

**MASTER OF SCIENCE IN SPEECH-LANGUAGE
PATHOLOGY**

M.Sc (Speech-Language Pathology)

SEMESTER SCHEME

**REGULATIONS, NORMS, SCHEME OF
EXAM AND CURRICULUM**

REHABILITATION COUNCIL OF INDIA

(Statutory body under Ministry of Social Justice & Empowerment)

B-22, Qutab Institutional Area, New Delhi – 110 075

E-mail: rehabstd@nde.vsnl.net.in

www.rehabcouncil.nic.in

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REGULATIONS & NORMS – 2009

MASTER OF SCIENCE IN SPEECH-LANGUAGE PATHOLOGY

M.Sc (Speech-Language Pathology)

1.0 Courses offered and duration of the course

1.1 M.Sc (Speech-Language Pathology)

1.2 Duration of the course: 4 Semesters / 2 years

Note: Each semester shall extend over a minimum period of eighteen weeks excluding examination days.

2.0 Eligibility for admission

2.1 Candidates with a BASLP/B.Sc (Speech and Hearing) degree of any recognized University are eligible for admission to the course.

2.2 There is no upper age limit for admission to the course.

2.3 Admission shall be made on the basis of:

a) Mark obtained in the entrance examination conducted by the Institution/university

b) Marks obtained in the qualifying examination.

OR

As per university norms

2.4 Entrance Examination

2.4.1 The object of entrance examination is to assess the knowledge and skill of the candidates in the core subjects of B.Sc (Speech and Hearing).

2.4.2 The Head of the Institution shall appoint a committee of examiners to conduct the entrance examination.

2.4.3 The entrance examination shall be conducted at the Head Quarters of the Institution.

2.4.4 Duration of the entrance examination shall be for 100 minutes with 100 questions of the multiple choice type.

2.4.5 Candidates can appear for the entrance examination in anticipation of results of qualifying examination. However, they have to fulfill the condition of 2.1 and provide records for the same before the stipulated date for admission.

2.4.6 The selection committee shall consist of the Head of the Institution, as Chairman, one faculty member of the institution nominated by Head of the Institution, and one member nominated by the Vice-Chancellor.

3.0 Scheme of Instruction

- 3.1 In each semester there shall be five papers. The detailed scheme of examination and paper titles are as given in **Annexure – I**.
- 3.2 Dissertation/Clinical practicum shall be in lieu of a paper.
- 3.3 The syllabus of every paper shall as far as possible, be divided in to five units.
- 3.4 Candidates shall attend camps/extension programs/educational tour conducted by the institution.
- 3.5 Hours of instruction (contact hours) per week
Theory : 4 hours per subject per week
Practical : I year – 15 hours per week
 II year – 20 hours per week

4.0 Attendance

- 4.1 Each semester shall be taken, as a unit for purpose of calculating attendance and a Candidate shall be considered to have put in the required attendance for the semester, if he/she has attended not less than 80% in case of theory classes and 90% in clinical practicum during each semester.
- 4.2 Shortage of attendance up to 15% may be condoned by the Vice Chancellor on the recommendation of the Head of the Institution on payment of a fee prescribed by the University. There shall be no condonation if attendance is below 65% in theory classes and 75% in clinical practicum during any semester.
- 4.3 A candidate who is having shortage of attendance in clinical practicum is permitted to make up this shortage by attending clinical work during vacation immediately after that semester but before commencement of the next semester.
Note: The candidates are permitted to avail this facility (4.3) in the I and III semesters only, with prior permission of the Head of the Institution.
- 4.4 A candidate, who fails to satisfy the requirement of attendance in a semester, shall rejoin the same semester in the immediate next academic year.
Note: This facility shall be available only **once** in the entire course.
- 4.5 If a candidate represents his/her Institution in Sports/NSS/Cultural or any official activities, he/she is permitted to avail to a maximum of 30 days in an academic year based on the recommendation and prior permission of the Head of the Institution.

5.0 Medium of Instruction

- 5.1 Medium of instruction shall be English.

6.0 Appearance for the Examination

6.1 Candidates on satisfactorily completing a semester shall apply for the examination in all papers prescribed for that semester.

7.0 Scheme of Examination

7.1 There shall be a University Examination at the end of each semester.

7.2 Duration of examination of theory paper of 80 marks shall be for 3 hours.

7.3 In case of theory paper the internal assessment will be for 20 marks, assessed through tests, seminars, camps and other assignments.

7.8 Clinical Practicum

7.8.1 The clinical practicum examinations shall be in the main subjects of study, i.e., in Audiology/Speech-Language Pathology (including the components of speech sciences).

7.8.2 Clinical practicum is part of all the semesters. However, internal assessment and clinical practicum examination with respect to clinical practicum of I and II semesters shall be conducted at the end of II semester. And that of III and IV semesters shall be conducted at the end of the IV semester.

7.8.3 Break up of marks of clinical practicum shall be as follows:

(a) 50 marks are allotted for internal assessment which is awarded on the basis of continuous evaluation of the clinical work of the candidate by the faculty of the departments to be nominated by the Director. The faculty shall evaluate each candidate on the following bases:

- i. Clinical skill/repertoire
- ii. Planning of therapy and execution
- iii. Maintenance and quality of clinical diary, lessons plans and progress report
- iv. Rapport with case/family
- v. Development of teaching aids
- vi. Efficient use of time/skills in execution
- vii. Professional attitude/motivation/aptitude for clinical work.

(b) 50 marks for clinical viva-voce conducted by an external examiner who shall examine the candidates' clinical skills while working with clinical population. Each candidate shall be assigned one or more subjects for this purpose by the heads of the concerned departments with the approval of the Head of the Institution.

7.8.4 Candidates failing/absenting in the clinical practicum examination shall repeat the clinical work of the previous two semesters i.e., candidates failing in clinical practicum of II semester shall repeat I and II semesters with respect to clinical practicum. Such candidates are not permitted to go to III semester.

Candidates failing in clinical practicum of IV semester shall repeat III and IV semesters with respect to clinical practicum.

7.9 Dissertation work

7.9.1 There shall be 100 marks for dissertation work.

7.9.2 The candidates shall submit three copies of dissertation before the commencement of theory examination of that semester. Candidates who fail to submit their dissertations on or before the stipulated date shall not be permitted to appear for the final semester examination.

8.0 Board of Examiners, Valuation

As per University norms.

9.0 Classification of successful Candidates

9.1 Minimum for a pass in each paper shall be 50% (exam. proper and internal assessment put together) and 50% in aggregate of all the semesters put together. There shall be no separate minima either for exam proper or for internal assessment.

9.2 Minimum for a pass in clinical practicum in each part (a & b of 7.8.3) shall be 50%.

9.3 For declaration of, First class with Distinction / First Class / Second class, the aggregate of the total marks secured by a candidate (including repeaters) in all the semesters shall be considered as detailed below:

70	≤	P	≤	100	First Class with Distinction
60	≤	P	<	70	First Class
50	≤	P	<	60	Second Class

Here P is the percentage of total marks secured in all the semesters of that course.

10.0 Provisions for Repeaters

As per University norms.

11.0 Award of Grace marks

As per University norms.

12.0 Norms for Minimum Infrastructural Facilities

1.	Faculty/Personnel	BASLP (20 seats) (Column 1)	BASLP (20 + 20 seats) (Column 2)	BASLP + MASLP (20 + 10 seats) (Column 3)	BASLP + MASLP/ M.Sc. (Aud.)/M.S c. (SLP) (40 + 15 seats) (Column 4)	M.Sc (Aud.)/M.Sc. (SLP) as addition to BASLP (40 seats) and MASLP (15) with 10 seats for each specialized M.Sc (Column 5)
a.	Full time					
	Professor			1 Professor or 2 Readers	1 Professor or 3 Readers	1 Professor or 1 Reader in each PG specialization in addition to that given in Column 4
	Reader or equivalent	1	1	1	1	1
	Lecturer	3	3 + 1	5	6	+2 in addition to that given in Column 4
	Speech Pathologist/Audiologist (Grade I) (Clinical Supervisor)	1	1 + 2	4	6	+2 in addition to that given in Column 4
	Speech Pathologist/Audiologist (Grade II)	2	2 + 1	2	4	4
	Lecturer in Clinical Psychology – Part time	1	1	1	1	1
	One Medical faculty as per requirement of the paper – Part time	1	1	1	1	1
	Lecturer in Linguistics – part time	1	1	1	1	1
	Electronic Engineer	1	1	1	1	1
	Ear Mould Technician	1	1	1	1	1
	Librarian/staff	1+1	1+1	1+1	1+1	1+1
b.	Visiting faculty for Anatomy and Physiology	1	1	1	1	1

NOTE :

1. Minimum of 2 faculty members in core areas will be required for giving recognition for the first year.

2. Before the commencement of second academic year one more lecturer must be appointed.
3. Before the commencement of third academic year one Reader must be appointed.
4. Only on completion of three batches of BASLP, an Institution becomes eligible to increase the intake provided infrastructure is increased as per laid down norms of RCI. Institute will be eligible to apply for starting MASLP course after the 1st batch of BASLP passes out, i.e; after 4 years of starting BASLP course subject to recommendation of Inspection Team/Visiting Expert.
5. In case of Professor not being available, 2 Readers are appointed to accommodate research guidance and administrative work.
6. All reservations in admission will apply as per Govt. rules for aided and Govt. institutions. The infrastructure will have to be enhanced as per the the seats getting increased under reservation policy.

Designation	Qualification		Experience		Publications
	Essential	Desirable	Essential	Desirable	
Professor	Ph.D. (Sp & Hg)		10 years teaching experience in the field		Essential
Reader/ Associate Professor	Ph.D. (Sp & Hg) or M.Sc. (Sp&Hg) with equivalent work by publications and research	Ph.D. (Sp. & Hg)	5 years of teaching / research/ clinical experience with graduate/ post graduate courses		Essential
Lecturer/ Assistant Professor	M.Sc.(Sp& Hg)	Ph.D. (Sp& Hg)	2 years clinical / research experience	Teaching experience	
Speech Pathologist/ Audiologist Grade I	M.Sc. (Sp& Hg)				
Speech Pathologist/ Audiologist Grade II	B.Sc. (Sp& Hg)	M.Sc. (Sp& Hg)			

12.1. Clinical Facilities

Facilities for diagnostic evaluation of speech, language, voice, hearing and associated disorders, both functional and organically based. Clients of all age groups with hearing impairment and clients with speech and language disorders.

Load and variety of clients should be commensurate with number of courses conducted and also to meet the clinical practicum requirement of each year of the course.

12.2. Library Facilities:

Library should accommodate at least, 30% of the institution’s students and staff total strength. Library should have internet and photocopying facilities.

- a) **Reading room :** Two reading rooms should be there
 - (i) Reference room with CBTIV and internet provisions
 - (ii) General Reading room
- b) **No. of books:** Books listed for each paper under “essential” should be available.
- c) **No. of Journals:** There should be atleast 5 most essential journals (2 each in Speech & Audiology and 1 general) for BASLP and 8 at MASLP levels (4 each for Speech & Audiology).
- d) **Staff :**
 - (i) Library and Information Officer – One No.
Qualifications: B.Lib with two years of experience in handling technical library using Information Technology.
 - (ii) Library Assistants: One
Qualifications: SSLC + Diploma in Library Sciences or SSLC + JOC in Library Sciences.

All the facilities may be increased to meet the requirements in a phased manner.

12.3. Audiovisual Instruments: Appropriate instruments as per No. and level of course should be provided.

12.4. Space:

Sr. No.		Size (Sq. Ft.)	Graduate	Graduate and PG
a)	Class Rooms	Size should be adequate to accommodate (9 sq. ft. per student)	Half the No. of total batches/ course (Min. 2 class room)	Half the No. of total batches/ course (Additional 1 room for each PG course)

b)	Room for reception where patients are registered.			
c)	Room for case history, Speech Diagnostic Room and Interviews	(6 x 6)	5 for 20 intake and 8 for 40 intake	With one PG course 12 and with each additional PG 2 extra
d)	Speech Lab (Quiet Room) for diagnostic purposes.	(15 x 20)	1	1+1
e)	Recording room (Sound proof)	(10 x 10)	1	1
f)	Speech Therapy Rooms/ Cabins	(6 x 6)	12 *to accommodate 50% of the students)	12
g)	- Single sound treated room. - Two Room Audiometric suite with control and test room situation. (Sound Proof. ANSI 1977)	(10 x 18)	For 20 intake one room and for 40-two rooms	For each of PG program i.e., MASLP –one room extra
h)	Room for hearing aid trial combination purpose.	(10 x 15)	1	1+1
i)	Earmould Lab	(15 x 20)	1	1
j)	Staff Room	As per staff strength (min size 15x20)	1	-
k)	Individual work space (with provision for storage facilities)	(10 x 10)	4	12
l)	Hearing aid repair lab	(10 x 10)	1	1
m)	Principal's Office room	(12 x 16)	1	1
n)	Sanitary facilities	As per requirement separate facilities for girl and boy students and staff		
o)	Hostels for Men and Women to accommodate at least 50% of the student population.			

p)	Administrative staff room.			
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12.5. Equipment (Minimum Requirement):

Sr. No.		Graduate	Graduate and PG
Audiology			
a)	2 channel Diagnostic Audiometer with Accessories such as earphone, ear cushion combination with adjustable headband, B.C. vibrator, transducers like microphone and matching loud speakers	1	1+1 and for Audiology specialization course one extra
b)	Portable Audiometer with provision of A.C. and B.C. testing : desirable screening audiometer	1 for each batch	1 + 1
c)	Clinical Immittance Audiometer (Desk model) with accessories.	2 instruments essential preferably one with screening type for field work. For 40 – three are required	1 more for MASLP and extra one for M.Sc. (Audio.)
d)	Portable/Screening impedance, audiometer	1	1 + 2
e)	Clinical BSEAR	1	1 + 1 (For M.Sc. [Audio.] stacked ABR and VEMP) are additions]
f)	Otoacoustic emission	1	1 more (one screening and two table models)
g)	Calibration equipment for AC, BC and free field (by possession or access)		
h)	Different types of Hearing Aids of mild moderate and strong categories body level and ear level, canal and spectacle hearing aid (1 each), FM, Digital, Programmable aids, ILS Assistive	A representative sample of hearing aids and assistive devices	Software programs for HAT

	listening devices.		
i)	IGO and HAT for hearing aid trial and making electroacoustic measurements.	1	1
j)	Stop watch	2	2 more
k)	Oto scope	2	2 more
l)	Proformae		
m)	Auditory training and Screening material		
n)	Ear Mould Lab-fully equipped	UV Labs for Soft mould for PG course	

Speech Pathology			
a)	Speech and Language Tests (Tests for differential diagnosis) (English and local language)	As per course requirement	As per course requirement
b)	Proformae		
c)	Speech Therapy material (Indian, Language and English)		
d)	Toys and Books		
e)	Mirrors - size 2' x 3'	4	6
f)	Speech Trainer	1	2
g)	Portable and Digital tape recorders	4	6
h)	Hi-Fi Ampli Deck with speakers and good microphone	1	2
i)	Expirograph/Aerophone	1	1+1 (for M.Sc – SLP)
j)	Computer PC-AT with VGA Color Monitor	1	3
k)	Software for diagnostic/therapeutic use	1	1
l)	Endostroboscope	-	One for M.Sc

			(SLP)
m)	EGG	1	1
n)	Stop Watch	2	4
o)	Audio cassettes for training/CDs		
p)	Pitch pipe		
q)	Tongue depressors	3	5

M. Sc (Speech-Language Pathology) Semester Scheme

Scheme of Examination

Sem No.	Paper No.	Title of the Paper	Marks for		
			Theory	I.A.	Total
I	1.1	Research Methods in Speech-Language & Hearing	80	20	100
	1.2	Statistics in Speech-Language & Hearing	80	20	100
	1.3	Technology for Speech-Language & Hearing	80	20	100
	1.4	Neurobiology of Speech and Language	80	20	100
	1.5	Clinical Linguistics & Multilingual Issues in Communication	80	20	100
II	2.1	Speech Production	80	20	100
	2.2	Maxillofacial Anomalies and Phonological Disorders	80	20	100
	2.3	Language, Cognition and Brain	80	20	100
	2.4	Child Language Disorders	80	20	100
	2.5*	(a) Clinical Practicum (Internal) (b) Clinical Practicum Exam. (External)	- -	50 -	50 50
III	3.1	Fluency & its Disorders	80	20	100
	3.2	Speech and Language Processing	80	20	100
	3.3	Aphasia	80	20	100
	3.4	Voice & its Disorders	80	20	100
	3.5	Suprasegmentals & Music Acoustics	80	20	100
IV	4.1	Adult Language Disorders	80	20	100
	4.2	Alternative and Augmentative Communication	80	20	100
	4.3	Motor Speech Disorders	80	20	100
	4.4*	(a) Clinical Practicum (Internal) (b) Clinical Practicum Exam. (External)	- -	50 -	50 50
	4.5	Dissertation**	-	-	100

* (a) Clinical Practicum (Internal) shall begin from I / III Semester. The Internal Assessment marks are based on performance of I and II / III and IV Semesters' Clinical Work taken together.

** Candidates shall begin Dissertation work in III Semester

*** All papers to be taught in 60 hours

MASTER OF SCIENCE IN SPEECH-LANGUAGE PATHOLOGY

I Semester

1.1 RESEARCH METHODS IN SPEECH-LANGUAGE AND HEARING

Unit 1 **12 hours**

- 1) Review of basic research methods, strategies and designs in Speech language pathology and Audiology.
- 2) Types of Research in speech language pathology and Audiology. Ex-post facto research, Normative research, Standard group comparison, Experimental research, Clinical and applied research, Sample surveys, Evaluation research.
- 3) Methods of Observation and measurement in speech language pathology and audiology.

Unit 2 **12 hours**

1. Experimental designs. The structure and logic of experimental designs, single
 - a. subject designs and group designs.
2. Documentation .
 - a) Organization , format and writing style.
 - b) Legal, ethical and cultural considerations for research in speech language pathology and audiology.

Unit 3 **12 hours**

Review of studies in speech and hearing as established in standard journals. Critical analysis of methods employed and identification of models of research that may unique to different areas.

Unit 4 **12 hours**

Evolution of research methods in speech and hearing since 1920s.

Unit 5 **12 hours**

1. Methods of experimental research in allied areas – Linguistics, Neurology, Clinical Psychology, Genetics, Physics and acoustics and their application to speech and Hearing.
2. Epidemiological research in Speech and Hearing.

1.2 STATISTICS IN SPEECH-LANGUAGE AND HEARING

Unit 1

12 hours

Review of basic statistics, statistical measures and their features.

Statistical inference: Methods of correlation and regression, cause and effect relation, chi-square, population estimate, probability, probability laws and hypothesis testing. The concept, theoretical distributions, estimation – point and interval estimation. Application to speech-language pathology and audiology with specific examples.

Unit 2

12 hours

Analysis of variance and covariance (ANOVA and ANCOVA): Basic models, assumptions, one way and two way classifications. Need for non-parametric tests. Consequence of failure of assumptions underlying ANOVA. Tests for additivity, homogeneity, transformation. Post – hoc tests analysis of covariance. Repeated measure.

Correlation, regression analysis and prediction including multiple regression and path analysis.

Unit 3

12 hours

Non-parametric statistics: Non-normal distributions, central limit theorem.

Unit 4

12 hours

Analysis of qualitative data: Contingency tables, measures of association, Kappa **coefficient**, log linear models. Content analysis.

Unit 5

12 hours

Multivariate analysis: Need for multivariate analysis, various methods, principal component analysis, factor cluster, discriminant function, MANOVA, MANCOVA, multiple regression and path analysis, logistic regression multidimensional scaling.

1.3 TECHNOLOGY FOR SPEECH-LANGUAGE AND HEARING

Unit 1 - Introduction to Basic Electronics and Computers

12 hours

- (a) Basic principle of operation and working of
 - Diodes, Transistors, FET's & UJT's, LED's, LCD's & IC's
 - D.C. Power supplies, a-c Voltage stabilizers and UPS
- (b) Fundamentals of Digital Electronics
 - Binary number system, Hex code, ASCII code, bit, byte, etc
 - Logic gates, Counters, Flip-flops etc.
- (c) Fundamentals of Computers:
 - Block Diagram of a computer and its working
 - Hardware, memory devices and other peripherals
 - Operating system, languages, application soft-wares
 - Programs, Flow charts
 - Internet and networking of computers

Unit 2 - Fundamentals of Digital Signal processing and Communication systems

12 hours

- (a) Analog and Digital systems
 - Analog signal and Digital Signals
 - Analog to Digital and Digital to analog converters
 - Need and advantages of digital systems and digital signal processing
- (b) Principles of digital signal processing
 - I I R system, its realization and implication
 - F I R system, its realization and implication
 - Basics of I I R and F I R filters and their implementation
- (c) Fundamentals of communication systems
 - AM transmission and reception
 - FM transmission and reception
 - Digital modulation Techniques such as delta modulation, PCM, PPM, PWM and their application in speech analysis.
 - Satellite communication

Unit 3 - Technology of Hearing Aids and Speech Processing and Analysis **12 hours**

- (a) Principle and working of
 - Body level hearing aid
 - BTE hearing aid
 - Digital, DSP based/programmable hearing aids
 - FM hearing aid
- (b) Evaluation of hearing aids
 - Electro acoustic characteristics
 - National and Inter-national standards
 - Hearing aid evaluation systems
- (c) Techniques of speech processing and analysis
 - Voice response system
 - Speaker recognition system and speech recognition system
 - Speech synthesis methods

Unit 4 - Biomedical signals and Signal Processing **12 hours**

- (a) Principles of generation of acoustic stimuli
 - Pure tones, tone bursts, clicks, filtered clicks and warble tones
 - Acoustic/Physical characteristics of all stimuli
 - Generation gating and filtering of stimuli
- (b) Evoked potential
 - Working principle
 - Electrodes
 - Recording of responses
- (c) Electrodes and transducers
 - Signal acquisition techniques from electrodes and transducers
 - Signal processing techniques such as differential amplification, common mode rejection, artifact rejection, filtering, signal averaging etc.
 - Addition and subtraction of waves

Unit 5 - Advanced Technology for Speech and Language Disorders **12 hours**

- (a) Electro-physiological methods in diagnosis

- Fundamental principles of EEG
 - Fundamental principles of EMG
- (b) Neuro-radiological methods in diagnosis
- Working principles
 - Interpretation and implications
- (c) Tools/studies to understand the organization of speech and language disorders and functions
- Cortical blood flow studies
 - Radio imaging techniques, functional MRI
 - Application of tools in studying genetic bases of speech language disorders
- (d) Tele rehabilitation

1.4 NEUROBIOLOGY OF SPEECH AND LANGUAGE

Unit 1

12 hours

- a) Anatomy and physiology of the cranial nerves related to speech and language
- b) Neuroanatomical and neurophysiological correlates of speech and language including subcortical mechanisms in
 - Normals- children and adults
 - Persons with language disorders-children and adults

Unit 2

12 hours

Cognitive psychology: Information processing and electrophysiological basis of memory and attention processes and its implications for speech and language disorders.

Unit 3

12 hours

Investigative procedures for assessment of speech and language mechanisms

- Neurological status
- Biological status

Unit 4

12 hours

Role of neurotransmitters in the mediation of speech and language.

Unit 5

12 hours

Neurobiology of aging and its effect on speech and language.

1.5 CLINICAL LINGUISTICS AND MULTILINGUAL ISSUES IN COMMUNICATION

Unit 1 **12 hours**

The Scope of Clinical Linguistics – Principles of General Linguistics and their Clinical Relevance.

Unit 2 **12 hours**

- 1) Phonology – General Concepts of Segmental and Non-segmental Phonology – Theoretical Background – Phonological Acquisition, Phonological Disability. Clinical Application of Distinctive Feature Analysis Principles, Practice and Clinical Application of Phonemic Analysis.
- 2) Grammar – Theoretical Background, General Concepts of Syntax and Morphology, The Scope of Grammatical Analysis, Grammatical Acquisition, Grammatical Disability. Principles, Practice and Application of Morphemic Analysis in a Clinical Situation.

Unit 3 **12 hours**

1. Semantics – Theoretical Background, Traditional Semantics, Linguistic Semantics, The Structure of Mental Lexicon, Semantic Fields, Structural Semantics – Synonymy, Hyponymy, Opposition Syntagmatic Relations, Componential Analysis, Non-Lexical Semantics – Phonetic Meaning, Phonological Meaning, Grammatical Meaning, Semantic Acquisition, Semantic Features, Acquisition of Meaning, Types of Semantic Disability, Semantic Analysis of Disordered Speech and Language.
2. Pragmatics – Theoretical Background Pragmatic Ability in Normal Pragmatic Disability and their types.

Unit 4 **12 hours**

Issues in Socio-linguistics – Standard and Non-standard Dialects, Regional and Social Dialects, Stylistic Variation of Language, Gender and Language, Registers, Creoles, Pidgins, Relation Between Language Culture, Religion, Politics, etc., Language Deficiency.

Unit 5 **12 hours**

Multilingual and cultural issues – A brief Introduction to the major language Families of the World – Language Families and Major Languages of India. Linguistic Determinism, Linguistic Relativity, Sapir-Whorf Hypothesis. Cultural Diversity of India, Cultural Issues in Verbal and Non-verbal Communication. Multicultural and Multilingual Issues in Rehabilitation With Special Reference to India.

II Semester

2.1 SPEECH PRODUCTION

Unit 1

12 hours

Acoustics of speech: Acoustic phonetics: Basics, Acoustics of vowels - Review and State-of –the-art, Acoustics of consonants: Review and state-of-the-art

Unit 2

12 hours

Spectrography - Basics, Place identification, Manner identification, Voicing identification, Aspiration identification

Unit 3

12 hours

Infant cry analyses, Analyses of laughter, Spectrography in normal subject. Spectrographic patterns in clinical population: Disorder of voice, phonology, and fluency, Forensic application, Applications of Spectrography in basic and applied research

Unit 4

12 hours

Physiology of speech

- Physiology of respiration: Purpose of respiration, Description of respiratory movements, Types of respiration, Methods of respiratory analysis
- Physiology of laryngeal function: Historical remarks, Muscles of the larynx, Laryngeal movements, Vocal resonance
- Neurophysiological bases of speech: Neuro-motor mechanism of the articulatory, phonatory and respiratory systems, Electro-physiology of the larynx.

Unit 5

12 hours

Aerodynamics of speech production: Upper airway dynamics, Lower airway, Dynamics, Aerodynamics of vowels, Aerodynamics of consonants: stops, fricatives, nasals.

2.2 MAXILLOFACIAL ANOMALIES AND PHONOLOGICAL DISORDERS

Unit 1

12 hours

Coarticulation – nature, definitions, kinds (anticipatory, carry over) - Models (feature based, syllabic and allophonic based, target based, phonologically based) – Physiological studies on coarticulation, effects of coarticulation (position and juncture effect, feature effect, transition effect, direction effect).

Unit 2

12 hours

- 1) Theories of phonological development
- 2) Application of phonological theories in evaluation and management of phonological disorders.
- 3) Metaphon theory and therapy
- 4) Metalinguistic abilities in phonological disorders
- 5) Application of metaphon theory to the rehabilitation of phonological disorders.

Unit 3

12 hours

Phonological process – different types, its analysis and phonological process pattern in various communication disorders

Unit 4

12 hours

1. Anatomy, physiology and embryology of the maxillo facial region.
2. Anomalies related to various articulators & compensatory articulation.
3. Velopharyngeal dysfunction – types, assessment and remediation.

Unit 5

12 hours

1. Rehabilitation in maxillofacial anomalies – medical, surgical, prosthesis and speech therapy.
2. Acoustical, perceptual and physiological aspects of articulation in subjects with
 - a. cleft palate
 - b. glossectomy & mandibulectomy
 - c. Person with hearing disorders.
3. Coarticulation in speech disorders – measurement of coarticulation and remediation.

2.3 LANGUAGE, COGNITION AND BRAIN

Unit 1 **12 hours**

Language, cognition and Brain

- Inter-relationships between language, cognition and brain: neurolinguistics and neural models
- Cognitive models of language function
- Neuroanatomical correlates of cognition and language

Unit 2 **12 hours**

Cognitive processes in the acquisition and disorders of language.

- Role of attention
- Memory (short-term, verbal, non-verbal)
- Reasoning, judgement and metacognition.

Unit 3 **12 hours**

Language and cognition – its relationship with aging.

Unit 4 **12 hours**

Assessment of cognitive processes with reference to language function.

Unit 5 **12 hours**

Team intervention for cognitive and communicative rehabilitation.

- Effects of surgical, pharmacological and electrophysiological treatment on language and cognition.
- Cognitive/metacognitive therapy with reference to language functions.

2.4 CHILD LANGUAGE DISORDERS

Unit 1

12 hours

- a) Current theories of language acquisition
- b) Models of language acquisition and their applications in child language disorders.
- c) Psycholinguistic, neurolinguistic and cognitive processes in child language disorders.

Unit 2

12 hours

Developmental and acquired language disorders in children- Linguistic, pragmatic, prosodic, behavioral and literacy characteristics in children with:

- Mental Retardation
- Person with hearing disorders
- Autism and Pervasive Developmental disorders
- Specific Language Impairment
- Aphasia
- Dyslexia
- Attention Deficit Hyperactivity Disorders
- Seizure and other related disorders

Unit 3

12 hours

Co-morbidity of child language disorders – Differential diagnosis and assessment of:

- Cognitive – linguistic
- Psycholinguistic and
- Neurolinguistic parameters.

Unit 4

12 hours

Management- medical, surgical, linguistic, behavioral, remedial, physio-occupational and special educational perspectives.

Unit 5

12 hours

Present status and prospects of child language disorders.

III Semester

3.1 FLUENCY AND ITS DISORDERS

Unit 1 **12 hours**

- 1) Definitions, factors affecting development of and dimensions of fluent speech
- 2) Physiological, linguistic, prosodic basis of fluency and its disorders.
- 3) Auditory processing in fluency and its disorders.

Unit 2 **12 hours**

1. Articulatory dynamics in fluency disorders.
2. Laryngeal dynamics in fluency disorders.

Unit 3 **12 hours**

Neurological processing in fluency disorders - Speech motor control in fluency disorder.

Unit 4 **12 hours**

1. Prevention, relapse of stuttering and related issues.
2. Theories and therapies of fluency disorders - Recent advances.
3. Severity of stuttering - Theoretical foundations and methods.

Unit 5 **12 hours**

1. Cluttering - Recent advances.
2. Efficacy of stuttering therapies.

3.2 SPEECH AND LANGUAGE PROCESSING

Unit 1 - Speech Processing **12 hours**

- a) Introduction to speech perception
- b) Basic issues in speech perception:
 - Linearity, segmentation, lack of invariance
 - Units of perceptual analysis: phoneme, syllable, word or beyond
 - Variability or perceptual constancy in speech
 - Perceptual organization of speech
- c) Theoretical approaches to speech perception
 - Invariant feature or cue-based approaches
 - Motor theory of speech perception
 - Direct-realistic approach to speech perception
 - TRACE

Unit 2 **12 hours**

Phonetic perception: perception of vowels, stop consonants, nasals, fricatives and other speech sounds.

Unit 3 **12hours**

Spoken word recognition – Methodology and issues

Unit 4 **12 hours**

- Visual word recognition
- Models and theories
 - Word and non- word naming
 - Acquired dyslexia
 - Role of phonology

Unit 5 **12 hours**

- a) Sentence comprehension
 - Basic capacities for perceiving phonetic contrasts: native language contrasts, foreign language contrasts, coping with variability in speech signal, role of memory and attention in infant speech perception
 - Prosodic organization in native language
 - Related developments in speech perception and speech production

- b) Processing of phonological, morphological, syntactic, semantic and pragmatic aspects of language.

3.3 APHASIA

Unit 1 **12 hours**

Classification systems in Aphasia - Cortical v/s subcortical types - Traditional v/s linguistic approaches

Unit 2 **12 hours**

Linguistic impairments in Aphasias - Phonological deficits, semantic deficits, agrammatism and paragrammatism

Non-linguistic impairments in aphasias

Unit 3 **12 hours**

Investigative and assessment procedures in clinical aphasiology.

- Language tests
- Linguistic analysis-subjective/objective tests.
- Functional profiles.

Unit 4 **12 hours**

Management of aphasia - Neurological, linguistic and communicative, physiotherapeutic, vocational and social aspects.

Unit 5 **12 hours**

Aphasia in multilinguals, illiterates, left-handers and sign language users, right hemisphere disorders, schizophasia, traumatic brain injury (TBI), primary progressive aphasias (PPA) and language disorders.

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3.4 VOICE AND ITS DISORDERS

Unit 1

12 hours

- a) Vocal fold physiology, neurophysiology of the Larynx, vibratory modes of vocal folds
- b) Models of vocal fold vibration - one-mass model, two-mass model, multiple mass model
- c) Development of the vocal fold
- d) Mechanical properties of the vocal fold
- e) Measurement of vocal fold vibration
- f) Electroglottography in understanding the movements of the muscles of vocal folds.

Unit 2

12 hours

- a) Voice evaluation: Aerodynamic tests - vital capacity, mean airflow rate, maximum duration of sustained blowing.
- b) Tests for assessing functions of the resonatory system, acoustic analysis, psychoacoustic evaluation and tests for laryngeal measurements (Model frequency, frequency range, Jitter, Intensity, Intensity range, Shimmer, Glottogram, Harmonic analysis) and other measures (LTAS, Nasality Measurements).

Unit 3

12 hours

- a) Pathophysiological changes in different voice disorders.
- b) Acoustical, aerodynamic and perceptual aspects of pathological voices.

Unit 4

12 hours

- a) Ageing and voice disorders. Management.
- b) Neurogenic voice disorders. Differential diagnosis and management.
- c) Endocrinal voice disorders and voice disorders related to transsexuals.
- d) Rehabilitation of laryngectomee – Recent advances.
- e) Acoustical, perceptual and physiological aspects of laryngectomee speech.

Unit 5

12 hours

- a) Issues related to professional voice and its care.
- b) Medical and surgical intervention in voice disorders.
- c) Vocal rehabilitation

3.5 SUPRASEGMENTAL AND MUSIC ACOUSTICS

Unit 1 **12 hours**

Introduction to musicology- Definition, components of music – rhythm, melody, harmony and tone. Types - instrumental, vocal, classical, non-classical, Western, Indian. Scales of measurements. Prerequisites – individuality, personality, artistry and perception.

Unit 2 **12 hours**

Singing – Physiology of singing – respiratory and phonatory bases of singing, posture, resonance and articulation.

Vocal problems in singers – causes, prevention, remediation, vocal hygiene, vocal exercises.

Unit 3 **12 hours**

Intonation – definition, types, factors affecting development of intonation in children, tests of intonation.

Stress - definition, development, types (syllable-timed, stress – timed, syllable, word), use of stress, physiology of stress, development of stress, correlates of stress, measurement of stress.

Rhythm - definition, development, isochrony, measurement of rhythm, rhythm in various languages, tests of rhythm, rhythm in stuttering.

Unit 4 **12 hours**

Neural basis of Suprasegmentals and dysprosody - Processing of prosodic features, hemispheric lateralization, types of dysprosody in various disorders

Unit 5 **12 hours**

Suprasegmental features in different types of speech and language disorders – Multi-lingual and cultural variations

IV Semester

4.1 ADULT LANGUAGE DISORDERS

Unit 1

12 hours

Non-aphasic language disorders in adults-causes, types, characteristics & classification of:

- Traumatic Brain Injury
- Dementia
- Acquired Dyslexias
- Alcohol induced language disorders
- Metabolic disorders of language

Unit 2

12 hours

Cognitive-linguistic–communicative impairments in non-aphasic language disorders in adults

Unit 3

12 hours

Differential diagnosis of non-aphasic language disorders in adults on the basis of neurodiagnostic, cognitive, linguistic, communicative speech - motor and behavior deficits.

Unit 4

12 hours

Assessment of non-aphasic language disorders in adults-procedures for neurological, cognitive - linguistic, communicative, speech motor and behavioral measurements.

Unit 5

12 hours

Management of non-aphasic language disorders in adults-Interdisciplinary approach

- Pharmaco-therapy
- Behavior therapy
- Physiotherapy
- Cognitive and communicative rehabilitation procedures.

4.2 ALTERNATIVE AND AUGMENTATIVE COMMUNICATION

Unit 1 **12 hours**

- 1) AAC – Introduction/overview
- 2) AAC system components – Symbol sets – Standardized and non-standardized, techniques for training, selection of modes, partnership issues and generalization.

Unit 2 **12 hours**

- 1) Assessment and decision making – Different types of assessment and applicability with different speech-language disorders
- 2) Vocabulary selection/language and oral/motor considerations and general intervention principles in different types of speech-language disorders.

Unit 3 **12 hours**

AAC intervention for children & adults with communication disorders – Type specific selection considerations.

Unit 4 **12 hours**

- 1) Processing of signals, signs & symbol sets in normals and AAC users.
- 2) Relevance of electronics and computers – General orientation and adaptation in Indian context.

Unit 5 **12 hours**

- 1) Team effort in the implementation of AAC.
- 2) AAC in Indian context.

4.3 MOTOR SPEECH DISORDERS

Unit 1 **12 hours**

Sensory motor processing in speech / correlates of oral sensor- motor dynamics.

- Neural substrates
- Findings in dysarthrics and apraxics.

Unit 2 **12 hours**

Models of speech processing in motor speech disorders – Dysarthria and apraxia.

Unit 3 **12 hours**

- 1) Motor speech disorders in children and adults – Dysarthria and Apraxia - types, assessment and remediation.
- 2) Differential diagnosis between age related changes and motor speech disorders.

Unit 4 **12 hours**

Dysphagia in children and adults with motor speech disorders – Types, assessment and remediation

Unit 5 **12 hours**

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- 1) Prosthetic, medical and surgical management in neurogenic speech disorders.
- 2) Speech remediation in dysarthria and apraxia
 - Issues related to vegetative therapy/sensory motor training for oral musculature
 - Principles of physiotherapy and occupational therapy in speech therapy
 - Speech correction – other facilitatory approaches and compensatory approaches.
- 3) Alternate modes of remediation of motor speech disorders.

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M.Sc – I Semester

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1.4 – NEUROBIOLOGY OF SPEECH AND LANGUAGE

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2.1 – SPEECH PRODUCTION

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2.3 – LANGUAGE COGNITION AND BRAIN

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2.4 – CHILD LANGUAGE DISORDERS

Unit 1

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M.Sc – III Semester

3.1 – FLUENCY AND ITS DISORDERS

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3.2 – SPEECH AND LANGUAGE PROCESSING

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Kuhl, P.K. (1982). *Speech perception: An overview of current issues*. In N. J. Lass, L.V. McReynolds, L.V., Northern J.L., and Yoder D.E. (Eds.), *Speech, Language and Hearing*. Vol. I, Normal Process, W.B. Sanders Company, Philadelphia.

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Unit 4

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Unit 5

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3.3 – APHASIA

Unit 1

Hegde, M.N. (1994). A course book on aphasia and other neurogenic language disorders, Singular publishing group, San Diego.

Kertesz, A (1979). Aphasia and associated disorders – Taxonomy, localization and recovery. Grune and Stratton, NY.

Unit 2

Caplan, D. (1990). Neurolinguistics and linguistic aphasiology – An introduction. Cambridge University Press

Code, C & Muller, D.J (1996). Forums in clinical aphasiology. Whurr Pub, London.

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Unit 3

Dressler, W & Stark J.A. (Ed.) (1988). Linguistic analyses of aphasic language. Springer series in Neuropsychology, Springer-Verlag, NY

Unit 4

Dworkin, J.P & Hartman, D.E (1994). Cases in neurogenic communication disorders – A workbook. Singular Publishing Group, Inc, San Diego

Unit 5

Rose, Whurr and Wyke (ed) (1993). Aphasia. Whurr Pub., London.

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3.4 – VOICE AND ITS DISORDERS

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- Baken, R.J. (1987). Clinical measurements of Speech and Voice. Taylor and Francis, London
- Boone, D.R. (1991). Is your voice telling on you? How to find and use your natural voice? Singular Publishing Group, San Diego.
- Davies, D.G. and Jahn, A.F. (1998). Care of the professional voice: A management guide for singers, actors and professional voice users. Butterworth Heinemann, Oxford.
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- Titze, I.R. (Ed.) (1993). Vocal fold physiology. Frontiers in Basic Science. Singular Publishing Group, San Diego.

3. 5 – SUPRASEGMENTALS AND MUSIC ACOUSTICS

Unit 1

Leeuwen, T. V. (1999). Speech, music and sound. Macmillan Press Ltd., Hong Kong.

Unit 2

Bunch, M. A. (1982). Dynamics of singing voice. Springer – Verlag/Wien, New York.

Proctor, D. F. (1980). Breathing, speech and song. Springer – Verlag/Wien, New York.

Unit 3

Johns – Lewis, C (1986) Intonation in discourse, College-Hill Press, Inc, San Diego.

M.Sc – IV Semester

4.1 – ADULT LANGUAGE DISORDERS

Common for all units

Morris, J.C (ed) (1994). Handbook of Dementic illnesses. Marcel Dekker Inc., NY.

Kirshner, H.S. (ed) (1995). Handbook of neurological speech and language disorders. Neurological diseases and therapy series Marcel Dekker, Inc, NY.

Gillis, et. al., (1996). Traumatic Brain Injury- rehabilitation for Speech-Language pathologists. Butterworth-Heinemann

Green et. al. (1997). Neurogenic communication disorders series. Singular pub co., London.

Morantz, R.A. and Walsh, J.W. (ed) (1994). Brain Tumors- a comprehensive text. Marcel Dekker inc., NY.

Unit 1

La Pointe, L (1990). Aphasia and related neurogenic language disorders. Current therapy of communication disorders. Series Editor William H Perkins, Thieme Medical Pub. NY

Unit 2

Goodglass, H and Wingfield, A (ed) (1997). Anomia-neuroanatomical and cognitive correlates. Academic press, London.

Morris, J.C. (ed) (1994). Handbook of dementic illnesses. Marcel Dekker Inc., NY.

Unit 5

Dworkin, J.P & Hartman, D.E. (ed) (1994). Cases in neurogenic communicative disorders – A work book. Singular publishing group, Inc, San Diego, California.

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MSL 4.2 – ALTERNATIVE AND AUGMENTATIVE COMMUNICATION

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Glennen. S.L. and Decoste. D.C. (1997). Handbook of augmentative and alternative communication. Singular Publishing Group Inc, San Diego, London.

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Silverman, F.H. (1980). Communication for the speechless. Prentice Hall Inc.

Tetzohner. F.H. and Jansen. M.H. (Eds.) (1996). Augmentative and alternative communication – European perspectives. Singular Publishing Group Inc, San Diego, California.

Vander Heiden. G. and Grilley. K. (Ed.)(1978). Non-verbal communication techniques and aids for the severely physically handicapped. University Park Press, New York.

Webster J.G. (Ed.). (1995). Electronic devices for the communication handicapped. Chapman and Hall, London.

4.3 – MOTOR SPEECH DISORDERS

- Berry. W.R. (1983). Clinical dysarthria. College Hill Press, San Diego.
- Beresford. S. (1995). Motor neuron diseases. Chapman and Hall, London.
- Blosser. J.L and DePompei. R. (1994). Paediatric traumatic brain injury – Proactive intervention. Singular Publishing Group Inc, San Diego, California.
- Brookshire. R.H. (1992). An introduction to neurogenic speech disorders. Mosby Year Book, St. Louis.
- Crary. M.A. (1993). Developmental motor speech disorders. Singular Publishing Group Inc, Whurr Publishers, San Diego, California.
- Darby. J.K. (Ed.). (1981). Speech evaluation in medicine. Grune and Stratton, New York.
- Darby. J.K. (Ed.) (1981). Speech evaluation in psychiatry. Grune and Stratton, New York.
- Darby. J.K. (Ed.) (1985). Speech and language evaluation in neurology- adult disorders. Grune and Stratton, Orlando.
- Darley, R., Aronson. A and Brown.B. (1975). Motor speech disorders. W.B.Saunders Company, Pennsylvania.
- Denhoff. E. and Robinault. I.P. (1960). Cerebral palsy and related disorders - A developmental approach to dysfunction. McGraw Hill, New York.
- Dikeman. K.J and Kazandjian. M.S. (1995). Communication and swallowing management in tracheostomized and ventilator dependent adults. Singular publishing group, San Diego.
- Duffy. J.R. Motor speech disorders (1995). Mosby yearbook Inc., St. Louis.
- Dworkin. J.P. (1991). Motor speech disorders. A treatment guide. Mosby Year Book, St. Louis,
- Dworkin. J.P. and Hartman. D.E. (1994). Cases in neurogenic communication disorders – A workbook. Singular Publishing Group Inc, Whurr Publishers, San Diego, California.
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- Hall. P.K., Jordon. L.S and Robin. D.A. (1993). Developmental apraxia of speech-theory and clinical practices. Pro-Ed., Austin.
- Hardy. J.C. (1983). Cerebral palsy. Prentice Hall Inc, New Jersey.
- Johns. D.F. (Ed.). Clinical management of neurogenic communicative disorders. Allyn and Bacon, Boston, 1985.
- Joseph. R. (1996). Neuropsychiatry, neuropsychology and clinical neuroscience. Williams and Wilkins, U.S.A.

- Kurlan. R. (1998). Handbook of Tourette's syndrome and related tic and behavioral disorders. Marcel Dekker Inc., New York.
- Kuehn. D.P. Lemme and Baumgartner (Ed.) (1989). Neural basis of speech, hearing and language. College Hill Press, Boston.
- Langley. B. and Lombardino. L.J. (Ed.). (1991) Neuro developmental strategies for managing communication disorders in children with severe motor dysfunction.
- Lass, N.J (1979). Speech and language. Advances in basic research and practice. Vol.1-11, Academic Press, New York.
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- Love. R.J. and Webb. W.G. (1992). Neurology for the speech, language pathologist. Butterworth- Heineman, Boston.
- McNeil. M.R. (Ed.). (1984). The dysarthrias. College Hill Press, San Diego.
- Murdoch. B.E. (1990). Acquired speech and languages disorders. Chapman & Hall, London.
- Netsell. R. (1986). A neurobiologic view of speech production and the dysarthrias. College Hill Press, San Diego.
- Periman A.L. and Delrieu (Eds.) (1997). Deglutition and its disorders – anatomy, physiology, clinical diagnosis and management. Singular Publishing Group Inc, Whurr Publishers, San Diego, London.
- Rosenthal, S.R. Sheppard and Lotze (Eds.) (1995). Dysphagia and the child with developmental disabilities. Singular Publishing Group Inc, Whurr Publishers, San Diego.
- Scherzer. A.L. and Tscharnuter. I. (1982). Early diagnosis and therapy in cerebral palsy primer on infant developmental problems. Marcel Dekker Inc, New York.
- Tuchman and Walter (Eds.). Disorders of feeding and swallowing in infants and children.
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- Wertz. R.T. Lapointe and Rosenbek. (1991). Apraxia of speech in adults. Singular Publishing Group, San Diego.
- Yorkston. K.M. Beukelman and Bell (1968). Clinical management of dysarthric speakers. Pro-ed, Austin.

List of Journals for reference in subjects related to Speech-language Pathology

Asia Pacific Journal of Speech, Language and Hearing

Brain

Brain & Language

Cleft Palate

Cortex

Education & Training in Mental Retardation and Developmental Disabilities

Folia Phoniatica

International Journal of Language & Communication Disorders

Journal of Acoustical Society of America

Journal of Child Language

Journal of Communication Disorders

Journal of Fluency Disorders

Journal of Learning Disabilities

Journal of Speech, Language and Hearing Research

Journal of Voice

Language Learning

Language, Speech and Hearing Services in School

Linguistics and Language Behavior Abstracts

Otolaryngologic Clinics of North America

Phonetica

Seminars in Speech & Language

Speech Communication

Journal of Medical Speech-Language Pathology
