HOLY CROSS COLLEGE (AUTONOMOUS)

Affiliated to Bharathidasan University

Nationally Accredited (3rd Cycle) with 'A' Grade by NAAC

College with Potential for Excellence.

Tiruchirapalli - 620002.

Department of Audiology and Speech Language Pathology

Programme: B.ASLP

PO No.	Programme Outcomes *Upon completion of the B.ASLP Degree Programme, the graduate will be able to*
PO-1	Function as audiologists and speech-language pathologists in different work settings
PO-2	Acquire practical knowledge to gather information and execute new techniques, protocols to excel in clinical skills.
PO-3	Understand concepts in speech, language, communication, hearing and incorporate it in Research activities
PO-4	Screen, evaluate, diagnose and assess the severity of different disorders related to speech, language, swallowing and hearing local, regional, national and international perspective
PO-5	Learn to liaise with professionals in allied fields and other stake holders

PSO No.	Programme Specific Outcomes *Upon completion of these courses the student would*
PSO-1	Manage speech, language, swallowing and hearing disorders across life span
PSO-2	Counsel persons with disorders of communication and their family members
PSO-3	Rehabilitate persons with speech, language, swallowing and hearing disorders
PSO-4	Assess and prevent speech, language, swallowing and hearing disorders
PSO-5	Undertake advocacy measures on behalf of and for persons with speech language and hearing disorders

(For Candidates admitted from the academic year 2020-21onwards)
HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI- 620002

School of Rehabilitation and Behavioral Sciences

B.ASLP COURSE PATTERN

I SEMESTER

S.No	Code	Title of the Course	Teaching Hours per Week
1.	U20AS1MCT01	B 1.1 Communication Sciences	4
2.	U20AS1MCT02	B1.2 Anatomy and Physiology of Speech and Hearing	4
3.	U20PS1MCT01	B1.3 Clinical Psychology	4
4.	U20AS1MCT03	B1.4 Linguistics and Phonetics	4
5.	U20AS1MCT04	B1.5 Electronics and Acoustics	4
6.	U20RA1MCT01	B1.6 Research Methods and Statistics	4
TOTAL			24

II SEMESTER

S.No	Code	Title of the Course	Teaching Hours per Week
1.	U20AS2MCT05	B2.1 Neurology	4
2.	U20AS2MCT06	B2.2 Otolaryngology	4
3.	U20AS2MCT07	B2.3 Speech-Language Pathology	4
4.	U20AS2MCT08	B2.4 Audiology	4
5.	U20AS2MCT39	Optional: Computer Fundamentals	4
6.	U20AS2MCP09	**Practicals** 2.5 Speech-Language Pathology	12
7.	U20AS2MCP10	**Practicals** 2.6 Audiology	12
TOTAL			44

Semester I

B 1.1 Communication Sciences

Hour - 60 Marks -100

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

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

Part A Speech-language Pathology

Unit 1: Speech, language and communication

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

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

Part B Audiology

Unit 3: Sound intensity and concept of decibel

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

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

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

Recommended Reading

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

B1.2 Anatomy and Physiology of Speech and Hearing

Hours - 60 Marks - 100

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

a) Anatomy of the auditory system
b) Anatomy of the speech mechanism
c) Physiology of hearing mechanism
d) Functioning of speech and swallowing mechanism

Unit 1: Introduction

a) General anatomical terms
b) Anatomical positions and planes of reference
c) Cells, tissues and muscles
d) Muscle connection and joints
e) Tissue - vascular and neural

Unit 2: Embryology

a) Basic terminologies related to embryology
b) Development of external ear
c) Development of middle ear
d) Development of Inner ear and the auditory system
e) Five examples of embryonic anomalies affecting speech-language & hearing
f) Development of respiratory structures
g) Development of larynx
h) Development of facial region and palate
i) Development of tongue and teeth

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

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) 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 4: Anatomy and physiology of external and middle ear

a) Anatomy of the external 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

Unit 5: Anatomy and physiology of labyrinth

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

Recommended Reading

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

B1.3 Clinical Psychology

Hour - 60 Marks -100

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

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

Unit 1: Introduction to psychology

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

Unit 2: Assessment procedures in clinical psychology

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) Behavioural assessment
f) Classification of abnormal behavior
g) History, need & rationale of classification
h) Current classificatory system: DSM, ICD

Unit 3: Developmental psychology

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

Unit 4: Principles of learning and behaviour modification

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

Unit 5: Neuropsychology and its relevance to study of speech

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

Recommended Reading

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

B1.4 Linguistics and Phonetics

Hour - 60 Marks -100

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

a) different branches and aspects of linguistics
b) characteristics and functions of language
c) different branches of phonetics, applied linguistics, and phonology
d) morphology, syntax, semantics, pragmatics
e) acquisition of language and factors affecting it
f) bi/multilingualism and related issues

Unit 1: Linguistics

a) Introduction to linguistics and different branches of linguistics: applied linguistics, sociolinguistics, psycholinguistics, metalinguistics, neurolinguistics 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.
d) Processes of word formation, content and function words
e) Endocentric and exocentric constructions, form classes, grammatical categories
f) Inflection and derivation, paradigmatic and syntagmatic relationship
g) Principles and practices of morphemic analysis
h) Langue versus parole
i) Competence vs. performance

Unit 2: Phonetics and Phonology

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

Unit 3: Morphology, syntax, semantics and applied linguistics

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.

Unit 4: Language acquisition

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

Unit 5: Bi/multilingualism

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
f) Metaphonology

g) Writing systems – types of writing
h) History of writing systems
i) Indian writing systems

Recommended Reading

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

B1.5 Electronics and Acoustics

Hours - 60 Marks - 100

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

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

Unit 1: Electronic components and power supply

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 2: Introduction to acoustics

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 3: Acoustical treatment, transducers and basics of computers

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 4: Digital signal processing

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

Unit 5: Instrumentation in speech and hearing

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

Recommended Reading

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

B1.6 Research Methods and Statistics

Hours - 60 Marks - 100

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

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

Part A: Research Methods

Unit I: Introduction to research methods

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)

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

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
e) Documentation of research: scientific report writing, different formats or styles (APA, AMA and MLA),
f) Ethics of research

Part B: Statistics

Unit III: Introduction to statistics and data collection

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

Unit IV: Statistics and research designs

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

Unit V: Epidemiology

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)

Recommended Reading

- Dane F. C. (2011). Sampling and Measurement. In Evaluating research: Methodology for people who need to read research. New Delhi: SAGE publication.
- Field, A. (n.d.). Discovering Statistics Using IBM SPSS (4th ed.). SAGE Publications.
- Hegde M. N. (2010). A course book on Scientific and professional writing for speech language pathology (4thEdition), Singapore: Delmar publication.
- Hegde, M. N. (2003). Clinical research in communicative disorders: Principles and strategies. (3rd Edition), Austin: Pro-ed
- Hesse-Biber, S. N. &Leavy, P. (2011). The Ethics of social research. In The Practice of qualitative research. (2nd Edition), New Delhi: SAGE publication.
- Jekel, F. J., Katz, L.D., & Elmore, G.J (2001). Basic Epidemiologic Concepts and Principles in epidemiology, Biostatistics, and Preventive Medicine (2nd Edition). Pennsylvian: Saunders
- Meline, T. (2010). A research primer for communication sciences and disorders. Singapore: Pearson publication.

Semester II

B 2.1 Neurology

Hour - 60 Marks -100

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

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

Unit 1: Anatomy and physiology of the nervous system

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) Neurosensory organization of speech and hearing
b) Central auditory nervous system
c) Anatomy of oral sensation and oral sensory receptors
d) Neuromotor 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

Recommended Reading

- Adams, R.D. &Sidman, R.L. (1968). Introduction to neuropathology. New Jersey: McGraw-Hill.
- Bhatnagar, S.C. (2012). Neuroscience for the Study of Communicative Disorders. Lippincott, Williams & Wilkins
- Garden, E. (1968). Fundamental of neurology, V Edn., Philadelphia: Sarenders Co.
- Webb, W. G., & Adler, R. K. (2008). Neurology for the speech-language pathologist (5th ed.). St. Louis, Mo: Mosby/Elsevier.
- Duffy, J. R. (2013). Motor Speech Disorders: Substrates, Differential Diagnosis, and Management (3rd Ed.). University of Michigan, Elsevier Mosby.

B2.2 Otolaryngology

Hour - 60 Marks -100

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

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

Unit 1: External and middle ear and their disorders

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 2: Inner ear and its disorders

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

Unit 3: Oral cavity and its disorders

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 4: Larynx and its disorders

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 restoration surgeries

Unit 5: 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

Recommended Reading

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

B2.3 Speech-Language Pathology

Hour - 60 Marks -100

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

a) different speech and language disorders
b) basic concepts and tools required for diagnosing speech and language disorders
c) basics of assessment procedures for speech and language disorders
d) basic principles and intervention procedures for speech and language disorders
e) clinical requirements to practice,
f) different laws, social-cultural and ethical issues
g) identification and prevention of speech and language disorders
h) basic principles of providing counselling and guidance to clients and caregivers

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
i) Individual and group therapy

j) 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

Recommended Reading

- Owens. Jr, Kimberly, A. Metz, F.E. (2014). 5th Ed. Introduction to Communication Disorders: A life span based Perspective. Pearson Communication Science and Disorders Series.
- Hegde, M. N., & Davis, D. (2005). Clinical methods and practicum in speech-language pathology (4th ed.). Australia; Clifton Park, NY: Thomson Delmar Learning.

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

B2.4 Audiology

Hour - 60 Marks -100

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

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

Unit 1: Differential sensitivity

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

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

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

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

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

Recommended Reading

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

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

B2.5 Practicals (Speech-language Pathology)

Marks -100

Practicals

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)

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) 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

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

(For Candidates admitted from the academic year 2017 onwards)

HOLY CROSS COLLEGE (AUTONOMOUS),

TIRUCHIRAPPALLI-2

DEPARTMENT OF AUDIOLOGY & SPEECH-LANGUAGE PATHOLOGY

B.ASLP COURSE PATTERN

III SEMESTER

S.No	Code	Title of the Course	Teaching Hours per Week
1.	U17AS3MCT13	B3.1 Voice and its Disorders	4
2.	U17AS3MCT14	B3.2 Speech Sound Disorders	4
3.	U17AS3MCT15	B3.3 Diagnostic Audiology: Behavioural Tests	4
4.	U17AS3MCT16	B.3.4 Amplification Devices	4
5.	U17AS3MCT42	Indian Constitution	4
6.	U17AS3MCP17	3.5 Clinicals in Speech -Language Pathology	12
7.	U17AS3MCP18	3.6 Clinicals in Audiology	12
TOTAL			44

IV SEMESTER

S.No	Code	Title of the Course	Teaching Hours per Week
1.	U17AS4MCT19	B.4.1 Motor Speech Disorders in Children	4
2.	U17AS4MCT20	B.4.2 Language Disorders in Children	4
3.	U17AS4MCT21	B.4.3 Diagnostic Audiology: Physiological Tests	4
4.	U17AS4MCT22	B.4.4 Implantable Hearing Devices	4

5.	U17AS4MCT43	Environment Studies	4
6.	U17AS4MCP23	B4.5 Clinicals in Speech -Language Pathology	12
7.	U17AS4MCP24	B4.6 Clinicals in Audiology	12
TOTAL			44

V SEMESTER

S.No	Code	Title of the Course	Teaching Hours per Week
1.	U17AS5MCT25	B5.1 Structural Anomalies and Speech Disorders	4
2.	U17AS5MCT26	B5.2 Fluency and its Disorders	4
3.	U17AS5MCT27	B5.3 Paediatric Audiology	4
4.	U17AS5MCT28	B5.4 Aural Rehabilitation in Children	4
5.	U17AS5MCP29	B5.5 Clinicals in Speech -Language Pathology	12
6.	U17AS5MCP30	B5.6 Clinicals in Audiology	12
TOTAL			40

VI SEMESTER

S.No	Code	Title of the Course	Teaching Hours per Week
1.	U17AS6MCT31	B6.1 Motor Speech Disorders in Adults	4
2.	U17AS6MCT32	B.6.2 Language Disorders in Adults	4
3.	U17AS6MCT33	B6.3Aural Rehabilitation in Adults	4
4.	U17AS6MCT34	B.6.4 Audiology in Practice	4
5.	U17AS6MCP35	B6.5 Clinicals in Speech -Language Pathology	12
6.	U17AS6MCP36	B6.6 Clinicals in Audiology	12
TOTAL			40

VII SEMESTER

S.No	Code	Title of the Course	Teaching Hours per Week
1.	U17AS7MCP37	B7.1 Clinicals in Speech -Language Pathology	12
2.	U17AS7 MCP38	B7.2 Clinicals in Audiology	12
TOTAL			24

VIII SEMESTER

S.No	Code	Title of the Course	Teaching Hours per Week
1.	U17AS8MCP39	B8.1 Clinicals in Speech -Language Pathology	12
2.	U17AS8MCP40	B8.2 Clinicals in Audiology	12
TOTAL			24

Semester III

B3.1 Voice and its Disorders

Hour - 60 Marks -100

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

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

Unit 1: Basic concepts in voice and its production

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

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

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

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

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

Practicals

a) Record phonation and speaking samples (counting numbers) from five children, adult men, adult women, geriatric men and geriatric women. Note recording parameters and differences in material.
b) Make inferences on age and sex differences across the samples obtained in the

previous experiment using perceptual voice profiling. Make a note of differences in pitch, loudness, quality and voice control. Explain how voice reflects ones personality and other social needs.

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

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

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

f) Perform acoustic analysis on five abnormal voice samples.

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

h) Administer a PROM on five individuals.

i) Prepare a vocal hygiene checklist.

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

Recommended Reading

- Stemple, J. C., Glaze, L. E., & Gerdeman, B, K. (2014). Clinical voice pathology: Theory & Management (5th Ed.). San Diego: Plural publishers.
- Aronson, A.E. & Bless, D. M. (2009). Clinical Voice Disorders.(4th Ed.). New York: Thieme, Inc.
- Boone, D. R., McFarlane, S. C, Von Berg, S. L. & Zraick, R, I. (2013): The Voice and Voice Therapy. (9th Ed.). Englewood Cliffs, Prentice-Hall, Inc. New Jersy.
- Professional Voice: Assessment and Management. Proceedings of the national workshop on "Professional Voice: Assessment and management", 9-10 Dec 2010. All India Institute of Speech & Hearing, Mysore. 2010.
- Andrews, M. L. (2006). Manual of Voice treatment: Pediatrics to geriatrics (3rd Ed.). Thomson Delmar Learning.
- Colton, R. H, Casper, J. K. & Leonard, R. (2006). Understanding voice problems. Baltimore: Williams & Wilkins.
- Sapienza, C. M., & Ruddy, B H. (2013). Voice Disorders.(2nd Ed.). San Diego: Plural Publisher.
- Voice: Assessment and Management. Proceedings of the national workshop on "Voice: Assessment and management", 14-15 Feb 2008. All India Institute of Speech & Hearing, Mysore. 2008.

B3.2 Speech Sound Disorders

Hour - 60 Marks -100

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

a) describe normal speech sound development and characterization of individuals with speech sound disorders.
b) perform phonological analysis and assessment of speech sound disorders.
c) plan intervention for individuals with speech sound disorders.

Unit 1: Speech sound acquisition and development

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 - I

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

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

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 approximation, 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

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.

Practicals

a) List the vowels and consonants in your primary language and provide phonetic and acoustic descriptions for the speech sounds.
b) Identify the vowels and consonants of your language on the IPA chart and practice the IPA symbols by transcribing 25 words.
c) Make a list of minimal pairs (pairs of words which differ by only one phoneme) in English.
d) Make a list of minimal pairs in any language other than English.
e) Identify the stages of speech sound acquisition by observations from videos of children from birth to 5 years of age.
f) Record the speech of a two year old typically developing child, transcribe and analyze the speech sample.
g) Record the speech of one typically developing child from 3-5 years of age (include single word and connected speech samples), transcribe the sample, and perform phonological assessment.
h) Analyze transcribed speech samples of typically developing children – practice independent and relational analysis.
i) Practice instructions for phonetic placement of selected sounds.
j) Develop a home plan with activities for any one section of phonological awareness in English and in one Indian language.

Recommended Reading

- Bernthal, J.E., Bankson, N.W., & Flipsen, P. (2013). Articulation and phonological disorders.(7th Ed.). Boston, MA: Pearson.
- Dodd, B. (2013). Differential diagnosis and treatment of children with speech disorder.(2nd Ed). NJ: Wiley.
- Rout, N (Ed)., Gayathri, P., Keshree, N and Chowdhury, K (2015). Phonics and Phonological Processing to Develop Literacy and Articulation; A Novel Protocol. A

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

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

B3.3 Diagnostic Audiology: Behavioural Tests

Hours - 60 Marks - 100

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

a) choose individualized test battery for assessing cochlear pathology, retro cochlear pathology, functional hearing loss, CAPD, vestibular dysfunctions, tinnitus and hyperacusis
b) independently run the tests and interpret the results to identify the above conditions and also use the information for differential diagnosis
c) make adjustments in the test parameters to improve sensitivity and specificity of tests.
d) make appropriate diagnosis based on the test results and suggest referrals.

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
d) Tests to detect central auditory processing disorders
e) Monaural low redundancy tests - filtered speech tests, time compressed speech test, speech-in-noise test, SSI with ICM, other monaural low redundancy tests.
f) Dichotic speech tests – Dichotic digit test, Staggered spondaic word test, Dichotic CV test, SSI with CCM, Competing sentence test, other dichotic speech tests.
g) Binaural interaction tests – RASP, BFT, MLD, other binaural interaction tests
h) Tests of Temporal processing – pitch pattern test, duration pattern tests, other temporal ordering tests, gap detection test, TMTF
i) Variables influencing the assessment of central auditory processing: Procedural and subject variables
j) 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

Practicals

a) Administer ABLB, MLB and prepare ladder gram (ABLB to be administered by blocking one ear with impression material)
b) Administer classical SISI on 3 individuals and note down the scores
c) Administer tone decay tests (classical and its modifications) and note down the results (at least 3 individuals)
d) Administer Bekesy audiometry
e) Administer Brief tone audiometry
f) Plot PIPB function using standardized lists in any 5 individuals

g) Administer the tests of functional hearing loss (both tone based and speech based) by asking subject to malinger and having a yardstick of loudness.
h) Administer CAPD test battery to assess different processes on 3 individuals and note down the scores
i) Administer Fukuda stepping test, Tandem gait test, Finger nose pointing, Romberg test, Sharpened Romberg test, Dix-Hallpike test, Log-roll test on 5 of the individuals each and note down the observations.
j) Estimate the pitch and loudness of tinnitus in 2 persons with tinnitus (under supervision). Assess the residual inhibition in them.
k) Plot Feldman masking curves for a hypothetical case
l) Administer Johnson Hyperacusis Dynamic Range Quotient on any 2 of the individuals and note down the scores.

Recommended Reading

- Gelfand, S. A. (2009). Essentials of Audiology. Thieme.
- Hall, J. W., & Mueller, H. G. (1996). Audiologists' Desk Reference: Diagnostic audiology principles, procedures, and protocols. Cengage Learning.
- Jerger, J. (1993). Clinical Audiology: The Jerger Perspective. Singular Publishing Group.
- Katz, J., Medwetsky, L., Burkard, R. F., & Hood, L. J. (Eds.). (2007). Handbook of Clinical Audiology (6th revised North American edition). Philadelphia: Lippincott Williams and Wilkins.
- Martin, F. N., & Clark, J. G. (2014). Introduction to Audiology (12 edition). Boston: Pearson.
- Roeser, R. J., Valente, M., & Hosford-Dunn, H. (2007). Audiology: Diagnosis. Thieme.
- Stach, B. A. (2010). Clinical audiology: an introduction (2nd ed). Clifton Park, NY: Delmar Cengage Learning.

B.3.4 Amplification Devices

Hours - 60 Marks - 100

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

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

Unit 1: Types of hearing aids

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

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

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

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)

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

Practicals

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

g) Perform real ear insertion measurements using different hearing aids (body level and ear level, hearing aids of different gains)
h) Compare speech perception through conventional BTE and RIC hearing aids using a rating scale
i) Observe assistive listening devices such as telephone amplifier, vibro-tactile alarms, note down the candidacy and their utility.
j) Administer a questionnaire to assess hearing aid benefit on 2 persons using hearing aids.
k) Carry out a role play activity of counselling a hearing aid user
l) Ear Molds
    - Take impression for the ear mold using different techniques, different methods and using different materials
    - Make hard mold for any 2 ears
    - Make soft mold for any 2 ears
    - Make vent in hard molds you made

Recommended Reading

- Dillon. (2012). Hearing Aids (2 edition). Thieme Medical and Scientific Publisher.
- Hall, J. W., & Mueller, H. G. (1998). Audiologists' Desk Reference: Audiologic management, rehabilitation, and terminology. Singular Publishing Group.
- Kates, J. M. (2008). Digital Hearing Aids (1 edition). San Diego: Plural Publishing Inc.
- Metz, M. J. (2014). Sandlin's Textbook of Hearing Aid Amplification: Technical and Clinical Considerations. Plural Publishing.
- Mueller, H. G., Hawkins, D. B., & Northern, J. L. (1992). Probe Microphone Measurements: Hearing Aid Selection and Assessment. Singular Publishing Group.
- Mueller, H. G., Ricketts, T. A., & Bentler, R. A. (2007). Modern Hearing Aids: Pre-fitting Testing and Selection Considerations: 1 (1 edition). San Diego, CA: Plural Publishing Inc.
- Sandlin, R. E. (Ed.). (1989). Handbook of Hearing Aid Amplification: Clinical Considerations and Fitting Practices v. 2. Boston: Singular Publishing Group.
- Sandlin, R. E. (Ed.). (1993). Understanding Digitally Programmable Hearing AIDS. Boston: Allyn & Bacon.
- Tate, M. (2013). Principles of Hearing Aid Audiology. Springer.
- Taylor, B., & Mueller, H. G. (2011). Fitting and Dispensing Hearing Aids (1 edition). San Diego: Plural Publishing Inc.
- Valente, M. (2002). Hearing Aids: Standards, Options, and Limitations. Thieme.

SEMESTER III
Optional : INDIAN CONSTITUTION

(80+20 marks) **(Total = 64 hrs)**

(Syllabus for compulsory paper for all undergraduate degree courses in III semester)

Unit 1: Indian Constitution: Its Philosophy and Framing

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

Unit 2: The Union & State Legislature

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

Unit 3: The Union & State Executive

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

Unit 4: The Judiciary

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

Unit 5: Issues

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

LIST OF BOOKS

1. D.D. Basu : Introduction to the Constitution of India
2.Granville Austin : India's Constitution – Cornerstone of a Nation

3.Granville Austin : Working of a Democratic Constitution - The Indian Experience
4. J. C. Johari : Indian Government and Politics Vol. 1 & 2
5. J.R. Siwach : Dynamics of Indian Government & Politics
6. D.C. Gupta : Indian Government & Politics
7. M.V. Pylee : India's Constitution
8. H.M. Rajasekhar : Bharatha Sarkara mattu Rajkiya
9. M.P. Bhuvaneshwara Prasad : Bharathiya Samvidhana Parichaya
10. S.K. Kabburi : Bharata Samvidhana
11. K.J. Suresh : Bharata Samvidhana
12. D.T. Deve Gowda : Bharata Sarkara mattu Rajkiya
13. Lohitashwa : Bharata Samvidhana

B3.5 Clinicals in Speech Language Pathology

Marks - 100

General considerations:

- Exposure is primarily aimed to be linked to the theory courses covered in the semester.
- After completion of clinical postings in Speech –language diagnostics, the student will know (concepts), know how (ability to apply), show (demonstrate in a clinical diary/log book based on clinical reports/recordings, etc), and do (perform on patients/ client contacts) the following:

Know:

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

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

Semester IV

B.4.1 Motor Speech Disorders in Children

Hours - 60 Marks - 100

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

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

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

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

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

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

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

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

Practicals

a) With the help of models, charts and software, identify the motor control centers in the brain.
b) Perform oro-motor examination in five children and adults and compare
c) Identify oro-motor reflexes (rooting, suckling, & phase bite) in 5 infants.
d) Demonstrate normal posture and breathing patterns required for varied speech tasks. Alter the postures and breathing patterns and notice changes in speech patterns.
e) Assess DDK rate in five typically developing children.
f) Rate intelligibility of speech in five typically developing children. Discuss factors that influenced speech intelligibility and their ratings.
g) Observe and record (a) physical status, (b) oral sensory motor abilities and vegetative skills, (c) respiration, (d) phonation, (e) resonation, (f) articulation and (g) language abilities in five typically developing children. Compare these with observations made from children with motor speech disorders.
h) Perform oro-motor exercises – isotonic and isometric. Discuss strategies to modify exercises for children.
i) Identify from video the AAC system such as low technology vs high technology systems and different symbol system, that is, Bliss symbols, IICP symbols and different signing systems – Makaton.
j) Observe feeding and swallowing skills in different age groups of children: 2 newborns; 2 infants, 2 toddlers, and 2 older children. Identify the differences in feeding methods, food consistencies, texture, quantity, feeding habits, feeding appliances used by these children.

Recommended Reading

- Arvedson, J.C., and Brodsky, L. (2002) (2nd Ed.). Pediatric swallowing and feeding. San Diego, Singular publishing.
- Caruso, F. J. and Strand, E. A. (1999). Clinical Management of Motor Speech Disordersin Children. New York: Thieme.
- Hardy, J. (1983). Cerebral Palsy. Remediation of Communication Disorder Series by F.N. Martin. Englewood Cliffs, Prentice Hall Inc.
- Love, R.J. (2000) (2nd Ed). Childhood Motor Speech Disorders. Allyn & Bacon.
- Love, R.J. and Webb, W.G. (1993). (2nd ed.) Neurology for the Speech-Language Pathologist. Reed Publishing (USA)

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

B.4.2 Language Disorders in Children

Hours - 60 Marks - 100

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

a) explain the process of acquisition of language and factors that influence its development in children.
b) identify and assess language delay and deviance in children.
c) select appropriate strategies for intervention.
d) counsel and provide guidance to parents/caregivers of 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

Practicals

a) Record mother-child interaction of one typically developing child in the age range of 0-1, 1-2, 2-4, 4-6 and 6-8 years of age. Compare linguistically the out puts from the mother and the child across the age groups. Make inferences on socio cultural influences in these interactions.
b) Make a list of loan words in two familiar languages based on interaction with 10 typically developing children in the age range of 2-4, 4-6, 6-8 and 8-10 years. Discuss the influence of bi- or multilingualism on vocabulary.
c) Record a conversation and narration sample from 3 children who are in preschool kindergarten, and primary school. Perform a language transcription and analyze for form, content and use.
d) Administer 3D LAT, ALD, LPT, ComDEALL checklist on 2 typically developing children.
e) Draft a diagnostic report and referral letter for a child with language disorder.
f) Demonstrate general language stimulation techniques and discuss the clinical application.
g) Demonstrate specific language stimulation techniques with appropriate materials and discuss its clinical applications.
h) Draft Subjective Objective Assessment Plan (SOAP) for a pre-recorded sample of a 45 minute session of intervention for a child with language disorder.
i) Draft a lesson plan for a child with language disorder.
j) Draft a discharge summary report for a child with language disorder

Recommended Reading

f) Roseberry-McKibbin, C. (2007). Language Disorders in Children: A multicultural and case perspective. Boston: Pearson Education, Inc.
g) 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
h) Hegde, M.N. (2005). Treatment protocols for language disorders in children – Vol. 1 2. San Diego: Plural Publishing
i) Owens, R.E. (2008). Language development: An introduction (7th ed.). Boston: Pearsons
j) Reed, V.A. (2004). An Introduction to children with language disorders (3rd Ed.)

New York: Allyn & Bacon

k) Rout, N and Kamraj, P (2014). Developing Communication - An Activity Book, A publication by NIEPMED, Chennai. Freely downloadable from http://niepmd.tn.nic.in/publication.php. ISBN 978-81-928032-41.

B.4.3 Diagnostic Audiology: Physiological Tests

Hours - 60 Marks - 100

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

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

Unit 1: Immittance evaluation

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)

a) Introduction and classification of AEPs
b) Instrumentation
c) Principles of AEP recording techniques:
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

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

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

Unit 5: Physiological tests for assessment of vestibular system

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

Practicals

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

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

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

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

Recommended Reading

- Hall, J. W., & Mueller, H. G. (1996). Audiologists' Desk Reference: Diagnostic audiology principles, procedures, and protocols. Cengage Learning.
- Hood, L. J. (1998). Clinical Applications of the Auditory Brainstem Response. Singular Publishing Group.
- Hunter, L., & Shahnaz, N. (2013). Acoustic Immittance Measures: Basic and Advanced Practice (1 edition). San Diego, CA: Plural Publishing.
- Jacobson, G. P., & Shepard, N. T. (2007). Balance Function Assessment and Management (1 edition). San Diego, CA: Plural Publishing Inc.
- Jacobson, J. T. (1985). The Auditory brainstem response. College-Hill Press.
- Katz, J., Medwetsky, L., Burkard, R. F., & Hood, L. J. (Eds.). (2007). Handbook of Clinical Audiology (6th revised North American ed edition). Philadelphia: Lippincott Williams and Wilkins.
- McCaslin, D. L. (2012). Electronystamography/Videonystagmography (1 edition). San Diego: Plural Publishing.
- Musiek, F. E., Baran, J. A., & Pinheiro, M. L. (1993). Neuroaudiology: Case Studies (1 edition). San Diego, Calif: Singular.
- Robinette, M. S., & Glattke, T. J. (Eds.). (2007). Otoacoustic Emissions: Clinical Applications (3rd edition). New York: Thieme.

B.4.4 Implantable Hearing Devices

Hours - 60 Marks - 100

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

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

Unit 1: Implantable hearing devices – basics

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 counseling, Informed consent

Unit 2: Bone anchored hearing devices and middle ear implants

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

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

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

l) Assessment of benefits
m) Optimization of hearing aid on contralateral ear

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

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

Practicals

a) Watch videos of BAHA, middle ear implant, cochlear implant
b) Create hypothetical cases (at least 5 different cases) who are candidates for cochlear implantation. Make protocol for recording an EABR
c) List down the technological differences across different models of cochlear implants from different companies, their cost
d) Observation of mapping
e) Watching of videos on AVT
f) Watch video on cochlear implant surgery

Recommended Reading

- Clark, G., Cowan, R. S. C., & Dowell, R. C. (1997). Cochlear Implantation for Infants and Children: Advances. Singular Publishing Group.
- Cooper, H., & Craddock, L. (2006). Cochlear Implants: A Practical Guide. Wiley.
- Dutt, S. N. (2002). The Birmingham Bone Anchored Hearing Aid Programme: Some Audiological and Quality of Life Outcomes. Den Haag: Print Partners Ipskamp.
- Eisenberg, L. S. (2009). Clinical Management of Children with Cochlear Implants.Plural Publishing.
- Gifford, R. H. (2013). Cochlear Implant Patient Assessment: Evaluation of Candidacy, Performance, and Outcomes. Plural Publishing.
- Hagr, A. (2007). BAHA: Bone-Anchored Hearing Aid. International Journal of Health Sciences, 1(2), 265–276.
- Kim C. S., Chang S. O., & Lim D. (Eds.). (1999). Updates in Cochlear Implantation :The 2nd Congress of Asia Pacific Symposium on Cochlear Implant and Related Sciences, Seoul, April 1999 (Vol. 57). Seoul: KARGER.
- Kompis, M., &Caversaccio, M.-D.(2011). Implantable Bone Conduction Hearing Aids.Karger Medical and Scientific Publishers.
- Mankekar, G. (2014). Implantable Hearing Devices other than Cochlear Implants. Springer India.
- Møller A.R. (2006). Cochlear and Brainstem Implants (Vol. 64).
- Niparko, J. K. (2009). Cochlear Implants: Principles & Practices. Lippincott Williams & Wilkins.

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

SEMESTER IV
Optional : ENVIRONMENTAL STUDIES

(80+20 marks) **(Total = 64 hrs)**

Unit 1: 2 hrs

The multidisciplinary nature of environmental studies
Definition, scope and importance

Unit 2: 8 hrs

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

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

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

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

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

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

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

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

Unit 3: 6 hrs

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

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

Unit 4: 8 hrs

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

Unit 5: 8 hrs

Environmental Pollution
Definition
Causes, effects and control measures of:-
a. Air pollution
b. Water pollution
c. Soil pollution
d. Marine pollution
e. Noise pollution
f. Thermal pollution
g. Nuclear hazards

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

Unit 6: 7 hrs

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

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

Unit 7: 6 hrs

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

Unit 8: 19 hrs

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

LIST OF BOOKS

Agarwal.K.C 2001 Environmental Biology. Nidi Publ.Ltd.Bikaner
Bharucha Erach. The Biodiversity of India, Mapin Publishing Pvt. Ltd, Ahmedabad – 380 013, India email: mapin@iccnel.net (R)

Brunner R.C 1989, Hazardous Waste

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

Cunningham, W.P. Cooper, T H Gorhani, E & Hepworth, M.T 2001 Environmental Encyclopedia, Jaico Publ. House, Mumbai 1196 p
De A.K. Environmental Chemistry, Wiley Eastern Ltd
Down to Earth, Centre for Science and Environment (R)

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

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

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

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

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

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

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

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

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

Sharma B.K 2001. Environmental Chemistry. Goel Publ. House, Meerut

Survey of the Environment. The Hindu (M)

B4.5 Clinicals in Speech-language Pathology

Marks – 100

General considerations:

- Exposure is primarily aimed to be linked to the theory courses covered in the semester.
- After completion of clinical postings in Speech –language diagnostics, the student will know (concepts), know how (ability to apply), show (demonstrate in a clinical diary/log book based on clinical reports/recordings, etc), and do (perform on patients/ client contacts) the following:

Know:

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

B4.6 Clinicals in Audiology

Marks – 100

General considerations:

- Exposure is primarily aimed to be linked to the theory courses covered in the semester, however, not just limited to these areas.
- After completion of clinical postings in auditory diagnostics and auditory rehabilitation, the student will Know (concept), know how (ability to apply), show (demonstrate in a clinical diary/log book), and do (perform on patients/ client contacts) the following:

Know:

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

Know-how:

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

Show:

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

Do:

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

- Hearing aid fitment for at least 5 individuals with mild to moderate and 3 individuals with mod-severe to profound
- Hearing aid selection with real ear measurement system on 3 individuals with hearing impairment

Evaluation:

- Internal evaluation shall be based on attendance, clinical diary, log book and learning conference.
- External evaluation: Spot test, OSCE, Record, Viva-voce, case work

Semester V

B5.1 Structural Anomalies and Speech Disorders

Hours - 60 Marks - 100

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

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

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

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

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

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

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 laryngectomee individuals
e) Assessment of speech and communication skills of laryngectomee individuals: Pre and post-operative considerations

Unit 5: Management of speech and communication in laryngectomies

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.

Practicals

a) Identify the different types of cleft lip and palate by looking at illustrations and images
b) Listen to 10 speech samples of children with cleft lip and palate and rate their nasality/ speech (articulation and cleft type errors) based on universal reporting parameters.
c) Identify the type of closure of velopharyngeal port for 5 normal individuals and 5 individuals with cleft lip and palate using videos of nasoendoscopy/ videofluroscopy.
d) Perform oral peripheral mechanism examination on 10 individuals and document the structure and functions of the articulators.
e) Analyse the different types of occlusion in 10 individuals.
f) Identify the type of glossectomy by looking at pictures/illustrations.

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.

Recommended Reading

- Berkowitz. S. (2001). Cleft Lip and Palate: Perspectives in Management. Vol II. San Diego, London, Singular Publishing Group Inc.
- Falzone. P., Jones. M. A., & Karnell. M. P. (2010). Cleft Palate Speech. IV Ed., Mosby Inc.
- Ginette, P. (2014). Speech Therapy in Cleft Palate and Velopharyngeal Dysfunction. Guildford, J & R Press Ltd.
- Karlind, M. & Leslie, G. (2009). Cleft Lip and Palate: Interdisciplinary Issues and Treatment. Texas, Pro Ed.
- Kummer, A.W. (2014). Cleft Palate and Craniofacial Anomalies: The Effects on Speech and Resonance. Delmar, Cengage Learning.
- Peterson-Falzone, S. J., Cardomone, J. T., &Karnell, M. P. (2006). The Clinician Guide to Treating Cleft Palate Speech. Mosby, Elsevier.
- Salmon . J & Shriley (1999). Alaryngeal speech rehabilitation for clinicians and by clinicians. ProEd
- Yvonne, E (Ed) (1983). Laryngectomy: Diagnosis to rehabilitation. London: Croom Helm Ltd

B5.2 Fluency and its Disorders

Hours - 60 Marks - 100

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

a) understand the characteristics of fluency and its disorders
b) evaluate and diagnose fluency disorders
c) learn about the techniques for the management of fluency disorders

Unit 1: Fluency

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

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

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

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

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

Practicals

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

Recommended Reading

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

- Wall, M. J., & Myers F. L. (1995). Clinical Management of Childhood Stuttering. Texas, PRO-ED, Inc.
- Ward, D. (2006). Stuttering and Cluttering: Frameworks for Understanding & Treatment. NY, Psychology Press.
- Yairi, E., & Seery, C. H. (2015). Stuttering - Foundations and Clinical Applications. 2nd Ed. USA, Pearson Education, Inc.

B5.3 Paediatric Audiology

Hours - 60 Marks - 100

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

a) describe auditory development
b) list etiologies and relate them to different types of auditory disorders that may arise
c) explain different hearing screening/identification procedures and their application
d) elaborate on different aspects of paediatric behavioral and 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

Practicals

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

j) Using role play demonstrate how the results of audiological assessment are explained to caregiver in children with the following conditions
    - Child referred in screening and has high risk factors in his history
    - Child with chronic middle ear disease
    - Child with CAPD
    - Child with severe bilateral hearing impairment

Recommended Reading

- Finitzo, T., Sininger, Y., Brookhouser, P., & Village, E. G. (2007). Year 2007 position statement: Principles and guidelines for early hearing detection and intervention programs. Paediatrics, 120(4), 898–921. http://doi.org/10.1542/peds.2007-2333
- Madell, J.R., & Flexer, C. (2008). Paediatric Audiology: Diagnosis, Technology, and Management. Ney York NY: Thieme Medical Publishers.
- Northern, J.L. and Downs, M.P. (2014). Hearing in Children. 6th Ed. San Diego: Plural Publishing.
- Seewald, R., and Thorpe, A.M. (2011). Comprehensive Handbook of Paediatric Audiology, San Diego: Plural Publishing. (core text book)
- www.jcih.org

B5.4 Aural Rehabilitation in Children

Hours - 60 Marks - 100

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

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

Unit 1: Auditory development, spoken communication and acoustic accessibility

a) Sensitivity period for auditory development
b) Impact of hearing impairment on auditory development, spoken language acquisition, 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, desktop group systems, blue tooth 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 in India.

Practicals

a) Watch documentaries such as "Sound and Fury" (2001). Write a reflection of why parents made communication choices for their children
b) Follow on links to the above film that shows the status of the children with hearing impairment after a few years.
c) Learn at least 50 signs across different categories of Indian sign language. Make a video of you signing 10 sentences. Have a class mate interpret them.
d) Interview a parent of a child with hearing impairment on how they adapted their child to wear the hearing aids and /or implant. What were the first responses to sound they observed and how language and speech develop?
e) Complete a functional auditory evaluation on one child with hearing loss. Do a speech and language evaluation and also write a report on the child strengths and weakness.
f) Design and demonstrate auditory learning activities at the four levels awareness, discrimination, identification and comprehension. Ensure that the activities encompass different skill level and difficulty levels.
g) Develop a short audio/film/pamphlet for parents in your local language on one of the following: teaching parent to trouble shooting the hearing aid/cochlear implant, establishing consistent use of listening device, activities to facilitate language across different age groups
h) Visit a school for the deaf. Document your observation about the acoustic environment in the class, strategies used by the teacher to promote listening and spoken language

Recommended Reading

- Fitzpatrick, E.M., and Doucet S.P. (2013) (Eds). Paediatric Audiologic Rehabilitation. Thieme, New York
- Hosford-Dumm, H., Roser, R., & Valente, M. (2007). Audiology Practice Management (2nd edition edition). New York: Thieme.
- Mardell, J., & Flexer, C. (2013). Paediatric Audiology: Diagnosis, Technology, and Management (2nd ed.). New York, NY: Thieme.
- Rout, N and Rajendran, S. (2015). Hearing aid Counselling and Auditory training Manual, A publication of NIPMED, Chennai. Freely downloadable from http://niepmd.tn.nic.in/publication.php. ISBN 978-81-928032-5-8.
- Schwartz, S., (2007) Choices in Deafness : a Parent's guide to Communication Options , 3rd edition Woodbine house Bethesda
- Status of Disability in India Hearing Impairment (2012) Rehabilitation Council of India, New Delhi
- Tye-Murray, N., (2014) Foundations of Aural Rehabilitation: Children , adults and their family members 4th edition Plural Publishing San Diego

B5.5 Clinicals in Speech Language Pathology

Marks - 100

General considerations:

- Exposure is primarily aimed to be linked to the theory courses covered in the semester.
- After completion of clinical postings in Speech –language diagnostics, the student will know (concepts), know how (ability to apply), show (demonstrate in a clinical diary/log book based on clinical reports/recordings, etc.), and do (perform on patients/ client contacts) the following:

Know:

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

Marks - 100

General considerations:

- Exposure is primarily aimed to be linked to the theory courses covered in the semester, however, not just limited to these areas.
- After completion of clinical postings in auditory diagnostics and auditory rehabilitation, the student will Know (concept), know how (ability to apply), show (demonstrate in a clinical diary/log book), and do (perform on patients/ client contacts) the following:

Know:

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

Know-how:

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

Show:

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

Do:

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

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

Evaluation:

- Internal evaluation shall be based on attendance, clinical diary, log book and learning conference.
- External evaluation: Spot test, OSCE, Record, Viva-voce, case work

Semester VI

B6.1 Motor Speech Disorders in Adults

Hours - 60 Marks - 100

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

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

Unit 1: Causes & Characteristics of dysarthria

a) Definition, etiology and classification of acquired dysarthria
b) General, speech and feeding related characteristics of acquired dysarthria with and without genetic underpinnings:
c) Vascular lesions: dysarthria following stroke/CVA, cranial and peripheral nerve palsies
d) Infectious condition of the nervous system: dysarthria following meningitis, encephalitis, polyneuritis, poliomyelitis, neurosyphilis.
e) Traumatic lesions: Dysarthria following TBI.
f) Toxic conditions of the nervous system: Dysarthria following exogenic and endogenic toxic conditions of the nervous system.
g) Anoxia of the nervous system: Dysarthria following anoxic conditions
h) Metabolic disorders affecting nervous system: Dysarthria following metabolic conditions that affect the nervous system, Wilson's disease etc.
i) Idiopathic causes: Dysarthria following idiopathic causes
j) Neoplastic lesions of nervous system: Dysarthria following neoplastic lesions in the nervous system
k) Demyelinating and degenerative conditions: Huntington's Chorea, Parkinson's, Multiple Sclerosis, Motor Neuron Diseases

Unit 2: Assessment and diagnosis of dysarthria

a) 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
b) Instrumental analysis of speech in dysarthria: Acoustic, kinematic and physiological
c) 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

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

Unit 4: Assessment and management of apraxia in adults

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

Unit 5: Management related issues in motor speech disorders

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

Practicals

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

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

Recommended Reading

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

B.6.2 Language Disorders in Adults

Hours - 60 Marks - 100

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

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

Unit 1: Neural bases of language

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

Unit 2: Language disorders in adults

a) 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
b) Differential diagnosis of various language disorders seen in adults.

Unit 3: Assessment and diagnosis of language disorders

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

Unit 4: Management of language disorders

a) 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

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

Practicals

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

Recommended Reading

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

B6.3 Aural Rehabilitation in Adults

Hours - 60 Marks - 100

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

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

Unit 1: Aural rehabilitation

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

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

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 world practice

Unit 4: Aural rehabilitation for adults

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

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

Practicals

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

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

d) Administer any three self-report questionnaires to three older adults who have hearing loss and write a report of the relationship of their hearing loss to performance on the scale
e) Administer any three self-report questionnaires to three adults who wear hearing aids and write a report of the relationship of their hearing loss to performance on the scale
f) Administer the hearing belief questionnaire (Saunders, 2013) on an adult. Identify the positive and negative attitude and behavior that may impact the success of aural rehabilitation
g) Design a session of aural rehab program (Objectives, activities, outcomes assessment) for adults recently fitted with cochlear implant, group of 4 older adults.
h) Design an individualised program for an executive using a hearing aid for the first time, and an adult moving from an analog to a digital hearing aid
i) Develop a pamphlet in your local language that would address any topic in aural rehabilitation

Recommended Reading

- Hull, R. H., (2014) ed. Introduction to Aural Rehabilitation 2nd edition Plural Publishing, San Diego Chapters 1, 2, 11 to 20
- Schow, R.L. & Nerbonne, M.A., (2012). Introduction to Audiologic Rehabilitation (6th edition), Allyn & Bacon, Boston.
- Tye-Murray, N., (2014). Foundations of Aural Rehabilitation: Children , adults and their family members 4th edition Plural Publishing San Diego Chapters 5-10

B.6.4 Audiology in Practice

Hours - 60 Marks - 100

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

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

Unit 1: Scope, legislation and ethics in audiology

a) Scope of practice in audiology (National – ISHA & International body - AAA)
b) Professional ethics (ISHA)
c) Legislations and conventions relating to disability: need and historical aspects
d) Classification of hearing impairment and disability certification,
e) Rehabilitation Council of India Act (1992) and its amendments
f) Person with Disability Act (1995)
g) National Trust Act (1999)
h) Right to Education (2012)
i) Biwako Millennium framework (2003) and Salamanca Statement 1994
j) UNCRPD
k) 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

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

Unit 3: Audiological practice in different settings

a) Audiological Private practice
b) ENT clinics
c) Paediatric / neonatology clinic/departments
d) Neurology departments
e) Factories and Industry
f) Hearing aid dispensing centre/hearing aid industry
g) Rehabilitation centres such as DRC/CRCs
h) Schools for the hearing impaired
i) Cochlear implant clinics
j) Multiple handicap habilitation centre and others

Unit 4: Noise and hearing conservation in industry and community

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

Unit 5: Scope and practice of tele audiology

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

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

Practicals

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

Recommended Reading

- Audiology Telepractice; Editor in Chief, Catherine V. Palmer, Ph.D.; Guest Editor, Greg D. Givens, Ph.D. Seminars in Hearing, volume 26, number 1, 2005.
- Bergland, B., Lindwall, T., Schwela, D.H., eds (1999). Guidelines on Community noise http://www.who.int/docstore/peh/noise/guidelines2.html WHO 1999
- BIS specifications relating to Noise Measurements.- IS:7194-1973 Specification for assessment of noise exposure during work for hearing conservation purposes.
- Census of India information on disability
- Dobie, R. A (2001). Medical legal evaluation of hearing loss, 2nd Ed.
- Hearing health and strategies for prevention of hearing impairment WHO (2001). International classification of Functioning, Disability and Health. Geneva: WHO
- http://www.asha.org/Practice-Portal/Professional-Issues/Audiology-Assistants/Teleaudiology-Clinical-Assistants/
- http://www.asha.org/uploadedFiles/ModRegTelepractice.pdf
- IS:10399-1982 Methods for measurement of noise emitted by Stationary vehicles
- IS:6229-1980 Method for measurement of real-ear
- IS:9167-1979 Specification for ear protectors. 95
- IS:9876-1981 Guide to the measurement of airborne acoustical noise and evaluation of its effects on man- IS:7970-1981 Specification for sound level meters.
- IS:9989-1981 Assessment of noise with respect to community response.
- John Ribera. Tele-Audiology in the United States. In Clinical Technologies: Concepts, Methodologies, Tools and Applications (pp. 693-702), 2011. Hershey, PA: Medical Information Science Reference. doi:10.4018/978-1-60960-561-2.ch305

- Lipscomb, D. M. (1994). Hearing conservation – In industry, schools and the military.
- Mandke, K and Oza R.K (2014). Private practice in speech pathology and audiology, 2014 ISHA
- Philippe Valentin Giffard. Tele-Audiology. Tort, 2012. ISBN 6139256615, 9786139256617
- Rawool, V. W. (2012). Hearing conservation in occupational, recreational, educational and home setting. Thieme: New York
- RCI, PWD and National Trust, and Right to education act
- Richard Wootton, John Craig, Victor Patterson, editors. Introduction to telemedicine. Second edition. London: The Royal Society of Medicine Press Ltd. 2006. p. 206 ISBN: 1 85315 677 9.
- Salamanca statement and framework for action
- Scope of practice by RCI
- Swanepoel de W, Hall JW 3rd .A systematic review of tele health applications in audiology. Telemed J E Health. 2010 Mar;16(2):181-200. doi: 10.1089/tmj.2009.0111.
- UNCRPD

B6.5 Clinicals in Speech-language Pathology

Marks - 100

General considerations:

- Exposure is primarily aimed to be linked to the theory courses covered in the semester.
- After completion of clinical postings in Speech–language diagnostics, the student will know (concepts), know how (ability to apply), show (demonstrate in a clinical diary/log book based on clinical reports/recordings, etc.), and do (perform on patients/ client contacts) the following:

Know:

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

B6.6 Clinicals in Audiology

Marks – 100

General considerations:

- Exposure is primarily aimed to be linked to the theory courses covered in the semester, however, not just limited to these areas.
- After completion of clinical postings in auditory diagnostics and auditory rehabilitation, the student will Know (concept), know how (ability to apply), show (demonstrate in a clinical diary/log book), and do (perform on patients/ client contacts) the following:

Know:

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

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

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.

(For candidates admitted from 2020-21 onwards)

Holy Cross College (Autonomous), Tiruchirappalli-2

School of Rehabilitation and Behavioral Sciences

Department of Audiology & Speech-Language Pathology

First Year - Semester – I

Course Title	Major Core B 1.1. Communication Sciences
Total Hours	60 hrs
Hours/Week	4 Hrs Wk
Code	U20AS1MCT01
Course Type	Theory
Credits	-
Marks	100

General Objectives:

After completing this course, the student will be able to understand the, Basic concepts in speech, hearing, language and communication, Basic concepts of hearing sensitivity and acoustics

Course Objectives:

CO No.	Course Objectives
CO-1	Remember and understand speech, language, communication and its normal development and analyze its functions
CO-2	Explain the bases of speech production
CO-3	Understand the concept of intensity, decibel and design its clinical application
CO-4	Summarize and organize the concepts of audibility and hearing
CO-5	Discuss the history and development of field of audiology and speech language pathology

UNIT I - Speech, LanguageandCommunication 12hrs

Concept of speech, language and communication, Compare and contrast between speech, language and communication based on its similarities, dissimilarities and functions, Assessment of speech and language development, Identification of factors affecting speech and language development
Extra reading/ Key words: *overlaid function, speech chain, types of bilingualism, components of language*

UNIT II – Bases of SpeechandLanguage 12hrs
Construction of speech production sub systems, Concept of acoustic theory, Speechproduction mechanism, Identification of different bases of speechproduction

Extra reading /Key words: *periodic and aperiodic sounds, G. Fant, acoustics of vowels and consonants*

UNIT III – Sound Intensity and Conceptof Decibel **12hrs**

Concept of absolute and relative units of sound intensity, Measurement and identification of sound intensityCharacteristics and application of decibels

Extra reading/ Key words: *Sound level meter, uses of SLM, weighting networks, calibration*

UNIT IV – AudibilityAndHearing **12hrs**

Differentiate between intensity and frequency, estimating the threshold of hearing through various methods, Differentiate between MAP and MAF, Assessment of sensation levels, threshold of pain and most comfortable levels

Extra reading /Key words*: missing 6 dB, son,phon, Fletcher Munson curve*

UNIT V – Introduction to Audiology and SpeechLanguagePathology **12hrs**

Mapping the history of audiology and speech language pathology, Development of audiology and speech language pathology in India , Identification of branches ofaudiology

Extra reading /Key words*: instrumentation in audiology, scope of audiology*

Note: Texts given in the Extra reading /Key words must be tested only through Assignment andSeminars

Course Outcomes:

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Define the terms speech, language and communication and explain each of its components in detail	PSO1 PSO4	**R, E**
CO-2	Identify the pre requisites and factors affecting speech and language development	PSO2 PSO3	**An, Ap**
CO-3	Explain acoustic theory of speech production	PSO 4	**R**
CO-4	Recall the characteristics and applications of decibel	PSO 5	**C**
CO-5	Describe the terms Sensation levels, Threshold of pain, Most comfortable levels	PSO 2	**An, Ap**
CO-6	Bridges theory with practicals thereby aiding in skill development	PSO 5	**U, C**

References

Text Books:

1. SubbaRao, T A. (1992). *Manual for Developing Communication Skills*. NIMH. ISBN: 81-86594-03-
2. Martin, F. N., & Clark, J. G. (2014). *Introduction to Audiology (12 edition).* Boston: Pearson.
3.Gelfand,S.A.(2009*).Hearing:AnIntroductiontoPsychologicalandPhysiological*

Acoustics (5 edition). London: CRC Press.

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

(For candidates admitted from 2020-21 onwards)

Holy Cross College (Autonomous), Tiruchirappalli-2

School of Rehabilitation and Behavioral Sciences

Department of Audiology & Speech-Language Pathology

First Year - Semester – I

Course Title	Major Core B1.2 Anatomy and Physiology of Speech And Hearing
Total Hours	60 hrs
Hours/Week	4 Hrs Wk
Code	U20AS1MT02
Course Type	Theory
Credits	-
Marks	100

General Objectives:

After completing this course, the student will be able to understand the Anatomy of the auditory system, Anatomy of the speech mechanism, Physiology of hearing mechanism, Functioning of speech and swallowing mechanism.

Course Objectives:

CO No.	Course Objectives
CO-1	Remember and understand embryology of orofacial structures
CO-2	Explain the anatomy and physiology of speech production
CO-3	Understand the anatomy and physiology of ear
CO-4	Summarize and organize the physiology of hearing and balance
CO-5	Understand the anatomy and physiology of swallowing

UNIT I–Introduction **12hrs**

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

Extra reading/ Key words: *overlaid function, speech chain, types of bilingualism, components of language*

UNIT II–Embryology **12hrs**

Basic terminologies related to embryology, Development of external ear, middle ear , inner ear and auditory system, Embryonic anomalies affecting speech-language & hearing, Development of respiratory structures, larynx, facial regions and palate

Extra reading /Key words*: embryology, Embryology of cleft lip and palate, structural anomalies of ear and face*

UNIT III – Anatomy and Physiology of Speech Production SystemsandSwallowing 12hrs

Mechanisms of breathing with emphasis on speech breathing, Supportive frame work of larynx, Anatomy of larynx, esophagus, resonatory and articulatory system, Brief mechanisms of swallowing and phonation, Contribution of articulatory and resonatory structures to speech production

Extra reading /Key words*: acoustic theory of speech production, mechanism of speech production, development of swallowing*

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

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

Extra reading /Key words*: head shadow, body baffle, localization, transformer action, lateralization, anomalies of external and middleear*

UNIT V – Anatomy and Physiologyof Labyrinth 12hrs

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

Extra reading /Key words*: bone conduction, congenital anomalies of inner ear*

Note: Texts given in the Extra reading /Key words must be tested only through Assignment andSeminars.

Course Outcomes:

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Explain different types of muscle tissues with relevant diagrams.	PSO –1 PSO –4	R, U
CO-2	Detail the anatomy of larynx with figures.	PSO –1 PSO –4 PSO –2	R, U
CO-3	Explain the mechanism of swallowing.	PSO –3 PSO –4	Ap, R
CO-4	Analyse the contribution of articulatory mechanism to speech production?	PSO –4 PSO –5 PSO –1	An, E
CO-5	Describe the development of ear and auditory system.	PSO –2 PSO –4 PSO –5	R, U
CO-6	Make models related to anatomy and physiology aiding in skill development	PSO - 2	E, C

References

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 Thomson Learning.NY.
2. Zemlin, W. R. (2010). *Speech and Hearing Science: Anatomy and Physiology:International Edition (4 edition*.). Boston:Pearson.

Reference Books:

1. Chaurasia, B.D (2004). Human Anatomy, vol 3. Head Neck and Brain 4 th Eds, CBSPublishers and Distributors, New Delhi. ISBN81-239-1157-2.
2. Kelley, M., Wu, D., & Fay, R. R. (Eds.). (2005). Development of the Inner Ear (2005edition.). New York:Springer.

(For candidates admitted from 2020-21 onwards)

Holy Cross College (Autonomous), Tiruchirappalli-2

School of Rehabilitation and Behavioral Sciences

Department of Audiology & Speech-Language Pathology

First Year - Semester – I

Course Title	**Major Core B1.3. Clinical Psychology**
Total Hours	**60 hrs**
Hours/Week	**4 Hrs Wk**
Code	**U20PS1MCT01**
Course Type	**Theory**
Credits	**-**
Marks	**100**

General Objectives:

After completing this course, the student will be able to understand the concept of psychology, assessment procedures and scope of psychology in speech and hearing.

Course Objectives:

CO No.	Course Objectives
CO-1	Remember and understand scope of clinical psychology and its significance for speech and hearing
CO-2	Explain the cognitive, motor, emotional and social development
CO-3	Understand the theories of learning and therapy techniques based on learning principles
CO-4	Implement neuropsychology in the field of speech and hearing
CO-5	Remember and understand scope of clinical psychology and its significance for speech and hearing

UNIT I - IntroductiontoPsychology **12Hrs**

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

Extra reading /Key words: *different school of psychology, application of psychology in speech therapy*

UNIT II - Assessment Procedures inClinicalPsychology **12Hrs**

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

Extra reading /Key words: *ICD 10, DSM V, ICF*

UNIT III -DevelopmentalPsychology **12Hrs**

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

Extra reading /Key words: *theory of mind, importance of motor development in speech and language development.*

UNIT IV - Principles of Learning andBehaviorModification **12Hrs**

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

Extra reading /Key words: *learning, conditioning, classical, operant, skill, behavior, application of learning theories in speech and language therapy*

UNIT V - Neuropsychology and its Relevance to Studyof Speech **12Hrs**

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

Extra reading /Key words: *importance of counseling, counseling tips for various speech and hearingdisorders*

Note: Texts given in the Extra reading /Key words must be tested only through Assignment and Seminars.

Course Outcomes:

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Explain the role of clinical psychology in the field of speech and hearing.	PSO2 PSO5	U
CO-2	Understand methods of assessment in clinical psychology	PSO4 PSO3	R
CO-3	Detail the assessment of cognitive functions.	PSO4 PSO3 PSO5	Ap, E
CO-4	Explain the stages in motor development till adulthood and counsel regarding it	PSO2 PSO4	C
CO-5	Describe the characteristics of a good counsellor.	PSO5 PSO1	An, E
CO-6	Bridging theory with practical aspects of speech language pathology and audiology - skill development	PSO 5	Ap, C

References

Text Books:

1. Morgon C.T., King R.A., Robinson N.M. *Introduction to Psychology*. Tata McGraw Hill PublishingCo.
2. Anastasi, A. (1999). *Psychological testing*, London:Freeman
3. Baura, M (2004). *Human Development and Psychlogy*, Rehabiliation Council of India,New Delhi. ISBN:81-7391-868-6
4. Coleman J.C. *Abnormal Psychology and Modern Life*, Taraporevala Sons &Co.

Reference Books:

1. Gregory, R.J. (2000). *Neuropsychological and geriatric assessment in Psychological Testing: History, Principles, and Applications (3rd ed.).* New York: Allyn &Bacon.
2. Hurlock, E.B. (1981). *Child development*. (VI Ed.). Mc Graw Hill International BookCo.
3. Kline, P. (1993). *The Handbook of Psychological Testing*.Routledge
4. Lezak, M., Loring, D.W., and Hannay, H.J. (2004). *Neuropsychological Assessment.Fourth Edition*. New York: Oxford UniversityPress
5. Siegal M.G. (Ed). (1987). *Psychological Testing from Early Childhood Through Adolescence*. International UniversitiesPress.

(For candidates admitted from 2020-21 onwards)

Holy Cross College (Autonomous), Tiruchirappalli-2

School of Rehabilitation and Behavioral Sciences

Department of Audiology & Speech-Language Pathology

First Year - Semester – I

Course Title	Major Core B1.4 Linguistics and Phonetics
Total Hours	60 hrs
Hours/Week	4 Hrs Wk
Code	U20AS1MCT03
Course Type	Theory
Credits	-
Marks	100

General Objectives:

After completing this course, the student will be able to understand the branches of linguistics and phonetics and its scope in the field of speech and hearing.

Course Objectives:

CO No.	Course Objectives
CO-1	Remember and understand different branches and aspects of linguistics and phonetics
CO-2	Explain the characteristics and functions of language
CO-3	Understand morphology, syntax, semantics, pragmatics
CO-4	Summarize acquisition of language and factors affecting it
CO-5	Define bilingualism and issues related to it

UNIT I-Linguistics **12Hrs**

Introduction to linguistics and different branches of linguistics: applied linguistics, sociolinguistics, psycholinguistics, metalinguistics, neurolinguistics and clinical linguistics, Language characteristics and functions, difference between animal communication systems and human language, Morphology – concepts of morph, allomorph, morpheme, bound free and compound forms, roots etc. Processes of word formation, content and function words, Endocentric and exocentric constructions, form classes, grammatical categories, Inflection and derivation, paradigmatic and syntagmatic relationship, Principles and practices of morphemic analysis, Langue versus parole, Competence vs. performance

Extra reading /Key words*: dialect, creole, pidgin*

UNIT II – PhoneticsandPhonology **12Hrs**

Introduction to phonetics, Articulatory, acoustic, auditory and experimental phonetics – an introduction, Articulatory classification of sounds – segmental and supra-segmental, Classification description and recognition of vowels and consonants, Pathological aspects of speech sound production, Transcription systems with special emphasis on IPA. Transcription of

samples of normal and disordered speech, Introduction to phonology, classification of speech sounds on the basis of distinctive features and phonotactic, Application of distinctive feature theory to speech pathology and speech therapy, phonotactics, phonotactic patterns of English and Indian languages, Phonemic analysis – Principles and practices; their practical implications for speech pathologists, Common phonological processes - assimilation, dissimilation, metathesis, haplology, epenthesis, spoonerism, vowel harmony, nasalization, neutralization

Extra reading /Key words*: types of phonetics, distinctive feature analysis, phonotactis in Tamil and English*

UNIT III - Morphology, Syntax, Semantics andAppliedLinguistics 12hrs

Morphology – concepts of morph, allomorph, morpheme, roots, compound forms - endocentricand exocentric constructions, free and bound morphemes, inflection and derivation, principles and practices of morphemic analysis **Syntax –** different methods of syntactic analysis IC analysis, phrase structure, grammar, transformational generative grammar, Introduction to the major types of transformations

Sentence types, notions about competence versus performance, Deep structure versus surface structure, Acceptability versus grammaticality language versus parole etc. A brief introduction to semantics – semantic feature theory, pragmatics, Processes of word formation, content and function words, form classes, grammatical categories, Syntax – concepts of phrases and clauses, sentence and its types, Different methods of syntactic analysis – Immediate constituent analysis, Phrase structure, grammar, transformational generative grammar– deep structure versus surface structure, acceptability versus grammaticality; Introduction to the major types of transformations, Usefulness of morphemic and syntactic analysis in planning speech and language therapy, A brief introduction to semantics, semantic relations, semantic feature theory, a brief introduction to pragmatics and discourse.

Extra reading /Key words*: competence and performance in language disorder, pragmatic disorder*

UNIT IV -LanguageAcquisition 12Hrs

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

Extra reading /Key words*: pre requisites, Nom Chomsky, LAD*

UNIT V-Bi/Multilingualism 12Hrs

Introduction to the language families of the world and India, Issues related to second language acquisition & factors influencing it, Inter-language theory, language transfer and linguistic interference, Differences between first and second language acquisition/learning, Bilingualism/Multilingualism, Metaphonology, Writing systems – types of writing, History of writing systems, Indian writing systems

Extra reading /Key words: stages of second language acquisition, report writing,

Note: Texts given in the Extra reading /Key words must be tested only through Assignment andSeminars.

Course Outcomes:

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Explain different branches of linguistics.	PSO 4	R, U
CO-2	Describe the functions and characteristics of language?	PSO2 PSO4	R, An
CO-3	Detail phonetics and its types.	PSO4 PSO5	E, R, U
CO-4	Explain application of distinctive feature theory in speech pathology and speech therapy?	PSO5 PSO1	C, E, An
CO-5	. Describe the factors affecting second language acquisition.	PSO3 PSO5	C, Ap, R, U
CO-6	Practical sessions on transcription which aids in assessment aiding skill development	PSO 4	Ap, An

References

Text Books:

1. Ball & Martin (1995). *Phonetics for speech pathology*. Delhi: AITBS Publishes,India.
2. Ball, Rahilly&Tench (1996). *The phonetic transcription of disordered speech*. San Diego: Singular Publishing GroupInc.
3. Clark and Yallop (1999). *An introduction to phonetics and phonology*. Oxford:Blackwell Publishes Inc.
4. Karanth, P (2003). *Cross-Linguistic study of Acquired Reading Disorders*. SagePublications, New Delhi. ISBN :0-306-48319-X

Reference Books:

3. Ladefoged, P. (1982). *A course in phonetics*. New York: Harcourt Brace JovanorichInc.
4. Shriberg& Kent (1982). *Clinical phonetics*. New York: John Wiley &Sons.

(For candidates admitted from 2020-21 onwards)

Holy Cross College (Autonomous), Tiruchirappalli-2

School of Rehabilitation and Behavioral Sciences

Department of Audiology & Speech-Language Pathology

First Year - Semester – I

Course Title	Major Core B1.5 Electronics and Acoustics
Total Hours	60 hrs
Hours/Week	4 Hrs Wk
Code	U20AS1MCT04
Course Type	Theory
Credits	-
Marks	100

General Objectives:

After completing this course, the student will be able to understand basics of electronics, acoustics and its application in speech and hearing.

Course Objectives:

CO No.	Course Objectives
CO-1	Remember and understand concept of electronics and acoustics
CO-2	Explain the basics of digital signal processing
CO-3	Understand theoretical basis of acoustics required for audiologists
CO-4	Summarize functioning of computers and computing systems
CO-5	Remember and understand concept of electronics and acoustics

UNIT I - Electronic Components andPowerSupply **12Hrs**

Resistors, capacitors, inductors, Transformers and potentiometers, Semiconductor diodes and transistors

Light emitting devices, seven segment displays, Liquid crystal displays, Principles of operations and working of Field Effect Transistors, Uni-junction transistors and thyristors, Introduction to linear and digital integrated circuits, Block diagram of a DC power supply, Linear regulated power supplies, line regulation and load regulation, specifications of a DC power supply unit, Switched Mode Power Supply

AC power supply, stabilizers, Uninterrupted Power Supply, and inverters, Basic electronic concepts such as Polarity, Grounding

Extra reading /Key words: *DSP, electronic circuit in hearing aids, polarity and grounding in elctrophysiological tests*

UNIT II - IntroductiontoAcoustics **12Hrs**

Vibrations and their characteristics , Sound - generation and propagation, Characteristics of sound

Amplitude, frequency and phase of pure tones, Amplitude, frequency and phase of complex tones (FFT and spectrum, relationship between time waveform, FFT and impulse response), Reflection and absorption, acoustic impedance, reverberation, Impedance and admittance, Electro-mechano-acoustic transformers

Extra reading /Key words: *application of impedance and admittance in audiology, rarefaction and condensation*

UNIT III - Acoustical Treatment, Transducers and Basicsof Computers 12Hrs

Introduction to audiometric rooms, Absorption coefficient, Sabine's formula, Materials for construction of audiometric rooms, Lighting, grounding and other miscellaneous issues related to audiometricrooms

Evaluation of efficiency of sound proofing in the audiometric rooms, Amplifiers, Microphones, loudspeakers - types and function, Fundamentals of digital electronics, binary number system, Hex code, bit, byte, logic gates, counters, flip-flops etc., Introduction to computers , Operating systems, hard ware, software, memory devices and other peripherals, care and preventive maintenance of computers

Extra reading /Key words: *ANSI standards of audiometric rooms, types of amplifiers in hearing aids*

UNIT IV - DigitalSignalProcessing 12Hrs

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

Extra reading /Key words: *digital signal processing in hearing aids, digital hearing aids, analog hearing aids*

UNIT V - Instrumentation in SpeechandHearing 12Hrs

Introduction to electronic instrumentation in speech and hearing, Electrodes, filters andpreamplifiers 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

Extra reading /Key words: *high tech AAC, text to speech devices*

Note: Texts given in the Extra reading /Key words must be tested only through Assignment and Seminars.

Course Outcomes:

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Define resistors and capacitors	PSO3 PSO5	U
CO-2	Differentiate between LED and LCD.	PSO3 PSO5	R
CO-3	Explain DC power supply with a block diagram.	PSO3 PSO5	U, R
CO-4	Explain the characteristics of sound.	PSO3 PSO5	R
CO-5	Plan acoustics for an audiometric room	PSO 3	C
		PSO 5	
CO-6	Block diagrams to understand better functioning of different amplification devices aiding Skill development	PSO 2	U, Ap

References

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.

Reference Books:

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.

(For candidates admitted from 2020-21 onwards)

Holy Cross College (Autonomous), Tiruchirappalli-2

School of Rehabilitation and Behavioral Sciences

Department of Audiology & Speech-Language Pathology

First Year - Semester – I

Course Title	Major Core B1.6 Research Methods and Statistics
Total Hours	60 hrs
Hours/Week	4 Hrs Wk
Code	U20RA1MCT01
Course Type	Theory
Credits	-
Marks	100

General Objectives:

After completing this course, the student will be able to understand the basic concepts of research and statistics in the field of speech and hearing

Course Objectives:

CO No.	Course Objectives
CO-1	Remember and understand concepts of research and statistics
CO-2	Apply the statistical methods and research designs in the field of speech and hearing
CO-3	Design and execution of research
CO-4	Discuss the ethical guidelines for conducting research
CO-5	Elaborate on Epidermology

UNIT I - Introduction toResearchMethods 12hrs

Meaning and purpose of research: meaning, Need for research in audiology and speech-language pathology, Funds/grants for research, Steps in research: identification, selection, Formulation of research questions: aims, objectives, statement of problem, hypothesis

Types of variables; types of sampling procedures (random and non-random); Types/ methods of data collection and their advantages and disadvantages, Reliability and validity (internal and external validity)

Extra reading /Key words*: methods of sampling, types of interview, types of questionnaires, types of data*

UNIT II – Research Design in Audiology andSpeech-LanguagePathology 12Hrs

Types of research: survey, ex-post facto research, normative research, standard-group comparison, Experimental and quasi experimental research: group design & single subjectdesign

Internal and external validity of research, Between groups vs. repeated measures design, Documentation of research: scientific report writing, different formats or styles (APA, AMA and MLA), Ethics of research

Extra reading /Key words*: experimental, non experimental, report writing in speech and hearing*

UNIT III - Introduction to Statistics andDataCollection 12hrs

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

Extra reading /Key words*: scales of measurement, data, normal distribution, variants, central tendency*

UNIT IV - Statistics andResearchDesigns 12hrs

Choosing statistics for different research designs, Correlational techniques: Pearson's Product Moment Correlation Coefficient; Spearman's Rank order correlation coefficient, Statistical inference: concept of standard error and its use; the significance of statistical measures; testingthe significance of difference between two means z-test, t-test; analysis of variance, post hoctests, Non-parametric tests: Chi-square test, Wilcoxon test, Mann-Whitney U test, Reliability and validity of test scores: reliability and validity, Item analysis, Analysis of qualitative data, Software for statistical analysis

Extra reading /Key words*: correlation, inference, non parametric, reliability andvalidity*

UNIT V–Epidemiology 12hrs

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

Extra reading / Key words*: epidemiology, methods, incidence and prevalence*

Note: Texts given in the Extra reading /Key words must be tested only through Assignment and Seminars.

Course Outcomes:

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Summarise the importance to study research in the field of audiology and speech language pathology.	**PSO2 PSO5**	**U, An**
CO-2	Detail about the steps for a research design.	**PSO3 PSO3**	**U, R, Ap**
CO-3	Explain the ethics in research.	**PSO 4**	**U, R, Ap**
CO-4	Describe reliability and validity with its types .	**PSO 5**	**U, R, Ap**
CO-5	Detail the various epidemiologic methods.	**PSO 2**	**U, R, E, Ap**
CO-6	Training in SPSS statistical software aiding in research Skill development	**PSO 5**	**E, C**

References

Text Books:

1. Dane F. C. (2011). Sampling and Measurement. In Evaluating research: Methodology forpeople who need to read research. New Delhi: SAGEpublication.
2. Field, A. (n.d.). Discovering Statistics Using IBM SPSS (4th ed.). SAGEPublications.
3. Hegde M. N. (2010). A course book on Scientific and professional writing for speechlanguage pathology (4thEdition), Singapore: Delmarpublication.
4. Hegde, M. N. (2003). Clinical research in communicative disorders: Principles andstrategies. (3rd Edition), Austin:Pro-ed
5. Hesse-Biber, S. N. &Leavy, P. (2011). The Ethics of social research. In The Practiceof qualitative research. (2nd Edition), New Delhi: SAGEpublication.

Reference Books:

1. Jekel, F. J., Katz, L.D., & Elmore, G.J (2001). Basic Epidemiologic Concepts andPrinciples in epidemiology, Biostatistics, and Preventive Medicine (2nd Edition). Pennsylvian: Saunders
2. Meline, T. (2010). A research primer for communication sciences and disorders.Singapore: Pearsonpublication.

(For candidates admitted from 2020-21 onwards)

Holy Cross College (Autonomous), Tiruchirappalli-2

School of Rehabilitation and Behavioral Sciences

Department of Audiology & Speech-Language Pathology

First Year - Semester – II

Course Title	Major Core B 2.1. Neurology
Total Hours	60 hrs
Hours/Week	4 Hrs Wk
Code	U20AS2MCT05
Course Type	Theory
Credits	-
Marks	100

General Objectives:

After completing this course, the student will be able to understand the basic concept of neurology related to speech and hearing

Course Objectives:

CO No.	Course Objectives
CO-1	Remember and understand basic concepts
CO-2	Explain cerebral plasticity and dominance and its relevance for speech
CO-3	Understand various neural diseases
CO-4	Summarize and organize basic principles
CO-5	Remember and understand basic concepts

UNIT I: Anatomy and Physiology of theNervousSystem 12Hrs

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

Extra reading/ Key words*: application of cerebral plasticity in speech and language intervention, circle of willis, watershed areas*

UNIT II: Neural Organization of Speech andHearingProcesses 12Hrs

Neurosensory organization of speech and hearing, Central auditory nervous system, Anatomy oforal sensation and oral sensory receptors, Neuromotor control of speech, The pyramidal, extra-pyramidal system, basal ganglia and cerebellar system, Lower and upper motor neuron, Alpha and gamma motor neurons,

Sensory and motor examination, oral, peripheral and other reflexes, Swallowing mechanism and neural control, Screening and bedside neurologicalexamination

Extra reading/ Key words *:* *dysphagia, CAPD, tonotopic organization*

UNIT III: Neural Disorders Associated With Speech and Hearing Disorders–I 12Hrs

Neural infections – meningitis, encephalitis, Developmental anomalies – spinal cord defects, syringomalacia and bulbia, Arnold chian malformations, Hydrocephalus – source and circulation of CSF, types and etiopathogenesis, UMN lesions –spastic dysarthria , LMN lesions –flaccid dysarthria, Mixed lesions, Extra pyramidal lesions – dyskinetic dysarthria, Cerebellum and cerebellar pathway lesions – ataxic dysarthria, Other diverse lesions and dysarthrias
Extra reading/ Key words *:* *spina bifida, congenital syndromes associated with nervous system development*

UNIT IV: Neural Disorders Associated with Speech and Hearing Disorders–II 12Hrs
Cerebrovascular diseases – ischemic brain damage – hypoxic ischemic encephalopathy, cerebral infarction – intracranial hemorrhage – intracranial, subarachnoid , Trauma to the CNS – subdural hematoma, epidural hematoma, parenchymal brain damages, Demyelinating diseases – multiple sclerosis, perivenous encephalomyelitis, Dementia, Degenerative, metabolic and nutritional disorders – Alzheimer's disease, Parkinsonism, Metabolic, hereditary, acquired, neuronal storage disorders, Wilson's disease, Phenylketonuria, Nutritional – Wernicke's encephalopathy, pellagra, Alcoholic cerebellar degeneration, Clinical-pathological methods and Neuro-imaging, Tumors of the CNS – gliomas, embryonal tumors of meninges, metastasis, malignanttumors
Extra reading/ Key words*: LSVT, ataxia, hypokinetic dysarthria, dementia*

UNIT V: SPEECH-LANGUAGE ANDSWALLOWINGDISORDERS 12Hrs
Central language mechanism and its disorders, Developmental motor speech disorders – cerebral palsy, muscular dystrophy, Neurologic disorders with primitive reflexes, diagnosis and management, Clinical neurological syndromes associated with speech and language disorders, Childhood language disorders associated with neurologic disorders, Swallowing associated with neurogenic disorders and assessing mastication and deglutition, Agnosia and other conditions associated with speech and hearing disorders , Cognitive disorders associated with neurologic disorders, General management principles and options for childhood neurogenic speech, language and hearing disorders, General management principles and options for adult neurogenic speech, language and hearing disorders
Extra reading/ Key words : *swallowing maneuvers, reflex pathway, phases of swallow*

Note: Texts given in the Extra reading /Key words must be tested only through Assignment andSeminars.

Course Outcomes:

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Identification and evaluation of cranial nerve important for speech production	PSO1 PSO3 PSO4	U, Ap, E
CO-2	Explain the importance of cerebral plasticity and dominance in the field of speech and hearing.	PSO1 PSO2 PSO3	R, U
		PSO 5	
CO-3	Describe about the central auditory nervous system.	PSO1 PSO4 PSO3	R, U
CO-4	Explain and evaluate the neural control for swallowing.	PSO1 PSO3 PSO4	U, E
CO-5	Differentiate between LMN and UMN disorder symptoms.	PSO1 PSO3 PSO4	R,U, Ap
CO-6	Describe different demyelinating conditions with its characteristics.	PSO1 PSO3 PSO4	R, U, An
CO-7	Make models related to neurology of Speech and Hearing	PSO 2	U, C, Ap

References

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, ElsevierMosby.
3. Bhatnagar, S.C. (2012). Neuroscience for the Study of CommunicativeDisorders. Lippincott, Williams &Wilkins

Reference Books:

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: McGraw-Hill.

(For candidates admitted from 2020-21 onwards)

Holy Cross College (Autonomous), Tiruchirappalli-2

School of Rehabilitation and Behavioral Sciences

Department of Audiology & Speech-Language Pathology

First Year - Semester – II

Course Title	Major Core B 2.2 Otolarnygology
Total Hours	60 hrs
Hours/Week	4 Hrs Wk
Code	U20AS2MCT06
Course Type	Theory
Credits	-
Marks	100

General Objectives:

After completing this course, the student will be able to understand the disorders ear and throat.

Course Objectives:

CO No.	Course Objectives
CO-1	Remember and understand causes, signs, symptoms, pathophysiology and management of diseases of external, middle and inner ear leading to hearing loss
CO-2	Explain causes, signs, symptoms, pathophysiology and management of diseases of laryngeal and articulatory systems

UNIT I – External and middle ear andtheirdisorders 12Hrs

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

Extra reading/ Key words: *Audiometric indications of each disorders discussed, management options for congenital anomalies of outer ear*

UNIT II – Inner ear anditsdisorders 12Hrs

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

Extra reading/ Key words: audiometric findings each disorders discussed, therapeutic management of tinnitus

UNIT III – Oral cavity anditsdisorders **12Hrs**

Anatomy of the oral cavity,Common disorders of the oral cavity **,**Tumors of the oral cavity **,**Cleft lip and palate – medical aspects **,**Clinical anatomy and physiology of pharynx **,**Inflammatory conditions of the pharynx, tonsils and adenoids **,**Tumors of the pharynx

Extra reading/ Key words : *oral cavity, tumors, cleft, glossectomy and mandibulectomy*

UNIT IV – Larynx anditsdisorders **12Hrs**

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

Extra reading/ Key words : *TEP, Esophageal speech and artificial larynx*

UNIT V – Esophagus and its disorders
12Hrs

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

Extra reading/ Key words : *esophagus, swallowing, airway*

Note: Texts given in the Extra reading /Key words must be tested only through Assignment andSeminars.

Course Outcomes:

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Identify the outer ear, middle ear and inner ear anomalies and plan its intervention strategies	PSO1 PSO3	R, Ap
CO-2	Describe the management options for tinnitus.	PSO 3	R,E, Ap
CO-3	Explain clinical anatomy and physiology of pharynx.	PSO3 PSO4	R,Ap
CO-4	Describe different congenital laryngeal pathologies and its management options	PSO1 PSO3	R,Ap

CO-5	Detail the anatomy and physiology of esophagus.	PSO3 PSO4	R,E, Ap
CO-6	. Undergo Clinical postings, Workshop, Clinical conference thereby aiding in Employability, Entrepreneurship and skill development	PSO 1 to PSO 5	Ap, C

References

Text Books:

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

Reference Books:

5. Chan, Y. and Goddard, J.C. (2015). K J Lee's Essential otolaryngology: head and necksurgery. (11th edition). New Delhi: Atlantic Publisher andDistributers
6. O'Neill, J.P. and Shah, J.P. (2016). Self-assessment in otolaryngology. Amsterdam:Elsevier
7. Postic, W.P., Cotton, R.T., Handler, S.D. (1997). Ear trauma. Surgical PediatricOtolaryngology. New York: Thieme Medical PublisherInc.
8. Wackym, A. and Snow, J.B. (2015). Ballenger's otorhinolaryngology head and necksurgery. (18th edition). United States: McGraw-Hill Medical

(For candidates admitted from 2020-21 onwards)

Holy Cross College (Autonomous), Tiruchirappalli-2

School of Rehabilitation and Behavioral Sciences

Department of Audiology & Speech-Language Pathology

First Year - Semester – II

Course Title	**Major Core B 2.3. Speech Language Pathology**
Total Hours	**60 hrs**
Hours/Week	**4 Hrs Wk**
Code	**U20AS2MCT07**
Course Type	**Theory**
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:

CO No.	Course Objectives
CO-1	Remember and understand different speech and language disorders
CO-2	Execute basic assessment procedures for various speech and language disorders
CO-3	Understand basic principles and intervention procedures for speech and language disorders
CO-4	Summarize and organize basic principles of providing counseling and guidance to clients and caregivers
CO-5	Plan basic procedures in intervention

UNIT 1: Basic Concepts and Methodsof Diagnostics 12hrs

Introduction to Speech Language Disorders , Definition and descriptions of delay, deviancy and disorders; impairment, disability and handicap , Incidence and prevalence of speech and language disorders ,Causes of speech and language disorders , Basic principles in assessment, evaluation and appraisal ,Tools for diagnosis- case history, interview, self-reports, questionnaire & observations Diagnostic models – SLPM, Wepman, Bloom and Lahey, Types of diagnoses – Clinical diagnosis, direct diagnosis, differential diagnosis, diagnosis by treatment, diagnosis by exclusion, team diagnosis, instrumental diagnosis, provocative diagnosis, tentative diagnosisadvantage/disadvantages , Characteristics of a diagnostic clinician ,Organization and basic requirements for clinical set up and team approach ,DSM, ICD classification and ICF

Extra reading/ Key words*: speech and language disorders, causes, principles, models, diagnosis, good clinician*

UNIT 2: Basic Concepts and MethodsofTherapeutics 12Hrs

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

Extra reading/ Key words*: speech therapy, group therapy, approaches, reinforcements, AAC*

UNIT 3: Overview Of Basic Assessment and Management ofSpeechDisorders 12Hrs

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

Extra reading/ Key words*: assessment, management, early identification, prevention*

UNIT 4: Overview of Basic Assessment and Management of Language Disorders

12Hrs

Types, Characteristics and classification of language disorders Causes of language disorders Overview of assessment procedures for child language disorders; adult language disorders; and neurogenic language disorders, Overview of management procedures for child language disorders; adult language disorders; and neurogenic language disorders ,Early identification and prevention of language disorders

Issues related to bi- /multilingualism

Extra reading/ Key words*: characteristics, classification, multilingualism, causes*

UNIT 5: Other Issues in Practice as a Speech – Language Pathologist

12hrs

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

Extra reading/ Key words*: code of ethics, scope of practice, 30ounseling, CBR, evidence based practice, acts and laws*

Note: Texts given in the Extra reading /Key words must be tested only through Assignment and Seminars.

Course Outcomes:

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	What are the characteristics of a diagnostic clinician?	PSO 4	R, Ap
CO-2	Explain different types of diagnosis with relevant	PSO 4	An, Ap
	examples.	PSO5 PSO2	
CO-3	Describe different approaches for managing language disorders in children	PSO1 PSO5	E, C, Ap, U
CO-4	Discuss the importance of early identification in speech and language disorders	PSO2 PSO1 PSO5	U, R, An
CO-5	Detail PWD act	PSO2 PSO3	R
CO-6	. Undergo Clinical postings, Workshop, Clinical conference thereby aiding in Employability, Entrepreneurship and skill development	PSO 1 to PSO 5	Ap, C

References

Text Books:

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

2.Hegde, M. N., & Davis, D. (2005). *Clinical methods and practicum inspeech-language pathology (4th ed.).* Australia; Clifton Park, NY: Thomson DelmarLearning.

3.Shipley, K. G., & Roseberry-McKibbin, C. (2006). Interviewing and counselling in

4.communicative disorders : *Principles and procedures (3rd ed*.). Austin, Tex: Pro-Ed.

5.Brookshire, R. H. (2003). *Introduction to neurogenic communication disorders (6th ed*.). St. Louis, Mo:Mosby

(For candidates admitted from 2020-21 onwards)

Holy Cross College (Autonomous), Tiruchirappalli-2

School of Rehabilitation and Behavioral Sciences

Department of Audiology & Speech-Language Pathology

First Year - Semester – II

Course Title	**Major Core B 2.4. Audiology**
Total Hours	**60 hrs**
Hours/Week	**4 Hrs Wk**
Code	**U20AS2MCT08**
Course Type	**Theory**
Credits	**-**
Marks	**100**

General Objectives:

After completing this course, the student will be able to carry out basic audiological assessment

Course Objectives:

CO No.	Course Objectives
CO-1	Understand and carryout experiments to measure differential sensitivity loudness and pitch
CO-2	. Carry out case history and tuning fork test
CO-3	. Evaluation of threshold using pure tone audiometry including masking on clinical population and appreciate the theoretical back ground of it
CO-4	. Carryout different tests involved in speech audiometry appreciate the theoretical back ground
CO-5	. Carryout subjective calibration and daily listening checks of the audiometer

UNIT I –Differential Sensitivity **12Hrs**

Concept of differential sensitivity, just noticeable difference and Weber's fraction , Applications of jnd's in clinical evaluations, Magnitude estimation and production, Equal loudness level contours and itsapplication

Extra reading/ Key words: *Temporal resolution tests, Fletcher Munson curve, mel*

UNIT II - Case history and TuningForkTests **12Hrs**

Administering case history, Case history interpretation, Differentiating adult and child case history, Execution tuning fork test and interpretation ofresults

Extra reading/ Key words: *false negative rinne, TORCH, ABC test*

UNIT III - PureToneAudiometry **12Hrs**

Classification of audiometers, Concept of audiogram and symbols used, Threshold estimation using PTA, Identification of factors affecting BC and AC thresholds, Measurement of noise levels in

audiometric rooms

Extra reading/ Key words: sound level meter, weighting networks, mid frequeny evaluation, audiometric configurations

UNIT IV -SpeechAudiometry **12Hrs**

Execution of speech audiometry, Identification of factors affecting speech audiometry, Familiarization of materials available in different languages, Execution of PIPB function, Procedure of BC speech audiometry

Extra reading/ Key words: *Spondee words, instrumentation for speech audiometry*

UNIT V - Clinical Masking And Instrumental Calibration

12Hrs

Concept of interaural attenuation and identification of factors affecting, Carry out masking in clinical population, Familiarization of different procedures of masking, Carry out daily listening checks and familiarization of objective calibration

Extra reading/ Key words: *cross hearing, couplers, artificial ear, nautons dilemma*

Note: Texts given in the Extra reading /Key words must be tested only through Assignment andSeminars.

Course Outcomes:

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Explain the procedure to interpret child vs adult case history and it's importance in management of hearing loss.	PSO4 PSO1 PSO3	R, E, Ap
CO-2	Identify the type of hearing loss based on audiogram and counsel regarding the rehabilitative options available.	PSO2 PSO3	An, Ap
CO-3	Elaborate on the need and procedure for masking	PSO4 PSO2	R
CO-4	Generate a protocol to assess an individual with cochlear hearing loss	PSO4 PSO5	C
CO-5	Perform PI-PB function testing in an individual with retro cochlear pathology and counsel	PSO1 PSO2	An, Ap
CO-6	. Undergo Clinical postings, Workshop, Clinical conference thereby aiding in Employability, Entrepreneurship and skill development	PSO 1 to PSO 5	Ap, C

References

Text Books:

1. Gelfand, S. A. (2009). Hearing: An Introduction to Psychological and Physiological Acoustics(5 edition.). London: CRC Press.
2. Katz, J. (2014). Handbook of Clinical Audiology (7th International edition edition.).Lippincott Williams andWilkins.
3. Martin, F. N., & Clark, J. G. (2014). Introduction to Audiology. Boston:Pearson.

4. Silman, S., & Silverman, C. A. (1997). Auditory Diagnosis: Principles and Applications (Reissue edition.). San Diego: Singular PublishingGroup

Reference Books:

9. Durrant, J. D., &Feth, L. L. (2012). Hearing Sciences: A Foundational Approach (1 edition). Boston:Pearson.
10. Emanuel, D. C., &Letowski, T. (2008). Hearing Science (1 edition.). Philadelphia:Lippincott Williams andWilkins.
11. Kaplan, H., Gladstone, V. S., & Lloyd, L. L. (1993). Audiometric Interpretation: A Manual of Basic Audiometry (2 edition.). Boston:Pearson.

(For candidates admitted from 2020-21 onwards)

Holy Cross College (Autonomous), Tiruchirappalli-2

School of Rehabilitation and Behavioral Sciences

Department of Audiology & Speech-Language Pathology

First Year - Semester – II

Course Title	Major Core B2.5 Practicals (Speech-language Pathology)
Total Hours	160 hrs
Hours/Week	4 Hrs Wk
Code	U20AS2MCP09
Course Type	Practicals
Credits	-
Marks	100

General Objectives:

After completing this course, the student will be able to assess childhood speech and language disabilities.

Course Objectives:

The learner will be able to

CO No.	Course Objectives
CO-1	Demonstrate normal aspects of speech
CO-2	Understand the developmental stages of speech and language behavior
CO-3	Demonstrate stress, rhythm and intonation and variations in rate of speech
CO-4	Analyse perceptually variations in prosody in different recorded samples of typical individuals at different age groups
CO-5	Perceptual analysis of speech and language parameters in children with speech and language disabilities

Practicals:

- Demonstrate normal aspects of speech and analyse perceptually variations in voice, articulation and fluency in different recorded speech samples of typical individuals at different age groups (children, adults and older adults) and sex.
- Demonstrate normal aspects of language and analyse perceptually variations in language in different recorded samples of typical individuals at different age groups (children, adults and older adults) andsex.
- 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) andsex.
- Use IPA to transcribe spokenwords.
- Record a standard passage, count number of syllables and words, identify syllable structure, syntactic structures in thepassage.
- Oral mechanism examination on 5 normal children and 5 normaladults.
- Prepare a chart and show the developmental stages of speech and languagebehavior.
- Administer standardized tests for assessment of delayed speech and language

development such as REEL, SECS, LAT, 3DLAT, ALD each on any 2children.

- Study the available normative data (Indian/Western) of speech such as respiratory, phonatory, resonatory and articulatoryparameters.
- 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/zratio.
- Study the available normative data (Indian/Western) of language such as phonology, semantics, syntax, morphology and pragmaticmeasures.
- Perceptual analysis of speech and language parameters in normal (2 children and 2 adults and persons with speech disorders (3 adults + 3children).
- Prepare a model diagnostic report of a patient with speech and languagedisorder.
- Prepare a diagnostic and therapykit.
- Make a list of speech language stimulation techniques and other therapy techniques for various speechdisorders.
- Familiarize with the sources for referral and parent counselingprocedures.
- Prepare a report on the available audiovisual material and printed material/pamphlets relating to speech-language pathology, public education of communication and hearing disorders,etc.
- Prepare a report on the available clinical facilities and clinical activities of theinstitute.

Clinical Practicum

- Observe the evaluation process and counselling of at least 5 different speech and language disorders inchildren.
- Observe the evaluation process and counselling of at least 5 different speechand language disorders inadults.
- Take case history of a minimum of 10 individuals (5 normal & 5 clients with complaints of speech-languageproblems).
- Observation of diagnostic procedures. Observe various therapeutic methods carried out with children and adults with speech and languagedisorders.

Course Outcomes:

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Transcribe speech using IPA	PSO 4	Ap
CO-2	Assess OPME for a child with speech and languagedisability	PSO 4	An
CO-3	Demonstrate speech and language stimulation techniques	PSO3 PSO1	R, Ap
CO-4	Prepare a list of available clinical facilities and activities of the institute	PSO 5	C
CO-5	Prepare a parent counseling format	PSO 2	Ap

(For candidates admitted from 2020-21 onwards)

Holy Cross College (Autonomous), Tiruchirappalli-2

School of Rehabilitation and Behavioral Sciences

Department of Audiology & Speech-Language Pathology

First Year - Semester – II

Course Title	Major Core B2.6 Practicals (Audiology)
Total Hours	160 hrs
Hours/Week	4 Hrs Wk
Code	U20AS2MCP10
Course Type	Practicals
Credits	-
Marks	100

General Objectives:

After completing this course, the student will be able to assess

Course Objectives:

The learner will be able to

CO No.	Course Objectives
CO-1	Calculate reference equivalent sound pressure levels (RETSPL) for head phones and bone vibrator
CO-2	Carry out clinical masking
CO-3	Perform daily listening checks and subjective calibrations
CO-4	Measure difference limen of intensity, frequency and duration
CO-5	Take case history

Practicals:

- Calculate reference equivalent sound pressure levels (RETSPL) for head phonesand bone vibrator for any two frequencies using 30participants.
- Measure most comfortable level on 10 participants with normal hearingsensitivity.
- Measure uncomfortable levels on 10 participants with normal hearingsensitivity.
- Calculate the sensation levels of MCL and UCLs in above 10participants.
- Measure difference limen of intensity, frequency and duration on 10 normalhearing adults and plot it in graphical form and interpret theresults.
- Measure equal loudness level contours at minimum level, 40 dB SPL, 70 dB SPL(1 kHz) in 5 normal hearingadults.
- Measure sone and mel in 5 normal hearing adults using scalingtechniques.
- Take case history on 5 adults and 5 children with hearing problem and correlatethe information from case history to results of pure toneaudiometry.
- Administer different tuning fork tests on 5 simulated conductive and 5 sensorineural hearing lossindividuals.
- Carry out pure tone and speech audiometry on 10 normal hearingindividuals.
- Carry out clinical masking on 10 normal hearing individuals with simulatedconductive hearing loss and carry out clinical masking on 5 individuals with conductivehearing

loss and 5 individuals with sensorineural hearing loss.

- Carryout daily listening checks and subjective calibrations 20 times andobserve objective calibrationonce
- Perform otoscopy and draw the tympanic membrane of 10 healthy normalindividuals

Clinical Practicum

- Observe case history being taken on 5 adults and 5 children with hearing problemand correlate the information from case history to results of pure toneaudiometry.
- Administer different tuning fork tests on 5 conductive and 5 sensori neural hearingloss individuals.
- Observe the pure tone audiometry being carried out on 30clients.
- Plot the audiogram, calculate the pure tone average and write the provisionaldiagnosis of observed clients.
- Perform otoscopy (under supervision) on at least 1 client with following conditions: Tympanic membrane perforation, SOM,CSOM

Course Outcomes:

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Carry out case history on an individual with hearing loss	PSO 2	Ap
CO-2	Perform otoscopy and write impression	PSO 5	An, Ap
CO-3	Perform daily listening check	PSO 4	R
CO-4	Calculate MCL, UCL, SL	PSO 4	C
CO-5	Carry out pure tone and speech audiometry	PSO 4	Ap

For candidates admitted from 2017 onwards
Holy Cross College (Autonomous), Tiruchirappalli-2
Department of Audiology & Speech-Language Pathology
Second Year - Semester – III

Course Title	**Major Core B 3.1 Voice and its Disorders**
Total Hours	**60 hrs**
Hours/Week	**4 Hrs Wk**
Code	**U17AS3MCT13**
Course Type	**Theory**
Credits	**-**
Marks	**100**

General Objectives:

After completing this course, the student will be able to understand the basic characteristics, assessment and management of voice disorders

Course Objectives:

CO No.	Course Objectives
CO-1	Discuss characteristics of normal voice and identify voice disorders
CO-2	Explain etiology related to voice disorders and its pathophysiology
CO-3	Evaluation of different voice disorders
CO-4	Execution of voice therapy in individuals with various voice disorders
CO-5	Discuss the intervention techniques

UNIT 1: Basic Concepts in Voice and its Production **12Hrs**

Identification of structures and functions of phonatory system, Concept of development of voice from birth to senescence, Familiarizing theories of phonation , Describing normal and abnormal voice

Extra reading/ Key words*: vocal registers, presbylarynx,*

UNIT 2: Characteristics and Pathophysiology of Voice Disorders **12Hrs**

Classification of voice disorders, its incidence and prevalence , Identification of congenital, neurological and non organic voice disorders , Voice problems in systemic disorders, endocrine disorders, transgenders and elderly, Concept of voice problems in professional voice users

Extra reading/ Key words*: causes of voice disorders, laryngeal pathology, effect of hormonal changes in voice*

UNIT 3: Assessment of Voice **12Hrs**

Assessment of clients with voice disorders using objective measures, Carry out perceptual voice evaluation

Reporting voice findings, Normative comparisons and differential diagnosis of voice disorders
Extra reading/ Key words*: PROM, DSI, High speed imaging techniques*

UNIT 4: Management of Voice **12Hrs**

Selection of goals and approaches for voice disorders , Providing vocal hygiene and preventive counseling Differentiation of management procedures between childhood and adult language disorders , Concept of medical and surgical treatment for voice disorders , Professional voice care
Extra reading/ Key words *:vocal hygiene, symptomatic voice therapy, facilitation techniques*

UNIT 5: Intervention Strategies For Voice Disorders **12Hrs**

Executing disorder specific intervention strategy, Post-operative care for benign vocal fold lesions disorders
Documenting voice therapy outcomes, Evaluation of therapy outcome and follow up
Extra reading/ Key words*: outcome measure, puberphonia, spasmodic dysphonia, functional aphonia*

Note: Texts given in the Extra reading /Key words must be tested only through Assignment and Seminars.

Course Outcomes:

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Describe the laryngeal anatomy with relevant diagrams	PSO 1 PSO 4	R, E
CO-2	Explain development of voice from birth to senescence	PSO 2 PSO 3	An, Ap
CO-3	Illuminate on the various causes of voice disorders.	PSO 4	R
CO-4	Identify various visualization procedures for assessing voice disorders?	PSO 5	C
CO-5	Carry out voice therapy for different disorders.	PSO 2	An, Ap
CO-6	Undergo Clinical postings, Workshop, Clinical conference thereby aiding in Employability, Entrepreneurship and skill development	PSO 1 to PSO 5	Ap, C

References

Text Books:

1. Stemple, J. C., Glaze, L. E., &Gerdeman, B, K. (2014). *Clinical voice pathology: Theory & Management (5th Ed.).* San Diego: Plural publishers.
2. Aronson, A.E. & Bless, D. M. (2009). *Clinical Voice Disorders.(4th Ed*.). New York: Thieme, Inc.
3. 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

For candidates admitted from 2017 onwards
Holy Cross College (Autonomous), Tiruchirappalli-2
Department of Audiology & Speech-Language Pathology
Second Year - Semester – III

Course Title	**Major Core B 3.2. Speech Sound Disorders**
Total Hours	**60 hrs**
Hours/Week	**4 Hrs Wk**
Code	**U17AS3MCT14**
Course Type	**Theory**
Credits	**-**
Marks	**100**

General Objectives:

After completing this course, the student will be able to describe normal speech and language development, execute assessment and intervention of speech sound disorders

Course Objectives:

CO No.	Course Objectives
CO-1	Understand normal speech sound acquisition
CO-2	Explain characteristics of individuals with speech sound disorders
CO-3	Perform phonological analysis and assessment of speech sound disorders.
CO-4	Plan intervention for individuals with speech sound disorders.
CO-5	Understand normal speech sound acquisition

UNIT I: Speech Sound Acquisition And Development **12hrs**

Concept of articulatory phonetics, Phonology and phonological theories, Methods to study speech sound acquisition , Acoustical analysis of speech sounds , Concept of coarticulation and its types

Extra reading/ Key words: *Linear and non linear phonology, spectrographic analysis, development of phonology*

UNIT II: Assessment of Speech Sound Disorders **12hrs**

Concepts of terminologies and classification of speech sound disorders, Identification of factors related to speech sound disorders, Execution of speech sound sampling procedure, Administration of tests in English and other Indian languages , Transcription of speech samples

Extra reading/ Key words :*IPA, TAT, comprehensive assessment , Deep test of articulation in Tamil*

UNIT III: Assessment of Speech Sound Disorders – II **12hrs**

Independent and relational analysis of speech sound disorders**,** Analysis of phonological process**,** Assessment of oral peripheral mechanism, Stimulability testing**,** Speech sound discrimination assessment**,** Speech intelligibility and speech severity assessment. **,** Documenting the assessment findings and determining the need for intervention.

Extra reading/ Key words: *SODA errors, speech intelligibility, pattern analysis, phonotactic inventory, Speech intelligibility rating scales, oral stereognosis*

UNIT IV: Management **12Hrs**

Target selection and framing therapy sessions**,** Organizing therapy sessions for speech sound disorders**,** Measurement of therapy outcome**,** Facilitation of generalization**,** Use of technology in articulation correction

Extra reading/ Key words: *generalization, motor approaches, prognostic indicators*

UNIT V: Management – II **12Hrs**

Selection and execution of cognitive linguistic approaches , Concept of general guidelines for linguistically-based approaches, Adapting intervention approaches to individuals from culturally and linguistically diverse backgrounds

Extra reading/ Key words: *Metaphon therapy, cycles approach, distinctive feature approach*

Note: Texts given in the Extra reading /Key words must be tested only through Assignment and Seminars.

Course Outcomes:

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Understand theories of phonological development.	PSO 1 PSO 3 PSO 4	U
CO-2	Explain the stages of phonological development.	PSO 1 PSO 4	R, U
CO-3	Identify factors related to speech sound disorders	PSO 2 PSO 4 PSO 3 PSO 5	R, U, An
CO-4	Describe and assess the tests developed in India for speech sound assessment.	PSO 1 PSO 4	U, E
CO-5	Differentiate between independent and relational analysis.	PSO 1 PSO 4	R,U
CO-6	Explain different factors affecting target selection in planning intervention for speech sound disorders.	PSO 1 PSO 4	An
CO-7	Identify and perform the various cognitive linguistic approaches for speech sound disorders specific to clients	PSO 1 PSO 3	R, Ap, C
CO-8	Undergo Clinical postings, Workshop, Clinical conference thereby aiding in Employability, Entrepreneurship and skill development	PSO 1 to PSO 5	Ap, C

References

Text Books:

1. Bernthal, J.E., Bankson, N.W., &Flipsen, P. (2013). *Articulation and phonological disorders.(7th Ed*.). Boston, MA: Pearson.
2. Velleman, S. L (2003). Resource guide for Childhood Apraxia of Speech.Delmar/Thomson Learning.

Reference Books:

1. Dodd, B. (2013). Differential diagnosis and treatment of children with speech disorder.(2nd Ed). NJ: Wiley.
2. Rout, N (Ed)., Gayathri, P., Keshree, N and Chowdhury, K (2015). Phonics and Phonological Processing to Develop Literacy and Articulation; A Novel Protocol. A publication by NIEPMED, Chennai. Freely downloadable from http://niepmd.tn.nic.in/publication.php. ISBN 978-81-928032-9-5
3. Vasanta, D. (2014). Clinical applications of phonetics and phonology. ISHA Monograph.Vol 14, No. 1.Indian Speech & Hearing Association.

For candidates admitted from 2017 onwards
Holy Cross College (Autonomous), Tiruchirappalli-2
Department of Audiology & Speech-Language Pathology
Second Year - Semester – III

Course Title	Major Core B 3.3 Diagnostic audiology : Behavioral tests
Total Hours	60 hrs
Hours/Week	4 Hrs Wk
Code	U17AS3MCT15
Course Type	Theory
Credits	-
Marks	100

General Objectives:

After completing this course, the student will be able to Execute a test battery approach for diagnosing various disorders

Understand the sensitivity and specificity of different tests before arriving at a diagnosis

Course Objectives:

CO No.	Course Objectives
CO-1	Choose individualized test battery for assessing cochlear pathology, retro cochlear pathology, functional hearing loss, CAPD, vestibular dysfunctions, tinnitus and hyperacusis
CO-2	Independently run the tests and interpret the results to identify the above conditions and also use the information for differential diagnosis
CO-3	Make adjustments in the test parameters to improve sensitivity and specificity of tests
CO-4	Make appropriate diagnosis based on the test results and suggest referrals

UNIT I - Introduction to diagnostic audiology **12Hrs**

Understand the physiological basis of Recruitment and adaptation ,Analyze the characteristics of screening and diagnostic tests using the concept of sensitivity and specificity,Critiquing the clinical indications of various auditory disorders.

Extra reading/ Key words: *False positive, False negative, True positive, True negative*

UNIT II - Tests to identify cochlear and retro cochlear pathology **12Hrs**

Organise appropriate test protocols for cochlear and retro cochlear pathology,Compare the outcome of tests for cochlear and retrocochlear pathology,Understand physiological basis of each tests.

Extra reading/ Key words: *Dead region of cochlea, Behavioral tests.*

UNIT III - Tests to diagnose functional hearing loss **12Hrs**

Understand the behavioral and clinical indicators of functional hearing loss,Critiquing the test protocol between adult and child with functional hearing loss,Infer the test protocols for unilateral and bilateral functional hearing loss

Extra reading/ Key words : *signs and symptoms of functional hearing loss, pure tone and speech tests for functional hearing loss.*

UNIT IV - Assessment of central auditory processing 12Hrs

Understand different behavioral processes of central auditory processing disorder,Execute various tests to detect central auditory processing disorders ,Classify the tests to asses brainstem and cortical lesion,Identify the variables influencing the assessment of central auditory processing

Extra reading/ Key words : *Bottle neck and subtlety principles, CAPD in Children.*

UNIT V - Assessment of persons with vestibular disorder, tinnitus, hyperacusis 12Hrs

Understand the anatomy and physiology of the vestibular system,Execute various behavioral tests to assess vestibular system,Understand the concept of tinnitus and hyperacusis,Implement different tests to assess tinnitus and hyperacusis

Extra reading/ Key words : *signs and symptoms of vestibular disorders, tinnitus and hyperacusis*

Note: Texts given in the Extra reading /Key words must be tested only through Assignment and Seminars.

Course Outcomes:

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Explain the need for a test battery approach	PSO 3	R, Ap
CO-2	Explain in details about different tests to assess retro cochlear pathology	PSO 3	R,E, Ap
CO-3	Elaborate on the signs and symptoms of functional hearing loss. Write down the tests to assess unilateral functional loss in children.	PSO 3 PSO 4	R,Ap
CO-4	Elaborate on the various behavioral process in the assessment of central auditory processing disorders. Add a note on bottle neck principle.	PSO 1	R,Ap
CO-5	Explain the anatomy and physiology of the vestibular system.	PSO 3 PSO 4	R,E, Ap
CO-6	Undergo Clinical postings, Workshop, Clinical conference thereby aiding in Employability, Entrepreneurship and skill development	PSO 1 to PSO 5	Ap, C

References

Text Books:

1. Jerger, J. (1993). Clinical Audiology: The Jerger Perspective. Singular Publishing Group.
2. 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.
3. Gelfand, S. A. (2009). *Essentials of Audiology*. Thieme
4. Martin, F. N., & Clark, J. G. (2014). *Introduction to Audiology (12 edition*). Boston: Pearson.

Reference Books:

1. Martin, F.N (1994), Introduction to Audiology, New Jersey: Prentice Hall.
2. Rupp, Stockdell (1980). Speech Protocols in Audiology, New York: Grune & Stratton.
3. Keith, R.M. (Ed.). (1981). Central Auditory Dysfunction. New York: Grune & Stratton.
4. Musiek, and Baran, J.A. (1987). Central Auditory Assessment: Thirty years of challenge and change. Ear and Hearing 3, 225-355.
5. Pinherio, H.L. Kusiek, F.E. (Eds) (1985). Assessment of Central Auditory Dysfunction Foundations and Correlates. Baltimore: Williams and Wilkins.
6. Willsford J.A. (1987), Handbook of Central Auditory Processing Disorders in Children. Drando, Grune & Stratton.
7. Feldman, A.S., & Willber, L.A. (Eds), (1976), Acoustic Impedance, Immittance: Measurement of Middle Ear Function, Baltimore: Williams & Wilkins.
8. Popelka, B.R. (Ed) (1981). Hearing Assessment with acoustic reflex. New York: Grune and Stratton.
9. Jacobson, J.T. (Ed) (1985). Auditory Brain Stem Response. Taylor and Francis, London.

For candidates admitted from 2017 onwards
Holy Cross College (Autonomous), Tiruchirappalli-2
Department of Audiology & Speech-Language Pathology
Second Year - Semester – III

Course Title	**Major Core B 3.4. Amplification Devices**
Total Hours	**60 hrs**
Hours/Week	**4 Hrs Wk**
Code	**U17AS3MCT16**
Course Type	**Theory**
Credits	**-**
Marks	**100**

General Objectives:

After completing this course, the student will be able to understand the criteria for selection of hearing aids for diverse population and the importance of programming with respect to various subjective and objective tests available to assess the benefits of hearing aids.

Course Objectives:

CO No.	Course Objectives
CO-1	Assess the candidacy for hearing aids and counsel accordingly
CO-2	Evaluate the listening needs and select the appropriate hearing aid
CO-3	Independently program digital hearing aids as per the listening needs of the client
CO-4	Assess the benefit from the hearing aid using subjective and objective methods
CO-5	Counsel the parents/care givers at all stages

UNIT 1: Types of Hearing Aids **12Hrs**

Understanding the history of development of hearing aids, Classification and different types of hearing aids, Review of basic elements of hearing aids, Group amplification devices

Extra reading/ Key words: *Master hearing aids, ALD's*

UNIT 2: Technological Aspects in Hearing Aids **12Hrs**

Understanding the signal processing techniques in hearing aids, Analyzing the signal enhancement strategies, Concept of compression and it's use in hearing aids, Reviewing the recent advances in hearing aids

Extra reading/ Key words: *head shadow/baffle/diffraction effects*

UNIT 3: Electro-Acoustic Measurements for Hearing Aids **12Hrs**

Analyzing the parameters to be considered for EAM, Maintenance and troubleshooting of hearing aids, Counselling and orienting the hearing aid user

Extra reading/ Key words: *BIS, IEC and ANSI standards*

UNIT 4: Selection of Hearing Aids **12Hrs**

Executing the programming of hearing aids, Inferring the importance of audiometric tests for hearing aid selection, Verification of hearing aid benefit through subjective and objective means, Identifying various pre-selection factors affecting hearing aid selection

Extra reading/ Key words: *feedback in hearing aids, assessing hearing aid benefits*

UNIT 5: Mechano-Acoustic Couplers (Ear Molds) **12Hrs**

Classifying different types of molds, Understanding special modifications in the ear molds Procedure for hard molds and soft mold

Extra reading/ Key words: *UV curing methods, mechano-acoustic couplers*

Note: Texts given in the Extra reading /Key words must be tested only through Assignment and Seminars.

Course Outcomes:

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Elaborate on the different types of hearing aids.	PSO 3	R
CO-2	Justify the importance of compression over peak clipping	PSO 4	E
CO-3	Explain the need for electro acoustic measurements and elaborate on different parameters measured	PSO 4	R
CO-4	Explain the pre-selection factors influencing the selection of hearing aid.	PSO 1 PSO 5	Ap, C
CO-5	Explain different special modifications of ear molds and counsel the importance of ear moulds	PSO 2	An, Ap
CO-6	Undergo Clinical postings, Workshop, Clinical conference thereby aiding in Employability, Entrepreneurship and skill development	PSO 1 to PSO 5	Ap, C

References

Text Books:

1. Kates, J. M. (2008). Digital Hearing Aids (1 edition). San Diego: Plural Publishing Inc.
2. Sandlin, R. E. (Ed.). (1993). Understanding Digitally Programmable Hearing AIDS. Boston: Allyn & Bacon.
3. Dillon. (2012). Hearing Aids (2 edition). Thieme Medical and Scientific Publisher.
4. Valente, M. (2002). Hearing Aids: Standards, Options, and Limitations. Thieme

Reference Books:

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

2. Metz, M. J. (2014). Sandlin's Textbook of Hearing Aid Amplification: Technical and Clinical Considerations. Plural Publishing.
3. Mueller, H. G., Hawkins, D. B., & Northern, J. L. (1992). Probe Microphone Measurements: Hearing Aid Selection and Assessment. Singular Publishing Group.
4. Mueller, H. G., Ricketts, T. A., & Bentler, R. A. (2007). Modern Hearing Aids: Pre- fitting Testing and Selection Considerations: 1 (1 edition). San Diego, CA: Plural Publishing Inc.
5. Taylor, B., & Mueller, H. G. (2011). Fitting and Dispensing Hearing Aids (1 edition). San Diego: Plural Publishing Inc.

For candidates admitted from 2017 onwards
Holy Cross College (Autonomous), Tiruchirappalli-2
Department of Audiology & Speech-Language Pathology
Second Year - Semester – III

Course Title	**Major Core B 3.5 Clinicals in Speech Language Pathology**
Total Hours	**160 hrs**
Hours/Week	**4 Hrs Wk**
Code	**U17AS3MCP17**
Course Type	**Practicals**
Credits	**-**
Marks	**100**

General Objectives:

After completing this course, the student will be able to link theoretical knowledge with the practical concepts.

Course Objectives:

The learner will be able to

CO No.	Course Objectives
CO-1	Know the procedures available to obtain a speech language sample
CO-2	Know how to apply informal and formal assessment methods
CO-3	Demonstrate therapy techniques
CO-4	Perform OPME
CO-5	Document reports/recordings

Know: Procedures to obtain a speech language sample for speech & language assessment from children of different age groups such as, pre schoolers, kindergarten, primary school and older age groups. Methods to examine the structures of the oral cavity/organs of speech. The tools to assess language abilities in children (with hearing impairment, specific language impairment & mixed receptive language disorder). Development of speech sounds in vernacular and linguistic nuances of the language.

Know-how: To evaluate speech and language components using informal assessment methods. To administer at least two standard tests for childhood language disorders. To administer at least two standard tests of articulation/ speech sounds. To assess speech intelligibility.

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

Do: Case history - minimum of 5 individuals with speech & language disorders. Oral peripheral examination - minimum of 5 individuals. Language evaluation report – minimum of

5. Speech sound evaluation report – minimum of 5.

Evaluation: Internal evaluation shall be based on attendance, clinical diary, log book and learning conference. External evaluation: Spot test, OSCE, Record, Viva-voce, case work

Course Outcomes:

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Evaluate speech and language components using informal assessment methods	PSO 4	Ap
CO-2	Analysis of language components for Form, content & use	PSO 4	An
CO-3	Obtain case history for individuals with speech & language disorders	PSO 2 PSO 4	R, Ap
CO-4	Prepare a list of available clinical facilities and activities of the institute	PSO 5	C
CO-5	Prepare a parent counseling format	PSO 2	Ap

For candidates admitted from 2017 onwards
Holy Cross College (Autonomous), Tiruchirappalli-2
Department of Audiology & Speech-Language Pathology
Second Year - Semester – III

Course Title	**Major Core B3.6 Clinicals in Audiology**
Total Hours	**160 hrs**
Hours/Week	**4 Hrs Wk**
Code	**U17AS2MCP18**
Course Type	**Practicals**
Credits	**-**
Marks	**100**

General Objectives:

After completing this course, the student will be able to link theoretical knowledge with the practical concepts.

Course Objectives:

The learner will be able to

CO No.	Course Objectives
CO-1	Know the methods available to calibrate audiometer
CO-2	Know-how to obtain detailed case history from clients or parents/guardians
CO-3	Plot audiograms with different degree and type using appropriate symbols
CO-4	Do case history on individuals with hearing loss
CO-5	Calculate percentage of hearing loss

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

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

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

Do: Case history on at least 5 adults and 3 children with hearing disorders. Tuning fork test on at least 2 individuals with conductive and 2 individuals with sensori-neural hearing loss. Pure tone audiometry with appropriate masking on 5 individuals with conductive, 5 individuals SN hearing loss and 3 individuals with unilateral/asymmetric hearing loss – 5

Evaluation:
Internal evaluation: Shall be based on attendance, clinical diary, log book and learning conference.
External evaluation: Spot test, OSCE, Record, Viva-voce, case work

Course Outcomes:

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Calculate pure tone average, % of hearing loss, minimum and maximum masking levels	PSO 4	R, Ap
CO-2	Perform tuning fork tests	PSO 4	An, Ap
CO-3	Administer SRT and SIS	PSO 4	Ap
CO-4	Analyse the case history and arrive at a diagnosis	PSO 2	E, An
CO-5	Plan for Audiological test battery	PSO 5	Ap

For candidates admitted from 2017 onwards
Holy Cross College (Autonomous), Tiruchirappalli-2
Department of Audiology & Speech-Language Pathology
Second Year - Semester – IV

Course Title	**Major Core B.4.1. Motor Speech Disorders in Children**
Total Hours	**60 hrs**
Hours/Week	**4 Hrs Wk**
Code	**U17AS4MCT19**
Course Type	**Theory**
Credits	**-**
Marks	**100**

General Objectives:

After completing this course, the student will be able to understand the basic characteristics, assessment and management of motor speech disorders

Course Objectives:

CO No.	Course Objectives
CO-1	Discuss the characteristics of motor speech disorders in children such as cerebral palsy, childhood apraxia of speech and other childhood dysarthrias
CO-2	Execute assessment of the speech and non-speech aspects associated with the above conditions
CO-3	Plan and execute therapy strategies for children with motor speech disorders
CO-4	Summarize brain structures involved in speech perception and production
CO-5	Explain Phases of swallowing

UNIT I - Neuro-Developmental Processes in Speech Production and Motor Speech Disorders **12Hrs**

Concept of neuro anatomy and sensorimotor integration, Identification of dysarthria in children, Differentiating types of dysarthria, Identification of apraxia of speech in children

Extra reading/ Key words: *disorders of tone and movement, lower motor neuron, upper motor neuron, control circuits*

UNIT II – Assessment of Motor Speech Disorders in Children **12Hrs**

Administration of case history and developmental neurological evaluation, Assessment of oral sensory and motor capacity, Assessment of speech sub-systems, Carry out speech assessment with specific reference to childhood apraxia of speech, Administration of test materials for developmental apraxia of speech, Concept of protocols for non-verbal and verbal praxis specific to Indian languages, Differential diagnosis of dysarthria and apraxia with other developmental disorders

Extra reading/ Key words *:primitive and postural reflexes, cranial nerve examination, praxis, phonetic inventory, DPAIC, Differential disgnosis of apraxia with speech characteristics tyical of dual or second language learners, DEMSS, MSAP*

UNIT III - Management of Childhood Dysarthria 12Hrs

Team approach in rehabilitation of motor speech disorders in children, Carry out Neuro-developmental therapy, Management of drooling, Behavioral management of respiratory, phonatory, resonatory and articulatory subsystems, Prosthetic appliances in treatment of childhood dysarthria, Application of non speech oro motor exercises, AAC in management of motor speech disorders, Planning intervention for children with dysarthria

Extra reading/ Key words*: Low tech and high tech AAC, oro motor exercises, multi disciplinary team,Talk tools and its applications, cultural and linguistic considerations in assessment*

UNIT IV - Management of Childhood Apraxia of Speech 12Hrs

Concept of principles of motor learning, Executing intervention for apraxia of speech in children, Use of AAC in childhood apraxia of speech, Evidence-based practice in intervention for childhood apraxia of speech, Planning intervention for childhood apraxia of speech

Extra reading/ Key words: *Integral stimulation, Multisensory and tactile cueing techniques, Gestural cueing techniques melodic intonation therapy, multiple phonemic approach, & instrumental feedback, phonological remedial approaches, response to intervention system (RTI), context specific communication boards, Kaufman Speech to Language Protocol, Nuffield Dyspraxia Program*

UNIT V - Feeding And Swallowing Disorders In Children 12Hrs

Concept of embryology related to feeding mechanism, Physiology of swallowing, Causes of dysphagia in children, Identification of signs and symptoms of dysphagia in children, Assessment of dysphagia in children, Intervention of dysphagia in children.

Extra reading/ Key words: *phases of swallow, swallowing reflexes, instrumental evaluation, non oral feeding, feeding modification, MBS, Oral FEES (O FEES)*

Note: Texts given in the Extra reading /Key words must be tested only through Assignment and Seminars.

Course Outcomes:

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Describe the neuroanatomy of speech and hearing.	PSO 1 PSO 4	R, E
CO-2	Define dysarthria and explain its types with characteristics	PSO 2 PSO 3	An, Ap
CO-3	Explain about the use of AAC in apraxia.	PSO 4	R
CO-4	What are the various behavioral management options for childhood dysarthria?	PSO 5	C
CO-5	What are the role of speech language pathologist in neonatal intensive care and feeding management?	PSO 2	An, Ap
CO-6	Undergo Clinical postings, Workshop, Clinical conference	PSO 1 to	Ap, C

	thereby aiding in Employability, Entrepreneurship and skill development	PSO 5	

References

Text Books:

1. Caruso, F. J. and Strand, E. A. (1999). *Clinical Management of Motor Speech Disorders in Children*. New York: Thieme.
2. Love, R.J. (2000) (*2nd Ed*). Childhood Motor Speech Disorders. Allyn & Bacon.
3. Love, R.J. and Webb, W.G. (1993). *(2nd ed.) Neurology for the Speech-Language Pathologist.* Reed Publishing (USA)

Reference Books:

1. Arvedson, J.C., and Brodsky, L. (2002) (2nd Ed.). Pediatric swallowing and feeding. San Diego, Singular publishing.
2. Hardy, J. (1983). Cerebral Palsy. Remediation of Communication Disorder Series by F.N. Martin. Englewood Cliffs, Prentice Hall Inc.
3. Rosenthal. S., Shipp and Lotze (1995). Dysphagia and the child with developmental disabilities. Singular Publishing Group.
4. Velleman, S. L (2003). Resource guide for Childhood Apraxia of Speech. Delmar/Thomson Learning.

For candidates admitted from 2017 onwards
Holy Cross College (Autonomous), Tiruchirappalli-2
Department of Audiology & Speech-Language Pathology
Second Year - Semester – IV

Course Title	**Major Core B 4.2 Language Disorders in Children**
Total Hours	**60 hrs**
Hours/Week	**4 Hrs Wk**
Code	**U17AS4MCT02**
Course Type	**Theory**
Credits	**-**
Marks	**100**

General Objectives:

After completing this course, the student will be able to understand the bases of language acquisition, assessment and management of childhood language disorders

Course Objectives:

CO No.	Course Objectives
CO-1	Understand normal language acquisition
CO-2	Explain the process of acquisition of language and factors that influence its development in children
CO-3	Execute assessment of language delay and deviance in children
CO-4	. Implementing appropriate strategies for intervention
CO-5	. Discuss intervention techniques

Note: Texts given in the Extra reading /Key words must be tested only through Assignment and Seminars.

UNIT 1: Bases of Language Acquisition, Development and Disorders 12 Hrs

Concept of theories of language acquisition , Basic concepts and terminologies of language development in bilingual children , Application of ICF in language disorders

Extra reading/ Key words*: Biologic, cognitive, ICD, DSM, ICF*

UNIT 2: Language Disorders – Definition, Classification, Causes, and Characteristics 12 Hrs

Definition and classification of language disorders , Identification of causes of language disorders Concept of syndromic condition leading to language disorders, Identification of other developmental disabilities

Extra reading/ Key words*: ASD, ADHD, RELD, SLI, LD, childhood aphasia, multiple disability, Language Learning Disability*

UNIT 3: Assessment of Language in Children **12 Hrs**

Preliminary components of assessment: Case history, screening, evaluation of environmental, linguistic & cultural variables. , Methods to assess children with language disorder: Formal versus informal assessment; types of assessment materials: assessment scales, observational checklists, developmental scales; standardization, reliability, validity, sensitivity and specificity of test materials , Informal assessment - pre-linguistic behavior, play, mother-child interaction , Language sampling: planning and collecting representative sample; strategies to collecting language sample, audio-video recording, transcription, Analysis of language sample: Specific to various components of language such as phonology, morphology, syntax, semantics and pragmatics. , Test materials for assessing language skills: Assessment of Language Development (ALD), 3D-Language Assessment Test, Linguistic Profile Test, Com-DEALL checklist, other Indian and global tests , Test materials used for children with developmental delay, intellectual disability: Madras Developmental Program Scale, Bayley's Scale for infant and toddler development , Test materials used for children with autism spectrum disorder: Modified-Checklist for Assessment of Autism in Toddlers,, Childhood Autism Rating Scale, Indian Scale for Assessment of Autism, Other test materials used for children with ADHD, ACA, LD (NIMH battery for assessment of Learning Disability) , Documenting assessment results: diagnostic report, summary report and referral report specific to disorder , Differential diagnosis of language disorders in children, Identification of components of analysis , Concept of methods to assess children with language disorders, Informal and formal assessment of children with language disorders , Documenting assessment results, Writing referral reports specific to disorder

Extra reading/ Key words *case history, test materials, diagnostic reports, referral reports, ICF frame work in assessment*

UNIT 4: Management of Language Disorders in Children – I **12 Hrs**

General principles and strategies of in children with language impairment, Types of service delivery models, Reinforcement in language therapy, types and schedules of reinforcement, Choice of language for intervention, incorporating principles of multiculturalism into treatment activities, Choosing and framing goals and Objectives: SMART Objectives, Selection of specific treatment strategies

Extra reading/ Key words*: strategies, reinforcements, intervention, stimulation techniques, individual and group therapy, expansion plus*

UNIT 5: Management of Language Disorders in Children – II **12 Hrs**

Team approach to intervention

Augmentative and alternative communication – types (aided and unaided) and application in child language disorders , Specific approaches to management of children with Autism, Approaches to management of children with LD , Strategies to facilitate language skills in children with disorders such as intellectual disability, Use of technology in language intervention , Home plan and counselling for children with language disorders, Documentation specific to the disorder, Decision making in therapy

Extra reading/ Key words *: goals, objectives, transfer, maintenance, generalization*

Course Outcomes:

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Explain the theories of language acquisition.	PSO 1	R, E

		PSO 4	
CO-2	Define Autism Spectrum Disorders. Explain in detail about the causes, classification and characteristics.	PSO 2 PSO 3	An, Ap
CO-3	Write in detail about the tests developed in India for assessing language disorders	PSO 4	R
CO-4	Describe about the application of AAC in childhood language disorders	PSO 5	C
CO-5	Prepare SOAP for Learning Disability	PSO 2	An, Ap
CO-6	Undergo Clinical postings, Workshop, Clinical conference thereby aiding in Employability, Entrepreneurship and skill development	PSO 1 to PSO 5	Ap, C

References

Text Books:

1. Owens, R.E. (2008). *Language development: An introduction (7th ed*.). Boston: Pearsons
2. Reed, V.A. (2004). *An Introduction to children with language disorders (3rd Ed.)* New York: Allyn & Bacon

For candidates admitted from 2017 onwards
Holy Cross College (Autonomous), Tiruchirappalli-2
Department of Audiology & Speech-Language Pathology
Second Year - Semester – IV

Course Title	Major Core B 4.3 Diagnostic audiology :physiological tests
Total Hours	60 hrs
Hours/Week	4 Hrs Wk
Code	U17AS4MCT21
Course Type	Theory
Credits	-
Marks	100

General Objectives:

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

The need and importance to carry out any physiological tests over behavioral tests

The correlation between behavioral and electrophysiological tests

Course Objectives:

CO No.	Course Objectives
CO-1	Justify the need for using the different physiological tests in the audiological assessment
CO-2	Independently run the tests and interpret the results to detect the middle ear, cochlear and retro cochlear pathologies and also differentially diagnose
CO-3	Design tailor-made test protocols in immittance, AEPs and OAEs as per the clinical need
CO-4	Make appropriate diagnosis based on the test results and suggest referrals

UNIT I - Immittance evaluation **12Hrs**

Concept of impedance and admittance, Measurement procedure and response parameters of tympanogram and reflexometry, Carryout different Eustachian tube functioning tests

Extra reading/ Key words: *wide band reflectance and wide band tympanometry*

UNIT II - Auditory evoked potentials (AEPS): auditory brainstem response (ABR) **12Hrs**

Understanding the principle and instrumentation of AEP's ,Classification of AEPs ,Protocol and procedure of recording auditory brainstem response,Enumerating the factors affecting auditory brainstem responses

Extra reading/ Key words: *ABR in hearing screening, ABR in pediatrics*

UNIT III - Overview of other aeps **12Hrs**

Understanding of EcochG, MLR, LLR and ASSR,Implementing the AEP's for differentially diagnosing different disorders ,Other long latency potentials such as P300, MMN, P600, N400, T-complex, CNV and their clinical applications

Extra reading/ Key words : *clinical applications of EcochG, MLR, LLR and ASSR*

UNIT IV - Otoacoustic emissions **12Hrs**

Understanding the origin and classification of otoacoustic emissions **,**Executing the measurement of SOAE, TEOAEs, and DPOAEs **,**Attributing the clinical applications of OAE's

Extra reading/ Key words : *Contralateral suppression of OAEs*

UNIT V - Physiological tests for assessment of vestibular system **12Hrs**

Classifying various test to assess function of vestibular system,Procedure and interpretation of vestibular evoked myogenic potentials,Understanding the concept of Videonystagmography, videoocculograph, electronystagmography,Attributing the clinical applications of vestibular test

Extra reading/ Key words : *anatomy and physiology of vestibular system*

Note: Texts given in the Extra reading /Key words must be tested only through Assignment and Seminars.

Course Outcomes:

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Elaborate on Eustachian tube function tests.	PSO 3 PSO 1	R, Ap
CO-2	Explain the instrumentation and classification of AEP's.	PSO 3	R,E, Ap
CO-3	Detail the Protocol and procedure of recording LLR.	PSO 3	R,Ap
CO-4	Describe the procedure of measurement of DPOAE and TEOAE along with its clinical applications.	PSO 1 PSO 4	R,Ap
CO-5	Carry out various physiological tests to assess the function of vestibular system.	PSO 3 PSO 4	R,E, Ap
CO-6	Undergo Clinical postings, Workshop, Clinical conference	PSO 1 to	Ap, C

	thereby aiding in Employability, Entrepreneurship and skill development	PSO 5	

References

Text Books:

1. Katz, J., Medwetsky, L., Burkard, R. F., & Hood, L. J. (Eds.). (2007). *Handbook of Clinical Audiology (6th revised North American ed edition*). Philadelphia: Lippincott Williams and Wilkins.
2. Musiek, F. E., Baran, J. A., & Pinheiro, M. L. (1993). Neuroaudiology: Case Studies (1 edition). San Diego, Calif: Singular. .
3. Gelfand, S. A. (2009). *Hearing: An Introduction to Psychological and Physiological Acoustics (5 edition*). London: CRC Press.

Reference Books:

1. Martin, F.N (1994), Introduction to Audiology, New Jersey: Prentice Hall.
2. Silman S. and Silverman C.A. (1991). Auditory Diagnosis Principles and Application. New York: Academic Press, Inc.
3. Rupp, Stockdell (1980). Speech Protocols in Audiology, New York: Grune & Stratton.
4. Keith, R.M. (Ed.). (1981). Central Auditory Dysfunction. New York: Grune & Stratton.
5. Musiek, and Baran, J.A. (1987). Central Auditory Assessment: Thirty years of challenge and change. Ear and Hearing 3, 225-355.
6. Pinherio, H.L. Kusiek, F.E. (Eds) (1985). Assessment of Central Auditory Dysfunction Foundations and Correlates. Baltimore: Williams and Wilkins.
7. Willsford J.A. (1987), Handbook of Central Auditory Processing Disorders in Children. Drando, Grune & Stratton.
8. Feldman, A.S., & Willber, L.A. (Eds), (1976), Acoustic Impedance, Immittance: Measurement of Middle Ear Function, Baltimore: Williams & Wilkins. Feldman, A.S., & Willber, L.A. (Eds), (1976), Acoustic Impedance, Immittance: Measurement of Middle Ear Function, Baltimore: Williams & Wilkins.
9. Popelka, B.R. (Ed) (1981). Hearing Assessment with acoustic reflex. New York: Grune and Stratton.
10. Jacobson, J.T. (Ed) (1985). Auditory Brain Stem Response. Taylor and Francis, London.

For candidates admitted from 2017 onwards
Holy Cross College (Autonomous), Tiruchirappalli-2
Department of Audiology & Speech-Language Pathology
Second Year - Semester – IV

Course Title	**Major Core B 4.4. Implantable Hearing Devices**
Total Hours	**60 hrs**
Hours/Week	**4 Hrs Wk**
Code	**U17AS4MCT22**
Course Type	**Theory**
Credits	**-**
Marks	**100**

General Objectives:

After completing this course, the student will be able to understand the, Candidacy criteria for fitting various implantable devices, Outcomes of fitting the implantable devices

Course Objectives:

CO No.	Course Objectives
CO-1	Assess candidacy for bone anchored hearing devices, middle ear implants, cochlear implants, and ABI
CO-2	Select the appropriate device depending on the audiological and non-audiological findings
CO-3	Handle post-implantation audiological management
CO-4	. Assess the benefit derived from implantation
CO-5	Counsel the parents/care givers during different stages of implantation

UNIT I: Implantable Hearing Devices – Basics 12 Hrs

Understanding the need for implantable hearing devices, Analysing the candidacy for implantable hearing devices, Identifying the team involved for the fitting of implantable hearing devices

Extra reading/ Key words: *History of implantable hearing devices, Pre-implant counseling*

UNIT II: Bone Anchored Hearing Devices and Middle Ear Implants 12 Hrs

Classifying the types and components of Bone anchored hearing devices and middle ear implants, Critically analysing the risks and complications of fitting these devices, Assessing candidacy and benefits of these devices

Extra reading/ Key words: *surgical approaches, contraindications*

UNIT III: Cochlear Implant and Brain Stem Implants – Basics 12 Hrs

Classifying different types of cochlear implant, Analysing the factors related to selection of the device, Assessing the audiological and non-audiological candidacy criteria

Extra reading/ Key words: *Surgical approaches, risks, complications*

UNIT IV: Cochlear Implants and Brainstem Implants **12 Hrs**

Understanding different signal coding strategies, Selecting appropriate objective measures of estimating benefit, Executing Post implant mapping and Audiological evaluation

Extra reading/ Key words: *Intraoperative monitoring by audiologists, assessment of benefits*

UNIT 5: Implantable Hearing Devices-Counselling and Troubleshooting; Rehabilitation **12 Hrs**

Executing Post implant Counselling on care and maintenance of the device, Understanding different post implant rehabilitation strategies, Differentiating the factors affecting outcome of implantable devices in adults and children

Extra reading/ Key words: *AVT, trouble shooting of devices*

Note: Texts given in the Extra reading /Key words must be tested only through Assignment and Seminars.

Course Outcomes:

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Fitting of implantable devices requires a team management approach. Justify.	PSO 1 PSO 3	U
CO-2	Elaborate on the candidacy criteria and the components of bone anchored hearing aids.	PSO 4	R
CO-3	Discuss different audiological and non-audiological candidacy criteria for fitting of cochlear implants.	PSO 2	R, Ap
CO-4	Write in detail about the post mapping audiological evaluation.	PSO 3	C
CO-5	Discuss various factors affecting outcome of implantable devices in adults and children.	PSO 5	An, E
CO-6	Undergo Clinical postings, Workshop, Clinical conference thereby aiding in Employability, Entrepreneurship and skill development	PSO 1 to PSO 5	Ap, C

References

Text Books:

1. Clark, G., Cowan, R. S. C., & Dowell, R. C. (1997). *Cochlear Implantation for Infants and Children*: Advances. Singular Publishing Group.
2. Cooper, H., & Craddock, L. (2006). Cochlear Implants: A Practical Guide. Wiley.
3. Valente, M. (2002). *Strategies for selecting and verifying hearing aid fittings. 2nd Edn.* Thieme.
4. Gelfand, S. A. (2009). *Hearing: An Introduction to Psychological and Physiological Acoustics (5 edition).* London: CRC Press.

Reference Books:

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

2. Gifford, R. H. (2013). Cochlear Implant Patient Assessment: Evaluation of Candidacy, Performance,
and Outcomes. Plural Publishing.
3. Hagr, A. (2007). BAHA: Bone-Anchored Hearing Aid. International Journal of Health Sciences, 1(2), 265–276.
4. Kompis, M., &Caversaccio, M.-D.(2011). Implantable Bone Conduction Hearing Aids.Karger Medical and Scientific Publishers.
5. Mankekar, G. (2014). Implantable Hearing Devices other than Cochlear Implants. Springer India.
6. Møller A.R. (2006). Cochlear and Brainstem Implants (Vol. 64).
7. Niparko, J. K. (2009). Cochlear Implants: Principles & Practices. Lippincott Williams & Wilkins.

For candidates admitted from 2017 onwards
Holy Cross College (Autonomous), Tiruchirappalli-2
Department of Audiology & Speech-Language Pathology
Second Year - Semester – IV

Course Title	**Major Core B 4.5 Clinicals in Speech Language Pathology**
Total Hours	**160 hrs**
Hours/Week	**4 Hrs Wk**
Code	**U17AS3MCP23**
Course Type	**Practicals**
Credits	**-**
Marks	**100**

General Objectives:

After completing this course, the student will be able to link theoretical knowledge with the practical concepts.

Course Objectives:

The learner will be able to

CO No.	Course Objectives
CO-1	Know various speech and language stimulation techniques
CO-2	Administer standard tests for childhood language disorders and speech sound disorder
CO-3	Assess individuals with swallowing disorder
CO-4	Assess individuals with voice disorder
CO-5	Perform case history for individuals with speech and language disorder

Know:

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

Know-how:

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

Show:

Acoustic analysis of voice – minimum of 2 individuals with voice disorders. Simple aerodynamic analysis - minimum of 2 individuals with voice disorders. Self evaluation of voice

– minimum of 2 individuals with voice disorders. Informal assessment of swallowing – minimum of 2 children. Assessment of reflexes and pre linguistic skills - minimum of 2 children. Pre –therapy assessment and lesson plan for children with language and speech sound disorders - minimum of 2 children each.

Do:

Case history - minimum of 2 individuals with voice disorders. Case history - minimum of 2 children with motor speech disorders Oral peripheral examination- minimum of 5 children Apply speech language stimulation/therapy techniques on 5 children with language disorders (with hearing impairment, specific language impairment & mixed receptive language disorder)/speech sound disorders – minimum of 5 sessions of therapy for each child. Exit interview and counselling - minimum of 2 individuals with speech language disorders.

Evaluation:

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

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

Course Outcomes:

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Administer formal assessment of voice	PSO 4	Ap
CO-2	Analysis of language components for Form, content & use	PSO 4	An
CO-3	Prepare assessment protocol for children with motor speech disorders	PSO 5	C
CO-4	Demonstrate speech & language stimulation techniques	PSO 4 PSO 1	R, Ap
CO-5	Counselling children with speech-language disorders	PSO 2	Ap

For candidates admitted from 2017 onwards
Holy Cross College (Autonomous), Tiruchirappalli-2
Department of Audiology & Speech-Language Pathology
Second Year - Semester – IV

Course Title	**Major Core B4.6 Clinicals in Audiology**
Total Hours	**160 hrs**
Hours/Week	**4 Hrs Wk**
Code	**U17AS2MCP24**
Course Type	**Practicals**
Credits	**-**
Marks	**100**

General Objectives:

After completing this course, the student will be able to link theoretical knowledge with the practical concepts.

Course Objectives:

The learner will be able to

CO No.	Course Objectives
CO-1	Know the National and international standards regarding electroacoustic characteristics of hearing aids
CO-2	Troubleshoot common problems with the hearing aids
CO-3	Select test battery depending on case history and basic audiological information
CO-4	Perform Hearing aid fitting
CO-5	Perform real ear and electroacoustic measurements

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

Course Outcomes:

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Calculate pure tone average, % of hearing loss, minimum and maximum masking levels	PSO 4	R, Ap
CO-2	Perform procedures to assess the listening needs	PSO 4	An, Ap
CO-3	Counsel individuals with hearing loss	PSO 2	Ap
CO-4	Analyse the case history and arrive at a diagnosis	PSO 2 PSO 4	E, An
CO-5	Plan for Audiological test battery	PSO 5	Ap

For candidates admitted from 2017 onwards
Holy Cross College (Autonomous), Tiruchirappalli-2
Department of Audiology & Speech-Language Pathology
Third Year - Semester – V

Course Title	Major Core B 5.1 Structural Anomalies And Speech Disorders
Total Hours	60 hrs
Hours/Week	4 Hrs Wk
Code	U17AS5MCT25
Course Type	Theory
Credits	-
Marks	100

General Objectives:

After completing this course, the student will be able to understand the basic characteristics, assessment and management of disorders with oro facial structural anomalies

Course Objectives:

CO No.	Course Objectives
CO-1	Understand the characteristics of disorders with structural anomalies including speech
CO-2	Evaluate and diagnose the speech characteristics seen in these disorders
CO-3	Execute the techniques for the management of speech disorders in cleft lip and palate conditions
CO-4	Summarize the characteristics & assessment of laryngectomy
CO-5	Explain structural anomalies of tongue and mandible - characteristics, assessment and management

UNIT I - Speech Characteristics of Persons with Cleft Lip and Palate 12Hrs

Types, characteristics and classification of cleft lip and palate, Identification of causes of cleft lip and palate, Concept of velopharyngeal inadequacy, Identification of associated problems in persons with cleft lip and palate

Extra reading/ Key words*: genetic, speech, language, feeding, occlusion, velopharyngeal dysfunction*

UNIT II – Assessment and Management of Cleft Lip and Palate Speech 12Hrs

Role of multi-disciplinary team in assessment, Assessment of persons with cleft lip and palate for speech language functions, Diagnosis and differential diagnosis of speech related functions, Reporting test results using Universal Parameters, Surgical and prosthetic management, Techniques and strategies to correct speech sound disorders and feeding, Counselling and guidance

Extra reading/ Key words*: assessment, techniques, prosthesis, surgery*

UNIT III - Structural Anomalies of Tongue and Mandible - Characteristics, Assessment and Management **12Hrs**

Types, classification and characteristics of structural anomalies of tongue and mandible, Causes for structural anomalies of tongue and mandible, Role of multidisciplinary team, Associated problems in persons with structural anomalies of tongue and mandible, Management of persons with structural anomalies of tongue and mandible

Extra reading/ Key words*: glossectomy, mandibulectomy, prosthesis, feeding, surgery, speech*

UNIT IV - Characteristics & Assessment of Laryngectomy **12Hrs**

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

Extra reading/ Key words*: laryngectomee, cancer, surgery types, pre and post operative counselling, aquather*

UNIT V - Management of Speech and Communication in Laryngectomies **12Hrs**

Esophageal speech, trachea esophageal speech and artificial larynx- candidacy, types of air intake procedures, speech characteristics and its modification through techniques and strategies, complications and contraindications, Other remedial procedures: Pharyngeal speech, buccal speech, ASAI speech, gastric speech, Speech restoration in laryngectomee

Extra reading/ Key words*:* *esophageal speech, TEP, artificial larynx, speech restoration, natural methods*

Note: Texts given in the Extra reading /Key words must be tested only through Assignment and Seminars

Course Outcomes:

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Describe the classification of cleft lip and palate.	PSO 1 PSO 4	R, E
CO-2	Explain the objective assessment of cleft lip and palate.	PSO 2 PSO 3	An, Ap
CO-3	Detail about the associated problems in mandibulectomy.	PSO 4	R
CO-4	Execute various management options for glossectomy?	PSO 5	C
CO-5	Explain about post operative counselling in laryngectomee	PSO 2	An, Ap
CO-6	Undergo Clinical postings, Workshop, Clinical conference thereby aiding in Employability, Entrepreneurship and skill development	PSO 1 to PSO 5	Ap, C

References

Text Books:

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

Reference Books:

5. Berkowitz. S. (2001). Cleft Lip and Palate: Perspectives in Management. Vol II. San Diego, London, Singular Publishing Group Inc.
6. Falzone. P., Jones. M. A., & Karnell. M. P. (2010). Cleft Palate Speech. IV Ed., Mosby Inc. Ginette, P. (2014). Speech Therapy in Cleft Palate and Velopharyngeal Dysfunction.Guildford, J & R Press Ltd.
7. Karlind, M. & Leslie, G. (2009). Cleft Lip and Palate: Interdisciplinary Issues and Treatment. Texas, Pro Ed.
8. Kummer, A.W. (2014). Cleft Palate and Craniofacial Anomalies: The Effects on Speech and Resonance. Delmar, Cengage Learning.
9. Salmon . J & Shriley (1999). Alaryngeal speech rehabilitation for clinicians and by clinicians. ProEd
10. Yvonne, E (Ed) (1983). Laryngectomy: Diagnosis to rehabilitation. London: Croom Helm Ltd

For candidates admitted from 2017 onwards
Holy Cross College (Autonomous), Tiruchirappalli-2
Department of Audiology & Speech-Language Pathology
Third Year - Semester – V

Course Title	**Major Core B 5.2. Fluency and its disorders**
Total Hours	**60 hrs**
Hours/Week	**4 Hrs Wk**
Code	**U17AS5MCT26**
Course Type	**Theory**
Credits	**-**
Marks	**100**

General Objectives:

After completing this course, the student will be able to understand the basic characteristics, assessment and management of fluency disorders

Course Objectives:

CO No.	Course Objectives
CO-1	Understand the characteristics of fluency and its disorders
CO-2	Evaluate and diagnose fluency disorders
CO-3	Execute the techniques for the management of fluency disorders
CO-4	Understand the characteristics of fluency and its disorders
CO-5	Evaluate and diagnose fluency disorders

UNIT I : Fluency **12Hrs**

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

Extra reading/ Key words*: dimensions of fluency, TTRIP, suprasegmentals of speech*

UNIT II: Stuttering and Other Fluency Disorders **12Hrs**

Definition and causes for stuttering , Characteristics of stuttering, Development of stuttering, Normal non fluency: characteristics and differential diagnosis , Theories of stuttering: organic, functional, neurogenic, diagnosogenic and learning , Cluttering: Definition, causes and characteristics, Neurogenic stuttering: Definition, causes and characteristics, Role of multi-disciplinary team in assessment

Extra reading/ Key words*: tracks of van riper, primary and secondary stuttering, transition period*

UNIT III: Assessment and Differential Diagnosis 12Hrs

Assessment of fluency disorders, Subjective methods: protocols and tests and objective methods of assessment, Qualitative and quantitative assessment , Differential diagnosis of fluency disorders

Extra reading/ Key words*: SOAP for stuttering, OASES, ACES*

UNIT IV: Management of Stuttering 12Hrs

Approaches to management, Changing scenario in management of stuttering, Different techniques and strategies used in management with their rationale, Relapse and recovery from stuttering, Issues of speech naturalness in stuttering

Extra reading/ Key words*: factors affecting relapse and recovery, naturalness rating scale*

UNIT V: Management of Fluency-Related Entities 12Hrs

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

Extra reading/ Key words*: cluttering, neurogenic stuttering, normal non fluency, prevention, early identification*

Note: Texts given in the Extra reading /Key words must be tested only through Assignment and Seminars.

Course Outcomes:

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Describe the development of suprasegmentals in speech.	PSO 1 PSO 3 PSO 4	U
CO-2	Define stuttering and other fluency disorders and explain its causes.	PSO 1 PSO 2 PSO 3 PSO 4	R, U
CO-3	Detail about the development of stuttering.	PSO 1 PSO 2 PSO 4 PSO 3 PSO 5	R, U, An
CO-4	Execute techniques used in the management of stuttering and explain with its rationale.	PSO 1 PSO 4	U, Ap
CO-5	Explain the management for neurogenic stuttering.	PSO 1 PSO 3 PSO 5	R,U
CO-6	Differentiate between various fluency disorders and their differential diagnosis	PSO 1 PSO 2	An

		PSO 3 PSO 4	
CO-7	. Undergo Clinical postings, Workshop, Clinical conference thereby aiding in Employability, Entrepreneurship and skill development	PSO 1 to PSO 5	Ap, C

References

Text Books:

1. Assessment and management of fluency disorders. Proceedings of the national workshop on "Assessment and management of fluency disorders", 25-26 Oct 2007. All India Institute of Speech & Hearing, Mysore. 2007.
2. Bloodstein, O., & Ratner, N. B. (2008). *A Handbook on Stuttering (6th Ed*.).Clifton Park, NY, Thomson Demer Learning.
3. Guitar, B. (2014). *Stuttering-An Integrated Approach to its Nature and Treatment. 4th Ed*. Baltimore, Lippincott Williams & Wilkins.

Reference Books:

1. Hegde, M. N. (2007). Treatment Protocols for Stuttering.CA Plural Publishing.
2. Howell, P. (2011). Recovery from Stuttering. New York, Psychology Press.
3. Packman, A., & Attanasio, J.S. (2004). Theoretical Issues in Stuttering. NY, Psychology Press.
4. Rentschler, G. J. (2012). Here`s How to Do: Stuttering Therapy. San Diego, Plural Publishing.

For candidates admitted from 2017 onwards
Holy Cross College (Autonomous), Tiruchirappalli-2
Department of Audiology & Speech-Language Pathology
Third Year - Semester – V

Course Title	Major Core B.5.3. Paediatric audiology
Total Hours	60 hrs
Hours/Week	4 Hrs Wk
Code	U17AS5MCT27
Course Type	Theory
Credits	-
Marks	100

General Objectives:
After completing this course, the student will be able to understand auditory development and classify auditory disorders based on its etiology and also execute paediatric assessment protocol.

Course Objectives:

CO No.	Course Objectives
CO-1	Describe auditory development
CO-2	List etiologies and relate them to different types of auditory disorders that may arise
CO-3	Explain different hearing screening/identification procedures and their application
CO-4	Elaborate on different aspects of paediatric behavioural and physiological / electrophysiological evaluation

UNIT I - Auditory development 12Hrs
Embryology of the ear,Auditory system development from periphery to cortex, Stages of auditory development from 0-2 years ,Incidence and prevalence of auditory disorders in children
Extra reading/ Key words: *prenatal hearing, Infant speech perception, Neuroplasticity*

UNIT II - auditory disorders 12Hr
Congenital and acquired hearing loss in children,Classification of hearing loss Minimal to profound ,Impact on auditory skills, speech-language, educational and socio-emotional abilities,Differentiate Unilateral and Bilateral Hearing loss,Auditory disorders in special population and Multiple handicap
Extra reading/ Key words: *ANSD, CAPD, Pseudohypocusis*

UNIT III - Early identification of hearing loss **12Hrs**

Importance of early hearing detection and intervention,Hearing screening in infants, toddlers, preschool children and school age children,Hearing screening in Global and Indian context

Extra reading/ Key words : *HRR, JCIH, Sensitivity and Specificity*

UNIT IV - Pediatric assessment I **12Hrs**

Behavioral observation audiometry and Conditioned orientation reflex audiometry,Pure tone audiometry in children,Speech audiometry in children,Immittance evaluation in paediatric population,Central auditory processing disorders assessment

Extra reading/ Key words : *VRA, TROCA and play audiometry*

UNIT V - pediatric assessment II **12Hrs**

Recording, interpretation and factors affecting OAE in paediatric population, Recording and interpretation of click evoked and tone burst evoked ABR in paediatric population, Recording ASSR, AMLR and ALLR in paediatric population, Diagnostic test battery for different age groups and in special population

Extra reading/ Key words : *Di**fferential diagnosis***

Note: Texts given in the Extra reading /Key words must be tested only through Assignment and Seminars.

Course Outcomes:

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Identification of auditory development from 0 to 2 years.	PSO 3 PSO 1	R, Ap
CO-2	Describe about the effects of neuroplasticity.	PSO 3	R,E, Ap
CO-3	Identify the characteristics of ANSD and formulate a test battery to diagnose it.	PSO 3	R,Ap
CO-4	Describe importance of hearing screening in preschool children and school children.	PSO 1 PSO 4	R,Ap
CO-5	Describe about various diagnostic test battery for different age groups.	PSO 3 PSO 4	R,E, Ap
CO-6	Formulate appropriate test protocol for a children with processing difficulties.	PSO 3 PSO 1	R,E, Ap
CO-7	Undergo Clinical postings, Workshop, Clinical conference thereby aiding in Employability, Entrepreneurship and skill development	PSO 1 to PSO 5	Ap, C

References

Text Books:

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

Reference Books:

1. 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.
2. http://doi.org/10.1542/peds.2007-2333
3. Madell, J.R., & Flexer, C. (2008). Paediatric Audiology: Diagnosis, Technology, and Management. Ney York NY: Thieme Medical Publishers.
4. Northern, J.L. and Downs, M.P. (2014). Hearing in Children. 6th Ed. San Diego: Plural Publishing.
5. Seewald, R., and Thorpe, A.M. (2011). Comprehensive Handbook of Paediatric Audiology, San Diego: Plural Publishing. (core text book) www.jcih.org

For candidates admitted from 2017 onwards
Holy Cross College (Autonomous), Tiruchirappalli-2
Department of Audiology & Speech-Language Pathology
Third Year - Semester – V

Course Title	**Major Core B 5.4. Aural Rehabilitation in Children**
Total Hours	**60 hrs**
Hours/Week	**4 Hrs Wk**
Code	**U17AS5MCT28**
Course Type	**Theory**
Credits	**-**
Marks	**100**

General Objectives:

After completing this course, the student will be able to understand different communication options and strategies available for children with hearing impairment and execute various strategies and activities based on the child's need to enhance communication in children with hearing impairment

Course Objectives:

CO No.	Course Objectives
CO-1	Describe the different communication options available for young children with hearing impairment
CO-2	Explain the impact of hearing impairment on auditory development and spoken language communication
CO-3	Describe factors that affect of acoustic accessibility and strategies to manage them at home and in classroom
CO-4	Design activities for auditory learning at different levels
CO-5	Enumerate how the needs of individuals with hearing impairment using sign language and spoken language as form of communication in India are being met

UNIT I - Auditory Development, Spoken Communication and Acoustic Accessibility 12Hrs
Impact of hearing impairment on auditory development, spoken language acquisition, parent child communication, Hearing loss implications for speech perception, Optimizing hearing potential through hearing aids and cochlear implants, Barriers to acoustic accessibility, Managing the listening environment for infants, toddlers schools, Signal to noise ratio enhancing technologies personal FM, loop systems, desktop group systems, blue tooth connectivity
Extra reading/ Key words: *sensitivity period, auditory deprivation, acoustics of speech, SNR, reverberation*

UNIT II - Communication Options 12Hrs
Detecting and confirming hearing loss, Parent support counselling, individual family service plan Choosing communication options, Auditory oral approach, Manual/ sign language, Cued speech and total communication, Listening devices hearing aid/cochlear implant

Extra reading/ Key words*: early intervention ,AVT, sign language, early intervention*

UNIT III- Optimal Listening and Learning Environments Infancy and Early Childhood **12Hrs**

Involvement of family, Intervention: Assessment, auditory learning, listening and language facilitation techniques in infancy and early childhood, Issues with children with mild hearing loss, unilateral hearing loss, Management of Children with hearing loss, ANSD or APD and special needs, Intervention at school age: Functional hearing assessment, communication assessment and intervention to integrate with academic targets

Extra reading/ Key words*: Optimal environment, Inclusive education, ANSD, APD*

UNIT IV - Auditory - Speech Reading Training and Literacy **12Hrs**

Auditory training/learning four design principles skill, stimuli, activity, and difficulty level, Early training Objectives, Formal and informal training, Auditory training for infants and very young children, Speech and language and literacy characteristics assessment and therapy

Extra reading/ Key words*: candidacy, speech reading, analytic and synthetic training, outcome measures*

UNIT V - Indian Perspectives **12Hrs**

Prevalence of hearing impairment in children, Available resources for education of the hearing impaired and historical perspectives in education, Early intervention programs and centres, Schools, College and vocational training centers for the hearing impaired, Assessment and therapy tools developed for individuals with hearing impairment in India.

Extra reading/ Key words*: ISL, Sign language, Cued speech, manpower resources*

Note: Texts given in the Extra reading /Key words must be tested only through Assignment and Seminars.

Course Outcomes:

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Identify the barriers to acoustic audibility	PSO 1 PSO 3	U
CO-2	Differentiate auditory oral approach and auditory verbal therapy.	PSO 4	R
CO-3	Describe optimum listening and learning environment and its importance in communication.	PSO 2	R, Ap
CO-4	Describe about analytic and synthetic training objectives and procedure	PSO 3	C
CO-5	Administration of therapy tools developed for individuals with hearing impairment in India.	PSO 5	An, E
CO-6	Undergo Clinical postings, Workshop, Clinical conference thereby aiding in Employability, Entrepreneurship and skill development	PSO 1 to PSO 5	Ap, C

References

Text Books:

1. Northern, J.L. and Downs, M.P. (2014). *Hearing in Children. 6th Ed*. San Diego: Plural Publishing.
2. Fitzpatrick, E.M., and Doucet S.P. (2013) (Eds). *Paediatric Audiologic Rehabilitation.* Thieme, New York

Reference Books:

1. Hull, R. H., (2014) ed. Introduction to Aural Rehabilitation 2nd edition Plural Publishing, San
   Diego Chapters 1, 2, 11 to 20
2. Schow, R.L. & Nerbonne, M.A., (2012). Introduction to Audiologic Rehabilitation (6th edition), Allyn & Bacon, Boston.
3. Tye-Murray, N., (2014). Foundations of Aural Rehabilitation: Children , adults and their family members 4th edition Plural Publishing San Diego Chapters 5-10

For candidates admitted from 2017 onwards
Holy Cross College (Autonomous), Tiruchirappalli-2
Department of Audiology & Speech-Language Pathology
Third Year - Semester – V

Course Title	Major Core B5.5 Clinicals in Speech Language Pathology
Total Hours	160 hrs
Hours/Week	4 Hrs Wk
Code	U17AS2MCP29
Course Type	Practicals
Credits	-
Marks	100

General Objectives:

After completing this course, the student will be able to link theoretical knowledge with the practical concepts.

Course Objectives:

The learner will be able to

CO No.	Course Objectives
CO-1	Know procedures to assess individuals with cleft lip and palate and laryngectomy
CO-2	Administer standard tests for childhood language disorders and fluency disorder
CO-3	Assess speech intelligibility, rate and nasality
CO-4	Evaluate the percentage of dis/dysfluencies
CO-5	Perform case history for individuals with speech and language disorder

Know:

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

Know-how:

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

Show:

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

Do:

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

Evaluation:

Internal evaluation: Based on attendance, clinical diary, log book and learning conference.

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

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Administer formal assessment of fluency	PSO 4	Ap
CO-2	Analysis of components of speech	PSO 4	An
CO-3	Prepare assessment protocol for individuals with fluency disorder and maxillofacial anomalies	PSO 5	C
CO-4	Demonstrate speech & language stimulation techniques	PSO 4 PSO 1	R, Ap
CO-5	Counselling children with fluency disorder and maxillofacial anomalies	PSO 2	Ap

For candidates admitted from 2017 onwards
Holy Cross College (Autonomous), Tiruchirappalli-2
Department of Audiology & Speech-Language Pathology
Third Year - Semester – V

Course Title	**Major Core B5.6 Clinicals in Audiology**
Total Hours	**160 hrs**
Hours/Week	**4 Hrs Wk**
Code	**U17AS2MCP30**
Course Type	**Practicals**
Credits	**-**
Marks	**100**

General Objectives:

After completing this course, the student will be able to link theoretical knowledge with the practical concepts.

Course Objectives:

The learner will be able to

CO No.	Course Objectives
CO-1	Know the protocols available to test human auditory system
CO-2	Perform environmental modification for an individual with hearing impairment
CO-3	Analyse ABR waveforms
CO-4	Perform pediatric hearing assessment
CO-5	Carry out listening training for children

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: Based on attendance, clinical diary, log book and learning conference.
External evaluation: Spot test, OSCE, Record, Viva-voce, case work

Course Outcomes:

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Administer Audiological test battery	PSO 4	R, Ap
CO-2	Perform procedures to assess the listening needs	PSO 4	An, Ap
CO-3	Counsel parents regarding hearing status of the child	PSO 2	Ap
CO-4	Carry out listening training and	PSO 1	R, Ap
CO-5	Plan activities for listening training	PSO 5	Ap

For candidates admitted from 2017 onwards
Holy Cross College (Autonomous), Tiruchirappalli-2
Department of Audiology & Speech-Language Pathology
Third Year - Semester – VI

Course Title	**Major Core B 6.1 Motor Speech Disorders in Adults**
Total Hours	**60 hrs**
Hours/Week	**4 Hrs Wk**
Code	**U17AS6MCT31**
Course Type	**Theory**
Credits	**-**
Marks	**100**

General Objectives:

After completing this course, the student will be able to understand the basic characteristics, assessment and management of motor speech disorders in adults

Course Objectives:

CO No.	Course Objectives
CO-1	Understand the characteristics of acquired motor speech disorders in adults
CO-2	Evaluate and diagnose the speech characteristics seen in these disorders .
CO-3	Execute the techniques for the management of speech disorders in these conditions .

UNIT 1: Causes & Characteristics of Dysarthria **12Hrs**

Definition, etiology and classification of acquired dysarthria **,** General, speech and feeding related characteristics of acquired dysarthria with and without genetic underpinnings**,** Different causes and disorders associated with acquired dysarthria

Extra reading/ Key words*: dysarthria, vascular lesions, infectious conditions, traumatic conditions, toxic lesions, metabolic disorders, idiopathic lesions*

UNIT 2: Assessment and Diagnosis of Dysarthria **12Hrs**

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, Assessment of feeding, swallowing and related issues in persons with dysarthria

Extra reading/ Key words*: subjective, instrumental, differential diagnosis, swallowing assessment*

UNIT 3: Management of Dysarthria **12Hrs**

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

Extra reading/ Key words*: principles, medical, prosthetic, surgical, facilitative, intelligibility, feeding*

UNIT 4: Assessment and Management of Apraxia in Adults 12Hrs

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

Extra reading/ Key words: *acquired, apraxia, subjective, instrumental, approaches*

UNIT 5: Management Related Issues in Motor Speech Disorders 12Hrs

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

Extra reading/ Key words*: maintenance, generalization, counselling, AAC*

Note: Texts given in the Extra reading /Key words must be tested only through Assignment and Seminars.

Course Outcomes:

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Explain the subjective assessment of dysarthria.	PSO 1 PSO 4	R, E
CO-2	Detail about the differential diagnosis between dysarthria and aphasia	PSO 2 PSO 3	An, Ap
CO-3	Explain about the characteristics and causes of verbal and nonverbal apraxia in adults	PSO 4	R
CO-4	Explain the role of multidisciplinary team in the management of dysarthria and apraxia in adults.	PSO 2	An, Ap
CO-6	Undergo Clinical postings, Workshop, Clinical conference thereby aiding in Employability, Entrepreneurship and skill development	PSO 1 to PSO 5	Ap, C

References

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

For candidates admitted from 2017 onwards
Holy Cross College (Autonomous), Tiruchirappalli-2
Department of Audiology & Speech-Language Pathology
Third Year - Semester – VI

Course Title	**Major Core B 6.2. Language disorders in adults**
Total Hours	**60 hrs**
Hours/Week	**4 Hrs Wk**
Code	**U17AS2MCT07**
Course Type	**Theory**
Credits	**-**
Marks	**100**

General Objectives:

After completing this course, the student will be able to understand the basic characteristics, assessment and management of language disorders in adults

Course Objectives:

CO No.	Course Objectives
CO-1	Understand the characteristics of language disorders in adults
CO-2	Evaluate and diagnose adult language disorders
CO-3	Execute the techniques for the management of respective disorders

UNIT I: Neural Bases of Language **12Hrs**

Correlates of language functions: Neuroanatomical Neurophysiological Neurobiological and 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

Extra reading/ Key words*: correlated, models, bilingualism, processing, right hemisphere*

UNIT II: Language Disorders in Adults **12Hrs**

Definition, causes and characteristics of speech, language and cognition in adult language disorders, Differential diagnosis of various language disorders seen in adults.

Extra reading/ Key words: *aphasia, PPA, RHD, dementia, schizophasia, TBI, subcortical*

UNIT III: Assessment and Diagnosis of Language Disorders **12Hrs**

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

Extra reading/ Key words: *assessment, scales, test, protocols, investigation*

UNIT IV: Management Of Language Disorders 12Hrs

Medical, linguistic and programmed intervention for persons with neurogenic language disorders

Extra reading/ Key words: *intervention, medical, linguistic , adult language disorder*

UNIT V: Rehabilitation Issues Relating To Adult Language Disorders 12Hrs

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 disorder, Augmentative and alternative strategies for adults with language disorders

Extra reading/ Key words*:* *team, factors, recovery, QoL, counselling, generalization, maintenance, AAC*

Note: Texts given in the Extra reading /Key words must be tested only through Assignment and Seminars.Course Outcomes:

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Identify the neuroanatomical correlates of language function.	PSO 1 PSO 3 PSO 4	U, R
CO-2	Detail about the neurolonguistic models of language function.	PSO 1 PSO 2 PSO 3 PSO 4	R, U
CO-3	Plan assessment and intervention for neurological language disorders	PSO 1 PSO 2 PSO 4 PSO 3 PSO 5	Ap, An, E
CO-4	Explain the differential diagnosis between aphasia and dementia.	PSO 1 PSO 4	U, Ap
CO-6	Execute language intervention strategies for individual diagnosed with Brocas aphasia.	PSO 1 PSO 3 PSO 4	An, C
CO-7	Undergo Clinical postings, Workshop, Clinical conference thereby aiding in Employability, Entrepreneurship and skill development	PSO 1 to PSO 5	Ap, C

References

Text Books:

1. Chapey, R. (2008). *Language Intervention strategies in aphasia and related neurogenic communication disorders*. Philadelphia: Lippincott Williams and Wilkins

2. Lapointe, L. L. (2005). *Aphasia and related neurogenic language disorders. (3rdEdn.).* Thieme.
3. Lapointe, L. L., Murdoch, B. E., & Stierwalt, J. A. G. (2010). *Brain based Communication Disorders*. Plural Publishing Inc.

Reference Books:

1. Whitworth, A., Webster, J., & Howard, D. (2005). A cognitive neuropsychological approach to assessment and intervention in aphasia: A clinician's guide. Psychology Press.
2. Edwards, S. (2005). Fluent Aphasia. Cambridge University Press. Laine, M. & Martin, N. (2006). Anomia: Theoretical and Clinical Aspects. Psychology Press.

For candidates admitted from 2017 onwards
Holy Cross College (Autonomous), Tiruchirappalli-2
Department of Audiology & Speech-Language Pathology
Third Year - Semester – VI

Course Title	Major Core B.6.3 Aural rehabilitation in adults
Total Hours	60 hrs
Hours/Week	4 Hrs Wk
Code	U17AS6MCT33
Course Type	Theory
Credits	-
Marks	100

General Objectives:

After completing this course, the student will be able to evaluate impaired communicative abilities and to facilitate communication by implementing successful aural rehabilitation program and execute various strategies and activities based on older adult's needs to enhance the quality of life.

Course Objectives:

CO No.	Course Objectives
CO-1	Describe the impact on the quality of life of adults with hearing impairment
CO-2	Explain the principles benefits and limitations of auditory training and speech reading
CO-3	Recognize factors that impair communication and suggest facilitative and repair strategies
CO-4	Identify components of aural rehabilitation program for adults (planning to outcome assessment)
CO-5	Identify strategies used with the older adult to implement a successful aural rehabilitation program
CO-6	Administer different tools for assessment of hearing handicap, attitudes and beliefs that can impact aural rehabilitation

UNIT I - Aural rehabilitation **12Hrs**

Definition and Scope of aural rehabilitation in adults,Prevalence of hearing loss in children and in adults (global and Indian data),Relationship between audiometric data with limitations, hearing difficulties and amplification,Considerations,Quality of life and impact on income, education, employment,Assessing communication handicap : interviews, questionnaire

Extra reading/ Key words: *communication handicap, vocational rehabilitation*

UNIT II - Listening training and speech reading for adults **12Hr**

Listening to speech with a hearing loss,Listening training to improve speech perception and music perception,Candidacy and Benefits of auditory training,Speech reading for communication, traditional methods and factors affecting,Characteristics of good lip readers versus good speech readers, Assessing vision only auditory only processing

Extra reading/ Key words: *candidacy, speech perception, music perception, lip reading vs speech reading*

UNIT III - Communication strategies **12Hrs**

Factors that influence the reception of spoken message,Facilitative communication strategies,Repairing a communication breakdown,Conversational styles,Communication strategies training formal instruction, guided learning, real world,practice

Extra reading/ Key words : *repair strategies, communication breakdown*

UNIT IV - Aural rehabilitation for adults **12Hrs**

Principles, components and process of aural rehabilitation in adults,Psychological impact of hearing loss and Support through counselling, Orienting towards hearing aid use, Needs assessment for non-hearing and assistive technology for adults, Categories of assistive technology,Aural rehabilitation programs: Individual vs group,

Extra reading/ Key words : *assistive technologies, adverse listening condition*

UNIT V - aural rehabilitation for older adults **12Hrs**

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

Extra reading/ Key words : *barriers, hearing aid features.*

Note: Texts given in the Extra reading /Key words must be tested only through Assignment and Seminars.

Course Outcomes:

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Write about the scope of aural rehabilitation in adults.	PSO 1	R
CO-2	Describe the steps involved in listening training to improve speech and musical perception.	PSO 3	R,E

CO-3	Brief about various communication strategies available to enhance communication.	PSO 3	R,Ap
CO-4	Identify various assistive listening devices available to repair communication breakdown	PSO 1	R,Ap
CO-5	Describe the various auditory and non-auditory barriers to communication	PSO 3 PSO 4	R,E, Ap
CO-6	Undergo Clinical postings, Workshop, Clinical conference thereby aiding in Employability, Entrepreneurship and skill development	PSO 1 to PSO 5	Ap, C

References

Text Books:

1. Schwartz, S., (2007) *Choices in Deafness : a Parent's guide to Communication Options , 3rd edition* Woodbine house Bethesda
2. Fitzpatrick, E.M., and Doucet S.P. (2013) (Eds). *Paediatric Audiologic Rehabilitation*. Thieme, New York

Reference Books:

6. Hull, R. H., (2014) ed. Introduction to Aural Rehabilitation 2nd edition Plural Publishing, San Diego Chapters 1, 2, 11 to 20
7. Schow, R.L. & Nerbonne, M.A., (2012). Introduction to Audiologic Rehabilitation (6th edition), Allyn & Bacon, Boston.
8. Tye-Murray, N., (2014). Foundations of Aural Rehabilitation: Children , adults and their family members 4th edition Plural Publishing San Diego Chapters 5-10

For candidates admitted from 2017 onwards
Holy Cross College (Autonomous), Tiruchirappalli-2
Department of Audiology & Speech-Language Pathology
Third Year - Semester – VI

Course Title	**Major Core B.6.4 Audiology In Practice**
Total Hours	**60 hrs**
Hours/Week	**4 Hrs Wk**
Code	**U17AS6MCT34**
Course Type	**Theory**
Credits	**-**
Marks	**100**

General Objectives:

General Objectives: After completing this course, the student will be able to implement appropriate service delivery, welfare measures, policies and legislations to the persons with hearing impairment and generate awareness programs and strategies to address excessive noise exposure and provide appropriate service delivery with professional ethics.

Course Objectives:

CO No.	Course Objectives
CO-1	List and describe the highlights of legislations relating to hearing impairment and other disabilities
CO-2	Incorporate ethical practices in professional service delivery. Provide information on welfare measures, policies of government when needed
CO-3	Describe different strategies to create awareness of hearing impairment and programs to address them
CO-4	. Explain the different clinical practice settings in audiology with reference to their requirement, protocols and role and responsibility of audiologist
CO-5	Describe terminology, technology and methods used in tele practice, and their application in audiological service delivery

UNIT I - Scope, Legislation and Ethics in Audiology 12Hrs

Scope of practice in audiology, 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

Extra reading/ Key words*: barrier free access and universal design*

UNIT II – Hearing Health and Strategies For Prevention Of Hearing Impairment 12Hrs

Epidemiology of hearing disorders**,** 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.)
Extra reading/ Key words*:ICD, ICF, prevention programs*

UNIT III - Audiological Practice In Different Settings 12Hrs

Private practice**,** ENT clinics and Neurology departments**,** Paediatric / neonatology clinic/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
Extra reading/ Key words*: cochlear implant, multiple handicap*

UNIT IV - Noise And Hearing Conservation In Industry And Community 12Hrs

Introduction to noise, types and sources in the industry and community, Effects of noise in the auditory system (outer, middle and inner ear), 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 and community, Hearing conservation program (HCP), steps, record keeping and Ear protective devices
Extra reading/ Key words*: TTS, PTS, NIHL, EPD's*

UNIT V - Scope And Practice of Tele Audiology 12Hrs

Introduction, definition, terminologies and history of tele-health, tele medicine, tele practice, Connectivity: internet, satellite, mobile data, Methods of tele-practice-store and forward and real time, 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
Extra reading/ Key words*: tele health, ethics*

Note: Texts given in the Extra reading /Key words must be tested only through Assignment and Seminars.

Course Outcomes:

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Wrie a note on various legislations and conventions relating to disability.	PSO 1 PSO 4	R, E
CO-2	Describe various stage of prevention and its importance	PSO 2 PSO 3	An, Ap

CO-3	Briefly write a note on audiological service delivery at different settings.	PSO 4	R
CO-4	Write in detail about the audiological and non audiological effects of noise exposure.	PSO 5	C
CO-5	Describe scope and practice of tele audiology.	PSO 2	An, Ap

References

Text Books:

1. BIS specifications relating to Noise Measurements.- IS:7194-1973 Specification for assessment of noise exposure during work for hearing conservation purposes.
2. Census of India information on disability Audiology Telepractice; Editor in Chief, Catherine V. Palmer, Ph.D.; Guest Editor, Greg D. Givens, Ph.D. Seminars in Hearing, volume 26, number 1, 2005.

Reference Books:

11. Audiology Telepractice; Editor in Chief, Catherine V. Palmer, Ph.D.; Guest Editor, Greg D. Givens, Ph.D. Seminars in Hearing, volume 26, number 1, 2005.
12. Bergland, B., Lindwall, T., Schwela, D.H., eds (1999). Guidelines on Community noise http://www.who.int/docstore/peh/noise/guidelines2.html WHO 1999
13. Dobie, R. A (2001). Medical legal evaluation of hearing loss, 2nd Ed.
14. John Ribera. Tele-Audiology in the United States. In Clinical Technologies: Concepts, Methodologies, Tools and Applications (pp. 693-702), 2011. Hershey, PA: Medical Information Science Reference. doi:10.4018/978-1-60960-561-2.ch305
15. Lipscomb, D. M. (1994). Hearing conservation – In industry, schools and the military.
16. Mandke, K and Oza R.K (2014). Private practice in speech pathology and audiology, 2014 ISHA
17. Philippe Valentin Giffard. Tele-Audiology. Tort, 2012. ISBN 6139256615, 9786139256617
18. Rawool, V. W. (2012). Hearing conservation in occupational, recreational, educational and home setting. Thieme: New York RCI, PWD and National Trust, and Right to education act Richard Wootton, John Craig, Victor Patterson, editors. Introduction to telemedicine. Second edition. London: The Royal Society of Medicine Press Ltd. 2006. p. 206 ISBN: 1 85315 677 9.
19. Swanepoel de W, Hall JW 3rd .A systematic review of tele health applications in audiology. Telemed J E Health. 2010 Mar;16(2):181-200. doi: 10.1089/tmj.2009.0111.

For candidates admitted from 2017 onwards
Holy Cross College (Autonomous), Tiruchirappalli-2
Department of Audiology & Speech-Language Pathology
Third Year - Semester – V

Course Title	**Major Core B6.5 Clinicals in Speech Language Pathology**
Total Hours	**160 hrs**
Hours/Week	**4 Hrs Wk**
Code	**U17AS2MCP35**
Course Type	**Practicals**
Credits	**-**
Marks	**100**

General Objectives:

After completing this course, the student will be able to link theoretical knowledge with the practical concepts.

Course Objectives:

The learner will be able to

CO No.	Course Objectives
CO-1	Differentially diagnose motor speech disorders in adults
CO-2	Administer standard tests for adult language disorders and motor speech disorder
CO-3	Assess dysphagia
CO-4	Evaluate the components of speech and language
CO-5	Manage individuals with aphasia and dysarthria

Know:

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

Know-how:

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

Show:

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

Do:

Voice therapy - Minimum of 2 individuals with voice disorders. Fluency therapy - Minimum of 2 individuals with fluency disorders. Bed side evaluation of individuals with neuro-communication disorders – Minimum of 2 individuals. Apply speech language stimulation/therapy techniques on 5 children with language disorders/speech sound disorders/ motor speech disorders – minimum 5 sessions of therapy for each child.

Evaluation:

Internal evaluation: Based on attendance, clinical diary, log book and learning conference.

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

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Administer formal tests of ALD and MSD assessment	PSO 4	Ap
CO-2	Analyse formally and informally the components of speech and language	PSO 4	An
CO-3	Prepare assessment protocol for individuals with dysphagia	PSO 5	C
CO-4	Demonstrate therapy techniques for voice and fluency	PSO 4 PSO 1	R, Ap
CO-5	Counseling individuals with aphasia and dysarthria	PSO 2	Ap

For candidates admitted from 2017 onwards
Holy Cross College (Autonomous), Tiruchirappalli-2
Department of Audiology & Speech-Language Pathology
Third Year - Semester – V

Course Title	**Major Core B6.6 Clinicals in Audiology**
Total Hours	**160 hrs**
Hours/Week	**4 Hrs Wk**
Code	**U17AS2MCP36**
Course Type	**Practicals**
Credits	**-**
Marks	**100**

General Objectives:

After completing this course, the student will be able to link theoretical knowledge with the practical concepts.

Course Objectives:

The learner will be able to

CO No.	Course Objectives
CO-1	Know the standards related to noise exposure
CO-2	Perform mapping of cochlear implant in infants and children
CO-3	Analyse objective responses like compound action potential
CO-4	Plan hearing conservation program
CO-5	Carry out AVT for children with hearing impairment

Know:

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

Know-how:

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

Show:

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

Do:

AVT on at least 1 child with hearing impairment Trouble shooting and fine tuning of hearing aids on at least 5 geriatric clients At least one activity for different stages involved in auditory training

Evaluation:

Internal evaluation: Based on attendance, clinical diary, log book and learning conference.
External evaluation: Spot test, OSCE, Record, Viva-voce, case work

Course Outcomes:

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Administer Audiological test battery	PSO 4	R, Ap
CO-2	Perform mapping	PSO 4	An, Ap
CO-3	Counsel parents regarding hearing status of the child	PSO 2	Ap
CO-4	Carry out AVT	PSO 1	R, Ap
CO-5	Plan activities for AVT	PSO 5	Ap

For candidates admitted from 2017 onwards
Holy Cross College (Autonomous), Tiruchirappalli-2
Department of Audiology & Speech-Language Pathology
Third Year - Semester – V

Course Title	**Major Core B7.1 Clinicals in Speech Language Pathology**
Total Hours	**160 hrs**
Hours/Week	**4 Hrs Wk**
Code	**U17AS2MCP37**
Course Type	**Practicals**
Credits	**-**
Marks	**100**

General Objectives:

After completing this course, the student will be able to link theoretical knowledge with the practical concepts.

Course Objectives:

The learner will be able to

CO No.	Course Objectives
CO-1	Diagnose speech, language, and swallowing disorders
CO-2	Administer standardized test battery for various communication disorders
CO-3	Maintain clinical records
CO-4	Plan clinical set up for Speech language pathology
CO-5	Manage persons with speech-language, communication, and swallowing disorders

General:

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

- Diagnosis and management of speech, language, and swallowing disorders across life span.
- Report evaluation findings, counsel and make appropriate referrals.
- Plan and execute intervention and rehabilitation programs for persons with speech language, communication, and swallowing disorders
- Develop and maintain records related to persons with speech-language, communication, and swallowing disorders

- Engage in community related services such as camps, awareness programs specifically, and community based rehabilitation activities, in general.
- Make appropriate referrals and liaise with professionals from related fields.
- Gain experience in different set ups and be able to establish speech centres in different set-ups
- Demonstrate that the objectives of the B.ASLP program have been achieved.
- Advise on the welfare measures available for their clinical clientele and their families.
- Advise and fit appropriate aids and devices for their clinical population.

Evaluation:

Internal evaluation: Based on attendance, clinical diary, log book and learning conference.

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

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Administer formal tests speech language pathology	PSO 4	Ap
CO-2	Analyse formally and informally the components of speech and language	PSO 4	An
CO-3	Prepare referral letter	PSO 5	C
CO-4	Demonstrate therapy techniques for speech and language	PSO 4 PSO 1	R, Ap
CO-5	Counseling individuals with speech and language disorder	PSO 2	Ap

For candidates admitted from 2017 onwards
Holy Cross College (Autonomous), Tiruchirappalli-2
Department of Audiology & Speech-Language Pathology
Third Year - Semester – V

Course Title	**Major Core B7.2 Clinicals in Audiology**
Total Hours	**160 hrs**
Hours/Week	**4 Hrs Wk**
Code	**U17AS2MCP38**
Course Type	**Practicals**
Credits	**-**
Marks	**100**

General Objectives:

After completing this course, the student will be able to link theoretical knowledge with the practical concepts.

Course Objectives:

The learner will be able to

CO No.	Course Objectives
CO-1	Diagnose hearing disorders across life span
CO-2	Perform Audiological test battery
CO-3	Analyse the condition form case history
CO-4	Plan rehabilitation programs for persons with hearing disorders
CO-5	Make appropriate referrals and liaise with professionals from related fields

General:

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

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

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

Evaluation:
Internal evaluation: Based on attendance, clinical diary, log book and learning conference.
External evaluation: Spot test, OSCE, Record, Viva-voce, case work

Course Outcomes:

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Administer Audiological test battery	PSO 4	R, Ap
CO-2	Perform appropriate referral	PSO 4	An, Ap
CO-3	Counsel parents and individuals with hearing loss	PSO 2	Ap
CO-4	Manage individuals with vestibular disorders	PSO 1	R, Ap
CO-5	Plan rehabilitation for individuals and adults with hearing loss	PSO 5	Ap