KERALA UNIVERSITY OF HEALTH SCIENCES

THRISSUR – 680 596, KERALA

REGULATIONS, CURRICULUM, AND SYLLABUS OF

MASTER OF SCIENCE (SPEECH LANGUAGE PATHOLOGY)

M.Sc. (SLP)

(With effect from 2019-20 admission onwards)

CONTENTS

1. INTRODUCTION

1.1 Preamble

The regulation of the Master of Science (Speech Language Pathology) M.Sc. (SLP) shall be the short form; being conducted by the Kerala University of Health Sciences is in accordance with the recommendations of the respective council with an emphasis on the health needs of the Kerala State.

1.2 Title of the course

It shall be Master of Science (Speech and language pathology). Abbreviated as M.Sc. (SLP)

1.2.1 Definition of Specialty

A branch of science which aims at ameliorating communication abilities in individuals of all ages, from infants to the elderly by evaluation and rehabilitation of speech, language, cognitive-communication and swallowing disorders simultaneously emphasizing upon technological aspects of production, transmission and perception of speech

2. AIMS AND OBJECTIVES OF COURSES

2.1 Goals of the course

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

- Function as teachers and researchers in institutions of higher learning,
- Diagnose and manage disorders of speech and language across life span,
- Counsel and guide persons with disorders of speech and language as well as their family members,
- Implement rehabilitation programs for persons with Communication disorders
- To function as the disability certification authority in the field,
- Liaise with professionals in allied fields and other stake holders,
- Implement prevention and public education programs,
- Undertake advocacy measures on behalf of and for persons with communication disorders,

- Advise government and other institutions on legal and policy issues related to persons with speech and language disorders, and
- To establish and administer institutions of higher learning in the area.

3. REGULATIONS

3.1 Academic eligibility for admission

3.1.1 Candidates with a BASLP or B.Sc (Speech & Hearing) degree of any University recognized by the Rehabilitation Council of India and RCI and approved by Kerala University of Health Sciences. An average of not less than 55% of marks are eligible for admission to M.Sc. (SLP). "Average" refers to average of the aggregate marks obtained in all the years/semesters of the qualifying examination.

3.1.2 Relaxation in the qualifying marks for designated categories of students shall be as per rules and regulations of respective University / State / Union Territories or the Central Government.

*3.1.3*Applicants shall not be older than 30 years at the time of admission.

3.1.4 The selection of students for the M.Sc.(SLP) course shall be made based strictly on merit as decided by the competent authority approved by the Government of Kerala/Kerala University of Health Sciences and as per guidelines of the respective council.

3.2 Registration

A candidate on admission to the M.Sc. (SLP) course shall apply to the University for Registration

- By making a formal application in the prescribed format.
- Original degree certificate/mark lists of qualifying examination.
- Transfer certificate from the previous institution.

- Allotment letter from the competent authority who conducted the admission.
- Equivalency and migration certificate wherever needed.
- Original SSLC/equivalent certificate.
- Internship certificate.
- The fees prescribed for the registration.

3.3 Duration of the program

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

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

Odd semesters – 1 & 3
Even semesters – 2 & 4

*3.3.3*There shall be examination at the end of each semester.

3.4 Medium of instruction and examination

Medium of instruction shall be English.

3.5 Student Teacher Ratio

Student-Guide ratio: 3:1.
One teacher can take a maximum of 3 students in each academic year.

3.6 Examination

3.6.1 Eligibility for appearing for the University examination

a. Attendance, conduct and condonation option:

Each candidate should put in at least 80% of attendance in Theory class & 90% attendance in Clinical Practicum in each academic year. Failures to put in /meet the required attendance by any student render him/her disqualified to appear in the

University exams. Condonation of attendance up to 10% (only once in the entire course) shall begranted by the head of the institution on genuine grounds, under intimation to controller of examinations. There shall be no condonation if attendance is below 70% percentage in theory classes and 80% in clinical practicum during each academic year. A candidate who does not have the required attendance will not be able to take examination or shall not be eligible to get admission for the next academic year. The Head of the institution should submit the Attendance performance certificate (APC) and conduct for every candidate as per university schedule.

b. Internal Assessment

Theory: It shall be based on periodical assessment, evaluation of student assignment, class presentation etc. Regular examination should be conducted throughout the course. Weightage for internal assessment shall be 20% of the total marks in each subject. There shall be 2 examinations and average will be taken as 50% of the internal assessment. The remaining 50% of the internal assessment will be based on day to day assessment.

Clinical Practicum: The internal assessment for clinical practicum shall be made by thefaculty of concerned departments based on the clinical skills in assessment, remediation, clinical case presentation and clinical viva. The weightage of internal assessment for clinical practicum shall be 50 % of the total marks.

The candidate must secure a minimum of 50% marks for internal assessment in a particular subject in order to be eligible to appear in the university examination of the subject.

The class average of internal assessment marks in each subject should not exceed 75%, both in theory and clinical practicum.

3.6.2 Scheme and schedule of examination

a. Scheme of examination

There shall be a university examination at the end of each academic semester. Duration of each theory paper shall be for 3hours.

Clinical Examination: Clinical Examination shall be conducted by the designated internal faculty of the department at the end of first and third semester.

Clinical examination will be conducted by external examiners at the end of second and fourth semester. Student's performance on evaluation of clinical population should be assessed by the external examiner. An internal faculty member can assist the external examiner, but shall not award marks. The examiners shall also evaluate records of clinical and practical work of the student.

b. Schedule of Examination

Supplementary examination will not be conducted for theory and clinical.

3.6.3 Question paper setting / pattern

a. Maximum mark for each theory paper shall be 80.

- Every theory paper shall comprise of five questions carrying 16 marks with internal divisions of 8 +8, 10 + 6 etc.

- The candidate should answer all the questions.
- Question paper setters shall be appointed from inside and/or outside the State
- Scrutiny of Question papers shall be done by the subject experts in respective faculties.

3.6.4 Scheme of valuation

- The valuation will be conducted as per KUHS rules and regulations.

3.7 Criteria for pass and grace marks

3.7.1 Criteria for pass

- The student is required to obtain a minimum of 50% in each of the theory papers, internal assessment, practical and clinical exams, and dissertation for a pass.

- Students will have to pass the clinical examination of the given semester to proceed to the next semester.

- Carry-over of papers: Maximum number of attempts for any paper / clinical practicum / dissertation shall be three inclusive of first attempt. There shall be no supplementary examination.

3.7.2 Grace marks

No grace marks shall be permitted for theory as well as clinicals.

3.8 Declaration of class

Successful candidates who obtain 75% and above marks are eligible for Distinction, 60% and above for First class and candidate who obtain 50% and above marks shall be declared to have passed the examination in Second class. Candidates who fail in first attempt in any subjects and pass subsequently shall not be ranked in distinction or first class.

3.9 Criteria for promotion

The candidate must clear clinical examinations of each semester to be eligible to attend the next semester. Theory papers can be attempted along with the regular examination of consecutive batch. The candidate must clear all the papers of first, second, and third semester before the commencement of fourth semester M.Sc.(SLP) examination

3.10 Rules for Supplementary batch / Additional batch

No supplementary batch / additional batch will be allowed.

3.11 Qualification of Teacher / Examiner

TEACHER: Post Graduation with 2 years of teaching/research/ clinical experience in the respective specialty.

EXAMINER: 3 years of teaching experience in the respective specialty after completion ofPost-Graduation.

GUIDE: PhD in speech and hearing / 5 years of teaching experience after MASLP / MSc Speech &Hearing / M.Sc. Speech language pathology.

3.12 Dissertation

3.12.1 Dissertation synopsis/Submission/Valuation

Synopsis proforma should be submitted to the University within three months of joining the course. Students shall complete a dissertation in the 3rd and 4th semester of the course and shall submit two months before the commencement of 4th semester examination. An external examiner shall assess the dissertation for 80 marks while the guide shall assess the performance of the candidate for 20 marks (internal assessment). The dissertation will be rated for a total of 100 marks (80 +20). Candidates who fail to submit their dissertation on or before the stipulated date shall not be permitted to appear for the final semester examination. The student who fail to obtain 50% marks in dissertation will be declared as failed and will be ineligible to appear for both theory and clinical exams unless and he or she resubmit the dissertation within 45 days with modificationsrecommended by the external examiner.

3.12.2 Standard format of dissertation

The dissertation should be submitted in the APA format. The APA format is given in the annexure.

3.12.3 Change of dissertation topic/Guide

As per KUHS Regulations.

3.13 Migration and Transfer

Migration and Transfer to other institutions within the University will not be allowed during the course of study.

3.14 Break of course - rules of re-admission

If a candidate is not appearing in the College for more than six months, he / she, on the recommendation of the Head of the Institution should get permission from the University for re-joining. Re-admission will be considered strictly as per the KUHS regulation.

3.15 Period of completion of course

The maximum permitted time period to complete the course is twice the duration of the Course. However each paper should be successfully completed within three attempts including the first one.

3.16 Eligibility of award of Degree

The University shall award the M.Sc. (Speech Language Pathology) /M.Sc. (SLP)degree and issue certificate only after the candidates successfully complete all the examinations stipulated.

4. COURSE CONTENT

4.1Syllabus and scheme of examination

A) Scheme of curriculum for first semester

CODES/PAPER NO	PAPER TITLE	TEACHING HOURS (MINIMUM)	EXAM DURATION	EXAM MARKS	IA MARKS	TOTAL MARKS
SLP 101	Research Methods, Epidemiology and Statistics	60	3	80	20	100
SLP 102	Speech Science & Speech Production	60	3	80	20	100
SLP 103	Language Disorders in Children	60	3	80	20	100
SLP 104	Technology in Speech-Language Pathology	60	3	80	20	100
SLP 105	Clinical Linguistics & Multilingual Issues	60	3	80	20	100
SLP 106	Clinical (Internal)	15 Hrs / week		100		100
Total						600

B) Scheme of curriculum for second semester

CODES/PAPER NO	PAPER TITLE	TEACHING HOURS (MINIMUM)	EXAM DURATION	EXAM MARKS	IA MARKS	TOTAL MARKS
SLP 201	Advances in Speech Sound Disorders	60	3	80	20	100
SLP 202	Voice: Science & Disorders	60	3	80	20	100
SLP 203	Speech Language Processing & Prosody	60	3	80	20	100
SLP 204	Neurobiology of Speech – Language & Cognition	60	3	80	20	100
SLP 205	Clinicals (External)	15 Hrs/Week		80	20	100
Total						500

C) Scheme of curriculum for third semester

CODES/PAPER NO	PAPER TITLE	TEACHING HOURS (MINIMUM)	EXAM DURATION	EXAM MARKS	IA MARKS	TOTAL MARKS
SLP 301	Neurogenic Speech Disorders	60	3	80	20	100
SLP 302	Disorders of Fluency	60	3	80	20	100
SLP 303	Aphasia	60	3	80	20	100
SLP 304	Language and Litracy Disorders	60	3	80	20	100
SLP 305	Cognitive Communication Disorders	60	3	80	20	100
SLP 306	Clinicals (Internal)	15 Hrs / Week		100		100
Total						600

D) Scheme of curriculum for fourth semester

CODES/PAPER NO	PAPER TITLE	TEACHING HOURS (MINIMUM)	EXAM DURATION	EXAM MARKS	IA MARKS	TOTAL MARKS
SLP 401	Practices in Speech, Language Pathology	60	3	80	20	100
SLP 402	Augmentative & Alternative Communication	60	3	80	20	100
SLP 403	Dysphagia	60	3	80	20	100
SLP 404	Dissertation			80	20	100
SLP 405	Clinicals(External)			80	20	100
Total						500

M.Sc (Speech-Language Pathology)

Course content
Semester I

SLP 101: Research Methods, Statistics & Epidemiology

Hours- 60 hours: Marks - 80

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

c) clinical research designs and statistical methods,
d) epidemiological issues and its relevance in speech-language research,
e) evidence based practice in speech and language pathology, and
f) ethical practices in research

Unit 1: Experimental Designs and Their Applicability in Speech-language Research

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

Unit 2: Epidemiology

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

Unit 3: Statistical Measures and their Features

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

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

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

Unit 4: Regression, Univariate and Multivariate Analysis

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

Unit 5: Evidence Based Practice

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

Recommended Reading

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

SLP 102: Speech Science and Speech Production

Hours - 60: Marks - 80

Objectives: At the end of the course, the students will be able to

a) describe the physiology of speech production,
b) discuss acoustic theories of speech production,
c) describe the acoustic characteristics of speech sounds, and
d) Know the application of acoustic analysis and speech synthesis.

Unit 1: Introduction to the Study of Speech Physiology

a) Physiological aspects of speech production (respiration, laryngeal and articulatory subsystem)
b) Aerodynamics of speech: mechanics of airflow – laminar, orifice and turbulent flow: maintenance of airway pressure for speech
c) Speech breathing
d) Lower air way dynamics: anatomy, laryngeal and lung activity in speech: conversational speech and loud speech; glottal activity in the production of speech sounds and whisper
e) Upper airway dynamics: constrictors in upper airway; aerodynamics of speech sounds
f) Measures of respiratory analysis and instrumentation: intraoral and sub glottal pressure; instrumentation

Unit 2 : Theories of Speech Production

a) Acoustic theory of speech production: source and filter characteristics; output speech and its characteristics
b) Critical evaluation of acoustic theory of speech production
c) Aspects of speech acoustics
d) Aspects of prosody and their realization
e) Characteristics and production of vocal music: Contrast with speech production

Unit 3: Instrumentation for Studying Speech

c) Acoustic analysis of speech - techniques of digital signal processing, Long Term Average Spectrum
d) Software for acquisition and acoustic analysis – freeware and patented software
e) Spectrogram: Identification of sounds and their acoustic features through spectrogram
f) Physiological measurements: Techniques and instrumentation like Electromyography Stroboscope, Electroglottography, Ultrasound, EMMA, evoked potentials, fMRI, PET

Unit 4: Acoustic and Aerodynamic Characteristics of Speech Sounds

a) vowels and diphthongs
b) plosives
c) nasal consonants
d) fricatives
e) other consonants - affricates, glides and liquids
f) effects of context and speaker

Unit 5: Application of Acoustic Analysis and Speech Synthesis

- Applications of acoustic analysis in speech disorders
- Forensic applications: semiautomatic and automatic methods
- Infant cry analysis- characteristics of normal and abnormal cries, models, infant cry as a tool for early identification of high-risk babies
- Speech synthesis and its applications: articulatory, parametric synthesis and analysis by synthesis

Recommended Reading

a) Borden, G. J., & Harris, K. S. (2011). Speech Science Primer, Philadelphia. Lippincott, William & Wilkins.
b) Ferrand, C. T. (2007). Speech Science – An Integrated Approach to Theory and Practice.2nd Edition, Boston, Allyn& Bacon.
c) Hixon, T. J., Weismer, G., &Hoit, J. D. (2014).Preclinical Speech Sciences; Anatomy Physiology Acoustics Perception.San Diego, Plural Publishing.
d) Hollien, H. (2002). Forensic Voice Identification. NY, Academic Press Inc.
e) Kent, R. D., & Read, C. (2002).The Acoustic Analysis of Speech. New York, Delmar Learning.
f) Ladefogd, P. (2001). An Introduction to the Sounds of Languages; Vowels and Consonants. Oxford, Black Well
g) Raphael, L. J. (2007). Speech Science Primer.Philadelphia, Lippincott Williams & Wilkins.
h) CIIL Publications on the production of sounds in different languages of India

SLP 103: Language Disorders in Children

Hours - 60 : Marks - 80

Objectives: At the end of the course, the student will be able to

a) know various theories and models of language acquisition in monolingual /bi/ multilingual children,
b) describe developmental and acquired language disorders in children,
c) discuss issues related to differential diagnosis and assessment of child language disorders,
d) describe various management approaches for child language disorders, and
e) critically evaluate research articles in the area of child language disorders

Unit 1: Theories of Language Acquisition

a) Critically evaluate theories of language acquisition- biological maturation, linguistic, cognitive, information processing and social theory - implications of theories for assessment and intervention)
b) bi / multilingualism – definition, types, acquisition of language in bi/multiligualism, Variables in second language acquisition: cognitive-linguistic and affective
c) Language acquisition in exceptional circumstances (Twins, Extreme deprivation (sensory, physical and emotional), childhood abuse, multiple disability, William syndrome)

Unit 2: Classification of language abnormalities based on etiology

- Genetic and chromosomal abnormalities
- Motor and sensory deficits
- Language disorders associated with pre-maturity and or high risky infancy
- Prenatal exposure to alcohol and other drugs
- Intellectual disabilities
- Acquired language disorders: causes, incidence and prevalence of acquired language disorders globally and in India; defining characteristics - cognitive communication deficits
- Specific Language Impairment - causes, incidence and prevalence of primary language disorders/ specific globally and in India and defining characteristics, differential diagnosis
    - cognitive communication deficits in child language disorders

Unit 3: Autism Spectrum Disorders / Pervasive Developmental Disorders

a) Introduction and classification (ICD10; DSM V)
b) Etiology, warning signs, defining characteristics, incidence and prevalence of Autism – national and international
c) Symbolic abilities and social aspects of communication
d) Language outcome in autism management – theoretical issues
e) Theory of mind – second order representation
a) Other diagnosis on the autism spectrum and associated disorders
b) Assessment and diagnosis of autism spectrum disorders- norm-referenced and criterion referenced tools; checklists and informal assessment tools used in India (ASIA, MISIC, INCELN tool etc.) and globally)
c) Prognosis and treatment – applied behavioral analysis, peer mediated interactions, floor time / developmental individual difference relationship based model, social-communication, emotional regulations abilities and transactional supports, responsive

teaching, relationship development intervention, Hanen approach, Treatment And Education of Autistic and Related Communication Handicapped Children, Picture exchange communication system, Com-DEAL and diet management.

Unit-4 Attention Deficit Hyperactivity Disorder

a) Introduction and classification (ICD 10, DSM V)
b) Causes, incidence and prevalence of ADHD globally and in India
c) Characteristics of different types
d) Relationship of ADHD to language and or learning disabilities
e) ADHD and other labels, adolescents with ADHD
f) Assessment and diagnosis of ADHD - norm-referenced and criterion referenced tools; checklists and informal assessment tools used in India and globally
g) Treatment of ADHD- areas of treatment – communication deficits academic issues, memory deficits, behavioral, medical and social issues

Unit 5: General Consideration in the Assessment and Management of Child Language Disorders

a) Critical review of developmental scales and norm-referenced tools for language development for Indian languages
b) Differential diagnosis of child language disorders
c) General principles and approaches to management in child language disorders.
d) Evidence-Based Practice and Response-to-Intervention in child language disorders
e) Team approach, guidance and counseling
f) Presence of comorbid features like swallowing / apraxia etc. and their assessment
g) Parent empowerment/ Parent implemented intervention for language delay/disorders

Recommended Reading

a) Bhatia, T. K. & Ritchie, W. C. (2014).Handbook of Bilingualism and Multilingualism.2nd Ed. East Sussex, Wiley Blackwell.
b) Gregg, N. (2009). Adolescence & Adults with Learning Disabilities and ADHD - Assessment and Accommodation. New York, Guilford Publications, Inc.
c) Hegde, M. N. (1996). A Course Book on Language Disorders in Children. San Diego, Singular Publishing Group.
d) Kaderavek, J. N. (2015). Language Disorders in Children: Fundamental Concepts of Assessment and Intervention. 2nd Ed. USA, Pearson Education Inc
e) Nelson, N. W. (1998). Childhood Language Disorders in Context: Infancy through Adolescence.2nd Ed.USA: Allyn& Bacon Inc.
- Paul, R. &Norbury, C. (2012).*Language disorders from infancy through adolescence: Listenig, speaking, reading, writing, and communicating* (4th Ed.). St. Louis, MO: Elsevier.
- Owes, J.R., Metz, D.E., & Farinells, K.A (2011) Introduction to Communication disorders - A Lifespan Evidence Based Perspective. Upper Saddle River; NJ, Pearson Education
- Vinson, P.B (2012). Language disorders across life span, Delmar, Cengage learning.

SLP 104 -Technology in Speech-Language Pathology

Hours - 60: Marks 80

OBJECTIVES

After going through this course the student will be able to explain:

- Latest technology involved in speech Acoustics, Signal processing, Instrumentation etc.
- fundamental concepts of the technology used in the instruments for diagnostics and therapeutics in Speech Language Sciences and Pathology
- the foundation of ICT (Information and Communication Technology) concepts and illustrate the applications of ICT in Speech & Language Sciences & Pathology

Unit 1: introduction to technology

a Information Technology

- Introduction to Computers
- Role of Operating systems
- Role of RAM and Hard disk
- Structure and functioning of computer networks

b Communication technology

- Frequency modulation & its applications in group hearing aids
- Basic structure of a Satellite communication system
- Concept of world wide web
- Internet connectivity – basic structure
- Telediagnosis & telerehabilitation system.

Unit 2 -Transducers for Speech-Language Sciences & Pathology

- Microphones – Basic structure & principle of operation of dynamic, condenser and electret microphones.
- Essential characteristics of microphones for recording, speech analysis and speech audiometry
- Loudspeakers – Basic structure & principle of operation of dynamic loudspeaker, moving coil and balanced armature type receivers
- Essential characteristics of headphones

Unit 3: Introduction to Digital signal processing and Information

3.1 Signal Processing components

- Role of Preamplifiers and Power amplifiers
- Filters – different types and their role

3.2 Fundamentals of speech signal processing

- Representing a speech signal in time domain
- Converting from time domain to frequency domain
- Short time analysis techniques

3.3 Digital signal processing

- Basic structure of a Digital signal processing system
- Process of Analog to Digital conversion
- Process of Digital to Analog conversion

- Basic concepts of Digital Signal Processing - Decomposition, Processing and Synthesis
- Implementation of Signal processing functions using DSP

Unit 4 : speech analysis & applications

4.1 Instrumentation in Speech - Language Sciences and pathology

- Speech Spectrograph and CSL
- Voice analysis systems
- Electro glotograph
- Articulograph
- Nasometer
- Fibre optic endoscope

4.2 Techniques

- LPC Analysis
- LTAS
- Cepstrum analysis
- Speaker recognition
- Speech synthesis
- Speech to text conversion

Unit 5 - Fundamentals of imaging technology

- X-Ray
- C-Arm
- CT scan
- MRI
- FMRI
- PET
- SPECT
- Diffusion tensor imaging techniques

Recommended reading:

- Crocker, M.J. (1998). Handbook of Acoustics, New York: John Wiley & Sons, Inc.,
- Rossing,T.D. (2002). The Science of Sound (3rd Edn.), Glenview: Pearson Education, Inc.,
- Vonlanthen, A. (2007). Hearing Instrument Technology for the Hearing Health Care Professionals. London: Singular Publishing Group
- Dillon, Harvey (2001). Hearing Aids. New York: Thieme Medical Publications.
- Katz, J. (2009). Handbook of Clinical Audiology (6th Edn.) Philadelphia : Wolters Kluwer
- Nagpal, D. P. (2009). Computer Fundamentals: Concepts, Systems and Applications. New Delhi: S. Chand and Company.
- Malvino, A. P. (1979). Digital Computer Electronics. Bombay: Tata Mcgraw Hill.
- Kennedy, B. (1993). Electronic Communiation Systems.(4th Edn). Bombay: Tata Mcgraw Hill.
- Hersh, M. A., Johnson, M.A. (2003). Assistive Technology for the Hearing Impaired Deaf and Deafblind. London : Springer.
- Tan, Li Jiang. (2013). Digital Signal Processing: Fundamentals and Applications (2nd Ed.) New York: Academic Press Inc.
- Arthur, S. (2008). Digital Hearing Aids, New York: Thieme Medical Publishers, Inc.
- Niparko, John K (2009). Cochlear implants - Principles and Practices (2nd Edn.) New York: Lippincott Williams & Wilkins
- Valente, Michael. (2002). Hearing Aids: Standards, Options and Limitations: Thieme Medical Publishers.

- Sandlin, R.E. (2002). Handbook of Hearing Aid Amplification, Volume I: Theoretical and Technical Considerations, London : Singular Publishing Group, Inc.
- Kent, R. D. (1995). The Acoustic Analysis of Speech, Delhi: AITBS Publishers, Inc.
- Khandpur, R.S. (1993). Hand Book of Bio-Medical Instrumentation. Bombay: Tata Mcgraw Hill
- Jacobson, John T. (1985). Auditory Brainstem Response. London: Taylor and Francis Ltd.
- Hall, James W. (2000). Handbook of Otoacoustic Emissions. New York : Delmar Cengage Learning.
- Katz, J. (2009). Handbook of Clinical Audiology (6th Edn).. Philadelphia: Wolters Kluwe

SLP 105: Clinical Linguistics and Multilingual Issues

Hours - 60: Marks - 80

Objectives: At the end of the course, the student will be able to

a) understand aspects of clinical linguistics relevant to speech-language pathology,
b) discuss the acquisition process and related disorders pertaining to various components of language,
c) discuss general concepts, theoretical background and issues related to socio-linguistics,
d) discussthe multilingual and multicultural issues in rehabilitation with reference to India, and
e) undertake research in the area of clinical linguistics related and relevant to speech-language pathology.

Unit 1: Introduction to clinical linguistics; Phonological, semantic and syntacticacquisition and related disorders

a) Introduction to clinical linguistics and scope of linguistics in clinical field.
b) Principles of general linguistics and their clinical relevance.
c) Phonological acquisition and disorders
d) Semantic acquisition and disorders
e) Grammatical acquisition and disorders

Unit 2: Pragmatics and sociolinguistic concepts

a) Pragmatics – Theoretical background: Discourse, deixis, anaphora, maxims and truth relations
b) Discourse comprehension
c) Discourse analysis/Narrative analysis in neurotypical adults and persons with disorders
d) Development of pragmatics in children
e) Pragmatic disorders with respect to some clinical disorders
f) Sociolinguistic concepts relevant to speech-language pathologists (language and dialects issues, various types and dialects, diglossia, stylistic variation of language-registers, Language contact-Creoles, Pidgins, language maintenance, language shift and language death, language deficiency)

Unit 3: Psycholinguistics and language acquisition

d) Issues involved in language acquisition – Motherese /child directed speech
e) Models of second language acquisition
f) Language acquisition in bi- and multi-lingual environments – concepts related to proficiency, dominance etc; issues and implications for assessment and intervention
g) Psycho linguistic models of language pathology

Unit 4: Neurolinguistics

a) Introduction to neurolinguistics
b) Language and lateralization – left brain and right brain differences
c) Coding and decoding
d) Neuroanatomical and neurophysiological bases of language learning and dysfunction
e) Mechanism and bases of recognition of spoken and visual word, sentence processing and discourse comprehension.

Unit 5: Multilingual and multicultural issues in communication

a) India as a multilingual nation– A brief introduction to the major language families of India
b) Relation between language and culture, language and thought relationship in view of Sapir-Whorf hypothesis: linguistic determinism and linguistic relativity
c) Cultural issues in verbal and non-verbal communication
d) Multicultural and multilingual issues in rehabilitation with special reference to India

Recommended Reading

- Allan, B. (2014). The guidebook to sociolinguistics.UK: Wiley Blackwell.
- Ball, M., J., Perkins, M., R., Müller, N. & Howard, S. (2008). The handbook of clinical linguistics. (Eds). Oxford: Blackwell Publishing.
- Bishop, D. V. M., & Leonard, L. B. (2007).Speech and language impairments in children. USA: Psychology
- Bonvillian, N. (2011). Language, culture and communication.New Jersey: Pearson Education.
- Pressacy, D. P. (2007).The Cambridge handbook of phonology. Cambridge: Cambridge University Press..
- Wei, L. (2014). Applied linguistics.UK: Wiley Blackwell.

Semester II

SLP 201: Advances in Speech Sound Disorders

Hours - 60 : Marks - 80

Objectives: At the end of the course, the students will be able to

a) describe recent theories and concepts related to phonological development and its disorders,
b) diagnose and manage children with speech sound disorders,
c) provide comprehensive care including speech therapy for persons with CLP as a member of the cleft palate team, and
d) guide and counsel families of children with CLP.

Unit 1: Phonological Development and Disorders

a) Recent concepts in theories of phonological development: Generative phonology, natural phonology, non-linear phonology, optimality theory
b) Application of phonological theories in evaluation and management of phonological disorders
c) Co-articulation – Types (anticipatory, carryover); Models of co-articulation - feature based, syllabic, allophonic, target, physiological and degree of articulatory constriction models); Physiological / Acoustical / Perceptual studies in co-articulation
d) Current concepts in taxonomy of speech sound disorders in children

Unit 2: Assessment and Management of Children with Phonological Disorders

a) Comprehensive phonological assessment procedures – Formal and informal; Independent and relational analyses; dynamic assessment
b) Assessment of phonological awareness and phonological processing in children with speech sound disorders
c) Critical appraisal of test material in Indian context - Specific issues in phonological assessment in multilingual environments
d) Determining need for intervention and intervention decisions

Unit 3: Management of Children with Speech Sound Disorders

a) Evidence based approaches to intervention – Motor based approaches, linguistic based approaches; use of non-speech oro-motor activities
b) Motor learning principles – applications to interventions
c) Considerations in intervention: methods to measure clinical change and determining progress in therapy and generalization
d) Specific considerations in intervention within multilingual contexts.
e) Use of software applications (Apps) in intervention; Use of tele-health for intervention of speech sound disorders

Unit 4: Cleft Lip and Palate

a) Phonological development in children with CLP
b) Development of other language attributes (morphology, semantics, syntax, pragmatics)
c) Velopharyngeal Closure- normal physiology, parameters affecting velopharyngeal closure and nature of velopharyngeal dysfunction in persons with CLP
d) Perceptual assessment protocols for speech characteristics in children with repaired CLP
e) Instrumental assessment of velopharyngeal closure- Imaging techniques, acoustic measurements, aerodynamic measurements

Unit 5: Management of Persons with CLP

c) Surgical, orthodontic and prosthodontic management in CLP.
d) Early intervention for children with CLP – Methods and studies related to efficacy
e) Speech and language therapy for persons with velopharyngeal dysfunction
f) Current evidence based practices in assessment and management of CLP

Recommended Reading

a) Bernthal, J.E., Bankson, N.W., &Flipsen, P. (2013).Articulation and phonological disorders (7th Ed.).Boston, MA: Pearson.
b) Dodd, B. (2013). Differential diagnosis and treatment of children with speech disorder (2nd Ed). NJ: Wiley.
c) Vasanta, D. (2014). Clinical applications of phonetics and phonology.ISHAMonograph.Vol 14, No. 1.Indian Speech & Hearing Association.
d) Velleman, S. L (2003). Resource guide for Childhood Apraxia of Speech.Delmar/Thomson Learning.
e) Williams, A., McLeod, S., & McCauley, R. (2010). Interventions for speech sound disorders in children. Baltimore: Brookes.

SLP 202: Voice: Science and Disorders

Hours - 60 : Marks - 80

Objectives: At the end of the course, the student will be able to

- understand the bio-mechanics of voice production in normal individuals and in those with voice disorders,
- explain and assess the roles of breathing mechanism, vocal fold vibration, vocal tract resonance and enunciation in voice production,
- delineate the varying roles and responsibilities of a SLP in a trans-disciplinary (medical) team to assess and treat voice disorders in children, adults, geriatrics and specific population including professional voice users, and
- appraise different service delivery models and procedures to run a voice clinic

Unit 1: Voice Science

a) Vocology – scope and objectives
b) Breathing and voicing: lungs and airways, breathing mechanism as an interactive sound generating system: breathing oscillator &valving oscillator, combining the breathing and valving oscillators with voicing
c) Vocal folds and voice: Biology of vocal fold tissue and lamina propria, muscular properties and vocal behaviours, biomechanics and voice control/modulation, voice fatigue, vocal injury and recovery, wound healing
d) Resonance and voice: concepts of acoustic impedance, reactance, inertance, and compliance, acoustic impedance of the vocal tract, the effect of vocal tract reactance on self-sustained vocal fold oscillation, idealized vocal tract shapes and voice quality, modulating phonation with articulation and prosody

Unit 2: Voice Assessment and Voice Disorders

a) Vocometry: assessing vocal ability: principles, methods and procedures: General assessment principles, evaluation procedures, tools of measurement, purpose of measurement, measurement scales, auditory perceptual evaluation- speech breathing, voice quality, resonance, and overview of instrumentation for voice assessment: visualization techniques, acoustic analysis, aerodynamic analysis, glottography, nasometry and electromyography
b) Voice disorders: issues in definition, incidence and prevalence, occupational risks and voice disorders
c) Classification of voice pathologies, characteristics and pathophysiology: Structural, neuropathologic, idiopathic, functional/behavioral - pathologies related to mechanical stress, tissue elasticity, fluid transport, airway environment and abnormal muscle activation
d) Voice disorders in specific populations: Laryngectomy, pediatric voice disorders, aging voice, professional voice, vocal cord dysfunction/paradoxical vocal fold motion, transgender and trans-sexual voice

Unit 3: Voice Habilitation

d) Voice management team, roles and functions
e) Pharmacological and surgical effects on voice: Current trend in medical and surgical management: Medications for bacterial and other infections, allergies, edema, pain, asthma, cough, gastric and laryngopharyngeal reflux, stage fright, spasmodic dysphonia, mood conditions, sleep disturbance, hormone imbalances, etc. Voice surgeries – pre-operative and post-operative care and precautions
f) Voice habilitation: Current views and approaches; EBP for voice and its disorders; Voice therapy methods for children and adults.
g) Voice exercise principles and procedures: Physiological voice therapy methods Vs. Behavioral voice therapy methods, role of vocal hygiene and voice rest, basics of exercise physiology, general principles, types of exercises, exercise prescription and progress, vocal exercise techniques – vocal function exercises, resonant voice exercise, confidential voice therapy, and other voice exercises including psychological approaches, relapse and restoration
h) Habilitation of persons with laryngectomy: Speech and medical considerations in laryngectomy, voice restoration in laryngectomees, counseling and quality of life

Unit 4: Voice Needs and Problems in Professional Voice Users

a) Vocal professionals and voice disorders: classification, pathologies affecting voice – frequency, personal and social impacts, occupational hazards and issues, nature of voice problems: repetitive strain injuries, acute injuries and chronic problems – presentation, assessment and treatment
b) Laryngeal rest, modified voice rest/conservative voice use, vocal hygiene; laryngeal rest versus exercise: effects on wound healing, general wound healing processes
c) Voice habilitation for singers and other elite vocal users: Demands on voice, nature of vocal training and use, voice fatigue and assessment, basic principles of motor learning, awareness training, and vocal exercises, concept of professional voice care team – role of medical and non-medical team players
d) Voice habilitation for teachers: voice problems in teachers: nature and manifestation, use of voice in classroom and factors influencing, vocal loading and assessment, vocal fatigue, techniques to improve the speaking voice and delivery, voice projection techniques, vocal education and counseling

Unit 5: Service Delivery and Other Professional Issues

a) Scope of practice in the area of voice – training in endoscopy, documentation, telepractice – trends across globe and in India (practice guidelines, technical reports, position statements, knowledge and skills document relevant to voice as per RCI, ASHA, European Laryngologiocal Society, and other relevant professional/statutory body).Issues in adopting and implementing the same in India.
b) Patient compliance and concordance to voice management: Relevance of voice problems/voice problems as a public health concern, measuring severity of voice condition, measurement of compliance to management options, treatment variables and effects, patient-clinician interactions, socio cultural and economic considerations
c) Voice clinics: SLP led clinics Vs. SLP in a medical team, space and other infrastructural requirements, specialty clinics considering needs of specific population such as singers, transgenders, transsexuals, non-native speakers, broadcasters, etc

a) Research and ethics in clinical practice: overview of basic and applied research in voice, ethics in clinical research, informed consent, clinical trials, methods to popularize services- roles of associations, conferences, working groups, awareness movements/drives like world voice day, camps, public awareness programs, role of media, prevention of voice problems.

Recommended Reading

d) American Speech-Language- Hearing Association. (2004a). Vocal tract visualization and imaging: Position statement. Available from www.asha.org/policy.
e) American Speech-Language- Hearing Association. (2004b). Vocal tract visualization and imaging: Technical report. Available from www.asha.org/policy.
f) Behrman, A. (2013). Speech & Voice Science (2nd Ed.). San Diego: Plural publishers.
g) Hixon, T. J., Weismer, G., &Hoit, J. D. (2014). Preclinical Speech Science: Anatomy, Physiology, Acoustics, Perception (2nd Ed.). San Diego: Plural publishers.
h) Sapienza, C.M., & Ruddy, B. H. (2013).Voice Disorders. (2nd Ed.). San Diego: Plural publishers.
i) Sataloff, R. T. (2006). Vocal Health & Pedagogy: Advanced Assessment and Treatment. Vol. II. (2nd Ed.). San Diego: Plural publishers.
j) Sataloff, R. T. (2006). Vocal Health & Pedagogy: Science and Assessment. Vol. I. (2nd Ed.). San Diego: Plural publishers.
k) Sataloff, R. T. (2005). Voice Science.San Diego: Plural publishers.
l) Scope of practice document – SLPA (2015) – Rehabilitation Council of India
m) Stemple, J. C., Glaze, L. E., &Gerdeman, B. K. (2014). Clinical Voice Pathology: Theory & Management (5th Ed.). San Diego: Plural publishers.
n) Titze, I. R., &Verdolini Abbott, K. (2012).Vocology: The Science and Practice of Voice Habilitation.Salt Lake City: National Center for Voice and Speech.

SLP 203: Speech Language Processing and Prosody

Hours – 60: Marks - 80

Objectives

After going through this course the student will be able to explain

1. Fundamentals of Speech and language processing
2. Theoretical understanding of speech language processing
3. Methods used in research on speech and language processing
4. Speech and language processing in clinical population
5. Models of intonation, rhythm, and stress
6. Methods used in research on suprasegmentals
7. Aprosodia in clinical population

Unit 1: Introduction to Speech language Processing

1.1 Introduction to speech Processing

- Basic issues in speech perception: Linearity, segmentation, lack of invariance, units of perceptual analysis – phoneme, syllable, word or beyond,
- perceptual constancy in speech – talker variability, variability in speaking rate,
- McGurk effect,
- perceptual organization in speech – Gestalt principles of perceptual grouping, phonetic organization

1.2 Theoretical approaches to speech perception

- Motor theory of speech perception,
- Analysis by synthesis theory,
- Auditory theory of vowel perception,
- Quantal theory,
- Neurological theories,
- Pandemonium model,
- Direct-realistic approach,
- Input to lexicon- Lexical acess from spectra (LAFS)
- Machine based computation models – TRACE, dual stream model,

Unit 2:Spoken word recognition and sentence comprehension (12 hours)

3.1 Spoken word recognition

- Introduction to spoken word recognition
- Methods used in spoken word recognition research:
- Word under noise,
- filtered, truncated words,
- lexical decision,
- word spotting,
- phoneme triggered lexical decision,
- speeded repetition of words,
- continuous speech,

- tokens embedded in words and non-words,
- rhyme monitoring,
- word monitoring,
- cross-model priming,
- ERPs,
- FMRI,
- McGurk effect

3.2 Models and Issues in spoken word recognition:

- The input to the lexicon - lexical access from spectra, constraints of temporal structure –
- Cohort model,
- interactive models of spoken word recognition - Logogen model, lexical and phonetic processing – phonetic categorization task, phoneme restoration studies, phoneme monitoring task, sentence and word processing,
- Processing of ambiguous words.
- Neighbourhood activation models,
- Elman's simple recurrent networks,
- Distributed cohort model,
- Plaut and Kello's model,
- Adaptive resonance theory,
- TRACE model

3.3 Stages and word recognition –

- Lexical concept,
- Lexical access,
- Phonological encoding,
- production.

3.4 Sentence comprehension

- Goal of sentence comprehension research
- Various methods/techniques used for sentences comprehension research
- Syntactic category ambiguity
- Attachment ambiguity: Models of attachment ambiguity resolution – Garden-path model, Referential theory, Constraint-based approaches
- Empirical studies – (1) structural preferences, eye fixation duration, regressive eye movements, (2) verb information, (3) thematic fit and argument assignment, (4) referential context – prepositional phrase attachment ambiguity, sentence clause/relative clause ambiguity, main clause/ relative clause ambiguity, (5) intonation and prosody.
- Event related potentials in sentence comprehension research
- Discourse comprehension

Unit 4: Spoken word recognition in clinical population, development of spoken word recognition, and cross language speech perception

- Speech perceptual deficits in learning disability, aphasia, dysarthria, individuals with hearing loss, stuttering

- Issues in infant speech perception, methods used in infant speech perception, development of speech perception, relationship between early speech perception and later language development, Empirical studies
- Issues in cross-language speech perception, models –Native language magnet model, Perceptual assimilation model,
- perception of disordered speech – perception of hearing impaired speech, dysarthric speech, cleft palate speech, laryngectomized speech

Unit 5 – prosody and its clinical aspects

- introduction to prosody – definition, components of stress, intonation and rhythm
- Neural basis of prosody - Neural basis of suprasegmentals and dysprosody, Functional localization hypothesis, Differential cue lateralization hypothesis (RH Hypothesis, F0 hypothesis and supporting studies), processing of prosodic features, hemispheric lateralization, types of dysprosody in various disorders.
- Prosody in different communication disorders
    - Prosodic feature in various speech and language disorders, hearing impairment – voicing control, pitch control, pitch range and level length, pauses, apraxia, SLI, autism, stuttering, flaccid dysarthria, spastic dysarthria, unilateral UMN dysarthria, ataxic dysarthria, hyper kinetic dysarthria, hypo kinetic dysarthria, mixed dysarthria, amyotrophic lateral SC lesions, Wilson's disease, multiple sclerosis, multilingual and multicultural variations in prosody, cross-language use of pitch, pitch and expressive volcalization / intonation

Recommended reading

- Raphael, L. J., Borden, G. J., & Harris, K. S. (2011). Speech Sciences Primer: Physiology, Acoustics and Perception of Speech. Philadelphia: Lippincott Williams & Wilkins,
- Fowler, C. A., Magnuson, J. S. (2012). Speech Perception. In Spivey, M. J., McRae, K., & Joanisse, M. F. (Eds.). The Cambridge Handbook of Psycholinguistics (pp. 3-25). Cambridge: Cambridge University Press,
- Magnuson, J. S., & Mirman, D., & Harris, H. D. (2012). Computational Models of Spoken Word Recognition. In Spivey, M. J., McRae, K., & Joanisse, M. F. (Eds.). The Cambridge Handbook of Psycholinguistics (pp.76-103). Cambridge: Cambridge University Press.
- Tatham, M., & Morton, K. (2011). A Guide to Speech Production and Perception. Edinburgh: Edinburgh University Press.
- Johns – Lewis, C. (1986) Intonation in discourse. San Diego: College –Hill Press, Inc.

SLP 204: Neurobiology of Speech-Language and Cognition

Hours - 60 : Marks - 80

Objectives: At the end of the course, the student will be able to

a) explain the anatomy and physiology of nervous system and role of neurotransmitters in relation to speech-language and its disorders,
b) know the laboratory - based procedures in understanding neural bases of speech-language,
c) discuss and interpret the neuro-diagnostic findings,
d) describe the neural bases of speech-language,
e) know the effect of aging on CNS structures, and
f) discuss research relevant to neuroscience of speech-language.

Unit 1: Anatomy and Physiology of the Nervous System Related to Speech-language

a) Review of central nervous system and peripheral nervous system, cortical and subcortical pathways
b) Blood supply to CNS
c) Neurotransmitters – types and classification, major location, functions and synthesis / chemical composition; signal propagation in the nervous system
d) Neurotransmitters in neuropathological conditions influencing speech, language and related disorders
e) Brain plasticity
f) Functional organization of brain – lateralization of functions
g) Evidence from neuroimaging studies on speech perception, comprehension and production

Unit 2 : Methods of Understanding the Neurological Status of Speech-language Mechanisms

a) Clinical examination of neurological status - history, physical examination, reflexes
b) Neuro-diagnostic procedures for routine clinical examination – cranial nerve examination, sensory & motor examination, examination of mental functions
c) Neuro-imaging procedures: X-Ray, CT scan, MRI, fMRI, TcMS, PET, SPECT, and others - advantages and disadvantages
d) Neuro-physiological procedures - Evoked potentials (visual, auditory and somato-sensory), eye-tracking. eletromyography (EMG), magnetoencephalography (MEG) - Advantages and disadvantages
e) Neuro-behavioral procedures - neurolinguistic investigation, priming and its types, reaction time measures and other related procedures

Unit 3: Concepts in Cognition and Brain

a Cognition- Description of Cognitive Processes, Cognitive Mapping, Cognitive Mechanisms, Concept, Schema and Properties

b Attention-Description and Types -Focused, Sustained, Divided, Alternating and Selective

c Memory-Description and Types -Sensory, Echoic, Iconic, Working, Eidetic, Long Term, Declarative, Procedural, Episodic and Semantic Memory

d Recognition and Recall
- Reasoning -Inductive And Deductive
- Thinking-Convergent And Divergent
- Interference-Proactive and Retroactive
- Metacognition

Unit 4: Cognitive Process Models and Implications of Information Processing for Speech-language

a) Models of Attention - Broadbent's Bottleneck Model, Norman and Bobrow's Model, Treisman model, Deutsch and Deutsch model.
b) Models of memory (Atkinson and Shiffrin'smultistore Model, Craik and Lockhart's Levels of Processing model, Baddley's Working Memory model)
c) Role of attention and memory in the development of speech and language
d) models of cognitive-linguistic process (hierarchical, process, interactive, computational, neural network); bilingual models (simultaneous and sequential processing)

Unit 5: Neuroscience of Aging and its Effect on Speech-language

- Aging - definition, types- (senescence and senility, primary and secondary aging, biological and psychological aging), phenomenon of aging (neurological, cognitive and behavioral correlates, structural changes with age, brain weight, ventricular size, microscopic changes and atrophy).
- Theories of aging - cellular, genetic, cumulative, random cell damage, programmed cell death, high level control of aging, cellular theories, geriatric theories and other theories
- Neurophysiological / functional changes with age: accuracy, speed, range, endurance, coordination, stability and strength; neurobehavioral correlates of aging -lateralization of functions across life span, cerebral asymmetry, electrophysiological and behavioral evidences
- Effects of aging on speech and language across life span: in typical and pathological conditions.
- Effect of aging on cognitive dimension and speech perception

Recommended Reading

a) Arslan, O. E. (2015). Neuroanatomical Basis of Clinical Neurology.2nd Edition, New York, CRC Press.
b) Benarroch, E. E., Daube, R. J., Flemming, D. K. & Westmoreland, F. B. (2008).Mayo Clinic Medical Neurosciences.5th Edition, USA, Mayo Clinic Scientific Press.
c) Bhatnagar, S. C. (2008). Neuroscience for the Study of Communicative Disorders.3rd Edition, New York, Wolters Kluwer Publisher.
d) Duffy, J. R. (2013). Neurological Bases of Motor Speech and its Pathologies, In Motor Speech Disorders: Substrates, Differential Diagnosis and Management. 3rd Edition, Missouri, Mosby Publisher.
e) Handy, T. C. (2005).Event-Related Potentials: A Methods Handbook. MIT press, London
f) Kemmerer, D. (2015). Cognitive Neuroscience of Language. New York, Psychology Press.

SLP 106 and SLP 205: Clinical Practicum

Know how

- Perform acoustic analysis of speech including FFT, LPC, cepstrum and inverse filtering; acoustic analysis of vowels, diphthongs, plosives, nasals, fricatives, Affricates and other speech sounds using spectrograms on PRAAT
- Vowel synthesis using parametric and analysis by synthesis; demonstration of articulatory synthesis
- Observation of stroboscopic evaluation of persons with voice disorders as part of team assessment
- Observation of endoscopic examination of persons with cleft lip and palate as part of team assessment
- Differential diagnosis of conditions relevant to speech and hearing as per DSM-V and ICD 10 classifications

Demonstrate

- Measurement of aerodynamic parameters using spirometer and instrumentation for aerodynamic analysis
- Record language samples of 5 typically developing children and 5 children with language disorders, transcribe the samples using International Phonetic Alphabet (IPA) and perform analysis of language in terms of different components of language
- Carry out and interpret the acoustic measures of voice on two recorded samples and correlate with the perceptual analysis
- Complete perceptual analysis of speech samples of persons with CLP.
- Demonstration of therapy techniques for disorders of speech sound, voice, and fluency.
- Practice and learn to use the strategies of direct selection, scanning, encoding and word prediction in a communication board/book or aided AAC system in simulated situation
- Practice and learn to use finger spelling and signs for functional vocabulary
- Learn to operate AAC devices, aids and software

Do

a) Complete evaluation, write detailed evaluation report, counsel persons with communication disorder and their families as required for the following:
   five children with language disorders using appropriate tests/protocols: Autism Spectrum Disorders, Attention Deficit Hyperactivity Disorder (ADHD), cognitive impairment and global developmental delay.
   five persons with stuttering using standardized tests (SSI, SPI etc.), including assessment of rate of speech, type, percent of dysfluencies, and quality of life measures.
   five persons with voice disorders including perceptual assessment using different scales, acoustic analysis of voice and patient reported outcome measurement.
   five children with speech sound disorders – record and transcribe speech samples (word and connected speech), carry out error analysis – pattern analysis, calculate percentage consonant correct, mean length of utterance.
b) Plan and carry out appropriate intervention program for children and adults with voice and fluency disorders, children with language disorders and children with speech sound disorders.
c) Plan and carry out intervention program for a child with language disorder using AAC

Semester III

SLP 301 Neurogenic Speech Disorders

Hours - 60: Marks - 80

Objectives: At the end of the course, the student will be able to

a) describe the neuroanatomical bases of speech motor control,
b) explain the models relevant to speech motor control, and
c) know the methods for assessment and management of neuromotor speech disorders.

Unit 1: Neuroanatomical and Physiological Substrates of Speech Motor Control

d) Review of neuroanatomical substrates of speech motor control- motor and sensory cortex, subcortical, cerebellar and brain stem structures and their pathways; cranial nerves and peripheral nervous system, types of mechanoreceptors and their topography in speech
e) Early models of speech motor control: Closed Loop, Open Loop, Associative Chain and Serial Order Model, Schema Theory, Task Dynamic Model, Mackay's Model, Gracco's Model,

C) Recent Models of Speech Motor Control: DIVA Model

a) Other speech control models related to development of speech motor control in children
b) Age related changes in speech motor control

Unit 2: Assessment and Management of Dysarthria in Adults

a) Perceptual methods: Rating scales and tests for speech parameters, prosody, speech intelligibility, comprehensibility and naturalness.
b) Recent advances in use of aerodynamic and acoustic analysis of speech among persons with dysarthria
c) Other physiological analyses of speech subsystems in persons with dysarthria
d) Behavioural approaches for treatment of speech subsystems affected in persons with dysarthria
e) Evidence based practice guidelines for management of dysarthria in adults

Unit 3: Assessment and Management of Dysarthria in Children

a) Behavioral approaches to correct posture, tone, and strength and sensori-motor treatment techniques
b) Specific behavioral approaches in developmental dysarthria: McDonald's Approach and Hardy's Approach
c) Application of facilitatory approaches (neurodevelopmental approach and methods for reflex inhibition) in the management of developmental dysarthrias– evidence base for facilitatory approaches

Unit 4: Assessment and Management of Apraxia of Speech (AOS) in Adults

a) Assessment for suspected apraxia of speech, apraxia of speech and non-speech apraxia: Perceptual assessment protocols; physiological assessment of speech in adults with AOS
b) Intervention methods for non-verbal apraxias

a) Intervention for AOS in adults: specific, programmed and nonspecific approaches – Evidence based practice
b) Motor learning principles – applications in intervention of AOS

Unit 5: Assessment and Management of Childhood Apraxia of Speech (CAS)

a) Current status of nature of CAS as primary disorder and CAS as co-morbid condition in other neurodevelopmental disorders
b) Assessment protocols for CAS and differential diagnosis from other speech sound disorders
c) Intervention approaches for CAS – Evidence based practice
d) Motor learning principles – applications in intervention of CAS

Recommended Reading

a) Burda, A. N. (2011). Communication and Swallowing Changes in Healthy Aging Adults.Chapter 7 & 8.MA, Jones &Barlett Learning.
b) Murdoch, B. E. (2010). Acquired Speech and Language Disorders: A Neuroanatomical and Functional Neurological Approach (2nd Ed.). New Delhi, India: John Wiley
c) Guenther F. H., &Perkell, J. S. (2004).A Neural Model of Speech Production and its Application to Studies of the Role of Auditory Feedback in Speech. UK, Oxford University Press.
d) Maassen, B., Kent, R., Peters, H., Lieshout, P.V., &Hulstijn, W. (Eds.) (2009).Speech Motor Control in Normal and Disordered Speech. NY, Oxford University Press.
e) Maassen, B., &Lieshout, P. V. (Eds.) (2010).Speech Motor Control: New Developments in Basic and Applied Research. NY, Oxford University Press.
f) McNeil, M. R. (2008). Clinical Management of Sensorimotor Speech Disorders (2nd Ed.). New York, NY, Thieme.
g) Perkell, J. S., & Nelson, W.L. Sensorimotor Control of Speech Production: Models and Data.Cambridge, Massachusetts Institute of Technology.
h) Caruso. A. C., & Strand, E. A. (1999).Clinical Management of Motor Speech Disorders in Children. New York. Thieme.
i) Crary. M. A. (1993). Developmental Motor Speech Disorders. San Diego, Singular Publishing Group.
j) Dodd, B. (2005). Differential Diagnosis and Treatment of Children with Speech Disorders.London, Whurr Publishers.
k) Duffy, J. R. (2013). Motor Speech Disorders: Substrates, Differential Diagnosis, and Management (3rd Ed.). University of Michigan, Elsevier Mosby.
l) Halpern, H., & Goldfarb, R. (2013). Language and Motor Speech Disorders in Adults (3rd Ed.). Chapters 8 and 9.MA, Jones &Barlett Learning.
m) Love. R. J. (2000). Childhood Motor Speech Disability (2nd Ed.). USA, Allyn& Bacon.
n) Manasco, M. H. (2014). Introduction to Neurogenic Communication Disorders.MA, Jones &Barlett Learning.
o) Weismer, G. (2007). Motor Speech Disorders: Essays for Ray Kent. San Diego, Plural Publishing Inc.
p) Yorkston, K. M., Beukelman, D. R., Strand, E. A., &Hakel, M. (2010). Management of Motor Speech Disorders in Children and Adults (3rd Ed.). Austin, Texas; Pro-Ed Inc.

SLP 302: Disorders of Fluency

Hours – 60: Marks - 80

Objectives: At the end of the course, the students will be able

d) explain the nature, types and bases of fluency and its disorders,
e) discuss the theories and models of stuttering,
f) describe, diagnose and manage persons with different types of fluency disorders,
g) implement a team of professional for evaluation and management of fluency disorders,
h) counsel the clinical clientele, their family members and others to manage the problem, and
i) evaluate research output in the area of fluency and its disorders

Unit 1: Overview of Fluency and its Disorders

a) Dimensions of fluency disorders- recent advances; Supra segments
b) Development of fluent speech: Factors affecting fluency of speech
c) Theories of stuttering - linguistic, articulatory, audiological, laryngeal and genetic predisposition
d) Neuro anatomical, neuro-physiological bases of fluency disorders
e) Cortical activation patterns in stuttering - aneuromotor problem
f) Stuttering as a timing disorder
g) Feedback and feed-forward models of stuttering.

Unit 2: Types of Non-fluencies and Dysfluencies

d) Normal non-fluency and developmental stuttering
e) Cluttering- causes and characteristics
f) Neurogenic, Psychogenic and other types of fluency disorders
g) Stuttering in persons with multiple disability

Unit 3: Assessment of Fluency and Dysfluency

- Objective tools for assessment of fluency and its disorders
- Subjective and perceptual assessment
- Electrophysiology in the evaluation of fluency disorders
- Functional radiological studies of stuttering
- Cognitive dimension of stuttering
- Diagnosis and differential diagnosis

Unit 4: Management of Disorders of Fluency

a) Spontaneous recovery and relapse
b) Principles of therapy; skill training
c) Approaches to management of fluency disorders in adults and children
d) Group therapy
e) Input from allied professionals in the management of fluency disorders
f) Behavioral and work-place management

a) Counseling - including parents and teachers
b) Social help and advocacy groups
c) Apps based and other innovative modes including telemode.

Unit 5: Recovery and Related Issues

a) Relapse and recovery pattern in fluency disorders
b) Efficacy and outcome measures of fluency therapy
c) Evidence based practice
d) Bilingualism / multilingualism relating to stuttering and cultural sensitivity
e) Ethics in research and management of stuttering

Recommended Reading

a) Bloodstein, O., & Ratner, N. B. (2008). A Handbook on Stuttering (6th Ed.). Clifton Park, NY, Thomson Demer Learning.
b) Conture, E., Curlee, R., &Rrichard F., (2007).Stuttering and Related Disorders of Fluency. 3rd Ed. N Y, Thieme Publishers.
c) Corder, Akingham, R.J. (1998): Treatment efficacy for stuttering. Singular Publishing
d) Group, San Diego.
e) Curlee (1993): Stuttering and related disorders offluency.Thieme Medical Publisher, New York.
f) Ham, R.E. (1990): Therapy of stuttering pre-school through adolescence. Prentice Hall, Englewood-Cliffs.
g) Manning, W. H. (2010). Clinical Decision Making in Fluency Disorders. 3rd Ed. NY, Delmer Language Learning
h) Myers, (1992): Cluttering.Kibworth, Far Communication.
i) Onslow, M., & Packman, A. (1999).The Handbook of Early Stuttering Intervention. USA, Singular Publishing Group.
j) Peters, H.F.M. and others (Ed.) :(1991). Speech motor control and stuttering.Excerpta medicals, Amsterdam.
k) Riley (1986).Stuttering severity instrumentfor children and adults.Pro.Ed. Austin.
l) Rustin, L. and others (1996).Assessment and therapy for young dysfluentchildren.Whurr Publishers, London.
m) Starkweather, C.W. and others (1990): Stuttering prevention.Inglewood Cliffs, Prentice Hall.
n) Webster, R. L. (2014). From Stuttering to Fluent Speech, 6300 Cases Later: Unlocking Muscle Mischief Create Space. South Carolina, Independent Publishing Platform
o) Wells (1987).Stuttering treatment. Prentice-Hall, New Jersey.

SLP 303: Aphasia

Hours - 60: Marks - 80

Objectives: At the end of the course, the student will be able to

e) describe the history and classification systems in aphasias,
f) acquire skills in understanding the linguistic and non-linguistic impairments in aphasias,
g) acquire skills in differential diagnosis and assessment of different types of aphasias,
h) acquire skills in management of persons with aphasia, and
i) critically analyze scientific articles related to aphasia.

Unit 1: Aphasia: Neuroanatomical Basis and Impairments

a) Neuroanatomical basis of major types of aphasias, key brain regions, aphasia case studies lesion-deficit relationships,.Classification of aphasic syndromes
b) Phonological aspects of aphasia: sound structure of language: A theoretical framework; speech production; speech perception
c) Lexical deficits in aphasia: functional architecture of the lexical system; aspects of the internal structure of the functional components
d) Semantic Processing: Evidence from Patients- Organization of Semantic Memory, Category-Specific Semantic Disorders, Sensory-Functional Theory, Domain-Dependent Theory, Semantic Processing in Aphasia, Evidence from EEG, N400, Lexical Characteristics Affecting the N400, Lexicality, Vocabulary Class, Word Frequency, Concreteness, Neural Basis of the N 400
e) Syntactic deficits in aphasia: sentence production; conceptions of normal production; models to understand syntactic deficits in aphasia; sentence comprehension: a framework for normal comprehension, sentence comprehension Impairment in Aphasia
f) subcortical aphasia – introduction, characteristics and neuroanatomical correlates

Unit 2: Associated problems in Aphasia and Aphasia in Varied Population

- Agnosias -definitions, types, neuroanatomical correlates
- Introduction to acquired disorders of reading: dual route models; connectionist models
- Acquired alexia; assessment and intervention of acquired reading disorders
- Written language and its impairments: classification of written language disorders

a) Neuroanatomical substrates of writing Assessment of writing disorders and intervention approaches to writing disorders
b) Neural Basis of Bilingualism and L2 Acquisition- Bilingualism, L2 Acquisition Theories, Neural Representation of L2 –Syntactic Processing –Phonological Processing – Lexical-Semantic Processing, Neural Control of Two Languages
c) Aphasia in bilinguals/multilingual population- definition and features
d) Aphasia in illiterates, left handers and sign language users- definition and features'

Unit 3: Assessment in Aphasia

- Formal and informal assessment tools both Indian and western - purpose, test constructs, rationale, scoring, procedures and interpretation. Do's and don'ts in assessment procedures
- Methods for studying language and the brain- neuroimaging and cortical potentials electroencephalography, magnetoencephalography, positron emission tomography, functional magnetic resonance imaging, diffusion tensor imaging techniques, N400 and T-complex
    - Differential diagnosis of different types of aphasia

Unit-4 Sponteneous recovery in Aphasia

- Anagraphical, neurological and Speech Language therapy and recovery
- Plasticity and recovery in aphasia: concepts of plasticity and recovery
- Prognostic factors; bio-chemical and physiologic mechanisms of recovery
- Structural mechanisms; behavioral mechanisms and language recovery in brain
- Link between plasticity, behavior and therapy; re-conceptualizing aphasia and aphasia therapy
- Recovery pattern in monolingual, bi/multilingual aphasia

Unit 5: Management of Persons with Aphasia

a) Introduction to language intervention strategies in adult aphasia
b) Psychosocial/functional, traditional, specialized, life participation approach to aphasia, social approaches to aphasia, quality of life approach to aphasia, team and partnerships in aphasia intervention, treatment manuals in Indian context.
c) Computer applications in the treatment of aphasia, tele-rehabilitation and constant therapy
d) Medical aspects of rehabilitation and rights of persons with aphasia \

Recommended Reading

b) Ardila, A. (2010). A Proposed Reinterpretation and Reclassification of Aphasic Syndromes.Aphasiology, 24 (3), 363–394.
c) Chapey, R. (2008).Language Intervention Strategies in Aphasia and Related Neurogenic Communication Disorders.Philadelphia, Lippincott Williams & Wilkins.
d) Davis, G.A. (2007). Aphasiology - Disorders and Clinical Practice. Boston. Pearson &Allyn& Bacon.
e) Goswami, S. P., Shanbal, J. C., Samasthitha S., Navitha U., Chaitra S. &Ranjini M. (2011). Manual for Adult Aphasia Therapy in Kannada (MAAT-K).The publication of All India Institute of Speech and Hearing, Mysore. ISBN No. 978-93-81-854-17-0
f) Goswami, S. P. & George A. (2006).ISHAmonograph.Adult Aphasia: Language Intervention. A publication of Indian Speech and Hearing Association
g) Goswami, S. P. (2012). Disability Act and Dementias: Sociological issues.Proceeding of the pre-conference continuing Education programme.A publication of the 44thISHACON, Hyderabad.
h) Papathanasiou, I. Coppens, P., &Potagas, C. (2013.). Aphasia and Related Neurogenic Communication Disorders.Burlington: Jones & Bartlett.
i) Sarno, T.M (1998). Acquired Aphasia. San Diego: Academic Press.

SLP 304: Language and Literacy Disorders

Hours - 60: Marks - 80

Objectives: At the end of the course, the student will be able to

a) explain the relationships among language, literacy, and cognition and specifically the role of oral language in acquisition of literacy skills,
b) discuss the development and related disorders pertaining to language and literacy among children,
c) discuss evidence based assessments of language and literacy skills, and
d) plan evidence based intervention for children with a focus on oral language based interventions

Unit 1: Reading: Development and Relationship with Language

a) Concepts related to reading and its acquisition – Decoding, reading accuracy, reading fluency, reading comprehension;
b) Differences among writing systems for languages; Importance of phoneme-grapheme correspondence for reading
c) Foundations for development of reading in languages with different writing systems (Phonological processing, phonological awareness, orthographic skills, visual processing skills, oral language skills);
a) Role of oral language in the acquisition of literacy – Aspects of oral language contributing to decoding (e.g., vocabulary and morphosyntax) and reading comprehension (e.g., syntax, syntactic awareness etc.) and spelling (e.g., morphological awareness)
b) Stages of reading and writing development – emergent literacy to proficient reading comprehension; Models of reading development in English /alphabetic script and other writing systems.

Unit 2: Disorders Related Language and Literacy

a) Definition and differences among underachievement in school, learning disability, reading disability, dyslexia, dysgraphia, dyscalculalia, language learning disability, language impairment/ specific language impairment; DSM V and ICD 10 classifications; challenges in use of classifications.
b) Linguistic characteristics of students with reading/language/learning disabilities
c) Issues related to co-morbidity and overlap among phonological disorders, specific language disorders, reading disability and auditory processing disorders with relation to development of reading
d) Genetics of literacy disorders (family risk, molecular genetics etc.).

Unit 3: Assessment

- Screening of children for language disorders in schools; Standardized tests to assess language and (English and other languages) in children 5-18 years
- Other forms of assessments to identify children with language/learning disabilities - Criterion referenced assessments, language sampling, portfolio, dynamic assessment, curriculum-based assessment etc.
- Specific assessment tools for learning disability in India (e.g., NIMHANS battery, Dyslexia Assessment for Languages in India and other published tests)

a) nformal assessment of different domains – Tasks and stimuli in specific languages for phonological awareness, orthographic skills, phonological processing, oral language skills etc.
b) Brief overview of assessment of associated areas (auditory processing, visual processing, memory etc.)

Unit 4: Evidence based Intervention for Literacy Development

a) Intervention approaches to promote emergent literacy
b) Intervention approaches to promote decoding and early reading skills
c) Intervention approaches to promote development of reading comprehension
d) Intervention approaches to promote spelling and written language output
e) Research on cross-linguistics issues in intervention; intervention for children with Bilingual / multilingual background and reading intervention

Unit 5: Issues related to Service Delivery and Related Laws/Policies

d) Modes of service delivery for school-aged children (clinical, consultative, collaborative, language-based classroom, peer-mediated)
e) Team members working children with literacy disorders; Response to Intervention– tiers and their role in instruction for poor readers; role of SLP in Response to Intervention
f) Acts, regulations and policies relevant to education and children with special needs in India (e.g., Right to Education Act, Sarva Siksha Abhiyan, regulations related to language exemption in examination, National Open School system).
g) Dyslexia associations/groups in India

Recommended Reading

a) C. A. Stone, E. R. Silliman, B. J. Ehren, & G. P. Wallach (Eds.), (2016). *Handbook of language and literacy: Development and disorders* (2nd ed.), pp. 339-357. New York, NY: Guilford Press.
b) Clarke, P. J., Truelove, E., Hulme, C., &Snowling, M. J. (2013). *Developing reading comprehension*.John Wiley & Sons.
c) Nag, S., &Snowling, M. J. (2012). School underachievement and specific learning difficulties. *IACAPAP e-Textbook of Child and Adolescent Mental Health.Geneva: International Association for Children and Adolescent Psychiatry and Allied Professions*.
d) Paul, R. &Norbury, C. (2012).*Language disorders from infancy through adolescence: Listenig, speaking, reading, writing, and communicating* (4th Ed.). St. Louis, MO: Elsevier.
e) Carroll, J. M., Bowyer-Crane, C., Duff, F. J., Hulme, C., &Snowling, M. J. (2011). *Developing language and literacy: Effective intervention in the early years*.John Wiley & Sons.
f) Turnbull, K. L. P., & Justice, L. M. (2011). *Language development from theory to practice*.Pearson Higher Ed.
g) Hulme, C., &Snowling, M. J. (2009). *Developmental disorders of language learning and cognition*.John Wiley & Sons.
h) Cabell, S. Q., Justice, L. M., Kaderavek, J., Pence, K. L., &Breit-Smith, A. (2008). *Emergent literacy: Lessons for success*.Plural Publishing.
i) Justice, L. M. (2006). *Clinical approaches to emergent literacy intervention*. Plural Publishing.

SLP 305: Cognitive-Communication Disorders

Hours – 60: Marks - 80

Objectives: At the end of the course, the student will be able to

a) describe various conditions in adults leading to cognitive communication disorders,
b) acquire skills in issues related to assessment of cognitive communication disorders,
c) acquire skills in management of cognitive communication disorders, and
d) critically evaluate research articles related to cognitive communication disorders.

Unit 1: An Overview of Cognitive Communication Disorders - Traumatic Brain Injury (TBI) and Right Hemisphere Damage (RHD)

a) introduction to cognitive communicative disorder
b) Communication Disorders Associated with TBI
- Neurology and Neuropathology of TBI
- Epidemiology of TBI
- Disability Following TBI- WHO-ICF Classification
- Cognitive Communication Deficits beyond Aphasia
- Discourse in Adults with TBI
- Assessment for Planning Functional Context-Sensitive Intervention
- Principles of Cognitive Rehabilitation of TBI

c) Nature, Assessment and Management of RHD
- Theoretical Accounts of Cognitive Communication Deficits In RHD
- Symptomatology of Cognitive Communication Disorders in RHD
- Evidence Based Practices in the Management of RHD

Unit 2: Dementia and Related Cognitive Disorders

a) Dementia – definition, types, characteristics
b) Neuropathology in Alzheimer's Disease (AD)
c) Cognitive communicative aspects in primary progressive aphasia (PPA)
d) Role of speech-language pathologist working with persons with dementia

Unit 3: Alcohol Induced Language Disorders and Metabolic Disorders of Language

a) Alcohol induced language disorder – definition, nature, general characteristics, cognitive features
b) Metabolic language disorders – definition, nature, types, general features, cognitive involvements

Unit 4: Assessment and differential diagnosis of cognition in various disorders

a. Assessment
    - Aphasia
    - Subcortical aphasia
    - Schizoaphasia
    - Dementia
    - Primary progressive aphasia
    - Alchohol induced language disorders
    - Metabolic disorders
b. Differential diagnosis of various cognitive communicative disorders

Unit 5: Management of cognitive communicative disorders

a. Cognitive Communicative Approaches:
    - Objectives of Cognitive Approach
    - Cognitive Stimulation: Stimulation of Recognition/Comprehension, Memory, Convergent Divergent and Evaluative Thinking
    - Relationship of Cognitive Intervention to Life Participation Approach
b. Role of Supportive Relationships in Cognitive Communication Disorders and Implications in Rehabilitation
c. Team and Partnerships in Cognitive Communication Disorders

Recommended Reading

a) Chapey, R. (2008).Language Intervention Strategies in Aphasia and Related Neurogenic Communication Disorders. Philadelphia, Lippincott Williams & Wilkins.
b) Gazzaniga, S., Ivry, M. S., Mangun, R. B., & George, R. (2014).Cognitive Neuroscience: The Biology of the Mind. New York, W. W. Norton & Company Inc.
c) Laura, L. M., & Heather, M. C. (2006).Neurogenic Disorders of Language: Theory Driven Clinical Practice. New York, Thomson Delmar Learning.
d) Sarno, T.M (1998). Acquired Aphasia. San Diego, Academic Press.
e) Papathanasiou, P. Coppens, & C. Potagas (2013), Aphasia and Related Neurogenic Communication Disorders.Burlington, Jones & Bartlett.
- Morris, J. C. (1994). Handbook of Dementic Illnesses. NY, Marcel Dekker Inc.

Semester IV

SLP 401: Practices in Speech-Language Pathology

Hours – 60: Marks - 80

Objectives: At the end of the course, the students should be able

a) know the role of an speech-language pathologist in different set-ups.
b) liaise with other professionals in setting-up an speech-language clinic.
c) audit speech-language practices in existing set-ups.
d) implement acts and legislations relating to persons with speech-language impairment,
e) advise Governments and other agencies on the formulation of policies and legislative acts relating to speech-language disability
f) understand the legal implications of practice in speech-language pathology.

Unit 1: Scope of Practice, Laws, Regulations and Professional Ethics

a) Scope of practice in global and Indian scenario
b) Professional ethics -
c) Existing acts, legislations, policies related to persons with communication impairment
d) Role of speech-language pathologists in the formulation of acts, regulations and policies
e) Implementation of acts, legislations, policies and welfare measures relating to persons with speech-language impairment
f) Advocacy groups, NGOs
g) Rights of citizens
h) National and international standards related to Speech-language pathology

Unit 2: Specialized Programs in Speech-language Pathology

a) Need for specialized programs in Speech-language pathology: Geriatric and persons with multiple handicaps
b) Other specializations (medical speech language pathology, forensic speech science)
• Health, wellness, and health care - Health promotion and disease prevention, quality of life and healthcare finances
• Disability-friendly environment including public education
e) Culture and religion sensitive practice in speech-language practice
a) Multilingual and multicultural sensitivity in therapeutics and management
b) Prevention and early identification programs including societal participation

Unit 3: Service Delivery Models in Speech-language Pathology

a) Services in different medical / rehabilitation/ research /educational set ups
b) School based services pertaining to regular and special schools
c) Community based practice in rural and urban areas
d) Family empowerment programs
e) Home based delivery of services
f) Autonomous practice in speech-language pathology
g) Services for other groups of professionals (professional voice users)

Unit 4: Tele-practice in Speech-language Pathology

a) Information and communication technology in speech-language pathology practice

a) Infrastructure for video-conferencing and tele-practice in Speech-language Pathology
b) Techniques/principles of remote testing for screening and diagnostic assessment for speech-language, intervention and counseling
c) Challenges and limitations of tele-practice in Speech-language Pathology in screening, assessment and evaluation, selection of aids and appliances, therapeutics and counseling.

Unit 5: Issues in Speech-Language Pathology Practice

d) Entrepreneurship and planning to set up private practice/clinic for speech-language pathology practice: Clinical ethics
e) Documentation in speech-language pathology practice: clinical / demographic data, database management and storage
f) ICF framework for documentation / reports
g) Quality control and auditing in speech-language pathology practice
h) Documenting and implementing evidence based practice in speech-language pathology
i) Understanding team approach: Work in cohesion with other professionals
j) Information resources in speech-language pathology including books and journals, both electronic and print - Databases - Evidence based practice: Changed scenario

Recommended Reading

a) Acts relating to disability, particularly hearing, enacted by the Indian Parliament.
b) ASHA.2007. Scope of Practice in Speech-Language Pathology [Scope of Practice].Available at: http://www.asha.org/policy.
c) ASHA. 2009a. Audiology and Speech-Language Pathology Outside the United States. Available at: http://www.aasha.org/members/international/intl_assoc.
d) ASHA.2009b. Telepractices for SLPs and Audiologists. Available at: http://www.asha.org/practice/telepractice
e) Cari M. Tellis, Orlando R. Baron (2015). Counseling and Interviewing in Speech-Language Pathology and Audiology
f) College of Audiologists and Speech-Language Pathologists of Ontario.(2004). Use of Telepractice Approaches in Providing Services to Patients/Clients.
g) David L. Irwin (2007). Ethics for speech-language pathologists and audiologists : an illustrative casebook
h) Position paper Speech and language therapy in adult critical care.Royal college of Speech-language therapists. (2014), London
i) Rizzo, S.R., &Trudean, M.D. (1994).Clinical administration in audiology and speech language pathology. San Diego: Singular Publishing Group Inc.
j) Rosemary Lubinski and Melanie W. Hudson. (2013), Professional Issues in Speech-Language Pathology and Audiology 4th Edition
k) Sarah Ginsberg; Jennifer Friberg; Collenn F. Visconti (2011). Scholarship of Teaching and Learning in Speech-Language Pathology and Audiology
l) Speech-Language Pathology Medical Review Guidelines (2015). American Speech-Language-Hearing Association
m) Stephen, R.R., Jr., Trudeau, D.M. (Eds.) (1994). Clinical administration in audiology & speech language pathology. San Diego: Singular Publishing Group Inc.
n) Todd K Houston (2013). Telepractice in Speech-Language Pathology
o) TriciSchraeder (2013). A Guide to School Services in Speech-Language Pathology 2nd Edition
p) www.disabilityaffairs.gov.in (website of Department of Empowerment with Disabilities
- www.rehabcouncil.nic.in (website of Rehabilitation Council of India)

SLP 402: Augmentative and Alternative Communication

Hours - 60: Marks - 80

Objectives: At the end of the course, the student will be able to

a) identify and describe various approaches and methods used in augmentative and alternative communication (AAC),
b) select appropriate AAC strategies and assessment procedures for individuals with complex communication needs,
c) describe the treatment plan for implementation of AAC with evidence based rationale,
d) discuss the current status of the use of technology and practice of AAC for intervention in the Indian context, and
e) identify issues for research.

Unit 1: Types, Classification and Description of AAC

a) Definition, history, need and classification of AAC
b) Team approach in AAC: Types, team members and their roles
c) Aided systems and symbols in AAC: different types and their details
d) Unaided systems and symbols in AAC: Different Types and their details
e) Technology in AAC:
    Communication Boards: Types
    Low and high tech aids & devices: Types, Interfaces

Unit 2: Assessment for AAC

a) Assessment of AAC Candidates: Models for assessment
b) Formal and informal assessment: Standard tests and scales
c) Considerations in other domains - physical/ motor and seating requirements, cognition, vision and hearing, speech perception

Unit 3: AAC Intervention: Principles and Procedures

a) General Principles and Strategies – Aided and unaided AAC
b) Selection of vocabulary and symbol representation of the vocabulary: - types of vocabulary, factors affecting choice of vocabulary
c) Strategies for selection of symbols in AAC, their types and factors affecting decision making: direct selection, scanning, encoding, word prediction
d) Selection and decision making with reference to low and high tech aids and devices

Unit 4: Specific Intervention Strategies with Different Populations

d) Specific intervention strategies for children with cognitive communication needs: (intellectullychallenged, cerebral palsy, children with language disorders and children with dual and multiple disabilities).
e) Specific intervention strategies for adults with cognitive communication need:
    Temporary conditions: laryngectomy, voice disorders
    Neurological conditions: Degenerative and non-degenerative conditions, Aphasia, traumatic brain injury

Structural disorders and disorders affecting speech intelligibility

b) Measuring outcomes in using AAC and evidence based practices

Unit 5: Contemporary Issues in AAC

- Use of technology: Hardware and software (applications) in intervention for children and adults with communication disorders
- Current status of AAC in India and scope for research
- Adaptation of AAC in different set ups: home, schools, work place, and other social situations
- Training in the use and application of AAC for parents and caregivers

Recommended Reading

a) Beukelman, D., &Mirenda, P. (2012). Augmentative and Alternative Communication: Supporting Children and Adults with Complex Communication Needs, Fourth Edition. Baltimore: MD.Paul Brookes Publishing.
b) Bryant, D. P., & Bryant, B. R. (2011). Assistive technology for people with disabilities.Pearson Higher Ed.
c) Light, J. C., Beukelman, D. R., &Reichle, J. (2003).Communicative Competence for Individuals Who Use AAC – From Research to Effective Practice. Baltimore, H.Brookes Publishing Co.
d) Lloyd, L., Fuller, D., &Arvidson, H. (1997).Augmentative and alternative communication: Handbook of principles and practices.Boston, MA: Allyn& Bacon.
e) McNaughton, D. &Beukelman, D.R. (2010).Transition strategies for adolescents & young adults who use AAC. Baltimore, MD: Paul H. Brookes Publishing Co.
f) Reichle, J., Beukelman, D.R., & Light, J.C. (2002) Exemplary practices for beginning communicators: Implications for AAC. Baltimore, MD: Paul H. Brookes Publishing
g) Soto, G., &Zangari, C. (2009).Practically Speaking Language Literacy & Academic Development for Students with AACNeeds.Baltimore: MD.Paul Brookes Publishing.
h) Mani, M.N.G., Gopalkrishnan, V., &Amaresh, G. (2001).Indian Sign Language Dictionary. Germany, CBM International.
i) Vasishta, M., Woodward, J., &Desantu, S. (1980). An Introduction to Indian Sign Language.New Delhi: All India Federation of the Deaf.

SLP 403: Dysphagia

Hours - 60 : Marks - 80

Objectives: At the end of the course, students shall be able to

a) understand the neuroanatomical and neurophysiological bases of normal and abnormal swallowing in children and adults,
b) appreciatethe varying roles and responsibilities of a SLPinainterdisciplinary team to assess and treat swallowing disorders across the lifespan (neonates, infants, children, adults and geriatrics),
c) appraise different service delivery models, and
d) understand ethical, cultural and professional considerations in the management of dysphagia.

Unit 1: Neuroanatomical and Neurophysiological Bases of Swallowing

a) Structures involved in three phases of swallow and peripheral nervous system control of mastication and swallowing (anatomy & physiology of three phases & cranial nerve innervation)
b) Central nervous system control for mastication and swallowing
c) Etiologies for dysphagia in adults (structural anomalies, neurological conditions, mechanical & motility)
d) Age-related changes in eating & swallowing.

Unit 2: Assessment of Swallowing and its Disorders

- Clinical assessment of swallowing: Clinical bedside evaluation, various published protocols for clinical examination, cervical auscultation for clinical examination
- Visual examination of swallowing and its disorders: modified barium swallow/videofluroscopic study of swallow, flexible endoscopic examination of swallowing – team for conducting assessment, procedure and interpretation
- Other instrumental evaluation (e.g., X Ray, Scintigraphy, Manometry, Transnasalesophagoscopy, acoustic analysis of swallowing)
- Self-report questionnaires and quality of life assessment for dysphagia
- Differential diagnosis - oral vs. pharyngeal dysphagia, prognostic variables and recommendations for oral/non-oral options for nutritional intake/ management.

Unit 3: Management of Dysphagia in Adults

a) Behavioral management - Compensatory and facilitatory strategies in detail
b) Other behavioral management strategies (e.g., neuromuscular electrical stimulation)
c) Pharmacological and surgical management of dysphagia
d) Specific management strategies for mechanical causes of dysphagia (tracheostomy, glossectomy, mandibulectomy, oral/ pharyngeal cancer, trismus etc.)
e) Evidence Based Practice (EBP) - levels of evidence, strengths and weaknesses, evidence base for various management approaches, evaluation of patient progress and treatment efficacy - when to continue treatment, when to terminate and when referrals are appropriate)

Unit 4: Pediatric Dysphagia

a) Anatomical differences in neonatal and pediatric upper aero digestive tract with reference to adults, Oral-motor and swallow development of infants and children
b) Clinical manifestations of feeding and swallowing difficulties in children
c) Motor and sensory issues in feeding/ swallowing among developmental conditions- Sensory based feeding disorders and special populations
d) Specific considerations for clinical and instrumental evaluation of swallowing in children
e) Direct and indirect strategies to facilitate safe swallow in children (including motor and sensory issues)
f) SLP in Neonatal Intensive Care Unit: Etiology of feeding delay/disorders in neonates; assessment of primitive reflexes, suck-swallow coordination among neonates, management of feeding delay/disorders in neonates

Unit 5: Service Delivery and Other Issues Related to Management

a) Scope of practice in the area of dysphagia: training in endoscopy, documentation, tele-practice
b) Trends across the world and in India: Review of practice guidelines, technical reports, position statements, knowledge & skills document relevant to dysphagia in India and other countries - issues in adopting and implementing the same in India.
c) Dysphagia clinics: SLP led clinics vs. SLP in a medical team, space and other infrastructural requirements within hospital setup, private clinics, schools and other centers.
d) Esophageal dysphagia – etiologies, symptoms, differential diagnosis and role of SLP in management.
e) Ethical and cultural considerations in dysphagia management

Recommended Reading

a) Groher, M. E., &Crary, M. A. (2015).Dysphagia: clinical management in adults and children.Elsevier Health Sciences.
b) Logemann, J.A. (1998). Evaluation and treatment of swallowing disorders.Second Edition. Pro-Ed. Austin, Tx.
c) Fraker, C., &Walbert, L. (2003).Evaluation and treatment of pediatric feeding disorders: From NICU to childhood.Speech Dynamics.
d) Cichero, J. A., & Murdoch, B. E. (Eds.). (2006). Dysphagia: foundation, theory and practice. John Wiley & Sons.

SLP306 and SLP 405: Clinical Practicum

Knowhow

a) Observation of modified barium swallow and/or flexible endoscopic examination of swallowing as part of team assessment
b) Observe and identify reports of persons with neurogenic communication disorders in tests such as EEG, CT Scan, MRI etc.
c) Reversible and irreversible conditions that cause neurogenic communication disorders.
d) Certification procedures
e) Rights and privileges of persons with communication disorder
f) Ethics in clinical practices

Demonstrate

a) Perform assessment oo typically developing child using assessment protocols for learning disability
b) Demonstrate process of differential diagnosis for persons with adult language and cognitive communication disorders.
c) Use of AAC for adults with communication disorders (e.g., alphabet supplementation board, software applications)
d) Perform assessment of phonological awareness, visuospatial skills, orthographic skills on typically developing children.

Do

b) Complete evaluation, write detailed evaluation report, counsel persons with communication disorder and their families as required for the following:
Three persons with aphasia using appropriate screening, diagnostic (WAB/ BDAE etc.) and performance tool
Bed side screening for five adults with communication disorders.
Three persons with adult cognition communication disorders using appropriate screening (ACE/MMSE/CLQT etc.), diagnostic (ABCD/CLAP etc.) and performance tool
Three persons with motor speech disorders including perceptual evaluation of speech subsystems, speech intelligibility assessment, instrumental assessments for respiration or phonology and quality of life assessment
Clinical swallow examination for five persons with concerns in swallowing
Three children at risk for language learning disability
c) Plan and carry out intervention program for adults with neurogenic speech disorders, aphasia, cognitive communication disorders and dysphagia
d) Prepare a report for persons with communication disorders for medico-legal purpose

Recommended journals

- Aging, Neuropsychology and Cognition
- American Journal of Speech Language and Hearing
- Aphasiology
- Asia Pacific J of Speech Language and Hearing
- Bilingualism: Language and Cognition
- Brain
- Brain and Language
- British Journal of Communication Disorders
- Cleft Palate
- Clinical Linguistics and Phonetics
- Communication Disorders Quarterly
- Contemporary Issues in Communication Sciences and Disorders
- Corpus Linguistics and Linguistic Theory
- Cortex
- Dyslexia
- Dysphagia
- Edn & Tg in MR & Developmental Disability
- Evidence Based Communication Assessment and Intervention
- First Language
- Folia Phoniatrica
- Indian Journal of Cleft Lip and Palate
- International J of Language & Communication Disorder
- International Journal of Speech Language Pathology
- J of Acoustic Society of America
- J of Child Language
- J of Communication Disorders
- J of Fluency Disorders
- J of Learning Disability
- J of Medical Speech – Language Pathology
- J of Speech language & hearing Research
- J of Voice
- Journal of Communication Disorders
- Journal of Cleft Lip Palate and Craniofacial Anomalies
- Journal of Acoustical Society of America
- Journal of Advanced Linguistic Studies
- Journal of All India Institute of Speech and Hearing
- Journal of Augmentative and Alternative Communication
- Journal of Cleft Lip and Palate
- Journal of Cognition and Development
- Journal of Cognitive Neuroscience
- Journal of Communication Disorder
- Journal of Fluency Disorders
- Journal of Folia Phoniatrica et Logopaedica
- Journal of Indian Speech & Hearing Association
- Journal of Logopedics Phoniatrics Vocology,
- Journal of Neurolinguistics
- Journal of Neurophysiology
- Journal of Neuroscience
- Journal of Phonetica

- Journal of Pragmatics
- Journal of Sociolinguistics
- Journal of Speech Hearing and Language Research
- Journal of Speech Production
- Journal of Speech, Language and Hearing
- Journal of Voice
- Language and Cognitive Process
- Language in India
- Language Learning
- Language Speech & hearing Services in Schools
- Linguistics Language Behavior Abstract
- Neuroscience
- Perspectives on Swallowing and Swallowing Disorders
- Phonetica
- Phonology
- Research in Autism Spectrum Disorder
- Seminars in Speech & Language
- Speech communication
- Speech Language and Hearing
- Stroke Rehabilitation
- The Cleft Palate and Craniofacial Journal