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

Rehabilitation Council of India
B-22, Qutab Institutional Area,
New Delhi - 110 016
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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 8^{th} 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@ (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	**Essential** a) M.Sc(Sp & Hg)/MASLP/equivalent and Ph.D (in core areas) b) 10 years teaching experience at PG/UG level c) PhD (in core areas*) d) Minimum of five Publications with cumulative impact factor of 05. e) Valid RCI registration **Desirable:** Experience of running under-graduate training programs	As per UGC guidelines
Associate Professor	**Essential** a) M.Sc(Sp & Hg)/M.ASLP/equivalent b) 8 years of teaching experience at graduate/ post graduate level; c) Minimum of five Publications with cumulative impact factor of 05. d) Valid RCI registration **Desirable:** Ph.D (in core areas*) Experience of running under-graduate training programs	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-Speech 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

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natomy of the external ear
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hysiology of external ear including localization
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ead shadow effect, inter-aural intensity and time differences
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rief anatomy of temporal bone
Ä □Ā Ā Ā
natomy of tympanic membrane and associate structures
Ä □Ā Ā Ā
natomy of middle ear and ossicles
Ä □Ā Ā Ā
natomy of Eustachian tube and middle ear muscles
Ä □Ā Ā Ā
hysiology of Eustachian tube
Ä □Ā Ā Ā
iddle ear transformer action
Ä □Ā Ā Ā
hysiology of middle ear muscles

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, Ceenage 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

Morgon 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 Psychlogy, Rehabiliation 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.

Karanth, 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 Ä □Ā Ā Ā
ibrations and their characteristics
ÈĀ Ä □Ā Ā Ā
ound - generation and propagation
ÈĀ Ä □Ā Ā Ā
haracteristics of sound
ÈĀ Ä □Ā Ā Ā
mplitude, frequency and phase of pure tones
ÈĀ Ä □Ā Ā Ā
mplitude, frequency and phase of complex tones (FFT and spectrum, relationship between time waveform, FFT and impulse response)
ÈĀ Ä □Ā Ā Ā
eflection and absorption, acoustic impedance, reverberation
ÈĀ Ä □Ā Ā Ā
mpedance and admittance
ÈĀ Ä □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, hard ware, 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 (4thEdition), 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 anamolies
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
Presbyacusis
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.

Shipley, 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.
Shipley, 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 ones 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 Jersy.
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

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

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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-Stewert 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 malinger 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 (moto 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,& Jordon'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) resonation, (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 Disordersin 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 out puts 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: Pearsons

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 quatify 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/Videonystagmography (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., & Glattke, 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 layngectomee individuals
Assessment of speech and communication skills of layngectomee 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/ videofluroscopy.
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 laryngectomee 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 sight 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 listing 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 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 companied, 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.
Bergland, 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
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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, stapedial 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.