - Contralateral suppression
 - Interpretation
 - Factors affecting
 - Clinical application

UNIT 2

(12 hrs)

1. Immittance
 - Principle and instrumentation
 - Tympanometry – low and high frequency tympanometry, Single and multi component, Multiple frequency tympanometry, Variables effecting tympanometry
 - Reflexometry – Auditory reflexes (AR), non-auditory reflexes, adaptation of auditory reflexes, ARLT, reflex averaging, reflex sensitization, temporal summation of acoustic reflex, binaural summation of AR
 - Factors affecting measurement,
 - Application of Immittance
 - Acoustic reflectometry- principles and application

UNIT 3

(12 hrs)

1. Early AEP – ECOCHG, ABR, SN 10, FFR, ASSR
 - Generators
 - Principles of recording
 - Factors affecting recording / interpretation
 - Correlation with FMRI, PET
 - Electrical ABR

- Clinical disorders
2. MLR and LLRs, MMN, P300, N400, T complex
 - Generators
 - Principles of recording
 - Factors affecting recording/interpretation including PAM and applications
 - Correlation with FMRI, PET
 - Electrical LLR
 - Clinical disorders

UNIT 4

(12 hrs)

1. Pathophysiological and audiological findings in different pathologies related to
 - External and middle ear diseases,
 - Blast, barotraumas, NIHL
 - Meniere's disease,
 - Acoustic neuroma,
 - Auditory dysynchrony,
 - Ototoxicity,
1. Tests to evaluate tinnitus and hyperacusis

UNIT 5

(12 hrs)

Nonaudiological tests in diagnosis of auditory disorders
 Auditory disorders in those with multiple problems, (C)APD
 Comprehensive report writing,
 Audiologist as a witness, medico-legal aspects legislations related to field of
 audiology
 Audiological practice in rural areas
 Audiological practice in ENT, Neurological set-ups

LIST OF BOOKS

SH 304 DIAGNOSTIC AUDIOLOGY

Berlin C. I (Ed) 1996 – Hair cells & hearing aids. Singular Publishing group, London

Hood.L.J (1998) Clinical applications of the auditory brainstem response Singular Publishing group Inc. U.S.A

Hall J. W III (1992) Handbook of Auditory evoked responses. Allyn & Bacon U.S.A

Jacobson J.T (Ed) 1994. Principles & Applications in Auditory evoked potentials Allyn & Bacon U.S.A

Katz J (Ed) Volume I – V Handbook of clinical audiology, Lippincott, Williams, Wielkins U.S.A

Ms Phenson L.D 1995 – Late potentials of the auditory system Singular publishing group
Rintelman W.F 1991 – Hearing Assesment, Allyn & Bacon U.S.A

Robinette M.S, Glatlke T.J (Eds) 1997. Otoacoustic emissions; Clinical Applications.
Thieme N.Y

Sahley T.L Nodar R.H; Musiek F.F 1997: Efferent Auditory system: Structure&
function. Singular Publishing group Inc.

Wiley T.L Fowler C.G 1997; Acoustic Immittance measures in clinical audiology: A
primer Singular Publishing group Inc

SH 305 HEARING DEVICES

[60 hrs]

Objectives

1. To familiarise the students on various types of devices and advances in technology with respect to amplificatory and implantable devices.
2. To sensitize students in selection strategies and tuning, critically review appropriateness of selected device for the client.

UNIT- 1 (12 hrs)

1. Hearing aids, components
2. Classification
3. Principles of analogue, programmable, digital hearing aids, signal enhancing technology
4. EAC
5. Outcome measures
6. Ear moulds – types and modifications

UNIT- 2 (12 hrs)

1. Selection of special features in hearing aids with reference to specific clients
2. Tinnitus maskers and their utility

UNIT- 3 (12 hrs)

1. ALDs:
 - Types: Auditory based, Visual based and Tactile based ALDs
 - Recent advances in technology, EAC measurements and accessories

UNIT- 4 (12 hrs)

1. Cochlear implant
 - Description, types, designs and features
 - Surgical procedure and biological safety in brief
 - Speech processing strategies
 - Assessment strategies
 - Post operative measurement – NRT, ESRT, EABR
 - Mapping
 - Outcomes

UNIT- 5 (12 hrs)

1. Middle ear implant, BAHA, Brainstem implant
 - Description
 - Selection
 - Assessment
 - Management
 - Outcome.

LIST OF BOOKS

SH 305 - Hearing Devices

Clark G.M; Cowan B.S; Dowel R.C1997. Cochlear Implantation for infants and children: Advances Singular Publishing group Inc

Mueller H.G; Hawkins D; Northern C.J 1992. Probe microphone measurements; Hearing aid selection and assessment Singular Publishing group Inc

Hersh M.A; Johnson M.A. 2003 – Assistive technology for the hearing impaired, Deaf and deaf blind, Springer, London

Sandlin E.R (Ed) 1995, Handbook of hearing aid amplifications. Volume 1. Theoretical & technical considerations Singular Publishing group Inc, London

Sandlin E.R (Ed) 1995, Handbook of hearing aid amplifications. Volume II. Clinical considerations and fitting practices. Singular Publishing group Inc, London

Studenbaker G.A; Hochberg I 1993. Acoustical factors affecting hearing aid performance. 2nd edition Allyn & Bacon U.S.A

Velente M 1994 Strategies for selecting and verifying hearing aid fittings Thieme N. Y

Velente M 1996 Hearing aids standards, options and limitations, Thieme N.Y

IV SEMESTER

SH 401 ADULT LANGUAGE DISORDERS

[60 hrs]

Objectives

1. To equip the student to understand advances in brain and language relationship
2. To familiarize the student with respect to advances in assessment and management of various language disorders in adults.

UNIT 1

[12 hrs]

- Neurophysiology of aphasia and related disorders. Language and cerebral dominance. Connectionist explanation of aphasia. Lesion size, lesion location and localization syndromes. Speech language and the brain
- Assessment and diagnosis in Neuro communication disorders. General principle. Testing of verbal comprehension, non verbal skills, verbal expression, and functional communication. Test interpretation, testing right hemisphere function and assessing the bilingual client,
- Different perspectives on aphasia, (linguistic, neurological, cognitive etc), pragmatics. Aspects of bilingual aphasia in illiterates and sign language users.

UNIT 2

[12 hrs]

- Advances in aphasia rehabilitation, (psychological sociolinguistic and pragmatic approaches) and treatment efficacy
- Acquired reading and writing disorders

UNIT 3

[12 hrs]

Dementia and communication. causes, types and language changes, assessment treatment and long term management

UNIT 4

[12 hrs]

Traumatic brain injury, consequences of TBI, cognitive-linguistic issues in communication assessment, rehabilitation outcomes.

UNIT 5

[12 hrs]

Other adult language disorders (characteristic assessment, intervention and issue in primary progressive aphasias, sub cortical aphasia, schizophasia and RHD.

LIST OF BOOKS

SH 401 ADULT LANGUAGE DISORDERS

An Introduction to Neurogenic Communication Disorders (4th Ed.) (1992). Brookshire, R.H. St.Louis: Mosby Year Book. ISBN 0-8151-1295-5

Aphasia (1988). Rose, F.C. Whurr, R. and Wyke, M.A.(Eds.) London : Whurr. ISBN 1-870332-66-0

Medical Speech-Language Pathology: A Practitioner's Guide. (1998). Johnson, A.F. and Jacobson, B.H. NY:Thieme. ISBN 0-86577-688-1

Aspects of Bilingual Aphasia (1995). Paradis,M.(Ed)Great Yarmouth; Galliard (Printers) Ltd. ISBN 0-08-425704

Pragmatics in Neurogenic Communication Disorders. (1998). Paradis,M.(Ed)Great Yarmouth; Galliard (Printers) Ltd. ISBN 0-08-043065-1

Linguistic Intervention in Aphasia. (2nd Ed.) (1969). Lesser, R.London; Whurr. ISBN 1-870332-77-6

Right hemisphere Communication Disorders: Theory and Management (1995). Tompkins,C.A California: Singular Publishing Group, Inc. ISBN 1-56593-176-9

Dementia – A Clinical Approach. (2nd Ed.).(1992). Cummins, J.L. and Benson: Whurr. ISBN 1-870332-94-6

SH 402 FLUENCY DISORDERS

(60 hrs)

Objectives

1. *To equip the student regarding various aspects related to the diagnosis, management and maintenance of skills to overcome dysfluencies in various disorders.*

UNIT 1

(12 hrs)

- Dimensions of fluent speech- review, recent advances and findings
- Factors affecting fluent speech.
- Theoretical constructs in fluency development.

UNIT 2

(12 hrs)

- Perspectives in fluency disorders (developmental, childhood and adult)
- Neuro anatomical, neurophysiologic aspects of fluency disorders.
- Linguistics, auditory processing, articulatory dynamics, laryngeal dynamics, prosodic, speech motor control viewpoints in stuttering.

UNIT 3

(12 hrs)

- Nature, characteristics, differential diagnosis, and current status of:
 - Normal Non fluency
 - Cluttering
 - Neurogenic stuttering
 - Drug-Induced stuttering

UNIT 4

(12 hrs)

- Assessment and diagnosis.
- Severity of stuttering –theoretical foundations and methods
- Efficacy measurements in stuttering therapy

UNIT 5

(12 hrs)

- Spontaneous recovery
- Prevention, relapse of stuttering and related issues
- Review of therapy in stuttering and recent advances in evidence based management of children and adults with stuttering.
- Efficacy and outcome measures of stuttering therapy

LIST OF BOOKS

SH 402: FLUENCY DISORDERS

Bloodstain, o., (1993), Stuttering, Allyn and Bacon, Boston.

Curlee & Perkins., (1995), Nature and treatment of shuttering: New directions

Curlee (1993). Stuttering and related disorders of fluency, Thieme Medical Publishers, New York.

Curlee, R.F. & Siegel, g.m. (2 Edn) (1996). Nature and treatment of stuttering. Allyn and Bacon, Boston.

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

Lass, N.J. (Ed) (1979). Speech and Language advances in basic research and practice. Academic Press, New York, Vol 1-9.

Perkins, W.L. (1992). Stuttering prevented. Whurr Publishers, London.

Schwartz, H.D. (1999). A primer for stuttering therapy. Allyn and Bacon, Boston.

Starkweather, D., (1987). Fluency and stuttering. Prentice-Hall, New Jersey

Weiss (1964). Cluttering. Prentice-Hall, New Jersey.

**SH 403 ADVANCES IN MANAGEMENT OF PERSONS WITH
HEARING DISORDERS** [60 hrs]

Objectives

1. To train the student to evaluate and learn specific needs of the client, need for amplificatory / assistive devices, educational, vocational and psychosocial and communicative demands.
2. To prepare the student for programs and intervention strategies as per the different needs of the clients.
3. To equip the student to critically review application of task analysis, program learning techniques wherever required in management of the clients.

UNIT 1 (12 hrs)

1. Habilitation of infants and children with hearing impairment
 - Early intervention programs
 - Importance (effect of auditory deprivation and role of auditory plasticity), rationale, Role of care givers
 - Process of informed decisions regarding: selection of method of rehabilitation, choice of amplification, language issue, selection of educational options
 - Alternate modes of intervention: CBR, correspondence programs, distance mode intervention, telepractices
 - Outcome measures
 - Audit of facilities in India
 - Formal education: Pre-school, School, College and vocational training programs
 - Role of audiologist in formal education
 - Technological needs in formal education

UNIT 2 (12 hrs)

1. Management of special groups in respect to amplification / implantable devices, placements and role of caregivers
 - Children and adults with multiple handicap (deaf-blind, neuro-motor, cognition problems, reading-writing problems)
 - Outcome measures
 - Management of children, adults, and geriatrics in respect to amplification/implantable devices, role of caregivers
 - Mild-to-moderate hearing loss, unilateral hearing loss
 - Sudden hearing loss, progressive hearing loss, fluctuating hearing loss
 - Psychosocial measures, Assertiveness training
 - Communication strategies
 - Outcome measures

UNIT 3 (12 hrs)

1. Management of tinnitus

- Application of audiological findings in management of tinnitus
- Neurophysiological model
- Techniques of management including tinnitus retraining therapy
- Amplification and maskers
- Counselling

2. Management of hyperacusis

- Application of audiological findings in management of tinnitus
- Neurophysiological model
- Techniques of management including tinnitus retraining therapy
- Counselling

UNIT 4

(12 hrs)

1. Legislations related to education issues of persons with hearing impairment

- International declarations (such as Biwako millennium framework, Salamanca statement)
- National acts / policies / schemes (such as PWD act, National Trust Act, Sarva Shiksha Abhiyan, DPEP scheme, ADIP scheme)
- Measures to implement legislations, schemes, policies
- Role of audiologist

UNIT 5

(12 hrs)

1. Management of CAPD cases:

- Choice of management based on audiological test results,
- Environmental modifications,
- Devices.
- Auditory perceptual training,
- Communications strategies,
- Cognitive\language management,
- Measuring outcomes

LIST OF BOOKS

SH 403 **ADVANCES IN MANAGEMENT OF PERSONS WITH HEARING DISORDERS**

Alpiner J.G (Ed) 1982 – Handbook of Adult Rehabilitative Audiology – 2nd Edition. William & Welkins U.S.A

Alpiner J.G; McCarthy P.A(Ed) 1993 – Rehabilitative Audiology Children & Adults William & Welkins U.S.A, William & Welkins 2000, 3rd Edition

Hull R.H (Ed) 2001 – Aural Rehabilitation – serving children and adults, 4th edition, Singular Publishing Group Inc

Luxon L.M (Ed) 2001 – Davies R.A (Eds) 1997 – Handbook of vestibular rehabilitation, Whurr Publisher Ltd, London

Sanders D.A 1971 – Aural Rehabilitation Prentice Hall, Inc, U.S.A

Tye Murray. N 1998 – Foundations of Aural Rehabilitation Singular Publishing Group , Inc, U.S.A

Tye Murray. N 2005 – Foundations of Aural Rehabilitation in Children and Adults & their family members (2nd edition) Thomson Delmar Learning Newyork

Vernon J.A; Moller A.R (Ed) 1995: Mechanisms of tinnitus, Allyn & Bacon, U.S.A

SH 405 **CLINICAL PRACTICUM – III & IV SEMESTER**

SPEECH LANGUAGE PATHOLOGY

Objectives

- Should be able to diagnose and manage various communication disorders
- 1. Should assess 10 clients with childhood language disorders / Adult language disorders/Fluency disorders / Motor speech disorders.
- 2. Should offer speech language therapy for at least 10 clients with childhood language disorders / Adult language disorders / Fluency disorders/ Motor speech disorders.

AUDIOLOGY

Objectives

- Should be able to diagnose and manage individuals having auditory disorders

Carry out :

1. Appropriate tests on at least 10 clients having cochlear / retro cochlear / auditory dyssynchrony
2. (C)APD tests on at least 5 clients
3. Multi frequency tympanometry on at least 5 clients
4. ASSR on at least 5 clients
5. MMN / LLR on at least 2 clients
6. Calibration of immittance and ABR
7. Selection of digital / programmable hearing aids for at least 10 clients
8. Rehabilitation programs for clients having tinnitus and hyperacusis

Students should also be exposed to cochlear implant mapping.

* * * * *
- - - - -