SCHOOL OF REHABILITATION AND BEHAVIOURAL SCIENCES

DEPARTMENT OF AUDIOLOGY AND SPEECH LANGUAGE PATHOLOGY

(For Candidates Admitted from the academic year 2021 – 2022 Onwards)
HOLY CROSS COLLEGE (AUTONOMOUS)
TIRUCHIRAPPALLI-620 002
SCHOOL OF REHABILITATION AND BEHAVIOURAL SCIENCES
DEPARTMENT OF AUDIOLOGY AND SPEECH LANGUAGE PATHOLOGY
CHOICE BASED CREDIT SYSTEM
LEARNING OUTCOMES-BASED CURRICULUM FRAMEWORK (LOCF)

Program Outcomes (POs)

After the completion of the degree program, the graduate will be able to

PO1 - Demonstrate ability and attitude to acquire knowledge and skills in the advancing global scenario to apply them effectively and ethically for professional and social development.

PO2-Involve in research and innovative endeavors and share their findings for the wellbeing of the society.

PO3-Work effectively in teams and take up leadership in multi-cultural milieu.

PO4-Act with moral, ethical and social values in any situation.

PO5- Excel as empowered woman to empower women.

PO6-Participate in activities towards environmental sustainability goals as responsible citizens.

PO7 - Pursue higher studies in the related field of science, humanities and management.

PO8-Collaborate with organizations, hospitals and schools to innovate and develop programmes for persons with special and psychological needs with professional rehabilitation competencies.

PO 9- Excel as rehabilitation professionals advocating policy change with effective administrative, empathetical skills to reach out and empower the differently abled and less privileged.

Programme Specific Outcomes (PSOs)

After the completion of the degree program, the graduate will be able to

PSO 1: Identify, classify, differentially diagnose and prepare the report for the speech, language, swallowing, hearing and vestibular disorders of human beings across life span.

PSO 2: Critically evaluate the reports of clinical population to counsel, treat, recommend different therapeutic and rehabilitation services

PSO 3: Formulate protocols for assessment and treatment of clinical population, make appropriate clinical judgements, referrals and liaise with professionals from related fields.

(For Candidates admitted from June 2021 onwards)
HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI – 620 002
SCHOOL OF REHABILITATION AND BEHAVIOURAL SCIENCES
DEPARTMENT OF AUDIOLOGY AND SPEECH LANGUAGE PATHOLOGY
CHOICE BASED CREDIT SYSTEM
LEARNING OUTCOMES-BASED CURRICULUM FRAMEWORK (LOCF)
UG COURSE PATTERN
B.ASLP

Course Title	**Major Core: B 1.1. Communication Sciences**
Code	**U21AS1MCT01**
Course type	**Theory**
Semester	**I**
Hours/Week	**4**
Credits	**-**
Marks	**100**

CONSPECTUS

This course will enable the students to know and understand the basic concepts in speech, language, communication, hearing sensitivity and acoustics.

COURSE OBJECTIVES

1. To remember the terms of speech, language, communication and its normal development
2. To comprehend the mechanism of speech production
3. To understand the concept of intensity, decibel, sound pressure and its clinical application
4. To impart knowledge of frequency, Up-down and staircase procedure, RETSPL, MC
5. To acquire the knowledge of history and development of field of audiology and speech language Pathology

UNIT 1: SPEECH, LANGUAGE AND COMMUNICATION
(12HOURS)

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

UNIT 2: BASES OF SPEECH AND LANGUAGE (12HOURS)

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

UNIT 3: SOUND INTENSITY AND CONCEPT OF DECIBEL (12HOURS)

a) Acoustic energy and power, absolute and relative units – importance of reference
b) Sound intensity and intensity levels –absolute and relative measurements and
c) Bel and decibels, sound pressure and decibel sound pressure levels, relationship between intensity and pressure
d) Characteristics and application of decibels

UNIT 4: AUDIBILITY & HEARING (12HOURS)

a) Hearing range –intensity and frequency
b) Up-down and staircase procedure of estimating minimum audible levels
c) Minimum audible pressure and field, Missing six dB and related issues
d) Reference equivalent threshold sound pressure levels and hearing levels
e) Sensation levels, Threshold of pain, Most comfortable levels

UNIT 5: INTRODUCTION TO AUDIOLOGY AND SPEECH-LANGUAGE PATHOLOGY (12HOURS)

Part A: Speech and language

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

Part B: Audiology

a) Audiology – historical aspects, development of instrumentation in audiology
b) Development of audiology: Indian and global context
c) Branches of audiology
d) Scope of audiology

TEXT BOOKS

a) Bordon, G J., Harris, K S., & Raphael, L J. (2006). Speech science primer: Physiology, acoustics, & perception of speech. Lippincott-Williams & Wilkins.

b) SubbaRao, T A. (1992). Manual for developing communication skills. NIMH. ISBN: 81-86594-03-5

c) Speaks, C. E. (1999). Introduction To Sound: Acoustics for the Hearing and Speech Sciences (3 edition). San Diego: Cengage Learning.

SUGGESTED READINGS

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

b) Gelfand, S. A. (2009). Hearing: An Introduction to Psychological and Physiological Acoustics (5 edition). London: CRC Press.

c) Khara L. Pence, T., Laura M. & Justice (2011). Language Development: From Theory to Practice (2nd Ed.),Allyn & Bacon Communication Sciences and Disorders

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

WEB REFERENCES

1.https://www.bing.com/search?q=SPEECH%2C+LANGUAGE+AND+COMMUNICATION+&qs=n&form=QBRE&sp=-1&pq=speech%2C+language+and+communication+&sc=8-35&sk=&cvid=6BE7772960524DE7AC378172CFE2B4C8
2.https://www.britannica.com/topic/language/Physiological-and-physical-basis-of-speech
3.https://courses.lumenlearning.com/physics/chapter/17-3-sound-intensity-and-sound-level/
4.https://hearinghealthmatters.org/hearingandkids/2015/hearing-aids-and-audibility/
5.https://education.byu.edu/sites/default/files/COMD/documents/ASLP133Fullsyllabuswinter2004.pdf

Note: Learners are advised to use latest edition of books.

COURSE OUTCOMES

CO No.	Course Outcomes	Cognitive Level (K1-K5)
CO-1	Define the basic components of speech, language, communication and terms in audiology	K1
CO-2	Understand the normal development, prerequisites and factors affecting speech language.	K2
CO-3	Apply the different bases and theory of speech, language and acoustic concepts of audiology to perform the assessment.	K3
CO-4	Distinguish speech, language, communication and different psychoacoustic procedures of audiology.	K4
CO-5	Explain the speech production and the concepts, procedures to assess hearing sensitivity and acoustics.	K5

(K1=Remember, K2=Understand, K3=Apply, K4=Analyze, K5=Evaluate)

PO – CO MAPPING

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO-1	H	H	H	-	L	-	H	H	H
CO-2	H	H	H	H	H	-	H	H	H
CO-3	H	H	H	H	H	-	H	H	H
CO-4	H	H	H	H	L	-	H	H	H
CO-5	H	H	H	H	H	-	H	H	H

PSO – CO MAPPING

CO/PSO	PSO1	PSO2	PSO3
CO-1	H	H	H
CO-2	H	H	H
CO-3	H	H	H
CO-4	H	H	H
CO-5	H	H	H

Course Title	**Major Core B1.2AnatomyandPhysiologyof Speech and Hearing**
Code	**U21AS1MCT02**
Course type	**Theory**
Semester	**I**
Hours/Week	**4**
Credits	**-**
Marks	**100**

CONSPECTUS

This course will help students to understand the embryological development, anatomy and physiology of structures related to speech, swallowing, hearing.

Course Objectives:

1.To remember the anatomical terms and positions and planes of reference, cells, tissues and muscles, muscle connection and joints.
2.To impart knowledge of embryologyoforal cavity, ear, larynx and respiratory structures
3.To understand the anatomy and physiology of speech production systems and swallowing.
4.To gain knowledge of the anatomy and physiology of external and middle ear
5.To comprehend the anatomy and physiology of labyrinth

UNIT I – Introduction **12hrs**

a) General anatomical terms
b) Anatomical positions and planes of reference
c) Cells, tissues and muscles
d) Muscleconnection and joints
e) Tissue– vascularand neural

UNITII–Embryology **12hrs**

a) Basic
b) Terminologies related to embryology
c) Developmen to fex ternal ear
d) Development of middle ear
e) Development of Inner ear and the auditory system
f) Five examples of embryonic anomalies affecting speech-language & hearing
g) Development of respiratory structures

h) Development of larynx
i) Development of facial region and palate
j) Development of tongue and teeth

UNITIII–Anatomy and Physiology of Speech Production Systems and Swallowing

12hrs

a) Mechanisms of breathing with emphasis on speech breathing
b) Supportive frame work of larynx
c) Anatomy of larynx
d) Anatomy of oesophagus
e) Brief mechanisms of swallowing f)
f) Mechanisms of phonation
g) Anatomy of articulators and associated structures
h) Contribution of articulatory structures to speech production
i) Anatomy of resonatory mechanisms
j) Contribution of resonatory mechanisms to speech production

UNIT IV – Anatomy and Physiology of External and Middle Ear 12hrs

a) Anatomy of the external ear and middle ear
b) Physiology of external ear including localization
c) Head shadow effect, inter-aural intensity and time differences
d) Brief anatomy of temporal bone
e) Anatomy of tympanic membrane and associate structures
f) Anatomy of middle ear and ossicles
g) Anatomy of Eustachian tube and middle ear muscles
h) Physiology of Eustachian tube
i) Middle ear transformer action
j) Physiology of middle ear muscles

UNITV–Anatomy and Physiology of Labyrinth 12hrs

a) Anatomy of bony and membranous labyrinth
b) Macro anatomy of cochlea
c) micro anatomy of cochlea
d) Innervations and blood supply to cochlea,
e) Overview of theories of hearing,
f) Physiology of cochlea
g) Electrical potentials of the cochlea
h) Physiology of hearing through bone conduction
i) Overview to physiology of balancing mechanisms
j) Overview to anatomy of central auditory pathway
k) Overview to central auditory mechanism

TEXT BOOKS

1. Seikel, J. A., King, D. W., & Drumright, D. G. (2010). *Anatomy & Physiology for Speech,Language, and Hearing (4th edition*). Delmar, Ceenage Learning, Division of ThomsonLearning.NY.
2. Zemlin,W.R.(2010).*SpeechandHearingScience:AnatomyandPhysiology:InternationalEdition(4 edition.*).Boston:Pearson.

SUGGESTED READINGS

1. 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.
2. Kelley, M., Wu, D., & Fay, R. R. (Eds.). (2005). Development of the Inner Ear (2005 edition.). New York: Springer.

WEB REFERENCES

1.https://www.healthpages.org/anatomy-function/anatomy-terms/
2.http://stdenis.weebly.com/uploads/6/3/4/0/6340863/the_anatomical_position.pdf
3.https://embryology.med.unsw.edu.au/embryology/index.php/Hearing_-_Inner_Ear_Development
4.https://www.visiblebody.com/hubfs/eBooks/2020%20eBooks/VisibleBody_Anatomy_of_Speech_021020.pdf
5.https://byjus.com/neet/structure-of-ear/
6.https://www.vestib.org/en/labyrinthe.html

Note: Learners are advised to use latest edition of books

Course Outcomes:

CO No.	Course Outcomes	Cognitive Level (K1-K5)
CO-1	Define the anatomical terms, anatomical positions, planes, cells, muscles and tissues.	K1
CO-2	Understand the embryological development of different anatomical structures related to speech, language and hearing.	K2
CO-3	Apply the knowledge of anatomy and physiology of structures related to speech and hearing to identify the congenital anomalies and structural abnormalities.	K3
CO-4	Classify, compare and differentiate structural abnormalities based on normal structure and physiological function.	K4
CO-5	Explain the importance of normal anatomical and physiological functions of structures related to speech, swallowing, language and hearing.	K5

(K1=Remember, K2=Understand, K3=Apply, K4=Analyze, K5=Evaluate)

PO – CO MAPPING

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO-1	H	H	H	-	H	-	H	H	H
CO-2	H	H	H	-	H	-	H	H	H
CO-3	H	H	H	-	H	-	H	H	H
CO-4	H	H	H	-	H	-	H	H	H
CO-5	H	H	H	-	H	-	H	H	H

PSO – CO MAPPING

CO/PSO	PSO1	PSO2	PSO3
CO-1	H	H	H
CO-2	H	H	H
CO-3	H	H	H
CO-4	H	H	H
CO-5	H	H	H

Course Title	**Major Core B 1.3. Clinical Psychology**
Code	**U21PS1MCT01**
Course type	**Theory**
Semester	**I**
Hours/Week	**4**
Credits	**-**
Marks	**100**

CONSPECTUS

Clinical psychology is focusing on basic human behaviors, development, Perception, thoughts, Feelings, principles, therapeutic techniques, assessment, management and counseling

Course Objectives:

1.To acquire Basic concept of Psychology
2.To understand the Assessment and classification for psychological disorder
3.To enable Individual developmental periods
4.To remember the Principle and techniques of behavior modification
5.To comprehend the Neuropsychological assessment, rehabilitation and counseling

Unit1: Introduction to psychology. 12hrs

a) Introduction to psychology: definition, history and schools of psychology
b) Scope of psychology
c) Meaning and definition of clinical psychology
d) Historical development, modern clinical psychology
e) Significance of clinical psychology in health sciences
f) Role of clinical psychology in speech and hearing
g) Concept of normality
h) Concept of abnormality
I) Models of mental disorders: biological, psychological social models

Unit2: Assessment procedures in clinical psychology. 12hrs

a) Methods in clinical psychology: case history, clinical interviewing, clinical observation, definition and types of psychological testing
b) Assessment of cognitive functions
c) Adaptive functions
d) Personality
e) Behavioral assessment
f) Classification of abnormal behavior

g) History, need & rationale of classification
h) Current classificatory system: DSM, ICD

Unit3: Developmental psychology 12hrs

a) Child and developmental psychology: meaning, definition and scope
b) Meaning of growth, development & maturation
c) Principles of child development
d) Motor development: general principals of motor development
e) Stages in motor development: early motor development, motor development during later childhood and adolescence, decline with age
f) Cognitive development: growth from early childhood to adolescence
g) Piaget's theory of cognitive development
h) Emotional development
i) Social development

Unit4: Principles of learning and behavior modification. 12hrs

a) Learning: meaning, definition and characteristics
b) Theories of learning: introduction
c) Pavlov's classical conditioning: experiments and principles
d) Skinner's operant conditioning: experiments and principles
e) Therapeutic techniques based on learning principles
f) Skill behavior techniques
g) Problem behavior techniques

Unit5: Neuropsychology and its relevance to study of speech. 12hrs

a) Neuropsychology: introduction and definition
b) Neuropsychological assessment
c) Neuropsychological rehabilitation
d) Application of neuropsychology in the field of speech and hearing
e) Counseling: introduction and definition
f) Types of counseling: directive and non-directive
g) Characteristics of a good counselor

TEXT BOOKS

1.Morgon C.T., King R.A., Robinson N.M. Introduction to Psychology. Tata Mc Graw Hill Publishing Co

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

3. Baura, M (2004). Human Development and Psychology, Rehabilitation Council of India, New Delhi. ISBN:81-7391-868-6

4. Coleman J.C. Abnormal Psychology and Modern Life, Tara porevala Sons & Co.

5. Gregory, R.J. (2000). Neuropsychological and geriatric assessment in Psychological Testing: History, Principles, and Applications (3rded.). New York: Allyn & Bacon.

SUGGESTED READINGS

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

2.Kline, P. (1993). The Handbook of Psychological Testing. Routledge
3.Lezak, M., Loring, D.W., and Hannay, H.J. (2004). Neuropsychological Assessment. Fourth Edition. New York: Oxford University Press
4.Siegal M.G. (Ed). (1987). Psychological Testing from Early Childhood Through Adolescence. International Universities Press.
5. Geoffrey P. Kramer, Douglas A. Bernstein, Vicky Phares (2014). Introduction to Clinical Psychology. 8th Ed, Pearson education, India.

WEB REFERENCE

1.https://nios.ac.in/media/documents/secpsycour/English/Chapter-1.pdf
2.https://opentext.wsu.edu/abnormal-psych/chapter/module-3-clinical-assessment-diagnosis-and-treatment
3.https://www.nu.edu/resources/what-is-developmental-psychology
4.https://study.com/academy/lesson/what-is-behavior-modification-definition-techniques-examples.html
5.https://www.betterhelp.com/advice/psychologists/what-is-neuropsychology-and-what-does-it-treat/

Note: Learners are advised to use latest edition of books

Course Outcomes:

CO No.	Course Outcomes	Cognitive Level (K1-K5)
CO-1	Relate the concept of Individuals normal behavior and abnormal behavior for the clinical population	K1
CO-2	Compare various assessment &therapeutic techniques for psychological disorders	K2
CO-3	Choose appropriate counseling process for atypical developmental individual	K3
CO-4	Inspect the various theories of psychological development.	K4
CO-5	Perceive the developmental stages of human beings and to assess the neuropsychological behavior.	K5

(K1=Remember, K2=Understand, K3=Apply, K4=Analyze, K5=Evaluate)

PO – CO MAPPING

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO-1	H	H	H	M	H	M	H	H	H
CO-2	H	L	L	M	L	H	H	H	M
CO-3	L	H	H	H	M	M	H	H	M
CO-4	H	M	H	H	H	L	M	M	M
CO-5	L	H	M	M	L	H	M	M	H

PSO – CO MAPPING

CO/PSO	PSO1	PSO2	PSO3
CO-1	H	H	H
CO-2	H	H	H
CO-3	H	H	H
CO-4	H	H	H
CO-5	H	H	H

Course Title	**Major Core B1.4Linguistics and Phonetics**
Code	**U21AS1MCT03**
Course type	**Theory**
Semester	**I**
Hours/Week	**4**
Credits	**-**
Marks	**100**

CONSPECTUS

Linguistics and phonetics course deals with various aspects of language and phonetics including the characteristics, function, factors that may have an effect on language development and the application of the same in speech and language assessment and intervention

COURSE OBJECTIVES

1. To remember and understand different branches and aspect so linguistics' and phonetics
2. To explain the characteristics and function sof language
3. To underst and morphology, syntax, semantics, pragmatics
4. To summarize acquisition of language and factor saffecti ngit
5. To define bilingualism and issues related to it

UNIT I Linguistic 12Hrs

a) Introduction to linguistics and different branches of linguistics: applied linguistics, sociolinguistics, psycholinguistics, meta linguistics, neuro linguistics and clinical linguistics

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

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

a. Processes of word formation, content and function words
b. Endocentric and exocentric constructions, form classes, grammatical categories
c. Inflection and derivation, paradigmatic and syntagmatic relationship
d. Principles and practices of morphemic analysis
e. Langue versus parole
f. Competence vs. performance

UNITII–Phonetics and Phonology 12Hrs

a) Introduction to phonetics
b) Articulatory, acoustic, auditory and experimental phonetics – an

introduction

c) Articulatory classification of sounds – segmental and supra-segmental
d) Classification description and recognition of vowels and consonants
e) Pathological aspects of speech sound production
f) Transcription systems with special emphasis on IPA. Transcription of samples of normal and disordered speech
g) Introduction to phonology, classification of speech sounds on the basis of distinctive features and phonotactics
h) Application of distinctive feature theory to speech pathology and speech therapy, phonotactics, phonotactic patterns of English and Indian languages
i) Phonemic analysis – Principles and practices; their practical implications for speech pathologists
j) Common phonological processes - assimilation, dissimilation, metathesis, haplology, epenthesis, spoonerism, vowel harmony, nasalization, neutralization

UNITIII-Morphology, Syntax, Semantics and Applied Linguistics12hrs

a) 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
b) Syntax – different methods of syntactic analysis
c) IC analysis, phrase structure, grammar, transformational generative grammar
d) Introduction to the major types of transformations
e) Sentence types, notions about competence versus performance
f) Deep structure versus surface structure
g) Acceptability versus grammaticality language versus parole etc.
h) A brief introduction to semantics – semantic feature theory, pragmatics
i) Processes of word formation, content and function words, form classes, grammatical categories
j) Syntax – concepts of phrases and clauses, sentence and its types
k) 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
l) Usefulness of morphemic and syntactic analysis in planning speech and language therapy
m) A brief introduction to semantics, semantic relations, semantic feature theory
n) A brief introduction to pragmatics and discourse.

UNITIV-Language Acquisition **12Hrs**

a) Issues in first language acquisition
b) Pre-linguistic stages, linguistic stages
c) Acquisition of phonology, morphology, syntax, semantics, and pragmatics
d) Language and cognition

e) A brief introduction to theories and models of language acquisition
f) Biological maturation theory, linguistic theory, behavioral theory, information processing theory, social interaction theory
g) An integrated approach to theories communicative competence and its development
h) Applied linguistics with special reference to communication disorders
i) Usefulness of morphemic and syntactic analysis in planning speech and language therapy

UNITV-Bi/ Multilingualism **12Hrs**

a) Introduction to the language families of the world and India
b) Issues related to second language acquisition & factors influencing it
c) Inter-language theory, language transfer and linguistic interference
d) Differences between first and second language acquisition/learning
e) Bilingualism/Multilingualism 24
f) Metaphonology
g) Writing systems – types of writing
h) History of writing systems
i) Indian writing systems

TEXT BOOKS

1. Ball&Martin(1995).*Phoneticsforspeechpathology*. Delhi:AITBSPublishes,India.
2. Ball, Rahilly&Tench (1996). *The phonetic transcription of disordered speech*. San Diego:SingularPublishingGroupInc.
3. ClarkandYallop(1999).*Anintroductiontophoneticsandphonology*.Oxford:BlackwellPublishesInc.

SUGGESTED READINGS

1. Karanth,P (2003).*Cross-LinguisticstudyofAcquiredReadingDisorders*.SagePublications,NewDelhi.ISBN : 0-306-48319-X
2. Ladefoged,P.(1982).*A courseinphonetics*.New York:HarcourtBraceJovanorichInc.
3. Shriberg&Kent (1982).*Clinicalphonetics*. New York:John Wiley&Sons

WEB REFERENCES

1.https://leverageedu.com/blog/pu/branches-of-linguistics/
2.http://www.phon.ox.ac.uk/jcoleman/PHONOLOGY1.html
3.https://parentingpatch.com/subfields-linguistics-defined-phonetics-phonology-morphology-syntax-semantics-pragmatics
4.https://scholar.harvard.edu/files/adam/files/language_acquisition.ppt.pdf
5.https://www.thoughtco.com/what-is-multilingualism-1691331

Note: Learners are advised to use latest edition of books.

COURSE OUTCOMES

CO No.	Course Outcomes	Cognitive Level (K1-K5)
CO-1	Define deferent branches of linguistics and deduce on function and characteristics of language.	K1
CO-2	Summarize branches of phonetics, applied linguistics, and phonology.	K2
CO-3	Identify the characteristics and function so language	K3
CO-4	Infer on language acquisition, second language acquisition, determine factors affecting it and make use of the same in speech and language therapy.	K4
CO-5	Explain morphologic, syntactic, semantic and pragmatic aspects of language with it's application in speech and language therapy.	K5

(K1=Remember, K2=Understand, K3=Apply, K4=Analyze, K5=Evaluate)

PO – CO MAPPING

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO-1	H	H	H	M	M	-	M	H	M
CO-2	H	H	H	M	M	-	M	H	M
CO-3	H	H	H	M	M	-	M	H	M
CO-4	H	H	H	H	H	-	M	H	H
CO-5	H	H	H	H	H	-	M	H	H

PSO –CO MAPPING

CO/PSO	PSO1	PSO2	PSO3
CO-1	H	H	H
CO-2	H	H	H
CO-3	H	H	H
CO-4	H	H	H
CO-5	H	H	H

Course Title	**Major Core B1.5Electronics and Acoustics**
Code	**U21AS1MCT04**
Course type	**Theory**
Semester	**I**
Hours/Week	**4**
Credits	**-**
Marks	**100**

CONSPECTUS

Electronics and Acoustics course deals with concept and power supply for various biomedical Instruments, aspects of digital signal processing, theoretical basis of acoustics and functioning of Computers and computing system**.**

Course Objectives:

1. To gain knowledge about the basic concept of electronic components and types of power supply for biomedical instruments.
2. To understand the knowledge of characteristics of sound.
3. To comprehend about the audiometric room set up, reverberations, transducers and computers.
4. To impart the concept of digital signal processing in instrumentation in speech and hearing.
5. To understand the functions of instruments used in speech and hearing.

UNIT I-Electronic Components and Power Supply **12hrs**

a)Resistors, capacitors, inductors

b) Transformers and potentiometers

c) Semiconductor diodes and transistors

d) Light emitting devices, seven segment displays, Liquid crystal displays

e) Principles of operations and working of Field Effect Transistors, Uni-junction transistors and thyristors

f) Introduction to linear and digital integrated circuits

g) Block diagram of a DC power supply

h) Linear regulated power supplies, line regulation and load regulation, specifications of a DC power supply unit, Switched Mode Power Supply

i) AC power supply, stabilizers, Uninterrupted Power Supply, and inverters

j) Basic electronic concepts such as Polarity, Grounding

UNIT II-Introduction to Acoustics **12Hrs**

a) Vibrations and their characteristics
b) Sound - generation and propagation
c) Characteristics of sound
d) Amplitude, frequency and phase of pure tones
e) Amplitude, frequency and phase of complex tones (FFT and spectrum, relationship between time waveform, FFT and impulse response)
f) Reflection and absorption, acoustic impedance, reverberation
g) Impedance and admittance
h) Electro-mechano-acoustic transformers

UNIT III-Acoustical Treatment, Transducers and Basics of Computers **12Hrs**

a) Introduction to audiometric rooms
b) Absorption coefficient, Sabine's formula
c) Materials for construction of audiometric rooms
d) Lighting, grounding and other miscellaneous issues related to audiometric rooms
e) Evaluation of efficiency of sound proofing in the audiometric rooms
f) Amplifiers
g) Microphones, loudspeakers - types and function
h) Fundamentals of digital electronics, binary number system, Hex code, bit, byte, logic gates, counters, flip-flops etc.
i) Introduction to computers
j) Operating systems, hard ware, software, memory devices and other peripherals, care and preventive maintenance of computers

UNIT IV-Digital Signal Processing **12Hrs**

a) Digital signal processing –introduction and need
b) Analog to digital converters, sampling and quantization,
c) Fundamentals of digital filtering
d) Infinite impulse response and finite impulse response filters
e) Time domain methods of speech processing
f) Frequency domain methods of speech processing
g) Linear predictive analysis of speech signals
h) Digital coding of speech signals
i) Automatic speech recognition
j) Speech synthesis

UNITV-Instrumentation in Speech and Hearing **12Hrs**

a) Introduction to electronic instrumentation in speech and hearing
b) Electrodes, filters and preamplifiers
c) 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.

TEXT BOOKS

1. Haughton, P., & Haughton, P. M. (2002). Acoustics for Audiologists (1st edition.). SanDiego, Calif: Emerald Group PublishingLimited.
2. Moser, P. (2015). Electronics and Instrumentation for Audiologists. PsychologyPress.
3. Moser, P. J. (2013). Electronics and Instrumentation for Audiologists. PsychologyPress.

SUGGESTED READINGS

1. 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. ISBN978-81-928032-1-0.
2. Speaks, C. E. (1999). Introduction To Sound: Acoustics for the Hearing and SpeechSciences (3edition.). San Diego: Cengage Learning.
3. Villchur, E. (1999). Acoustics for Audiologists (1 edition.). San Diego, Calif: DelmarCengage Learning.

WEB REFERENCES

1.www.sciencedirect.com
2.www.audiologyonline.com
3.www.springeropen.com
4.www.ncbi.nlm.nih.gov

Note: Learners are advised to use latest edition of books.

COURSE OUTCOMES

CO No.	Course Outcomes	Cognitive Level (K1-K5)
CO-1	Recall and define the basics of electronic components, computers and acoustics	K1
CO-2	Understand the characteristics of sound, transducers and audiometric room set up.	K2
CO-3	Apply the theoretical basis of acoustics and digital electronics to perform the speech and hearing evaluation.	K3
CO-4	Distinguish various electronic components, various transducers and different processing of acoustic signals.	K4
CO-5	Explain digital signal processing and electronic instrumentation in speech and hearing.	K5

(K1=Remember, K2=Understand, K3=Apply, K4=Analyze, K5=Evaluate)

PO – CO MAPPING

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO-1	H	H	H	-	M	-	H	H	H
CO-2	H	H	H	-	M	-	H	H	H
CO-3	H	H	H	-	M	-	H	H	H
CO-4	H	H	H	-	M	-	H	H	H
CO-5	H	H	H	-	M	-	H	H	H

PSO – CO MAPPING

CO/PSO	PSO1	PSO2	PSO3
CO-1	H	H	H
CO-2	H	H	H
CO-3	H	H	H
CO-4	H	H	H
CO-5	H	H	H

Course Title	**Major Core: B1.6 Research Methods and Statistics**
Code	**U21RA1MCT01**
Course Type	**Theory**
Semester	**I**
Hours/Week	**5 Hrs. Wk.**
Credits	**-**
Marks	**100**

CONSPECTUS

This course will facilitate the learner to understand the basic concepts and process of research, statistical application and epidemiological studies with regard to Audiology and Speech Language Pathology

COURSE OBJECTIVES:

1. To remember and understand basic concepts of research, variables, data collection and its relevance in the field of audiology and speech-language pathology
2. To understand and apply research designs, concept of reliability and validity and documentation of research
3. To remember and understand concepts of statistics, scales of measurement and classification of intervals
4. To apply and analyze various statistical application like parametric and non-parametric test with regard to different research designs
5. To understand epidemiological studies and its methods

Part A: Research Methods

Unit I: Introduction to research methods (11 hours)

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

Extra reading/ keywords: *Scope of Research, problem formulation, Government and Non-Government Funds for research, Null Hypothesis, Test Hypothesis*

Unit II: Research design in audiology and speech-language pathology (11 hours)

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

Extra reading/ keywords: *Descriptive Research, Historical Research, Longitudinal studies, Quantitative and Qualitative Research, Article Writing, Paper Publication*

Part B: Statistics

Unit III: Introduction to statistics and data collection (11 hours)

a) Application of statistics in the field of Audiology and speech-language pathology.
b) Scales of measurement: nominal, ordinal, interval, ratio
c) Classification of data: class intervals, continuous and discrete measurement
d) Normal distribution: general properties of normal distribution, theory of probability, area under normal probability curve
e) Variants from the normal distribution: skewness and kurtosis
f) Measure of central tendency: mean, median, mode
g) Measures of variability: range, deviation (average and standard deviation), variance

Extra reading/ keywords: *Descriptive Statistics, Inferential Statistics, Data Coding, Quantitative and Qualitative Data, Types of Analytics*

Unit IV: Statistics and research designs (11 hours)

a) Choosing statistics for different research designs
b) Correlational techniques: Pearson's Product Moment Correlation Coefficient; Spearman's Rank order correlation coefficient
c) 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,
d) Non-parametric tests: Chi-square test, Wilcoxon test, Mann-Whitney U test,
e) Reliability and validity of test scores: reliability and validity, Item analysis
f) Analysis of qualitative data
g) Software for statistical analysis

Extra reading/ keywords: *Regression Analysis, Bayes Theorem, Intercorrelations techniques and interpretation, concepts of error, accuracy, precision and bias*

Unit V: Epidemiology (11 hours)

a) Basic epidemiologic concepts and principles
b) Epidemiologic data sources and measurements
c) Epidemiologic methods – questionnaire survey, screening, personal survey, testing
d) Media - their advantages and disadvantages
e) Incidence and prevalence of hearing, speech, language disorders as per different census (NSSO, WHO)

Extra reading/ keywords: *Epidemiological models, concept of Disease Occurrence, Crude, Specific and adjusted Rates, Types of Media and its impact on Disability, Incidence and Prevalence of Differently Abled population in general*

PRACTICUM (5 HOURS)

1. Writing a Research Proposal
2. Reviewing Literature for particular topic
3. Carrying out manual and software data analysis for quantitative data.

TEXT BOOKS

1. Akaninwor, George I. Ken. (2006). A Handbook On Research Methods and Statistics.
2. C.R. Kothari, Gaurav Garg Research Methodology: Methods and Techniques – 1 September 2019.
3. Rietveld Toni (2020) Human Measurement Techniques in Speech and Language Pathology: Methods for Research and Clinical Practice

SUGGESTED 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.

WEBSITE REFERENCES:

https://library.sacredheart.edu/c.php?g=29803&p=185902

https://www.questionpro.com/blog/what-is-research/

https://saylordotorg.github.io/text_introductory-statistics/s05-01-basic-definitions-and-concepts.html

https://whatis.techtarget.com/definition/statistical-analysis

http://www.fao.org/3/w7295e/w7295e08.htm

https://www.britannica.com/science/epidemiology/Basic-concepts-and-tools

Note: Learners are advised to use latest edition of books.

COURSE OUTCOMES

CO No.	Course Outcomes	Cognitive Level (K1-K5)
CO-1	Describe the concept of research, research design, statistics, and epidemiology in the context of audiology and speech language pathology	K1
CO-2	Explain different types of research methods, variables and data collection in the process of research	K2
CO-3	Relate and apply different formats of documentation of research and statistical tests for data analysis	K3
CO-4	Analyze the results of statistical tests for interpretation and discussion of results in the research process	K4
CO-5	Evaluate the results of the research studies for the application of intervention strategies in the field of audiology and speech language pathology	K5

(K1=Remember, K2=Understand, K3=Apply, K4=Analyze, K5=Evaluate)

PO – CO MAPPING

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO-1	H	H	H	H	M	M	M	H	H
CO-2	H	M	H	M	M	-	H	H	H
CO-3	H	M	H	H	-	-	H	M	H
CO-4	H	M	H	L	-	-	H	M	H
CO-5	H	M	H	L	M	M	H	H	H

PSO – CO MAPPING

CO/PSO	PSO1	PSO2	PSO3
CO-1	H	H	H
CO-2	H	M	H
CO-3	H	H	H
CO-4	H	M	H
CO-5	H	M	H

Semester II

Course Title	**Major Core B2.1 Neurology**
Code	**U21AS2MCT05**
Course type	**Theory**
Semester	**II**
Hours/Week	**4**
Credits	**-**
Marks	**100**

CONSPECTUS

Neurology course deals with the basic concepts of neurology related to speech, language, swallowing, hearing and balance; neural deficits associated with various speech, swallowing and hearing disorders; and management options for the same.

COURSE OBJECTIVES

1. To remember and understand basic concepts of neurology
2. To explain cerebral plasticity and dominance
3. To summarize and organize basic principles of neurology
4. To understand various neural diseases
5. To choose general management options for various neural diseases

SYLLABUS

UNIT I- Anatomy and physiology of the nervous system

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

UNIT 2- Neural organization of speech and hearing processes

a) Neuro sensory organization of speech and hearing
b) Central auditory nervous system

c) Anatomy of oral sensation and oral sensory receptors
d) Neuro motor control of speech
e) The pyramidal, extra-pyramidal system, basal ganglia and cerebellar system
f) Lower and upper motor neuron
g) Alpha and gamma motor neurons
h) Sensory and motor examination, oral, peripheral and other reflexes
i) Swallowing mechanism and neural control
j) Screening and bedside neurological examination

UNIT 3- Neural disorders associated with speech and hearing disorders – I

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

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

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

UNIT 5- Speech-language and swallowing disorders

a) Central language mechanism and its disorders
b) Developmental motor speech disorders – cerebral palsy, muscular dystrophy
c) Neurologic disorders with primitive reflexes, diagnosis and management
d) Clinical neurological syndromes associated with speech and language disorders
e) Childhood language disorders associated with neurologic disorders
f) Swallowing associated with neurogenic disorders and assessing mastication and deglutition
g) Agnosia and other conditions associated with speech and hearing disorders
h) Cognitive disorders associated with neurologic disorders
i) General management principles and options for childhood neurogenic speech, language and hearing disorders
j) General management principles and options for adult neurogenic speech, language and

hearing disorders

TEXT BOOKS:

1. Webb, W. G., & Adler, R. K. (2008). Neurology for the speech-language pathologist (5th ed.). St. Louis, Mo: Mosby/Elsevier.
2. Duffy, J. R. (2013). Motor Speech Disorders: Substrates, Differential Diagnosis, and Management (3rd Ed.). University of Michigan, Elsevier Mosby.
3. Bhatnagar, S.C. (2012). Neuroscience for the Study of Communicative Disorders. Lippincott, Williams & Wilkins

SUGGESTED READINGS

1. 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.
2. Adams, R.D. &Sidman, R.L. (1968). Introduction to neuropathology. New Jersey: McGrawHill.

WEB REFERENCES

1.https://www.ncbi.nlm.nih.gov/
2.https://n.neurology.org/
3.http://www.scholarpedia.org/
4.https://www.ncbi.nlm.nih.gov/
5.https://hsl.lib.unc.edu/
6.https://www.asha.org/

COURSE OUTCOMES

CO No.	Course Outcomes	Cognitive Level (K1-K5)
CO-1	Define the basic components of speech, language, communication and terms in audiology	K1
CO-2	Understand the normal development, prerequisites and factors affecting speech language.	K2
CO-3	Apply the different bases and theory of speech, language and acoustic concepts of audiology to perform the assessment.	K3
CO-4	Distinguish speech, language, communication and different psychoacoustic procedures of audiology.	K4
CO-5	Explain the speech production and the concepts, procedures to assess hearing sensitivity and acoustics.	K5

(K1=Remember, K2=Understand, K3=Apply, K4=Analyze)

PO – CO MAPPING

CO	**PO 1**	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO8**	**PO 9**
CO1	H	H	M	M	M	-	M	M	H
CO2	H	H	M	M	M	-	M	H	H
CO3	H	H	H	H	H	-	H	H	H
CO4	H	H	H	H	H	-	H	H	H

PSO – CO MAPPING

CO/PSO	**PSO1**	**PSO2**	**PSO3**
CO-1	H	M	H
CO-2	H	M	H
CO-3	H	H	H
CO-4	H	H	H

Course Title	**MajorCoreB2.2 Otolaryngology**
Code	**U21AS2MCT06**
Course type	**Theory**
Semester	**II**
Hours/Week	**4**
Credits	**-**
Marks	**100**

CONSPECTUS

This course will help students to understand causes, signs, symptoms, pathophysiology and management of diseases of external, middle, inner ear,laryngeal and articulatory systems.

Course Objectives:

1.To explain the anatomy and disorders of external ear and middle ear.
2.To impart knowledge of disordersofinner ear and its surgical management.
3.To understand the anatomy of oral cavity and pharynx and its disorders.
4.To gain knowledge of the anatomy and disorders of larynx and its surgical management.
5.To comprehend the anatomy and disorders of esophagus and its surgical management.

Unit I: External and middle ear and their disorders
12hrs

a) Clinical anatomy of the ear
b) Congenital anamolies
c) Diseases of the external ear
d) Tumors of the external ear
e) Perforation and ruptures of tympanic membrane
f) Eustachian tube dysfunction
g) Otitis media with effusion
h) Cholesteatoma and chronic suppurative otitis media
i) Otosclerosis
j) Trauma to temporal bone
k) Facial nerve and its disorder

Unit II: Inner ear and its disorders 12hrs

a) Congenital anomalies

b) Meniere's Disorder
c) Ototoxicity
d) Presbyacusis
e) Disorders of vestibular system
f) Vestibular Schwannoma
g) Tinnitus and medical line of treatment
h) Pre-surgical medical and radiological evaluations for implantable hearing devices
i) Overview of surgical technique for restoration and preservation of hearing
j) Post-surgical care and complication of surgery for cochlear implants
k) Overview of surgical technique, post-surgical care and complication of surgeries for implantable bone conducted hearing aids and middle ear implant

UNITIII–Oral cavity and its disorders12hrs

a) Anatomy of the oral cavity
b) Common disorders of the oral cavity
c) Tumors of the oral cavity
d) Cleft lip and palate – medical aspects
e) Clinical anatomy and physiology of pharynx
f) Inflammatory conditions of the pharynx, tonsils and adenoids
g) Tumors of the pharynx

UNIT IV – Larynx and its disorders 12hrs
a) Clinical anatomy of larynx
b) Difference between adult and infant larynx
c) Clinical examination of larynx
d) Stroboscopy - technique, procedure, interpretation and precautions
e) Congenital laryngeal pathologies
f) Inflammatory conditions of the larynx
g) Vocal nodule and other disorders of the vocal folds
h) Benign and malignant tumours of the larynx
i) Laryngectomy – overview of surgical procedure
j) Phono surgery and other voice restorationsurgeries

UNITV–Esophagus and its disorders
a) Clinical anatomy and physiology of esophagus
b) Clinical examination of esophagus
c) Congenital anomalies of esophagus
d) Esophageal fistula
e) Inflammatory conditions of esophagus
f) Benign conditions of esophagus
g) Malignant conditions of the esophagus
h) Airway management procedures

TEXT BOOKS

3. 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
4. Dhingra, P. L. (2013). Diseases of Ear, Nose and Throat (Sixth edition). Elsevier.

SUGGESTED READINGS

3. O'Neill, J.P. and Shah, J.P. (2016). Self-assessment in otolaryngology. Amsterdam: Elsevier
4. Postic, W.P., Cotton, R.T., Handler, S.D. (1997). Ear trauma. Surgical Pediatric Otolaryngology. New York: Thieme Medical Publisher Inc.
5. Wackym, A. and Snow, J.B. (2015). Ballenger's otorhinolaryngology head and neck surgery. (18th dition). United States: McGraw-Hill Medical

WEB REFERENCES

1.https://entokey.com/outer-and-middle-ear-disorders/
2.https://www.introduction-to-inner-ear-disorders/
3.https://www.medicinebau.com/uploads/7/9/0/4/79048958/diseases_of_oral_cavity.pdf
4.https://entokey.com/congenital-anomalies-of-the-larynx/
5.https://www.merckmanuals.com/professional/ear,-nose,-and-throat-disorders/laryngeal-disorders/overview-of-laryngeal-disorders
6.https://www.kenhub.com/en/library/anatomy/esophagus
7.https://my.clevelandclinic.org/health/diseases/16976-esophageal-disorders

Note: Learners are advised to use latest edition of books

Course Outcomes:

CO No.	Course Outcomes	Cognitive Level (K1-K5)
CO-1	Define the anatomical terms, anatomical positions, planes, cells, muscles and tissues.	K1
CO-2	Understand the embryological development of different anatomical structures related to speech, language and hearing.	K2
CO-3	Apply the knowledge of anatomy and physiology of structures related to speech and hearing to identify the congenital anomalies and structural abnormalities.	K3
CO-4	Classify, compare and differentiate structural abnormalities based on normal structure and physiological function.	K4
CO-5	Explain the importance of normal anatomical and physiological functions of structures related to speech, swallowing, language and hearing.	K5

(K1=Remember, K2=Understand, K3=Apply, K4=Analyze)

PO – CO MAPPING

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO-1	H	H	H	-	H	-	H	H	H
CO-2	H	H	H	-	H	-	H	H	H
CO-3	H	H	H	-	H	-	H	H	H
CO-4	H	H	H	-	H	-	H	H	H

PSO – CO MAPPING

CO/PSO	PSO1	PSO2	PSO3
CO-1	H	H	H
CO-2	H	H	H
CO-3	H	H	H
CO-4	H	H	H

Course Title	**Major Core B 2.3. Speech Language Pathology**
Code	**U21AS2MCT07**
Course type	**Theory**
Semester	**II**
Hours/Week	**4**
Credits	**-**
Marks	**100**

GENERAL OBJECTIVES:

After completing this course, the student will be able to understand different speech and language disorders, its basic assessment and management

COURSE OBJECTIVES

1. To remember and understand different concepts in speech and language diagnostics
2. To understand and explain basic procedures and approachesin speech and language therapeutics
3. To summarize basic assessment and intervention procedures for speech sound disorders, voice disorders and fluency disorders.
4. To understand basic assessment and intervention procedures for child, adult and neurogenic language disorders
5. To explain and understandthe scope and issues in practice as Speech Language Pathologist.

Unit 1: Basic concepts and methods of diagnostics

a) Introduction to Speech Language Disorders
b) Definition and descriptions of delay, deviancy and disorders; impairment, disability and handicap
c) Incidence and prevalence of speech and language disorders
d) Causes of speech and language disorders
e) Basic principles in assessment, evaluation and appraisal
f) Tools for diagnosis- case history, interview, self-reports, questionnaire & observations
g) Diagnostic models – SLPM, Wepman, Bloom and Lahey
h) 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
i) Characteristics of a diagnostic clinician
j) Organization and basic requirements for clinical set up and team approach
k) DSM, ICD classification and ICF

Unit 2: Basic concepts and methods of therapeutics

a) Basic concepts and terminologies in speech therapeutics
b) General principles of speech and language therapy
c) Speech therapy set-up
d) Individual and group therapy
e) Procedures and types of for speech-language therapy
f) Approaches to speech and language therapy – formal, informal and eclectic approaches
g) Planning for speech and language therapy – goals, steps, procedures and activities
h) Importance of reinforcement principles and strategies in speech and language therapy, types and schedules of rewards and punishment
j) Individual and group therapy AAC and other nonverbal methods of therapy

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

a) Causes of speech disorders
b) Overview of assessment procedures for voice disorders; articulation and phonological disorders; and fluency disorders
c) Overview of management procedures for voice disorders; articulation and phonological disorders; and fluency disorders
d) Early identification and prevention of speech disorders
e) Basic concepts in assessment and management of swallowing disorders

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

a) Types, characteristics and classification of language disorders
b) Causes of language disorders
c) Overview of assessment procedures for child language disorders; adult language disorders; and neurogenic language disorders
d) Overview of management procedures for child language disorders; adult language disorders; and neurogenic language disorders
e) Early identification and prevention of language disorders
f) Issues related to bi- /multilingualism

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

a) Professional code of conduct – social, cultural and other ethical issues
b) Scope of practice –different set ups and prerequisites
c) Documentation of diagnostic, therapeutic and referral reports
d) Counselling, guidance, facilitation of parent participation and transfer of skills
e) Evaluation of therapy outcome and follow up
f) Evidence based practice
g) Community based rehabilitation
h) Role of itinerant speech therapist, Anganwadis, resource teachers etc.
i) PWD act, National Trust, Consumer protection Act, noise pollution Act and other public laws, RCI, ISHA and other organizations controlling the field
j) Facilities and concessions available for speech and hearing disabled

Text Books

- 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.

- Shipley, K. G., & McAfee, J. G. (2004). Assessment in speech-language pathology: A resource manual (3rd ed.). Australia; Clifton Park, NY: Delmar Learning.

Suggested Reading

- 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.
- Ysseldyke, J. E., &Algozzine, R. (2006). Teaching students with communication disorders : A practical guide for every teacher. Thousand Oaks, Calif.: Corwin Press.

Note: Learners are advised to use latest edition of books.

COURSE OUTCOMES

CO No.	Course Outcomes	Cognitive Level (K1-K5)
CO-1	Relate the concept of Individuals normal behavior and abnormal behavior for the clinical population	K1
CO-2	Compare various assessment &therapeutic techniques for psychological disorders	K2
CO-3	Choose appropriate counseling process for atypical developmental individual	K3
CO-4	Inspect the various theories of psychological development.	K4
CO-5	Perceive the developmental stages of human beings and to assess the neuropsychological behavior.	K5

(K1=Remember, K2=Understand, K3=Apply, K4=Analyze)

PO – CO MAPPING

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO-1	H	H	H	-	M	-	H	H	H
CO-2	H	H	H	H	M	-	H	H	H
CO-3	H	H	H	H	M	-	H	H	H
CO-4	H	H	H	H	H	-	H	H	H

PSO – CO MAPPING

CO/PSO	PSO1	PSO2	PSO3
CO-1	H	H	H
CO-2	H	H	H
CO-3	H	H	H
CO-4	H	H	H

Course Title	**Major Core: B 2.4. Audiology**
Code	**U21AS2MCT08**
Course type	**Theory**
Semester	**II**
Hours/Week	**4**
Credits	**-**
Marks	**100**

CONSPECTUS

This course will enable the students to take case history, to carry out the tuning fork tests, pure tone audiometry, and speech audiometry, subjective and objective calibration.

COURSE OBJECTIVES

1. To remember the concept of Frequency, Intensity, Duration.
2. To comprehend the case history and tuning fork tests.
3. To acquire the knowledge of Pure tone Audiometry and its procedures
4. To understand the procedures and application of Speech Audiometry
5. To impart the knowledge of clinical masking and instrumental calibration

UNIT 1: DIFFERENTIAL SENSITIVITY (12HOURS)

a) Concept of differential sensitivity, just noticeable difference
b) Weber's fraction
c) Intensity discrimination
d) Frequency discrimination
e) Duration discrimination and temporal resolution
f) Applications of jnd's
g) Magnitude estimation and production
h) Loudness – equal loudness level contours and its application
i) Loudness scales - sone, phone, Steven's power law
j) Pitch- scales of pitch

UNIT 2: CASE HISTORY AND TUNING FORK TESTS (12HOURS)

a) Need for case history
b) Basics of history taking
c) Essential factors to be included in case history for adults
d) Essential factors to be included in case history for children
e) Interpretation of case history
f) Audiological evaluation – rationale and purpose
g) Principles, procedure, interpretation, advantages and disadvantages of Rinne and Schwabach tuning fork test
h) Principles, procedure, interpretation, advantages and disadvantages of Weber and Bing tuning fork test
i) Audiometric version of Weber and Bing test

UNIT 3: PURE TONE AUDIOMETRY (12HOURS)

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

UNIT 4: SPEECH AUDIOMETRY (12HOURS)

a) Importance and purpose
b) Different types of stimuli used in speech audiometry
c) Concept of phonetically and phonemically balanced
d) Speech detection thresholds – procedure and application
e) Speech reception thresholds – procedures and application
f) Word recognition scores –procedure and applications
g) PIPB function – procedure and applications
h) Factors affecting speech audiometry
i) BC speech audiometry – procedure and its application
j) Test materials available in various languages

UNIT 5: CLINICAL MASKING AND INSTRUMENTAL CALIBRATION (12HOURS)

a) Definition and different terminologies
b) Purpose and rationale of clinical masking
c) Different types of stimulus employed in clinical masking
d) Interaural attenuation and factors affecting interaural attenuation
e) When to mask and how much to mask – importance of adequate noise levels
f) Different procedures for masking
g) Masking for speech audiometry
h) Calibration definition and purpose
i) Daily listening checks and subjective calibration
j) Objective calibration of air conduction transducers
k) Objective calibration of bone conduction transducers
l) Frequency calibration

TEXT BOOKS

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

SUGGESTED READINGS

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

WEB REFERENCES

1. http://apps.usd.edu/coglab/WebersLaw.html
2.https://www.uptodate.com/contents/image?imageKey=PC%2F58032&topicKey=PC%2F15359&source=see_link
3. https://www.sciencedirect.com/topics/medicine-and-dentistry/pure-tone-audiometry
4. https://www.entltd.com/throat-speech/speech-swallowing/speech audiometry/#:~:text=What%20Is%20Speech%20Audiometry%3F,speech%20discrimination%20(SD)%20abilities.
5. https://www.ishaindia.org.in/pdf/Guidelines-Standard-Audiometric-Screening-Procedures.PDF

Note: Learners are advised to use latest edition of books.

COURSE OUTCOMES

CO No.	Course Outcomes	Cognitive Level (K1-K5)
CO-1	Remember the concept of differential sensitivity, pure tone audiometry, and speech audiometry.	K1
CO-2	Understand the procedures of pure tone audiometry, speech audiometry, masking and calibration.	K2
CO-3	Apply the knowledge of tuning fork tests, PTA, speech audiometry, masking to indentify hearing disorders.	K3
CO-4	Compare and Contrast the different procedures of hearing tests.	K4
CO-5	Explain the importance of daily listening check and calibration.	K5

(K1=Remember, K2=Understand, K3=Apply, K4=Analyze)

PO – CO MAPPING

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO-1	H	H	H	H	H	-	H	H	H
CO-2	H	H	H	H	H	-	H	H	H
CO-3	H	H	H	H	H	-	H	H	H
CO-4	H	H	H	H	H	-	H	H	H

PSO – CO MAPPING

CO/PSO	PSO1	PSO2	PSO3
CO-1	H	H	H
CO-2	H	H	H
CO-3	H	H	H
CO-4	H	H	H

Course Title	**Optional :**Computer Fundamentals
Total Hours	**62 Hrs**
Hours/Week	**4 Hrs/Wk**
Code	**U21AS2MCT37**
Course Type	**Theory**
Credits	**4**
Marks	**100 (80+20 marks)**

CONSPECTUS

To understand the fundamental concepts of computer and to develop technical skills using MS-WORD, MS- EXCEL and MS-POWERPOINT

COURSE OBJECTIVES

1. To understand the general features and generations of a computer and Applications of computer in various fields
2. To understand Computer Organization, Secondary storage devices and I/O devices
3. To understand Computer hardware and software, Languages, Operating Systems, Database Systems and Number Systems
4. To acquire the skills in MS-WORD, MS- EXCEL and MS-POWERPOINT and apply the skills in the fields of Audiology
5. To understand the basic concepts of networks and Analyze the areas in the field of Audiology where it can be applied - Case studies related to the field of Audiology (Networking of speech and hearing clinic, networking for tele-rehabilitation).

Unit 1: **(8 hrs)**

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

Unit 2: **(10 hrs)**

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

Unit 3:

(12 hrs) Computer hardware and software. Machine language and high level

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

Unit 4: **(10 hrs)**

Word processing and electronic spread sheet. An overview of MS-WORD, MS-EXCEL and MS-POWERPOINT (image, file formats, audio and video file formats, print file formats). Elements of Basic programming. Simple Illustrations.

Unit 5: **(10 hrs)**

Network of computers. Types of networks, LAN, Intranet and Internet, Internet Applications. World wide web, e-mail, browsing and searching. Search engines, Multimedia applications. Case study : Networking of speech and hearing clinic, networking for tele-rehabilitation.

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

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

Simple MS-DOS commands – One session

Windows operating system - icons, menus and sub menus, my computer - sharing of files and folders – two sessions

Desktop publishing – preparation of a document using MS.WORD - Two sessions

Installation of a software ,virus scanning – illustration. One session. Spreadsheet calculation using MS EXCEL .One session.

BASIC programming – illustrations – One session.

Internet use. Surfing, browsing ,search engines ,E-mail. Two sessions

COURSE OUTCOMES

At the end of this course, Students will be able to

CO No.	Course Outcomes	Cognitive Level (K1-K4)
CO 1	Discuss General features of a computer, Generation of computers and the applications of computer in various fields.	K1
CO 2	Explain Computer Organization, Secondary storage devices and I/O devices, Select the appropriate I/O device and Storage device for the given situation, Differentiate hardware from software, High Level Language from LLL	K2
CO 3	Develop an Algorithm and Flowchart for any given problem	K3
CO 4	Apply the skills developed in MS-WORD, MS- EXCEL and MS-POWERPOINT to the field of Audiology	K4

TEXT BOOKS

SUGGESTED READINGS

1. Alexis Leon and Mathews Leon (2000): Fundamentals of Information technology, Leon Techworld Pub.
   Alexis Leon and Mathews Leon (2009): Fundamentals of Information technology, II Edition, Vikas Pub.
2. Jain, S.K.(1999):Information Technology "O" level made simple. BPB Pub.
3. Jain, V.K.(2000): "O" Level Personal Computer software. BPB Pub.
4. Rajaraman, V(2014): Fundamental of Computers, 6th Edition, Prentice Hall India.
5. Hamacher, Computer Organization. McGrawhill.
6. Alexis Leon: Computers for everyone. Vikas, UBS.
7. Anil Madaan: Illustrated Computer Encyclopedia. Dreamland Pub.
8. Sinha. Computer Fundamentals. 4th Edition, BPB Pub.(2004)

MAPPING

CO – PO

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO1	M	M	M	M	M	M	M	M	M
CO2	M	M	M	M	M	M	M	M	M
CO3	M	M	M	M	M	M	M	M	M
CO4	H	H	H	H	H	H	H	H	H
CO5	H	H	H	H	H	H	H	H	H

CO – PSO

CO/PSO	PSO1	PSO2	PSO3
CO1	M	H	M
CO2	M	H	M
CO3	M	H	M
CO4	H	H	H
CO5	H	H	H

2.5 Practicals (Speech-language Pathology)

Code: U21AS2MCP09

Marks -100

Practicals

a) 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.
b) 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.
c) 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.
d) Use IPA to transcribe spoken words.
e) Record a standard passage, count number of syllables and words, identify syllable structure, syntactic structures in the passage.
f) Oral mechanism examination on 5 normal children and 5 normal adults.
g) Prepare a chart and show the developmental stages of speech and language behavior.
h) Administer standardized tests for assessment of delayed speech and language development such as REEL, SECS, LAT, 3DLAT, ALD each on any 2 children.
i) Study the available normative data (Indian/Western) of speech such as respiratory, phonatory, resonatory and articulatory parameters.
j) 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.
k) Study the available normative data (Indian/Western) of language such as phonology, semantics, syntax, morphology and pragmatic measures.
l) Perceptual analysis of speech and language parameters in normal (2 children and 2 adults and persons with speech disorders (3 adults + 3 children).
m) Prepare a model diagnostic report of a patient with speech and language disorder.
n) Prepare a diagnostic and therapy kit.
o) Make a list of speech language stimulation techniques and other therapy techniques for various speech disorders.
p) Familiarize with the sources for referral and parent counseling procedures.
q) 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.
r) Prepare a report on the available clinical facilities and clinical activities of the institute.

Clinical Practicum

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

language disorders in adults.

c) Take case history of a minimum of 10 individuals (5 normal & 5 clients with complaints of speech-language problems).
d) Observation of diagnostic procedures.
e) Observe various therapeutic methods carried out with children and adults with speech and language disorders.

B2.6 Practicals (Audiology)

Code: U21AS2MCP10

Marks -100

Practicals

Calculate/derive the answers for following

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

Perform the following experiments

a) Calculate reference equivalent sound pressure levels (RETSPL) for head phones and bone vibrator for any two frequencies using 30 participants.
b) Measure most comfortable level on 10 participants with normal hearing sensitivity.
c) Measure uncomfortable levels on 10 participants with normal hearing sensitivity.
d) Calculate the sensation levels of MCL and UCLs in above 10 participants.
e) Measure difference limen of intensity, frequency and duration on 10 normal hearing adults and plot it in graphical form and interpret the results.
f) Measure equal loudness level contours at minimum level, 40 dB SPL, 70 dB SPL (1 kHz) in 5 normal hearing adults.
g) Measure sone and mel in 5 normal hearing adults using scaling techniques.
h) 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.
i) Administer different tuning fork tests on 5 simulated conductive and 5 sensori neural hearing loss individuals.
j) Carry out pure tone and speech audiometry on 10 normal hearing individuals.
k) 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.
l) Carryout daily listening checks and subjective calibrations 20 times and observe objective calibration once
m) Perform otoscopy and draw the tympanic membrane of 10 healthy normal individuals
n) Measure difference limen of intensity, frequency and duration on 10 normal hearing adults and plot it in graphical form and interpret the results
o) Measure equal loudness level contours at minimum level, 40 dB SPL, 70 dB SPL (1 kHz) in 5 normal hearing adults
p) Measure sone and mel in 5 normal hearing adults using scaling techniques
q) 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
r) Administer different tuning fork tests on 5 simulated conductive and 5 sensori neural hearing loss individuals
s) Carry out pure tone and speech audiometry on 10 normal hearing individuals

t) arry 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

u) Carryout daily listening checks and subjective calibration 20 times and observe objective calibration once

Clinical Practicum

a) 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.

b) Administer different tuning fork tests on 5 conductive and 5 sensori neural hearing loss individuals.

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

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

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

Course Title	**Major Core B3.1 Voice and its Disorders**
Code	**U21AS3MCT11**
Course type	**Theory**
Semester	**III**
Hours/Week	**4**
Credits	**-**
Marks	**100**

CONSPECTUS

This course will enable the students to understand the basic characteristics, assessment and management of voice disorders.

COURSE OBJECTIVES

1. To remember the laryngeal anatomy, development and parameters of voice.
2. To comprehend the etiology and pathophysiology of different voice disorders.
3. To gain knowledge of the assessment of voice disorders.
4. To understand the different approaches used in management.
5. To impart the knowledge of intervention strategies and counseling for voice disorders.

UNIT 1: BASIC CONCEPTS IN VOICE AND ITS PRODUCTION (12HOURS)

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

UNIT 2: CHARACTERISTICS AND PATHOPHYSIOLOGY OF VOICE DISORDERS (12HOURS)

a) Pathologies of the laryngeal mechanism: classification of voice disorders, incidence, and prevalence
b) Etiology of voice disorders: voice misuse and abuse, medical related etiologies, primary disorder etiologies and personality related etiologies
c) Pathologies of vocal fold cover (infective and trauma related secondary conditions) and muscular dysfunction

d) Non-organic voice disorders: functional disorders, psychosomatic- functional aphonia and physiological- voice abuse, puberphonia)
e) Congenital voice disorders
f) Neurological voice disorders
g) Voice problems in systemic illnesses and endocrine disorders
h) Voice problems in transgenders
i) Voice problems in the elderly
j) Voice problems in professional voice users: teachers and singers

UNIT 3: ASSESSMENT OF VOICE (12HOURS)

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

UNIT 4: MANAGEMENT OF VOICE (12HOURS)

a) Voice therapy orientation: basic principles, goal setting and approaches
b) Vocal hygiene and preventive counselling
c) Symptomatic voice therapy – voice facilitation techniques
d) Psychological approaches to voice therapy – psychoanalysis, rational emotive therapy and cognitive behavior therapy
e) Physiological approach – breathing and postural techniques
f) Holistic voice therapy approaches -1: accent therapy, confidential voice therapy,
g) Holistic voice therapy approaches - 2: vocal function exercises, resonant voice therapy, Lee Silverman voice therapy
h) 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
i) Professional voice care

UNIT 5: INTERVENTION STRATEGIES FOR VOICE DISORDERS (12HOURS)

a Vocal trauma related disorders
b Functional voice disorders – inappropriate vocal components
c Functional aphonia
d Puberphonia/mutational falsetto
e Muscle tension dysphonia
f Sulcus vocalis
g Vocal fold palsy

h Spasmodic dysphonia
i GERD/LPR
j Benign vocal fold lesions requiring surgical intervention
k Post-operative care for benign vocal fold lesions disorders
l Documenting voice therapy outcomes

TEXT BOOKS

a) Stemple, J. C., Glaze, L. E., &Gerdeman, B, K. (2014). Clinical voice pathology: Theory & Management (5th Ed.). San Diego: Plural publishers.
b) Aronson, A.E. & Bless, D. M. (2009). Clinical Voice Disorders.(4th Ed.). New York: Thieme, Inc.
c) 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.
d) 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.

SUGGESTED READINGS

a) Andrews, M. L. (2006). Manual of Voice treatment: Pediatrics to geriatrics (3rd Ed.). Thomson Delmar Learning.
b) Colton, R. H, Casper, J. K. & Leonard, R. (2006). Understanding voice problems. Baltimore: Williams & Wilkins.
c) Sapienza, C. M., & Ruddy, B H. (2013). Voice Disorders.(2nd Ed.). San Diego: Plural Publisher.
d) 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.

WEB REFERENCES

1. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5412481/
2. https://www.asha.org/practice-portal/clinical-topics/voice-disorders/
3. https://www.pluralpublishing.com/application/files/8815/4716/7805/media_cav2e_SamplePages.pdf
4. https://www.ijhns.com/doi/pdf/10.5005/jp-journals-10001-1518
5. https://pubmed.ncbi.nlm.nih.gov/17943906/

Note: Learners are advised to use latest edition of books.

COURSE OUTCOMES

CO No.	Course Outcomes	Cognitive Level (K1-K5)
CO-1	Remember the basic concepts of voice production.	K1
CO-2	Understand the etiology, characteristics and pathophysiology of congenital and acquired voice disorders.	K2
CO-3	Apply the knowledge of perceptual, acoustic, aerodynamic evaluation to identify the different voice disorders.	K3
CO-4	Compare and Contrast the voice disorders and make inferences about different management approaches.	K4
CO-5	Evaluate the voice characteristics of individuals with different pathologies	K5

(K1=Remember, K2=Understand, K3=Apply, K4=Analyze, K5=Evaluate)

PO – CO MAPPING

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO-1	H	H	H	H	H	-	H	H	H
CO-2	H	H	H	H	H	-	H	H	H
CO-3	H	H	H	H	H	-	H	H	H
CO-4	H	H	H	H	H	-	H	H	H
CO-5	H	H	H	-	-	-	H	H	H

PSO – CO MAPPING

CO/PSO	PSO1	PSO2	PSO3
CO-1	H	H	H
CO-2	H	H	H
CO-3	H	H	H
CO-4	H	H	H
CO-5	H	H	H

Course Title	**Major CoreB3.2 Speech Sound Disorders**
Code	**U21AS3MCT12**
Course type	**Theory**
Semester	**III**
Hours/Week	**4**
Credits	**-**
Marks	**100**

CONSPECTUS

This course will help students to understand the normal speech sound development, characteristics of speech sound disorder, assessment and management of speech sound disorder.

Course Objectives:

1.To explain the fundamentals of articulatory phonetics and speech sounds acquisition.
2.To impart knowledge of classification and assessment of speech sound disorders.
3.To understand the independent and relational analysis of speech sound disorders.
4.To gain knowledge of motor based treatment approaches.
5.To comprehend the linguistically-based treatment approaches.

Unit 1: **Speech sound acquisition and development** **12hrs**

a) Fundamentals of articulatory phonetics - phonetic description of vowels & consonants.
b) Phonology & phonological theories – generative phonology, natural phonology.
c) Phonology & phonological theories – non-linear phonology, optimality theory.
d) Methods to study speech sound acquisition – diary studies, cross sectional studies and longitudinal studies.
e) Speech sound acquisition
i. birth to one year (development of infant speech perception, early speech production).
ii. one to two years (consonant inventories, influence of phonological knowledge on vocabulary acquisition).
iii. two to five years (growth of phonetic, phonemic, phonotactic inventory – consonants, clusters, phonological patterns).
iv. above five years (speech sound mastery and development of literacy – phonological awareness).
v. Factors influencing speech sound acquisition

f) Acoustics of speech sounds
g) Speech intelligibility, factors affecting speech intelligibility, assessment of speech intelligibility
h) Co articulation: types and effects
i) Phonological development in bilingual children.
j) Phonological development in Indian languages.

Unit 2: Assessment of speech sound disorders- I12hrs

a) Current concepts in terminology and classification of speech sound disorders

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

ii. Speech sound disorders of unknown origin, classification by symptomatology.

b) Factors related to speech sound disorders

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

ii. cognitive – linguistic, psychosocial and social factors.

iii. metalinguistic factors related to speech sound disorders.

c) Introduction to assessment procedures: aims of assessment, screening and comprehensive assessment. d) Speech sound sampling procedures - issues related to single word and connected speech samples; imitation and spontaneous speech samples, contextual testing, recording of speech samples.

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

f) Influence of language and dialectal variations in assessment.

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

Unit 3: Assessment of speech sound disorders - II 12hrs

a) Introduction to independent and relational analysis.
b) 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).
c) Relational analyses – SODA, pattern analysis, (distinctive features, phonological process analysis).
d) Phonological processes analyses - language specific issues, identification and classification of errors.
e) Assessment of oral peripheral mechanism.
f) Speech sound discrimination assessment, phonological contrast testing.
g) Stimulability testing.
h) Determining the need for intervention – speech intelligibility and speech severity assessment.

i) Factors influencing target selection – stimulability, frequency of occurrence, developmental appropriateness, contextual testing, and phonological process analysis.
j) Case study – Documenting the assessment findings and determining the need for intervention.

Unit 4: Management – I **12hrs**

a) Basic considerations in therapy – target selection, basic framework for therapy, goal attack strategies, organizing therapy sessions, individual vs. group therapy.
b) Treatment continuum – establishment, generalization and maintenance; measuring clinical change.
c) Facilitation of generalization.
d) Maintenance and termination from therapy.
e) Motor-based treatment approaches – Principles of motor learning.
f) Discrimination/ear training and sound contrast training.
g) Establishing production of target sound – imitation, phonetic placement, successive pproximation, context utilization.
h) Traditional approach, contextual/sensory-motor approaches.
i) General guidelines for motor-based treatment approaches.
j) Use of technology in articulation correction.

Unit 5: Management – II **12hrs**

a) Core vocabulary approach.
b) Introduction to linguistically-based treatment approaches- Distinctive feature therapy.
c) Minimal pair contrasts therapy.
d) Metaphon therapy, Cycles approach.
e) Broad-based language approaches.
f) General guidelines for linguistically-based approaches.
g) Phonological awareness and phonological disorders.
h) Phonological awareness intervention for preschool children.
i) Adapting intervention approaches to individuals from culturally and linguistically diverse backgrounds.
j) Role of family in intervention for speech sound disorders.

TEXT BOOKS

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

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

3. Rout, N (Ed)., Gayathri, P., Keshree, N and Chowdhury, K (2015). Phonics and Phonological Processing to Develop Literacy and Articulation; A Novel Protocol. Apublication by NIEPMED, Chennai. Freely downloadable from http://niepmd.tn.nic.in/publication.php. ISBN 978-81-928032-9-5

SUGGESTED READINGS

1.Vasanta, D. (2014). Clinical applications of phonetics and phonology. ISHA Monograph.Vol 14, No. 1.Indian Speech & Hearing Association.
2.Velleman, S. L (2003). Resource guide for Childhood Apraxia of Speech.Delmar/Thomson Learning.
3.Williams, A., McLeod, S., & McCauley, R. (2010). Interventions for speech sound disorders in children. Baltimore: Brookes.

WEB REFERENCES

1. https://en.wikipedia.org/wiki/International_Phonetic_Alphabe
2. https://www.asha.org/practice-portal/clinical-topics/articulation-and-phonology/#
3. https://www.verywellmind.com/speech-sound-disorder-types-causes-treatment-5220400
4. https://pubmed.ncbi.nlm.nih.gov/33718569/
5. https://www.asha.org/public/speech/disorders/speech-sound-disorders/

Note: Learners are advised to use latest edition of book

Course Outcomes:

CO No.	Course Outcomes	Cognitive Level (K1-K5)
CO-1	Remember the fundamentals of phonetics, phonological theories, speech sound acquisition of speech and acoustics of speech.	K1
CO-2	Understand the classification of speech sound disorders and speech sound sampling procedures.	K2
CO-3	Apply the knowledge of different theories to assess the	K3
CO-4	Compare, analyze and make inferences about different treatment approaches for speech sound disorders.	K4
CO-5	Evaluate and plan intervention strategies for individuals with speech sound disorder	K5

(K1=Remember, K2=Understand, K3=Apply, K4=Analyze, K5= Evaluate)

PO – CO MAPPING

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO-1	H	H	H	-	H	-	H	H	H
CO-2	H	H	H	-	H	-	H	H	H
CO-3	H	H	H	-	H	-	H	H	H
CO-4	H	H	H	-	H	-	H	H	H
CO-5	H	H	H	-	-	-	H	H	H

PSO – CO MAPPING

CO/PSO	PSO1	PSO2	PSO3
CO-1	H	H	H
CO-2	H	H	H
CO-3	H	H	H
CO-4	H	H	H
CO-5	H	H	H

Course Title	**Major CoreB3.3 Diagnostic Audiology: Behavioural Tests**
Code	**U21AS3MCT13**
Course type	**Theory**
Semester	**III**
Hours/Week	**4**
Credits	**-**
Marks	**100**

CONSPECTUS

This course deals with the choosing of individualized test battery for assessing various hearing and balance related disorders; and to improve sensitivity and specificity of tests for making appropriate diagnosis and referrals based on the test results.

COURSE OBJECTIVES

6. To remember and understand basic concepts of diagnostic audiology
7. To explain clinical indicators of hearing and balance related disorders
8. To summarize the tests to diagnose functional hearing loss
9. To understand various auditory processing abilities
10. To choose test battery for assessing vestibular, tinnitus andhyperacusis

Unit 1- Introduction to diagnostic audiology

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

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

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

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

e) Theories and physiological bases of recruitment

f) Theories and physiological bases of adaptation

g) 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

a)ABLB, MLB and SISI tests

b)Behavioural tests of adaptation

c)Bekesy audiometry

d)Brief tone audiometry

e)PIPB function

f) Glycerol test

g)Test to identify dead regions of cochlea

UNIT 3- Tests to diagnose functional hearing loss

a)Behavioural and clinical indicators of functional hearing loss
b)Pure tone tests including tone in noise test, Stenger test, BADGE, puretone DAF
c)Speech tests including Lombard test, Stenger test, lip-reading test, Doerfler-Stewert test, Low level PB word test, Yes-No test, DAF test
d)Identification of functional hearing loss in children: Swinging story test, Pulse tone methods

UNIT 4: Assessment of central auditory processing

a)Definition, different behavioral processes

b)Behavioral and clinical indicators of central auditory processing disorders

c)Bottle neck and subtlety principles and their implications in tests to detect central auditory processing disorders

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

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

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

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

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

i)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

a)Introduction to structure and function of vestibular system
b)Vestibular ocular reflex and vestibulo spinal reflex
c)Overview on other systems involved in balance
d)Signs and Symptoms of vestibular disorders
e)Team in the assessment and management of vestibular disorders
f)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
g)Overview of tinnitus and hyperacusis and tests for assessment
h)Pitch matching, loudness matching, residual inhibition, Feldman masking curves
i)Johnson Hyperacusis Dynamic Range Quotient

TEXT BOOKS:

4. Gelfand, S. A. (2009). Essentials of Audiology. Thieme
5. Hall, J. W., & Mueller, H. G. (1996). Audiologists' Desk Reference: Diagnostic audiology principles, procedures, and protocols. Cengage Learning.
6. Jerger, J. (1993). Clinical Audiology: The Jerger Perspective. Singular Publishing Group.
7. 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

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3. Martin, F. N., & Clark, J. G. (2014). Introduction to Audiology (12 edition). Boston: Pearson.
4. Roeser, R. J., Valente, M., & Hosford-Dunn, H. (2007). Audiology: Diagnosis. Thieme.
5. Stach, B. A. (2010). Clinical audiology: an introduction (2nd ed). Clifton Park, NY: Delmar Cengage Learning.

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1.https://www.researchgate.net/publication/330710343_Diagnostic_audiology_pocket_guide
2. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6127066/
3.https://www.sciencedirect.com/topics/medicine-and-dentistry/functional-hearing-loss
4.https://www.asha.org/practice-portal/clinical-topics/central-auditory-processing-disorder/
5. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6468277/
6. https://vestibular.org/article/diagnosis-treatment/diagnosis/
7. https://www.asha.org/practice-portal/clinical-topics/tinnitus-and-hyperacusis/

Note: Learners are advised to use latest edition of books

COURSE OUTCOMES

CO No.	**Course Outcomes**	**Cognitive Level (K1-K5)**
CO-1	Define the basic concepts of diagnostic audiology and recall clinical indicators of various hearing and balance disorders	K1
CO-2	Explain the tests to diagnose cochlear, Retro cochlear pathology functional hearing loss, tinnitus and hyperacusis	K2
CO-3	Apply the concept of diagnostic audiology to identify the deficits associated with auditory processing, and vestibular system.	K3
CO-4	Compare and contrast the characteristics of different behavioral tests to assess vestibular functioning and draw a conclusion on appropriate diagnosis and referrals	K4
CO -5	Evaluate and make appropriate diagnosis on clients with various pathologies	K5

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(K1=Remember, K2=Understand, K3=Apply, K4=Analyze, K5 = Evaluate)

PO – CO MAPPING

CO	**PO 1**	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO8**	**PO 9**
CO1	H	H	M	-	M	-	M	M	H
CO2	H	H	M	-	M	-	M	H	H
CO3	H	H	H	-	H	-	H	H	H
CO4	H	H	H	-	H	-	H	H	H
CO5	M	M	H	-	-	-	H	H	H

PSO – CO MAPPING

CO/PSO	**PSO1**	**PSO2**	**PSO3**
CO-1	H	H	H
CO-2	H	H	H
CO-3	H	H	H
CO-4	H	H	H
CO-5	H	H	H

Course Title	**Major Core B.3.4 Amplification Devices**
Code	**U21AS3MCT14**
Course type	**Theory**
Semester	**III**
Hours/Week	**4**
Credits	**-**
Marks	**100**

CONSPECTUS

This course will help students to understand the hearing aid candidacy, selection of hearing aids, subjective and objective assessment to assess the hearing aid benefits, programming of digital hearing aids, ear molds and counselling.

Course Objectives:

1.To explain the basic elements and types of hearing aids.
2.To impart knowledge of signal enhancing technology of hearing aids.
3.To understand the electro acoustic characteristics measurements of hearing aids.
4.To gain knowledge of hearing aid programming and different methods for assessing the hearing aid benefits.
5.To comprehend the types and special modifications of ear molds.

Unit 1: Types of hearing aids **12hrs**

a) Historical development of hearing aids: development of concept of amplification, development of different types of amplification devices
b) Review of basic elements of hearing aids: Microphone, Amplifier, Receiver/vibrator, Cords, Batteries.
c) 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
d) Group amplification – hard wired, induction loop, FM, infrared
e) Assistive listening devices – types and selection (Telephones, Television, typing technology)

Unit 2: Technological aspects in hearing aids **12hrs**

a) Routing of signals, head shadow/baffle/diffraction effects

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

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

d) Signal processing in hearing aids – BILL, TILL, PILL

e) Signal enhancing technology

f) Noise reduction algorithms

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

h) Recent advances in hearing aids

Unit 3: Electro-acoustic measurements for hearing aids **12hrs**

a) 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

b) Electro-acoustic measurements, BIS, IEC and ANSI standards

c) Environmental tests.

d) Care, maintenance and troubleshooting of hearing aids

e) Counselling and orienting the hearing aid user (Client and significant others)

Unit 4: Selection of hearing aids **12hrs**

a) 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

b) Hearing aid programming

c) Methods for assessing hearing aid benefit

d) Real ear insertion measurements for verification of hearing aid benefit: REIG, REUR, REAR, REOR, RESR, REIG, REAG, RECD

e) Acoustic feedback in hearing aids

Unit 5: Mechano-acoustic couplers (Ear molds) **12hrs**

a) Different types of molds

b) Procedure for hard molds and soft mold

c) UV curing methods

d) Special modifications in the ear molds: Vents (diagonal and parallel), deep canal molds, short canal, horns, Libby horn, reverse horn, acoustic modifier

e) Effects of mechano-acoustic couplers on the hearing aid output

TEXT BOOKS

1. Dillon. (2012). Hearing Aids (2 edition). Thieme Medical and Scientific Publisher.
2. Hall, J. W., & Mueller, H. G. (1998). Audiologists' Desk Reference: Audiologic management, rehabilitation, and terminology. Singular Publishing Group.
3. Kates, J. M. (2008). Digital Hearing Aids (1 edition). San Diego: Plural Publishing Inc.
4. Metz, M. J. (2014). Sandlin's Textbook of Hearing Aid Amplification: Technical and Clinical Considerations. Plural Publishing.
5. Mueller, H. G., Hawkins, D. B., & Northern, J. L. (1992). Probe Microphone Measurements: Hearing Aid Selection and Assessment. Singular Publishing Group.

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1. Mueller, H. G., Ricketts, T. A., &Bentler, R. A. (2007). Modern Hearing Aids: Prefitting Testing and Selection Considerations: 1 (1 edition). San Diego, CA: Plural Publishing Inc.
2. Sandlin, R. E. (Ed.). (1989). Handbook of Hearing Aid Amplification: Clinical Considerations and Fitting Practices v. 2. Boston: Singular Publishing Group.
3. Sandlin, R. E. (Ed.). (1993). Understanding Digitally Programmable Hearing AIDS. Boston: Allyn & Bacon.
4. Tate, M. (2013). Principles of Hearing Aid Audiology. Springer.
5. Taylor, B., & Mueller, H. G. (2011). Fitting and Dispensing Hearing Aids (1 edition). San Diego: Plural Publishing Inc.
6. Valente, M. (2002). Hearing Aids: Standards, Options, and Limitations. Thieme.

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1. https://www.asha.org/practice-portal/professional-issues/hearing-aids-for-children/#:~:text=Hearing%20aids%20are%20considered%20medical%20devices%
2. https://www.fda.gov/medical-devices/hearing-aids/types-hearing-aids
3. https://www.nidcd.nih.gov/health/hearing-aids
4. https://www.researchgate.net/publication/224739629_Digital_signal_processing_technology_and_applications_in_hearing_aids
5. https://www.slideshare.net/ghulamsaqulain/lecture-5-description-of-electro-acoustic-characteristics-of-hearing-instruments-and-techniques-for-clinical-fitting

Note: Learners are advised to use latest edition of books

Course Outcomes:

CO No.	Course Outcomes	Cognitive Level (K1-K5)
CO-1	Remember the basic elements of hearing aids.	K1
CO-2	Understand the types of hearing aids, signal processing in hearing aids, and signal enhancing technologies of hearing aids.	K2
CO-3	Apply the knowledge of electro acoustic characteristics, functional gain and insertion gain to assess the hearing aids and its benefits.	K3
CO-4	Compare, analyze the selection factors, prescriptive and comparative procedures and make inferences about selection of hearing aids, ear molds and programming of hearing aids.	K4
CO – 5	Evaluate listening needs and benefit of hearing aids with appropriate subjective and objective tests	K5

(K1=Remember, K2=Understand, K3=Apply, K4=Analyze, K5 = Evaluate)

PO – CO MAPPING

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO-1	H	H	H	-	H	-	H	H	H
CO-2	H	H	H	-	H	-	H	H	H
CO-3	H	H	H	-	H	-	H	H	H
CO-4	H	H	H	-	H	-	H	H	H
CO-5	H	H	H	-	-	-	H	H	H

PSO – CO MAPPING

CO/PSO	PSO1	PSO2	PSO3
CO-1	M	H	H
CO-2	M	H	H
CO-3	M	H	H
CO-4	M	H	H
CO-5	H	H	H

Course Title	**Optional Paper Indian Constitution**
Code	**U21AS3MCT38**
Course type	**Theory**
Semester	**III**
Hours/Week	**4**
Credits	**-**
Marks	**100**

CONSPECTUS

This course will enable the students to understand the salient features of Indian Constitution and the working of Legislature, Executive and Judiciary in India.

COURSE OBJECTIVES

1. To identify the important features of Indian constitution.
2. To understand the law making process of Union and State Legislature.
3. To know the functions and powers of State and Union Executive.
4. To evaluate the importance of Supreme Court of India, writs and judicial review.
5. To impart the knowledge on issues related to human rights, reservation, federalism and secularism in India.

UNIT 1: INDIAN CONSTITUTION: ITS PHILOSOPHY AND FRAMING (12 HOURS)

a) The constituent Assembly
b) Preamble, Fundamental Rights and Fundamental Duties
c) Directive Principles of State Policy
d) Amendment and Review of the Constitution

UNIT2:THEUNION&STATELEGISLATURE (12 HOURS)

a) Union Parliament
b) State Legislature
c) Law-making process
d) Committee System

UNIT3:THEUNION&STATEEXECUTIVE (12 HOURS)

a) The President of India
b) The Prime minister and Council of Ministers
c) The State Governor, Chief Minister and Council of Ministers
d) Coalition Government

UNIT4:THEJUDICIARY **(12 HOURS)**

a) The Supreme Court of India
b) Judicial Review
c) Writs
d) JudicialActivismandPublicInterestLitigation

UNIT 5: ISSUES **(12 HOURS)**

a) Indian Federalism
b) Human Rights and Environmental Protection
c) ReservationandSocialJustice
d) Secularism

TEXT BOOKS

a) Basu, D.D, (1960). Introduction to the Constitution of India (23rd Ed.). LexisNexis.
b) Austin Granville, (1966).India'sConstitution:CornerstoneofaNation (4th Ed.). OUP India.
c) Laxmikanth. M (2019). Indian Polity (6th Ed.). McGraw Hill.

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a) GranvilleAustin, (2003). WorkingaDemocratic Constitution: A History of The Indian Experience , Oxford University Press.
b) Johari, J. C. (2012). Indian Government and Politics Vol. 1 & 2 (13th Ed.). Shoban Lal & Co.
c) Siwach, J.R.(1990). Dynamics of Indian Government & Politics. Sterling Publishers, New Delhi.
d) Gupta, D.C. (1988). Indian Government & Politics (3rd Ed.).Vikas Publishing House Pvt Ltd.
e) Pylee, M.V. (2004) Constitutional Government in India, S Chand.

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1. **http://www.lawtycoon.com/salient-feature-of-indian-constitution.html**
2. **https://parliamentofindia.nic.in/**
3. **https://legislativebodiesinindia.nic.in/parliament%20of%20india.htm**
4. **https://main.sci.gov.in/**
5. **https://nhrc.nic.in/**
6. **https://knowindia.india.gov.in/profile/the-union/executive**

Note: Learners are advised to use latest edition of books.

COURSE OUTCOMES

CO No.	Course Outcomes	Cognitive Level (K1- K5)
CO-1	Remember the salient features of Indian constitution and the importance of safeguarding its supremacy.	K1
CO-2	Understand the working of legislature, executive and judiciary in central and state governments.	K2
CO-3	Examine the significance of judicial review and public interest litigation in present India.	K3
CO-4	Analyse the issues related to human rights and reservation policies	K4
CO-5	Critically evaluate the functioning of federalism and secularism in India.	K5

(K1=Remember, K2=Understand, K3=Apply, K4=Analyze, K5=Evaluate)

PO – CO MAPPING

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO-1	H	H	H	H	M	M	H	M	H
CO-2	H	H	H	H	H	M	H	M	M
CO-3	H	H	H	H	H	H	H	H	M
CO-4	H	H	H	H	H	H	H	H	H
CO-5	H	H	M	H	M	M	H	M	M

PSO – CO MAPPING

CO/PSO	PSO1	PSO2	PSO3
CO-1	L	H	H
CO-2	M	H	H
CO-3	M	H	H
CO-4	H	H	H
CO-5	M	H	H

B3.5 Clinicals in Speech Language Pathology
Code: U21AS3MCP15

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:

1. 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.
2. Methods to examine the structures of the oral cavity/organs of speech.
3. The tools to assess language abilities in children (with hearing impairment, specific language impairment & mixed receptive language disorder).
4. Development of speech sounds in vernacular and linguistic nuances of the language.

Know-how:

1. To evaluate speech and language components using informal assessment methods.
2. To administer at least two standard tests for childhood language disorders.
3. To administer at least two standard tests of articulation/ speech sounds.
4. To assess speech intelligibility.

Show:

1. Analysis of language components – Form, content & use – minimum of 2 samples.
2. Analysis of speech sounds at different linguistic levels including phonological processes – minimum of 2 samples.
3. Transcription of speech language samples – minimum of 2 samples.
4. Analyse differences in dialects of the local language.

Do:

1. Case history - minimum of 5 individuals with speech & language disorders.
2. Oral peripheral examination - minimum of 5 individuals.
3. Language evaluation report – minimum of 5.
4. 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
Code: U21AS3MCP16

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:

1. Methods to calibrate audiometer.
2. Materials commonly employed in speech audiometry.
3. Calculation pure tone average, % of hearing loss, minimum and maximum masking levels.
4. Different types of hearing loss and its common causes

Know-how:

1. To obtain detailed case history from clients or parents/guardians.
2. To carryout commonly used tuning fork tests.
3. To administer pure tone audiometry including appropriate masking techniques on adults using at least techniques
4. To administer tests to find out speech reception threshold, speech identification scores, most comfortable and uncomfortable levels on adults.

Show:

1. Plotting of audiograms with different degree and type with appropriate symbols – 2 audiograms per degree and type
2. Detailed case history taken and its analysis
3. Calculation degree, type and percentage of hearing loss on 5 sample conditions

Do:

1. Case history on at least 5 adults and 3 children with hearing disorders
2. Tuning fork test on at least 2 individuals with conductive and 2 individuals with sensori-neural hearing loss
3. 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

Course Title	**Major Core B.4.1 Motor Speech Disorders in Children**
Code	**U21AS4MCT17**
Course type	**Theory**
Semester	**IV**
Hours/Week	**4**
Credits	**-**
Marks	**100**

CONSPECTUS

This course deals 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, to plan and execute therapy strategies for children with motor speech disorders.

COURSE OBJECTIVES

1. To remember the bases of neuro-developmental process in motor speech disorders.
2. To comprehend the assessment procedures of motor speech disorders in children.
3. To gain knowledge on management of childhood dysarthria.
4. To understand the different approaches used for childhood apraxia of speech.
5. To impart the knowledge of dysphagia in children.

SYLLABUS

Unit1: Neuro-developmental processes in speech production and motor speech disorders (12 Hours)

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

Unit 2: Assessment of motor speech disorders in children (12 Hours)

a) Case history and developmental neurological evaluation – primitive postural and oro-pharyngeal reflexes, cranial nerve examination
b) Assessment of oral sensory and motor capacity – Oral peripheral mechanism examination, neuro- muscular status
c) Assessment of speech sub-systems – quantitative and qualitative
d) Assessment of speech intelligibility and comprehensibility
e) Assessment of associated problem
f) 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
g) Test materials – checklist for childhood apraxia of speech, screening test for developmental apraxia of speech
h) Protocols for non-verbal and verbal praxis specific to Indian languages
i) Differential diagnosis- dysarthria and other developmental disorders
j) Differential diagnosis - childhood apraxia of speech and other developmental disorders

Unit 3: Management of childhood dysarthria (12 Hours)

a) Team approach in rehabilitation of motor speech disorders in children
b) Neuro-developmental therapy
c) Non speech oral-motor exercises: its application for children with dysarthria
d) Management of drooling
e) Behavioral management of respiratory, phonatory, resonatory and articulatory subsystems
f) Prosthetic appliances in treatment of childhood dysarthria
g) 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
h) Case studies: Planning intervention for children with dysarthria

Unit 4: Management of childhood apraxia of speech (12 Hours)

a) Principles of motor learning
b) Integral stimulation – dynamic temporal cueing
c) Multisensory and tactile cueing techniques (moto kinesthetic speech training, sensory motor approach, PROMPTS, Touch cue method & speech facilitation)
d) Gestural cueing techniques (signed target phoneme therapy, adapted cueing techniques, cued speech, visual phonics,& Jordon's gestures)
e) Miscellaneous techniques (melodic intonation therapy, multiple phonemic approach, & instrumental feedback)
f) Cognitive/conceptual/ linguistic /phonological remedial approaches - phonotactics
g) Other approaches: Vowel and diphthong remediation techniques (Northampton (Yale) vowel chart and Alcorn symbols), Nancy Kauffman's speech praxis treatment kit

h) Use of AAC in childhood apraxia of speech
i) Evidence-based practice in intervention for childhood apraxia of speech
j) Case studies: Planning intervention for childhood apraxia of speech

Unit 5: Feeding and swallowing disorders in children (12 Hours)

a) Embryology- periods and structures of development
b) Anatomical structures of swallowing- upper aero digestive system, anatomic difference between adults and children
c) Physiology of swallowing- swallow phases, neural control of swallowing, reflexes related to swallowing, suckling and sucking, airway and swallowing
d) Terms involved in dysphagia and development of feeding skills
e) Causes of dysphagia in children
f) Signs and symptoms of dysphagia in children
g) Assessment – inferences from neural developmental assessment, cranial nerve examination, assessment scales, nutritive and non-nutritive assessment, instrumental assessment (VFS, cervical auscultation), gastrointestinal evaluation
h) Management: positioning, oral- motor treatment, team approach, non oral feeding, transitional feeding, modifications in feeding
i) Role of speech-language pathologist in neonatal intensive care with reference to feeding and swallowing

TEXT BOOKS:

- 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.

SUGGESTED READINGS

- 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.

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1. https://www.cerebralpalsysymptoms.com /birth-injury/childhooddysarthria
2. https://www.researchgate.net/publication/Quantitative and QualitativeEvaluation of Neuromotor Behaviour in children
3. https://www.asha.org/njc/aac/Augmentative and alternative communication

4. https://www.mayoclinic.org/childhood apraxia of speech
5. https://www.asha.org/pediatric feeding and swallowing

COURSE OUTCOMES

CO No.	Course Objectives	Cognitive Level (K1- K5)
CO-1	To remember and explain the fundamental characteristics of motor speech disorders in children such as cerebral palsy, childhood apraxia of speech, other childhood dysarthria and swallowing	K1
CO-2	To Under stand and Execute assessment of the speech and non-speech aspects associated with the above conditions	K2
CO-3	To Plan and execute therapy strategies for children with motor speech disorders and swallowing disorders	K3
CO-4	To analyse the brain structures involved in speech perception and production	K4
CO-5	To evaluate the phases of swallowing, its assessment and management	K5

(K1=Remember, K2=Understand, K3=Apply, K4=Analyze, K5 =Evaluate)

PO – CO MAPPING

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO-1	H	H	H	-	H	-	H	H	H
CO-2	H	H	H	-	H	-	H	H	H
CO-3	H	H	H	-	H	-	H	H	H
CO-4	H	H	H	-	H	-	H	H	H
CO-5	H	H	H	-	-	-	H	H	H

PSO – CO MAPPING

CO/PSO	PSO1	PSO2	PSO3
CO-1	H	H	H
CO-2	H	H	H
CO-3	H	H	H
CO-4	H	H	H
CO-5	H	H	H

Course Title	**Major Core B 4.2 Language Disorders in Children**
Code	**U21AS4MCT18**
Course type	**Theory**
Semester	**IV**
Hours/Week	**4**
Credits	**-**
Marks	**100**

CONSPECTUS

This course will enable the students to understand the basic characteristics, assessment and management of child language disorders.

COURSE OBJECTIVES

1. To remember the bases of language acquisition, development, delay and disorders.
2. To comprehend the etiology, classification and characteristics of child language disorders.
3. To gain knowledge of the assessment of child language disorders.
4. To understand the different approaches used in intervention.
5. To impart the knowledge of counseling and provide guidance to children with language disorders.

UNIT 1: Bases of language acquisition, development and disorders

a) Theories of language acquisition 1: Biological, Psycholinguistic/syntactic theory
b) Theories of language acquisition 2: Cognitive, social interaction/pragmatic, information processing, behavioral
c) Pre-cursors for normal development of language
d) Development of components of language from birth to two years (pre-linguistic/pre-symbolic to symbolic)
e) Development of components of language during preschool period
f) Development of components of language during early school age and beyond
g) 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
h) Development of language in culturally diverse environments and exceptional circumstances – neglect and abuse, twins, low-socio economic background
i) Over view of language disorders – definition and classification based on ICD, DSM
j) Application of ICF in language disorders

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

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

UNIT 3: Assessment of language in children

a) Preliminary components of assessment: Case history, screening, evaluation of environmental, linguistic & cultural variables.
b) 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
c) Informal assessment - pre-linguistic behavior, play, mother-child interaction
d) Language sampling: planning and collecting representative sample; strategies to collecting language sample, audio-video recording, transcription
e) Analysis of language sample: Specific to various components of language such as phonology, morphology, syntax, semantics and pragmatics.
f) 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
g) Test materials used for children with developmental delay, intellectual disability: Madras Developmental Program Scale, Bayley's Scale for infant and toddler development
h) 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
i) Other test materials used for children with ADHD, ACA, LD (NIMH battery for assessment of Learning Disability)
j) Documenting assessment results: diagnostic report, summary report and referral report specific to disorder
k) Differential diagnosis of language disorders in children

UNIT 4: Management of language disorders in children - I

a) 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)
b) Types of service delivery models - Individuals versus group; direct versus tele-

rehabilitation; structure of therapy session, setting the environment, furniture, seating arrangements

c) Reinforcement in language therapy, types and schedules of reinforcement
d) Choice of language for intervention, incorporating principles of multiculturalism into treatment activities
e) Choosing and framing goals and Objectives: SMART Objectives
f) Specific treatment techniques
    i. Incidental teaching, self-talk, parallel talk, expansion, extension, recasting, joint routines, joint book reading,
    ii. whole language, modifying linguistic input, communicative temptations
    iii. drill, modeling
    iv. Focused stimulation, vertical structuring, milieu teaching, and model
g) Caregivers and family in intervention: Structured and informal approaches

UNIT 5: Management of language disorders in children - II

a) Team approach to intervention
b) Augmentative and alternative communication – types (aided and unaided) and application in child language disorders
c) Specific approaches to management of children with Autism: PECS, Lovaas, TEACCH, Com-DEALL, ABA, Facilitated Communication
d) Approaches to management of children with LD
e) Strategies to facilitate language skills in children with disorders such as intellectual disability: Redundancy, chunking, chaining
f) Use of technology in language intervention
g) Home plan and counselling for children with language disorders
h) Documentation specific to the disorder: pre-therapy; lesson plan; SOAP notes
i) Documentation specific to the disorder: summary report, referral report
j) Decision making in therapy: transition to next objective, termination of therapy

TEXT BOOKS

a) Roseberry-McKibbin, C. (2007). Language Disorders in Children: A multicultural and case perspective. Boston: Pearson Education, Inc.

b) 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

c) Hegde, M.N. (2005). Treatment protocols for language disorders in children – Vol. 1 San Diego: Plural Publishing

SUGGESTED BOOKS

a) Owens, R.E. (2008). Language development: An introduction (7th ed.). Boston: Pearsons

b) Reed, V.A. (2004). An Introduction to children with language disorders (3rd Ed.) New York: Allyn & Bacon

c) 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

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6. ***https://www.psychiatry.org/psychiatrists/practice/dsm***
7. https://www.asha.org/practice-portal/clinical-topics/spoken-language-disorders/
8. https://www.ling.upenn.edu/courses/ling001/acquisition.html
9. https://journalppw.com/index.php/jpsp/article/view/
10. https://pubs.asha.org/doi/abs/10.1044/2022_JSLHR-21-00628

Note: Learners are advised to use latest edition of books.

COURSE OUTCOMES

CO No.	Course Outcomes	Cognitive Level (K1-K5)
CO-1	Remember the basic process of language acquisition and factors affecting language development in children.	**K1**
CO-2	Understand the etiology, classification, characteristics of child language disorders.	**K2**
CO-3	Apply the knowledge to assess language delay and disorders in children.	**K3**
CO-4	Compare and Contrast the language disorders in children and select appropriate strategies for intervention.	**K4**
CO-5	Evaluate , counseling and provide appropriate guidance to caregivers and families of children with communication disorders	**K5**

(K1=Remember, K2=Understand, K3=Apply, K4=Analyze, K5=Evaluate)

PO – CO MAPPING

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO-1	H	H	H	H	H	-	H	H	H
CO-2	H	H	H	H	H	-	H	H	H
CO-3	H	H	H	H	H	-	H	H	H
CO-4	H	H	H	H	H	-	H	H	H
CO-5	H	H	H	-	-	-	H	H	H

PSO – CO MAPPING

CO/PSO	PSO1	PSO2	PSO3
CO-1	H	H	H
CO-2	H	H	H
CO-3	H	H	H
CO-4	H	H	H
CO-5	H	H	H

Course Title	**Major Core B 4.3 Diagnostic Audiology: Physiological Tests**
Code	**U21AS4MCT19**
Course type	**Theory**
Semester	**IV**
Hours/Week	**4**
Credits	**-**
Marks	**100**

CONSPECTUS

This course deals with the need for using the different physiological tests for assessing various hearing and balance related disorders; and to design tailor made test protocol for making appropriate diagnosis and referrals based on the test results.

COURSE OBJECTIVES

11. To remember and understand basic concepts of immittance evaluation
12. To explain about recording, factors affecting and clinical applications of auditory brainstem response (ABR)
13. To summarize the cortical and other auditory evoked potentials(AEPs)
14. To understand classification,measurement and clinical applications of OAEs
15. To choose appropriate test battery for assessing vestibular system

Unit 1- Immittance evaluation (12 Hours)

a) Clinical significance of physiological tests in audiology

b)Immittance evaluation: Principle of immittance evaluation: Concept of impedance and admittance, their components

c) Tympanometry: definition, measurement procedure, response parameters, their measurement and normative, classification of tympanogram, clinical significance of tympanometry

d) Eustachian tube functioning tests of tympanometry: basics of pressure equalization function of ET, Valsalva, Toynbee, William's pressure swallow, inflation-deflation test.

e)Overview on multicomponent and multi-frequency tympanometry

f)Overview on wide band reflectance and wide band tympanometry

g)Reflexometry: definition, acoustic reflex pathway, measurement procedure, clinical applications of acoustic reflexes, special tests

Unit 2- Auditory evoked potentials (AEPs): Auditory brainstem response (ABR) (12 Hours)

a) Introduction and classification of AEPs
b) Instrumentation
c) Principles of AEP recording technique
d) Auditory brainstem response generators
e) Protocol and procedure of recording auditory brainstem response
f) Factors affecting auditory brainstem responses
g) Clinical applications of ABR
h) ABR in the paediatric population
i) Role of ABR in infant hearing screening

UNIT 3- Overview of other AEPs (12 Hours)

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

UNIT 4: Otoacoustic emissions (12 Hours)

a) Introduction to otoacoustic emissions
b) Origin and classification of OAEs
c) Instrumentation
d) Procedure of OAE measurement: SOAE, TEOAEs, and DPOAEs
e) Interpretation of results: SOAE, TEOAEs, and DPOAEs
f) Clinical applications of OAEs: SOAE, TEOAEs, and DPOAEs
g) Contralateral suppression of OAEs and its clinical implications

UNIT 5- Physiological tests for assessment of vestibular system (12 Hours)

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

TEXT BOOKS:

8. Hood, L. J. (1998). Clinical Applications of the Auditory Brainstem Response. Singular Publishing Group.
9. Hall, J. W., & Mueller, H. G. (1996). Audiologists' Desk Reference: Diagnostic audiology principles, procedures, and protocols. Cengage Learning.
10. Hunter, L., & Shahnaz, N. (2013). Acoustic Immittance Measures: Basic and Advanced Practice (1 edition). San Diego, CA: Plural Publishing

11. 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
12. Jacobson, G. P., & Shepard, N. T. (2007). Balance Function Assessment and Management (1 edition). San Diego, CA: Plural Publishing Inc.

SUGGESTED READINGS

6. Jacobson, J. T. (1985). The Auditory brainstem response.
7. McCaslin, D. L. (2012). Electronystamography/Videonystagmography (1 edition). San Diego: Plural Publishing
8. Musiek, F. E., Baran, J. A., & Pinheiro, M. L. (1993). Neuroaudiology: Case Studies (1 edition). San Diego, Calif: Singular.
9. Robinette, M. S., & Glattke, T. J. (Eds.). (2007). Otoacoustic Emissions: Clinical Applications (3rd edition). New York: Thieme.

WEB REFERENCES

1. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC23058282.
2. https://www.audiologyonline.com/audiology-ceus/course/back-to-basics-immittance-audiometry-22985
3. https://www.asha.org/public/hearing/auditory-brainstem-response.
4. https://www.asha.org/public/hearing/otoacoustic-emissions/
5. https://vestibular.org/article/diagnosis-treatment/diagnosis/

Note: Learners are advised to use latest edition of books

COURSE OUTCOMES

CO No.	Course Outcomes	Cognitive Level (K1-K5)
CO-1	Define the basic concepts of immittance ,impedance and admittance and classify various hearing and balance disorders	K1
CO-2	Explain the auditory evoked potentials tests to diagnose cochlear, retrocochlear pathology and various disorders.	K2
CO-3	Apply the concept of OAEs to identify the deficits associated with different types and degree of hearing loss.	K3
CO-4	Apply the concept of physiological tests of vestibular system to identify the deficits associated with vestibular disorders.	K4
CO-5	Compare and contrast the characteristics of different physiological tests to assess auditory vestibular functioning and draw a conclusion on appropriate diagnosis and referrals	K5

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(K1=Remember, K2=Understand, K3=Apply, K4=Analyze K5=Evaluate)

PO – CO MAPPING

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO8	PO 9
CO1	H	H	M	-	M	-	M	M	H
CO2	H	H	M	-	M	-	M	H	H
CO3	H	H	H	-	H	-	H	H	H
CO4	H	H	H	-	H	-	H	H	H
CO5	H	H	H	-	H	-	H	H	H

PSO – CO MAPPING

CO/PSO	PSO1	PSO2	PSO3
CO-1	H	H	H
CO-2	H	H	H
CO-3	H	H	H
CO-4	H	H	H
CO-5	H	H	H

Course Title	Major Core B4.4 Implantable Hearing Devices
Code	U21AS4MCT20
Course type	Theory
Semester	IV
Hours/Week	4
Credits	-
Marks	100

CONSPECTUS

This course enables the students to know and understand the basic and advanced concepts of surgically implantable hearing devices which are given to the patient with various types and degrees of hearing loss.

COURSE OBJECTIVES

1. To remember the candidacy for bone anchored hearing devices, middle ear implants, cochlear implants, and ABI
2. To comprehend appropriate device depending on the audiological and non-audiological findings
3. To gain knowledge on post-implantation audiological management
4. To understand the benefit derived from implantation, and
5. To impart the parents/care givers during different stages of implantation

SYLLABUS

Unit 1: Implantable hearing devices - basics (12 Hours)

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

Unit 2: Bone anchored hearing devices and middle ear implants (12 Hours)

a) Types, components
b) Surgical approaches, risks, complications
c) Audiological evaluations for candidacy, contraindications
d) Assessment of benefits

Unit 3: Cochlear implant and brain stem implants –basics (12 Hours)

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

Unit 4: Cochlear implants and brainstem implants (12 Hours)

a) Signal coding strategies, classification, types
b) Intraoperative monitoring by audiologists
c) Objective measures: ESRT, ECAP, prom stim, EABR, aided cortical potentials
d) Post implant Mapping: schedule, pre-requisites, switch-on, mapping parameters, impedance, compliance, role of objective and subjective measures in mapping,
e) Post mapping audiological evaluation
f) Assessment of benefits
g) Optimization of hearing aid on contralateral ear

Unit 5:Implantable hearing devices - Counselling and troubleshooting; Rehabilitation (12 Hours)

a) Post implant Counselling on care and maintenance and troubleshooting of the device
b) Overview of post implant rehabilitation including AVT
c) Factors affecting outcome of implantable devices in adults and children

TEXT BOOKS:

- 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.

SUGGESTED READING

- Møller .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.

Note: Students are advised to use latest edition of books.

WEB REFERENCES

1. https://www.entofathens.com/hearing-balance/hearing-aids/implantable-hearing-devices/
2. https://www.hearinglink.org/your-hearing/implants/
3. https://www.asha.org/public/hearing/cochlear-implant/
4. https://www.audiologyonline.com/articles/implantable-auditory-technologies-13250
5. https://hearingreview.com/hearing-products/implants-bone-conduction/cochlear-implants/implantable-hearing-evolves

COURSE OUTCOMES

CONo.	Course Outcomes	Cognitive Level (K1-K5)
CO-1	Define the need, history, candidacy, team involved, informed consent, & pre-implant counselling of implantable hearing devices.	K1
CO-2	Explain the types, components, surgical approaches, risks, complications, audiological evaluation, candidacy, contraindication, & assessments of benefits of bone anchored hearing devices, & middle ear implants.	K2
CO-3	Sketch the terminologies, types, components, features, surgical approaches, risks, complications, audiological evaluation, audiological & non audiological candidacy, & contraindication of cochlear implants, &brainstem implants.	K3
CO-4	Organize on the signal coding strategies, intraoperative monitoring, objective measures, post implant mapping, post implant audiological evaluation, assessment of benefits, & optimization of hearing aid on the Contralateral ear with respect to	K4

	cochlear implants, & brainstem implants.	
CO-5	Evaluate the post implant counselling, care, maintenance, troubleshooting, rehabilitation, & factors affecting the outcomes of implantable hearing devices in adults and children.	K5

(K1=Remember, K2=Understand, K3=Apply, K4=Analyze, K5=Evaluate)

PO – CO MAPPING

CO	**PO 1**	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO8**	**PO 9**
CO1	L	H	H	M	-	L	M	M	M
CO2	H	H	H	H	-	L	H	H	H
CO3	H	H	H	H	-	L	H	H	H
CO4	H	H	H	H	-	L	H	H	H
CO5	H	H	H	H	-	L	H	H	H

PSO – CO MAPPING

CO/PSO	**PSO1**	**PSO2**	**PSO3**
CO-1	H	M	M
CO-2	H	H	H
CO-3	H	H	H
CO-4	H	H	H
CO-5	H	H	H

Course Title	**Optional Paper: ENVIRONMENTAL STUDIES**
Code	**U21AS4MCT39**
Course type	**Theory**
Semester	**IV**
Hours/Week	**4**
Credits	**-**
Marks	**100**

CONSPECTUS

This course deals with the study of structure and function of our life-supporting environment and to understand causes, effects, and solutions of different environmental problems.

COURSE OBJECTIVES

To understand multidisciplinary nature of environmental studies and critically examine the gap in the resource availability, use, and conservation.

To explain the concept of ecosystem and ecological succession.

To identify the causes of environmental pollution and related solution.

To assess the environmental impact of human activities and plan and execute to protect biodiversity

To analyze the link cause and effect of pollution and understand the Indian constitutional provisions with respect to the environmental protection and fundamental rights.

UNIT I: Introduction to Environment **(2 Hours)**

a) The multidisciplinary nature of environmental studies
b) Environment – Definition and the components: physical components, socioeconomic and cultural component
c) Scope and importance of Environmental Studies

UNIT 2: Natural Resource: Renewable and Non-Renewable and Sustainable Development **(8 Hours)**

a) Forest resources: Use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forests and tribal people.
b) Water resources: Use and over-utilization of surface and ground water, floods,drought, conflicts over water, dams' benefits and problems.
c) Mineral resources: Use and exploitation, environmental effects of extracting andusing mineral resources.
d) Food resources: World food problems, changes caused by agriculture andovergrazing, effects of modern agriculture, fertilizer-pesticide problems, waterlogging, salinity.

e) Energy resources: Growing energy needs, renewable and non-renewable energysources, use of alternate energy sources.
f) Land resources: Land as a resource, land degradation, man induced landslides, soilerosion and desertification.
g) Role of an individual in conservation of natural resources.
h) Equitable use of resources for sustainable lifestyles.

UNIT 3: Eco Systems **(6 Hours)**

a) Concept of an ecosystem
b) Structure and function of an ecosystem
c) Energy flow in the ecosystem: Food chains, food webs and ecological pyramids
d) Ecological succession
e) Introduction, types, characteristic features, structure and function of the following

Ecosystem: Forest ecosystem, Grassland ecosystem, Desert ecosystem, Aquatic ecosystem (ponds, streams, lakes, rivers, oceans, estuaries).

UNIT 4: Biodiversity and its conservation **(8 Hours)**

a) Introduction – Definition, genetic, species and ecosystem diversity
b) Biogeographically classification of India
c) Value of biodiversity: consumptive use, productive use, social, ethical, esthetic andoption values
d) Biodiversity at global, national and local levels
e) India as a mega diversity nation
f) Hot-spots of biodiversity
g) Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts
h) Endangered and endemic species of India
i) Conservation of biodiversity: In-situ and ex-situ conservation of biodiversity

UNIT 5: Environmental Pollution **(8 Hours)**

a) Definition and causes, effects and control measures of: Air pollution, Water pollution, Soil pollution, Marine pollution, Noise pollution, Thermal pollution, Nuclear hazards.
b) Solid waste management: causes, effects and control measures of urban andindustrial wastes
c) Role of an individual in prevention of pollution
d) Disaster management: floods, earthquakes, cyclone and landslides

UNIT 6: Environmental Policies & Practices **(7 Hours)**

a) Concept of unsustainable to sustainable development
b) Urban problems related to energy
c) Water conservation, rain water harvesting, watershed management
d) Resettlement and rehabilitation of people, its problems and concerns, case studies

e) Environment ethics, issues and possible solutions
f) Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust.
g) Wasteland reclamation
h) Environment Protection Act, Air (Prevention and Control of Pollution) Act, Water (Prevention and control of pollution) Act, Wild life protection Act, Forest conservation Act
i) Issues involved in enforcement of environment legislation
j) Public awareness

UNIT 7: Human population and the Environment **(6Hours)**

a) Population growth, variation among nations
b) Population explosion, family welfare programme
c) Environment and human health
d) Human rights
e) Value education
f) HIV/AIDS
g) Women and child welfare
h) Role of information technology in environment and human health

UNIT 8: Field Work **(19 Hours)**

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

TEXT BOOKS:

1. Agarwal.K.C 2001 Environmental Biology. Nidi Publ.Ltd.Bikaner
2. Bharucha Erach. The Biodiversity of India, Mapin Publishing Pvt. Ltd,
3. Ahmedabad – 380 013, India email: mapin@iccnel.net (R)
4. Brunner R.C 1989, Hazardous Waste
5. Cark R.S Marine Pollution, Clanderson Press Oxford (TB)
6. Cunningham, W.P. Cooper, T H Gorhani, E & Hepworth, M.T 2001 Environmental
7. Encyclopedia, Jaico Publ. House, Mumbai 1196 p
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9. Down to Earth, Centre for Science and Environment (R)
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4. https://vardhaman.org/wp-content/uploads/2021/03/ENVIRONMENTAL-SCIENCE-1.pdf
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COURSE OUTCOMES

CONo.	CourseOutcomes	Cognitive Level (K1-K4)
CO-1	Define the scope and importance of environmental studies and recall natural resources and its associated problems.	K1
CO-2	Explain the concept, types and features of ecosystem and examine the forces impacting ecosystems like climate change, stress, population, consumerism, globalization, and land use.	K2

CO-3	Describe the importance of biodiversity in natural environments and analyze the issues of handling pollution by the human being.	K3
CO-4	Compare and contrast the endangered and endemic species of India and illustrate Indian constitutional provisions with respect to the environmental protection	K4

(K1=Remember, K2=Understand, K3=Apply, K4=Analyze)

PO – CO MAPPING

CO	**PO 1**	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO8**	**PO 9**
CO1	H	H	M	M	M	M	M	M	H
CO2	H	H	H	M	M	H	M	H	H
CO3	H	H	H	H	H	H	H	H	H
CO4	H	H	H	H	H	H	H	H	H

PSO – CO MAPPING

CO/PSO	**PSO1**	**PSO2**	**PSO3**
CO-1	H	M	M
CO-2	H	M	M
CO-3	H	M	M
CO-4	H	M	M

B4.5 Clinicals in Speech-language Pathology
Code: U21AS4MCP21

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:

1. Speech & language stimulation techniques.
2. Different samples /procedures required to analyse voice production mechanism. (acoustic/ aerodynamic methods / visual examination of larynx/ self evaluation)
3. Different samples /procedures required to analyse speech production mechanism in children with motor speech disorders.

Know-how:

1. To administer at least two more (in addition to earlier semester) standard tests for childhood language disorders.
2. To administer at least two more (in addition to earlier semester) standard tests of articulation/ speech sounds.
3. To set goals for therapy (including AAC) based on assessment/test results for children with language and speech sound disorders.
4. To record a voice sample for acoustic and perceptual analysis.
5. To assess parameters of voice and breathing for speech.
6. Assessment protocol for children with motor speech disorders including reflex profile and swallow skills.
7. Counselling for children with speech-language disorders.

Show:

1. Acoustic analysis of voice – minimum of 2 individuals with voice disorders.
2. Simple aerodynamic analysis - minimum of 2 individuals with voice disorders.
3. Self evaluation of voice – minimum of 2 individuals with voice disorders.
4. Informal assessment of swallowing – minimum of 2 children.
5. Assessment of reflexes and pre linguistic skills - minimum of 2 children.
6. Pre –therapy assessment and lesson plan for children with language and speech sound disorders - minimum of 2 children each.

Do:

1. Case history - minimum of 2 individuals with voice disorders.

2. Case history - minimum of 2 children with motor speech disorders
3. Oral peripheral examination- minimum of 5 children
4. 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.
5. 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

B 4.6 Clinicals in Audiology
Code: U21AS4MCP22

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

THIRD YEAR - SEMESTER V

Course Title	**Major Core B5.1 Structural Anomalies and Speech Disorders**
Code	**U21AS5MCT23**
Course type	**Theory**
Semester	**V**
Hours/Week	**4**
Marks	**100**

CONSPECTUS

This course will enable the students to understand the basic characteristics, assessment and management of structural anomalies and speech disorders.

COURSE OBJECTIVES

1. To remember the basic terminologies, causes, classification and speech characteristics of persons with cleft lip and palate.
2. To comprehend the evaluation, diagnosis and management of cleft lip and palate speech.
3. To gain knowledge of the speech characteristics associated problems, evaluation and management of structural anomalies of tongue and mandible.
4. To understand the classification, associated problems and assessment of laryngectomy.
5. To impart the knowledge of various management approaches of speech and communication in laryngectomies.

UNIT 1: SPEECH CHARACTERISTICS OF PERSONS WITH CLEFT LIP AND PALATE (12 HOURS)

a) Types, characteristics and classification of cleft lip and palate
b) Causes of cleft lip and palate: genetic, syndrome and others
c) Velopharyngeal inadequacy: types, causes and classification
d) 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 (12 HOURS)

a) Team of professionals in the management of persons with cleft lip and palate: their roles in diagnosis and management.
b) Assessment of persons with cleft lip and palate for speech language functions:
c) Subjective assessment of speech characteristics and speech intelligibility: proforma, tests, scales and others.
d) Objective assessment of phonatory, resonatory and articulatory features
e) Diagnosis and differential diagnosis of speech related functions
f) Subjective assessment of language and communication functions

g) Reporting test results using Universal Parameters
h) Management of persons with cleft lip and palate
i) Surgical and prosthetic management
j) Techniques and strategies to correct speech sound disorders
k) Techniques and strategies to improve feeding
l) Counselling and guidance

UNIT 3: STRUCTURAL ANOMALIES OF TONGUE AND MANDIBLE - CHARACTERISTICS, ASSESSMENT AND MANAGEMENT (12 HOURS)

a) Types, classification and characteristics of structural anomalies of tongue and mandible
b) Causes for structural anomalies of tongue and mandible
c) Team of professionals in the management of persons with structural anomalies of tongue and mandible and their roles.
d) Associated problems in persons with structural anomalies of tongue and mandible:
    - Speech
    - Feeding
    - Dental and occlusion
    - Psychological and others
e) 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 (12 HOURS)

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

UNIT 5: MANAGEMENT OF SPEECH AND COMMUNICATION IN LARYNGECTOMIES (12 HOURS)

a) Esophageal speech: candidacy, types of air intake procedures, speech characteristics and its modification through techniques and strategies, complications and contraindications.
b) Tracheo-esophageal speech: candidacy, types of TEP, fitting of prosthesis, speech characteristics and its modification through techniques and strategies, complications and contraindications.
c) Artificial larynx: types, factors for selection, output characteristics, techniques for efficient use of artificial larynx, complications and contraindications.
d) Other remedial procedures: Pharyngeal speech, buccal speech, ASAI speech, gastric speech.

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

TEXT BOOKS

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

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

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

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

SUGGESTED READINGS

a) Kummer, A.W. (2014). Cleft Palate and Craniofacial Anomalies: The Effects on Speech and Resonance. Delmar, Cengage Learning.
b) Peterson-Falzone, S. J., Cardomone, J. T., &Karnell, M. P. (2006). The Clinician Guide to Treating Cleft Palate Speech. Mosby, Elsevier.
c) Salmon . J &Shriley (1999). Alaryngeal speech rehabilitation for clinicians and by clinicians. ProEd
d) Yvonne, E (Ed) (1983). Laryngectomy: Diagnosis to rehabilitation. London: Croom Helm Ltd

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14. https://pubmed.ncbi.nlm.nih.gov/23169434/
15. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7544801

Note: Learners are advised to use latest edition of books.

COURSE OUTCOMES

CO No.	Course Outcomes	Cognitive Level (K1-K5)
CO-1	Remember about speech characteristics of persons with Cleft lip and palate.	K1
CO-2	Understand the evaluation and diagnosis of persons with cleft lip and palate.	K2
CO-3	Apply the knowledge to evaluate and diagnose the speech characteristics seen in individuals with structural anomalies of tongue and mandible.	K3

CO-4	Infer the causes, associated problems, evaluation of laryngectomy.	K4
CO-5	To determine the appropriate management and techniques of speech and communication in laryngectomies	K5

(K1=Remember, K2=Understand, K3=Apply, K4=Analyze, K5=Evaluate)

PO – CO MAPPING

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO-1	H	H	H	H	H	-	H	H	H
CO-2	H	H	H	H	H	-	H	H	H
CO-3	H	H	H	H	H	-	H	H	H
CO-4	H	H	H	H	H	-	H	H	H
CO-5	H	H	H	-	-	-	H	H	H

PSO – CO MAPPING

CO/PSO	PSO1	PSO2	PSO3
CO-1	H	H	H
CO-2	H	H	H
CO-3	H	H	H
CO-4	H	H	H
CO-5	H	H	H

Course Title	**Major Core B5.2Fluency and its Disorders**
Code	**U21AS5MCT24**
Course type	**Theory**
Semester	**V**
Hours/Week	**4**
Marks	**100**

CONSPECTUS

This course will enable the students to understand the basic characteristics, assessment and Management of fluency and its disorders.

COURSE OBJECTIVES

1. To understand understand the characteristics of fluency and its disorders
2. To evaluate and diagnose fluency disorders
3. To learn about the techniques for the management of fluency disorders

UNIT 1: FLUENCY (12 HOURS)

a. Scope and definition of fluency
b. Factors influencing fluency
c. Definition and characteristics of features of suprasegmentals in speech: rate of speech, intonation. rhythm, stress and pause
d. Suprasegmental features in typical speech
e. Suprasegmental features in the speech of persons with fluency disorders
f. Developmental aspects of suprasegmentals of speech
g. Normal non-fluency

UNIT 2: STUTTERING AND OTHER FLUENCY DISORDERS (12 HOURS)

a. Stuttering: Definition and causes for stuttering
b. Characteristics of stuttering: core and peripheral characteristics, primary and secondary stuttering, effect of adaptation and situation
c. Development of stuttering
d. Normal non fluency: characteristics and differential diagnosis
e. Theories of stuttering: organic, functional, neurogenic, diagnosogenic and learning
f. Cluttering: Definition, causes and characteristics
g. Neurogenic stuttering: Definition, causes and characteristics

UNIT 3: ASSESSMENT AND DIFFERENTIAL DIAGNOSIS (12 HOURS)

a. Assessment of fluency disorders: stuttering, cluttering, neurogenic stuttering and normal non fluency:
b. Subjective methods: protocols and tests
c. Objective methods
d. Qualitative and quantitative assessment
e. Differential diagnosis of fluency disorders

UNIT 4: MANAGEMENT OF STUTTERING (12 HOURS)

a. Approaches to management
b. Changing scenario in management of stuttering
c. Different techniques and strategies used in management with their rationale
d. Relapse and recovery from stuttering
e. Issues of speech naturalness in stuttering

UNIT 5: MANAGEMENT OF FLUENCY-RELATED ENTITIES (12 HOURS)

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

TEXT BOOKS

a. Bloodstein, O., & Ratner, N. B. (2008). A Handbook on Stuttering (6th Ed.).Clifton Park, NY, Thomson Demer Learning.
b. Guitar, B. (2014). Stuttering-An Integrated Approach to its Nature and Treatment. 4th Ed. Baltimore, Lippincott Williams & Wilkins.
c. Hegde, M. N. (2007). Treatment Protocols for Stuttering.CA Plural Publishing.
d. Howell, P. (2011). Recovery from Stuttering. New York, Psychology Press.

SUGGESTED READINGS

a. Assessment and management of fluency disorders. Proceedings of the nationalworkshop on "Assessment and management of fluency disorders", 25-26 Oct 2007.All India Institute of Speech & Hearing, Mysore. 2007.
b. Rentschler, G. J. (2012). Here`s How to Do: Stuttering Therapy. San Diego, PluralPublishing.
c. Wall, M. J., & Myers F. L. (1995). Clinical Management of Childhood Stuttering.Texas, PRO-ED, Inc.
d. Ward, D. (2006). Stuttering and Cluttering: Frameworks for Understanding &Treatment. NY, Psychology Press.

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17. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9132036/
18. https://pubmed.ncbi.nlm.nih.gov/16782685/
19. https://pubmed.ncbi.nlm.nih.gov/27303004/

Note: Learners are advised to use latest edition of books.

COURSE OUTCOMES

CO No.	Course Outcomes	Cognitive Level (K1-K5)
CO-1	Remember about speech characteristics of fluency and its disorders.	K1
CO-2	Understand the evaluation and diagnosis of persons withfluency disorders	K2
CO-3	Apply the knowledge to evaluate and diagnose the speech characteristics seen in individuals with fluency disorders	K3
CO-4	Infer the causes, associated problems, evaluation of fluency disorders	K4
CO-5	To determine the appropriate management and techniques of fluency disorders	K5

(K1=Remember, K2=Understand, K3=Apply, K4=Analyze, K5=Evaluate)

PO – CO MAPPING

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO-1	H	H	H	H	H	-	H	H	H
CO-2	H	H	H	H	H	-	H	H	H
CO-3	H	H	H	H	H	-	H	H	H
CO-4	H	H	H	H	H	-	H	H	H
CO-5	H	H	H	-	-	-	H	H	H

PSO – CO MAPPING

CO/PSO	PSO1	PSO2	PSO3
CO-1	H	H	H
CO-2	H	H	H
CO-3	H	H	H
CO-4	H	H	H
CO-5	H	H	H

Course Title	**Major Core B5.3 Pediatric Audiology**
Code	**U21AS5MCT25**
Course type	**Theory**
Semester	**V**
Hours/Week	**4**
Marks	**100**

CONSPECTUS

This course will enable the students to understand the normal development of hearing, various auditory disorders with respect to pediatric population, importance of early identification and the tests and protocol involved in the pediatric assessment.

COURSE OBJECTIVES

1. To remember the typical auditory development.
2. To comprehend the various etiologies and relate them to different types of auditory disorders that may arise.
3. To gain knowledge on the different hearing screening/identification procedures & their applications.
4. To understand the different aspects of pediatric behavioral evaluation.
5. To impart knowledge on the various pediatric physiological/electrophysiological evaluation.

UNIT 1: AUDITORY DEVELOPMENT

a) Review of Embryology of the ear
b) Development of auditory system from periphery to cortex
c) Neuroplasticity
d) Prenatal hearing
e) Normal auditory development from 0-2 years
f) Infant speech perception
g) Incidence and prevalence of auditory disorders in children

UNIT 2: AUDITORY DISORDERS

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

UNIT 3: EARLY IDENTIFICATION OF HEARING LOSS

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

UNIT 4: PAEDIATRIC ASSESSMENT I

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

UNIT 5: PAEDIATRIC ASSESSMENT II

a) Recording and interpretation of OAE in paediatric population
b) Factors affecting OAE in paediatric population
c) Recording and interpretation of click evoked and tone burst evoked ABR in paediatric population
d) Factors affecting ABR in paediatric population
e) Recording ASSR in paediatric population
f) Recording AMLR, ALLR in paediatric population
g) Assessment of hearing loss in special population
h) Diagnostic test battery for different age groups
i) Diagnosis and differential diagnosis

TEXT BOOKS

- 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)

SUGGESTED READINGS

- 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.

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https://www.hopkinsallchildrens.org/Services/Rehabilitation/Audiology
https://www.nationwidechildrens.org/specialties/audiology
https://www.stanfordchildrens.org/en/service/audiology

Note: Learners are advised to use latest edition of books.

COURSE OUT COMES:

CO No.	Course Outcomes	Cog. Level (K1-K5)
CO-1	Remember about the normal auditory development.	K1
CO-2	Understand the etiologies of various auditory disorders and its impact on communication.	K2
CO-3	Apply the knowledge to learn about hearing screening procedures and to understand its impact on early identification & management of hearing loss.	K3
CO-4	Infer the process and steps involved in pediatric behavioural hearing assessment.	K4
CO-5	To determine the importance and steps involved in pediatric physiological/electrophysiological hearing assessment.	K5

(K1=Remember, K2=Understand, K3=Apply, K4=Analyze, K5=Evaluate)

PO – CO MAPPING

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO-1	H	H	H	H	H	-	H	H	H
CO-2	H	H	H	H	H	-	H	H	H
CO-3	H	H	H	H	H	-	H	H	H
CO-4	H	H	H	H	H	-	H	H	H
CO-5	H	H	H	H	H	-	H	H	H

PSO – CO MAPPING

CO/PSO	PSO1	PSO2	PSO3
CO-1	H	H	H
CO-2	H	H	H
CO-3	H	H	H
CO-4	H	H	H
CO-5	H	H	H

Course Title	**Major Core B5.4 Aural Rehabilitation in Children**
Code	**U21AS5MCT26**
Course type	**Theory**
Semester	**V**
Hours/Week	**4**
Marks	**100**

CONSPECTUS

This course will enable the students to describe the different communication option 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.

COURSE OBJECTIVES

6. To remember the typical auditory development.
7. To comprehend the various communication options.
8. To gain knowledge on the optimal listening & learning environments in infancy and early childhood.
9. To understand the different aspects of Auditory – speech reading training & literacy.
10. To impart knowledge on Indian perspective of aural rehabilitations services available.

UNIT 1: AUDITORY DEVELOPMENT, SPOKEN COMMUNICATION AND ACOUSTIC ACCESSIBILITY

a) Sensitivity period for auditory development
b) Impact of hearing impairment on auditory development, spoken languageacquisition, parent child communication
c) Factors affecting auditory development
d) Hearing loss implications for speech perception: acoustics of speech
e) Optimizing hearing potential through hearing aids
f) Optimizing hearing potential through cochlear implants
g) Barriers to acoustic accessibility: distance, signal to noise ratio, reverberation
h) Managing the listening environment for infants, toddlers' schools
i) Signal to noise ratio enhancing technologies personal FM, loop systems, desktopgroup systems, Bluetooth connectivity

UNIT 2: COMMUNICATION OPTIONS

a) Detecting and confirming hearing loss

b) Parent support counselling, individual family service plan
c) Choosing communication options
d) Auditory oral approach
e) Auditory verbal therapy
f) Manual/sign language: Indian and Global context
g) Cued speech and total communication
h) Listening devices hearing aid/cochlear implant
i) Early intervention programs

UNIT 3: OPTIMAL LISTENING AND LEARNING ENVIRONMENTS INFANCY AND EARLY CHILDHOOD

a) Involvement of family
b) Factors impacting family involvement, supporting families through information and education
c) Creating optimum listening and learning environment
d) Intervention: Assessment, auditory learning, listening and language facilitation techniques in infancy and early childhood
e) Issues with children with mild hearing loss, unilateral hearing loss,
f) Children with hearing loss, ANSD or APD: Children are intervened late
g) Children with hearing loss and other special needs
h) Listening and spoken language in school age: benefits of inclusion
i) Intervention at school age: Functional hearing assessment, communication assessment and intervention to integrate with academic targets

UNIT 4: AUDITORY - SPEECH READING TRAINING AND LITERACY

a) Candidacy for auditory training and speech reading
b) Auditory training/learning four design principles skill, stimuli, activity, and difficulty level
c) Early training Objectives
d) Analytic and Synthetic training Objectives
e) Formal and informal training
f) Auditory training for infants and very young children
g) Outcomes of training
h) Speech and language and literacy characteristics
i) Speech language and literacy evaluation assessment
j) Speech language therapy

UNIT 5: INDIAN PERSPECTIVES
a) Prevalence of hearing impairment in children
b) Education of the deaf in India historical perspectives
c) Available resources for education of the hearing impaired
d) Early intervention programs and centers
e) Schools for the hearing impaired; day schools, residential schools
f) Beyond school: college and vocational training
g) Training manpower resources for service delivery
h) Indian sign language

i) Training sign language interpreters
j) Cued speech in India
k) Assessment and therapy tools developed for individuals with hearing impairment inIndia.

TEXT BOOKS

- 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, andManagement (2nd ed.). New York, NY: Thieme.
- Rout, N and Rajendran, S. (2015). Hearing aid Counselling and Auditory trainingManual, A publication of NIPMED, Chennai. Freely downloadable from http://niepmd.tn.nic.in/publication.php. ISBN 978-81-928032-5-8.

SUGGESTED READINGS

- 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

Note: Students are advised to use the latest edition of books.

WEB REFERENCES

https://www.asha.org/public/hearing/child-aural-rehabilitation/
https://perfecthearing.my/aural-rehabilitation-children/
https://synapse.koreamed.org/articles/1080341
https://pubmed.ncbi.nlm.nih.gov/24597636/

COURSE OUTCOMES

CO No.	Course Outcomes	Cognitive Level (K1-K5)
CO-1	Remember about the normal auditory development.	K1
CO-2	Understand the various communication options available.	K2
CO-3	Apply the knowledge to learn about the optimal listening and learning environment available from infancy to early childhood.	K3
CO-4	Infer the process and steps involved in auditory speech reading training.	K4

CO-5	To determine the Indian perspectives of aural rehabilitation in children.	K5

(K1=Remember, K2=Understand, K3=Apply, K4=Analyze, K5=Evaluate)

PO – CO MAPPING

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO-1	H	H	H	H	H	-	H	H	H
CO-2	H	H	H	H	H	-	H	H	H
CO-3	H	H	H	H	H	-	H	H	H
CO-4	H	H	H	H	H	-	H	H	H
CO-5	H	H	H	H	H	-	H	H	H

PSO – CO MAPPING

CO/PSO	PSO1	PSO2	PSO3
CO-1	H	H	H
CO-2	H	H	H
CO-3	H	H	H
CO-4	H	H	H
CO-5	H	H	H

B5.5 Clinicals in Speech Language Pathology
Code: U21AS5MCP27

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:

1. Procedures to assess speech fluency and its parameters using standardized tests for children and adults.
2. Differential diagnosis of motor speech disorders in children.
3. Procedures to assess individuals with cleft lip and palate, and other oro-facial structural abnormalities.
4. Procedures to assess laryngectomee and provide management options.

Know-how:

1. To administer at least two more (in addition to earlier semesters) standard tests for childhood language disorders.
2. To record a speech sample for analysis of fluency skills (including blocks & its frequency, rate of speech, prosody, etc.).
3. To assess posture and breathing for speech in children with motor speech disorders.
4. To consult with inter-disciplinary medical/rehabilitation team and counsel the individual/family regarding management options and prognosis.

Show:

1. Rating of cleft, speech intelligibility and nasality – minimum of 2 individuals with cleft lip and palate.
2. Language assessment - minimum of 2 individuals with cleft lip and palate.
3. Transcription of speech sample and assessment of percentage dis/dysfluency– minimum of 2 individuals with stuttering.
4. Assessment of rate of speech on various speech tasks – at least on 2 children & adults.

Do:

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

3. Oral peripheral examination on minimum of 2 individuals with cleft lip and palate.
4. 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
Code: U21AS5MCP28

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

Course Title	**Major Core B 6.1 MOTOR SPEECH DISORDERS IN ADULTS**
Code	**U21AS6MCT29**
Course type	**Theory**
Semester	**VI**
Hours/Week	**4**
Credits	**-**
Marks	**100**

CONSPECTUS

This course will help students to understand the characteristics of acquired motor speech disorders in adults , evaluate, diagnose the speech characteristics and to learn about the techniques for the management of speech and related errors in acquired motor speech disorders.

Course Objectives:

1.To explain the causes and characteristics of motor speech disorder in adults .
2.To impart knowledge on importance of various types of assessment and differential diagnosis of motor speech disorder in adults .
3.To understand the management options and therapeutic approaches of dysarthria .
4.To gain knowledge in assessment and management of apraxia in adults .
5.To comprehend the issues related in rehabilitating adults with motor speech disorder in adults .

Unit 1: Causes & Characteristics of dysarthria **12 Hrs**

- 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 12 Hrs

- 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 12 Hrs

- 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 12 Hrs

- 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 12 Hrs

- 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

TEXT BOOKS

1) Brookshire, R. H. (2007). Introduction to Neurogenic Communication Disorders. University of

Virginia, Mosby.
2) Duffy, J. R. (2013). Motor Speech Disorders: Substrates, Differential Diagnosis, and Management (3rd Ed.). University of Michigan, Elsevier Mosby.
3) Dworkin, P. J. (1991). Motor Speech Disorders: A Treatment Guide. St. Louis: Mosby.
4) Ferrand, C. T., & Bloom, R. L. (1997). Introduction to Organic and Neurogenic Disorders of Communication: Current Scope of Practice. US, Allyn & Bacon.
5) Goldenberg, G. (2013). Apraxia: The Cognitive Side of Motor Control. Oxford University Press, UK.

SUGGESTED READINGS

1) Lebrun, Y. (1997). From the Brain to the Mouth: Acquired Dysarthria and Dysfluency in Adults. Netherlands, Kluwer Academic Publishers.
2) Murdoch, B. E. (2010). Acquired Speech and Language Disorders: A Neuroanatomical and Functional Neurological Approach (2nd Ed.). New Delhi, India: John Wiley & Sons.
3) Papathanasiou, I. (2000) (Eds.). Acquired Neurogenic Communication Disorders – A Clinical Perspective, Chapters 5, 6 & 7. London, Whurr Publishers.
4) 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.

WEB REFERENCES

- https://pubmed.ncbi.nlm.nih.gov/17167188/
- https://www.researchgate.net/topic/Motor-Speech-Disorders/publications
- https://pubs.asha.org/doi/10.1044/2020_AJSLP-20-00144
- https://journals.sagepub.com/doi/abs/10.1258/135763303322596318?journalCode=jtta
- https://books.google.co.in/books?hl=en&lr=&id=UT2JA5E32WAC&oi=fnd&pg=PR1&dq=Motor+Speech+Disorders+in+%22Adults%22+&ots=f-2Axcssuj&sig=FyflR2lAqXFtgluztVW27LNtNDM&redir_esc=y#v=onepage&q=Motor%20Speech%20Disorders%20in%20%22Adults%22&f=false

Note: Learners are advised to use latest edition of books

Course Outcomes:

CO No.	Course Outcomes	Cognitive Level (K1-K5)
CO-1	Remember the causes & characteristics of acquired motor speech disorder in adults .	K1
CO-2	Understand the different types of assessment protocols and importance of differential diagnosis in motor speech disorder	K2
CO-3	Apply the knowledge of different techniques of management for adults with motor speech disorder .	K3
CO-4	Compare, analyze and make inferences about differences in treatment approaches that are used to rehabilitate adults with dysarthria and apraxia.	K4
CO-5	Evaluate and plan intervention strategies for individuals with motor speech disorders in adults considering the issues related in rehabilitation	K5

(K1=Remember, K2=Understand, K3=Apply, K4=Analyze, K5= Evaluate)

PO – CO MAPPING

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO-1	H	H	M	L	-	-	H	H	M
CO-2	H	H	H	H	-	H	H	H	H
CO-3	H	H	H	H	-	H	H	H	H
CO-4	H	H	H	H	-	H	H	H	H
CO-5	H	H	H	H	-	H	H	H	H

PSO – CO MAPPING

CO/PSO	PSO1	PSO2	PSO3
CO-1	H	H	H
CO-2	H	H	H
CO-3	H	H	H
CO-4	H	H	H
CO-5	H	H	H

Course Title	**Major Core B 6.2 LANGUAGE DISORDERS IN ADULTS**
Code	**U21AS6MCT30**
Course type	**Theory**
Semester	**VI**
Hours/Week	**4**
Credits	**-**
Marks	**100**

CONSPECTUS

This course will help students to understand the characteristics of language disorders in adults, evaluate anddiagnose the speech characteristics, learn about the techniques for the management of speech and related errorsseen in adults with Language disorders.

Course Objectives:

1.To explain the fundamentals and neural bases of language.
2.To impart knowledge of characteristics of speech, language and cognition in adults with different types of language disorders.
3.To understand the assessment and diagnosis of language disorders in adults.
4.To gain knowledge in management of adults with different types of language disorders.
5.To comprehend the issues related in rehabilitating adults with language disorders.

Unit 1: Neural bases of language **12 Hrs**

- 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 **12 Hrs**

- 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 **12 Hrs**

- 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 **12 Hrs**

- 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 **12 Hrs**

- 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 disorder

TEXT BOOKS

1. Chapey, R. (2008). Language Intervention strategies in aphasia and related neurogenic communication disorders. Philadelphia: Lippincott Williams and Wilkins
2. Edwards, S. (2005). Fluent Aphasia. Cambridge University Press.
3. Laine, M. & Martin, N. (2006). Anomia: Theoretical and Clinical Aspects. Psychology Press.
4. Lapointe, L. L., Murdoch, B. E., & Stierwalt, J. A. G. (2010). Brain based Communication Disorders. Plural Publishing Inc.
5. Stemmer, B., & Whitaker, H. A. (Eds.). (2008). Handbook of Neuroscience of Language. Elsevier.

SUGGESTED READINGS

1. Davis, G. A. (2014). Aphasia and related Communication Disorders. Pearson Education Inc.
2. Lapointe, L. L. (2005). Aphasia and related neurogenic language disorders. *(3rdEdn.). Thieme*
3. Whit worth, A., Webster, J., & Howard, D. (2005). A cognitive neuropsychological approach to assessment and intervention in aphasia: A clinician's guide. Psychology Press.

WEB REFERENCES

1. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3059138/
2. https://link.springer.com/article/10.1007/S00415-018-8762-6
3. https://www.scribd.com/document/173702242/Aphasia-and-Apraxia-at-a-Glance
4. https://www.scribd.com/document/173702427/Dysarthria-at-a-Glance
5. https://www.scribd.com/document/83469364/The-Neuroscience-on-the-Web-Series

Note: Learners are advised to use latest edition of books

Course Outcomes:

CO No.	Course Outcomes	Cognitive Level (K1-K5)
CO-1	Remember the fundamentals and neural bases of language processing	K1
CO-2	Understand the characteristics of speech, language and cognition in different types of language disorders in adults	K2
CO-3	Apply the knowledge of different characteristics and appropriate assessment techniques in adults with language disorders	K3
CO-4	Compare, analyze and make inferences about different treatment approaches that are used to rehabilitate adults with language disorders	K4
CO-5	Evaluate and plan intervention strategies for individuals with language disorders in adults considering the issues related in rehabilitation	K5

(K1=Remember, K2=Understand, K3=Apply, K4=Analyze, K5= Evaluate)

PO – CO MAPPING

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO-1	H	H	M	-	M	-	H	H	M
CO-2	H	H	H	H	M	H	H	H	H
CO-3	H	H	H	H	M	H	H	H	H
CO-4	H	H	H	H	M	H	H	H	H
CO-5	H	H	H	H	-	H	H	H	H

PSO – CO MAPPING

CO/PSO	PSO1	PSO2	PSO3
CO-1	H	H	H
CO-2	H	H	H
CO-3	H	H	H
CO-4	H	H	H
CO-5	H	H	H

Course Title	**Major Core B6.3 Aural Rehabilitation in Adults**
Code	**U21AS6MCT31**
Course type	**Theory**
Semester	**VI**
Hours/Week	**4**
Credits	**-**
Marks	**100**

CONSPECTUS

This course will enable the students to identify components of aural rehabilitation program for adults, 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.

COURSE OBJECTIVES

1. To explain the definition, assessment procedures & scope of aural rehabilitation in adults
2. To impart knowledge on various listening training & speech reading option available for aural rehabilitation in adults.
3. To understand various communication strategies applicable for aural rehabilitation of adults.
4. To gain knowledge on different aspects of aural rehabilitation in adults.
5. To comprehend the various perspectives of aural rehabilitations services available for older adults.

UNIT 1: Aural rehabilitation **12 Hrs**

a) Definition
b) Scope of aural rehabilitation in adults
c) Prevalence of hearing loss in children (global and Indian data)
d) Prevalence of hearing loss in adults (global and Indian data)
e) Relationship between audiometric data, hearing difficulties and amplification considerations
f) Limitations of audiometric data
g) Quality of life and impact on income, education, employment;
h) Assessing communication handicap: interviews, questionnaires
i) Vocational rehabilitation

UNIT 2: Listening training and speech reading for adults **12 Hrs**

a) Listening to speech with a hearing loss
b) Candidacy for auditory training
c) Listening training to improve speech perception
d) Listening training to improve music perception
e) Benefits of auditory training

f) Speech reading for communication
g) Characteristics of good lip readers versus good speech readers
h) Factors affecting speech reading
i) Assessing vision only auditory only processing
j) Traditional methods of speech reading training.

UNIT 3: Communication strategies **12 Hrs**

a) Factors that influence the reception of spoken message
b) Facilitative communication strategies
c) Repair strategies
d) Repairing a communication breakdown
e) Conversational styles
f) Communication strategies training formal instruction, guided learning, real worldpractice

UNIT 4: Aural rehabilitation for adults **12 Hrs**

a) Principles of aural rehabilitation in adults
b) Psychological impact of hearing loss
c) Support through counselling
d) Orienting towards hearing aid use
e) Needs assessment for non-hearing and assistive technology for adults
f) Categories of assistive technology
g) Aural rehabilitation programs: Individual vs group
h) Components of aural rehabilitation program
i) Process of aural rehabilitation:
j) Communication under adverse listing conditions

UNIT 5: Aural rehabilitation for older adults **12 Hrs**

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

TEXT BOOKS

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

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

SUGGESTED READINGS

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

Note: Students are advised to use the latest edition of books.

WEB REFERENCES

https://www.asha.org/practice-portal/professional-issues/aural-rehabilitation-for-adults/
https://www.audiology.org/consumers-and-patients/managing-hearing-loss/aural-rehabilitation-for-adults/
https://journals.lww.com/thehearingjournal/fulltext/2022/12000/what_is_adult_aural_rehabilitation_and_why_pursue.8.aspx
https://en.wikipedia.org/wiki/Aural_rehabilitation

COURSE OUTCOMES

CO No.	Course Outcomes	Cognitive Level (K1-K5)
CO-1	Remember the definition, assessment procedures & scope of aural rehabilitation in adults	K1
CO-2	Understand the various listening training & speech reading option available for aural rehabilitation in adults.	K2
CO-3	Apply the knowledge of various communication strategies applicable for aural rehabilitation of adults.	K3
CO-4	Compare, analyze and make inferences about to understand the different aspects of aural rehabilitation in adults.	K4
CO-5	Evaluate and plan intervention strategies for aural rehabilitations services available for older adults	K5

(K1=Remember, K2=Understand, K3=Apply, K4=Analyze, K5=Evaluate)

PO – CO MAPPING

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO-1	H	H	H	H	H	-	H	H	H
CO-2	H	H	H	H	H	-	H	H	H
CO-3	H	H	H	H	H	-	H	H	H
CO-4	H	H	H	H	H	-	H	H	H
CO-5	H	H	H	H	H	-	H	H	H

PSO – CO MAPPING

CO/PSO	PSO1	PSO2	PSO3
CO-1	H	H	H
CO-2	H	H	H
CO-3	H	H	H
CO-4	H	H	H
CO-5	H	H	H

Course Title	**Major Core B.6.4 Audiology in Practice**
Code	**U21AS6MCT32**
Course type	**Theory**
Semester	**VI**
Hours/Week	**4**
Credits	**-**
Marks	**100**

CONSPECTUS

This Audiology in Practice Paper focuses on legislation's, ethical practices, welfare measures, and policies. Students will explore various clinical settings, understanding audiologist roles, responsibilities, measurement techniques, and strategies to address noise impact in industries and communities.

Course Objectives:

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

Unit1:Scope,legislation and ethics in audiology **12Hrs**

- 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 12 Hrs

- 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.)

Unit3:Audiological practice in different settings 12Hrs

- 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 12 Hrs

- 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 12 Hrs

- 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
- 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

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- Census of India information on disability

- International classification of Functioning, Disability and Health. Geneva: WHO Organization, W. H. (2007). *International Classification of Functioning, Disability, and Health: Children & Youth Version : ICF-CY*. World Health Organization.

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- American Speech-Language-Hearing Association. (n.d.).http://www.asha.org/Practice-Portal/Professional-Issues/Audiology

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- Bakhshi, P., Babulal, G. M., & Trani, J.-F. (2017). Education of children with disabilities in New Delhi: When does exclusion occur? *PLOS ONE*, *12*(9), e0183885. https://doi.org/10.1371/journal.pone.0183885

- Kumar, S., & Kumar, S. (2018). *RPwD ACT, 2016 AND SCHOOL EDUCATION: CONCERNS AND CHALLENGES*. International Journal of Research and Analytical Reviews. http://ijrar.com/upload_issue/ijrar_issue_694.pdf

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- Maciver, D., Rutherford, M., Arakelyan, S., Kramer, J. M., Richmond, J., Todorova, L., Romero-Ayuso, D., Nakamura-Thomas, H., ten Velden, M., Finlayson, I., O'Hare, A., & Forsyth, K. (2019). Participation of children with disabilities in school: A realist systematic review of psychosocial and environmental factors. *PLOS ONE*, *14*(1), e0210511. https://doi.org/10.1371/journal.pone.0210511

- Prakash, S. S. (2012). Inclusion of children with hearing impairment in schools: A survey on teachers' attitudes.*AsiaPacificDisabilityRehabilitationJournal*,*23*(3),90–111.https://doi.org/10.5463/DCID.v23i3.117

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2. https://www.asha.org/slp/healthliteracy/
3. https://www.asha.org/policy/et2016-00342/
4. http://hub.americantelemed.org/resources/telemedicine-practice-guidelines%20
5. https://www.asha.org/articles/practicing-at-the-top-of-the-audiology-license/
6. https://www.cdc.gov/niosh/docs/96-110/pdfs/96-110.pdf
7. https://www.cdc.gov/niosh/docs/96-110/pdfs/96-110.pdf
8. https://www.osha.gov/Publications/osha3074.pdf

Note: Learners are advised to use latest edition of books

Course Outcomes:

CO No.	Course Outcomes	Cognitive Level (K1-K5)
CO-1	To Remember various clinical practice settings, audiologist roles, measurement techniques, and strategies for addressing noise impact in industries and communities.	K1
CO-2	To Understand the significance of legislations, ethical practices, and welfare measures in audiology, grasping the diverse clinical settings and comprehending the roles, responsibilities, measurement techniques, and noise impact strategies in industries and communities within the field.	K2
CO-3	Apply legislative knowledge, ethical practices, and welfare measures in audiological services, integrating strategies for awareness, program implementation, and understanding various clinical settings. Additionally, apply methods to measure noise impact, address excessive exposure, and utilize tele practice technology and terminology for effective audiological service delivery.	K3
CO-4	Analyze and Evaluate the impact of legislations, ethical practices, and welfare measures on audiological service delivery, critically examining strategies for hearing impairment awareness and comparing clinical practice settings. Assess noise impact, analyze strategies for noise exposure, and evaluate the application of terminology, technology, and methods in tele practice for effective audiological service delivery.	K4
CO-5	Evaluate and design intervention strategies for hearing impairment, assess the impact of legislations, ethical practices, and welfare measures on audiological service delivery, critically analyze various clinical settings, protocols, and audiologist roles, and evaluate methods for noise impact measurement and strategies, along with assessing the application of tele practice technology for efficient service delivery.	K5

(K1=Remember, K2=Understand, K3=Apply, K4=Analyze, K5= Evaluate)

PO – CO MAPPING

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO-1	H	H	M	-	M	-	H	H	M
CO-2	H	H	H	H	M	H	H	H	H
CO-3	H	H	H	H	M	H	H	H	H
CO-4	H	H	H	H	M	H	H	H	H
CO-5	H	H	H	H	-	H	H	H	H

PSO – CO MAPPING

CO/PSO	PSO1	PSO2	PSO3
CO-1	H	H	H
CO-2	H	H	H
CO-3	H	H	H
CO-4	H	H	H
CO-5	H	H	H

B6.5 Clinicals in Speech-language Pathology

Code:U21AS6MCP33

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:

1. Procedures to assess motor speech disorders in adults.
2. Differential diagnosis of motor speech disorders in adults.
3. Procedures to assess individuals with adult language disorders, and other related abnormalities.

Know-how:

1. To administer at least two standard tests for adult language disorders.
2. To administer at least two standard tests/protocols for motor speech disorders in adults.
3. To record a sample for analysis of language and speech skills in adults with neuro-communication disorders.
4. To assess posture, breathing, speech and swallowing in adults with motor speech disorders.
5. To consult with inter-disciplinary medical/rehabilitation team and counsel the individual/family regarding management options and prognosis.

Show:

1. Language assessment - minimum of 2 individuals after stroke.
2. Associated problems in individuals after stroke and its evaluation.
3. Dysphagia assessment – minimum of 2 children & adults.
4. Goals and activities for therapy (including AAC) based on assessment/test results for adults with neuro-communication disorders.

Do:

1. Voice therapy - Minimum of 2 individuals with voice disorders.
2. Fluency therapy - Minimum of 2 individuals with fluency disorders.
3. Bed side evaluation of individuals with neuro-communication disorders – Minimum of 2 individuals.
4. 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

B 6.6 Clinicals in Audiology

Code:U21AS6MCP34

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:

1. National and international standards related to noise exposure.
2. Recommend appropriate treatment options such as speech reading, AVT, combined approaches etc.

Know-how:

1. To carryout noise survey in Industry and community
2. To carryout mapping of cochlear implant in infants and children using both objective and subjective procedures
3. To trouble shoot cochlear implant

Show:

1. Analysis of objective responses like compound action potential, stapedial reflexes on at least 3 samples
2. Comprehensive hearing conservation program for at least 1 situation

Do:

1. AVT on at least 1 child with hearing impairment
2. Trouble shooting and fine tuning of hearing aids on at least 5 geriatric clients
3. 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
Code: U21AS7MCP35

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:

1) Diagnosis and management of speech, language, and swallowing disorders across life span.
2) Report evaluation findings, counsel and make appropriate referrals.
3) Plan and execute intervention and rehabilitation programs for persons with speech language, communication, and swallowing disorders
4) Develop and maintain records related to persons with speech-language, communication, and swallowing disorders
5) Engage in community related services such as camps, awareness programs specifically, and community based rehabilitation activities, in general.
6) Make appropriate referrals and liaise with professionals from related fields.
7) Gain experience in different set ups and be able to establish speech centres in different set-ups
8) Demonstrate that the objectives of the B.ASLP program have been achieved.
9) Advise on the welfare measures available for their clinical clientele and their families.
10) Advise and fit appropriate aids and devices for their clinical population.

B7.2 Clinicals in Audiology

Code: U21AS7MCP36

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:

1) Diagnosis and management of hearing disorders across life span.
2) Report evaluation findings, counsel and make appropriate referrals.
3) Plan and execute intervention and rehabilitation programs for persons with hearing disorders
4) Develop and maintain records related to persons with hearing disorders
5) Engage in community related services such as camps, awareness programs specifically, and community based rehabilitation activities, in general.
6) Make appropriate referrals and liaise with professionals from related fields.
7) Gain experience in different set ups and be able to establish hearing centres in different set-ups
8) Demonstrate that the objectives of the B.ASLP program have been achieved.
9) Advise on the welfare measures available for their clinical clientele and their families.
10) Advise and fit appropriate aids and devices for their clinical population.