

KERALA UNIVERSITY OF HEALTH SCIENCES

THRISSUR – 680 596, KERALA



REGULATIONS, CURRICULUM, AND SYLLABUS OF

MASTER OF AUDIOLOGY & SPEECH LANGUAGE PATHOLOGY(MASLP)

(With effect from 2012-13 admission onwards)

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1. INTRODUCTION

1.1 Preamble

The regulation of the Master of Audiology & Speech Language Pathology (MASLP) 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 AUDIOLOGY AND SPEECH LANGUAGE PATHOLOGY – Abbreviated as MASLP

1.2.1 Branches of Study

Audiology and Speech-Language Pathology

1.2.2 Definition of various Specialities

Audiology- Is defined as the science of hearing and balancing, art of its assessment and the habilitation and rehabilitation of individuals with hearing and balancing disorders.

Speech Language Pathology- Is defined as the branch of science which deals with Speech, language, deglutition and its disorders.

2. AIMS AND OBJECTIVES OF COURSES

2.1 Goals of the course

1. Prepare audiologists and speech-language pathologists to fill diverse roles in the broad area of speech-language pathology and audiology in a variety of professional environments;
2. Provide the student with knowledge about the changing role of the speech-language pathologists and audiologists within our society;
3. Facilitate an interdisciplinary view of disorders of human communication and hearing;
4. Provide speech-language pathologists and audiologist with the course work and practicum experiences needed to meet national standards for clinical knowledge and skills and to earn the Certificate of Clinical Competence (CCC).

3. REGULATIONS

3.1 Academic eligibility for admission

BASLP/B.Sc (Speech & Hearing) degree or equivalent from any recognized University in India recognised by RCI and approved by Kerala University of Health Sciences.

The selection of students for the MASLP 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 MASLP course shall apply to the University for Registration

- By making a formal application in the prescribed format.
- Original degree certificate/marklists 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 course

Two academic years.

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 upto 10% (only once in the entire course) shall be

granted 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 the faculty 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 35% 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 year. Duration of each theory paper shall be for 3hours.

Clinical Practicum Examination: There shall be a Clinical Practicum Examination for Speech Language Pathology and Audiology which will be conducted by an internal and external examiner for 50 marks.

b. Schedule of Examination

Supplementary examination will not be conducted for clinical practicum.

3.6.3 Question paper setting / pattern

- 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

- For each theory subject a candidate must obtain a separate 50% marks for university examination and 50% for internal assessment
- For each clinical practicum a candidate must obtain a separate 50% marks for university examination and 50% for internal assessment

3.7.2 Grace marks

A maximum of 5 marks or as per University regulations may be given as grace mark either in a subject alone or distribute it among subjects so as to make the candidate eligible for a pass. No grace marks will be given for clinical practicum

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 can carry over from first year to second year after clearing the clinical practicum. Theory papers can be attempted as supplementary examination after six months and first year theory papers should be cleared before the commencement of second year MASLP 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 speciality.

EXAMINER: 3 years of teaching experience in the respective speciality after completion of Post-Graduation.

GUIDE: PhD in speech and hearing / 5 years of teaching experience after MASLP / MSc Speech & Hearing with minimum of two publications as first author in index journal.

3.12 Dissertation

3.12.1 Dissertation synopsis/Submission/Valuation

Synopsis proforma should be submitted to the University within six months of joining the course. Dissertation should be submitted three months before the commencement of second year university Examination. Board of Examinations shall appoint two Faculties for the valuation of Dissertation and the valuation form shall mention "Accepted / Accepted with modification / Rejected." If it is accepted with modifications, candidate will be given 45 days for correction and resubmission through proper channel. If it is rejected it will be sent to another external expert for second valuation. If it is again rejected the candidate will not be permitted to appear for the examination. He/she should then redo the work and submit within a period of six months. Such dissertations will be valued in the examination centre itself at the time of practical/clinical examination.

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

Each student is eligible to apply for award of MASLP degree if he/ she clears all the papers (Theory and clinical practicum of the 2 academic years).

4. COURSE CONTENT

4.1 Syllabus and scheme of examination

A) Scheme of curriculum for first year

CODES/PAPER NO.	PAPER TITLE	TEACHING HOURS (MINIMUM)	EXAM DURATION	EXAM MARKS	IA MARKS	TOTAL MARKS
SH 101	Statistics and research Methods	75	3	80	20	100
SH 102	Advances in speech sciences.	75	3	80	20	100
SH 103	Clinical Linguistics	75	3	80	20	100
SH 104	Auditory Physiology	75	3	80	20	100
SH 105	Psychophysics of audition	75	3	80	20	100
SH 106	Voice and Fluency Disorders	75	3	80	20	100
SH 107	Speech language Processing	75	3	80	20	100
SH 108	Clinical Practicum-Speech Language Pathology	15 hours/week		50	50	100
SH 109	Clinical Practicum-	15hours/week		50	50	100

	Audiology					
Total Marks						900

B) Scheme of curriculum for second year

CODES/PAPER NO.	PAPER TITLE	TEACHING HOURS (MINIMUM)	EXAM DURATION	EXAM MARKS	IA MARKS	TOTAL MARKS
SH 201	Language Acquisition and Language Disorders in Children	75	3	80	20	100
SH 202	Speech Perception and its disorders.	75	3	80	20	100
SH 203	Clinical phonology and Neuromotor Disorders	75	3	80	20	100
SH 204	Diagnostic Audiology	75	3	80	20	100
SH 205	Hearing Devices	75	3	80	20	100
SH 206	Adult Language Disorders	75	3	80	20	100
SH 207	Advances in the management of Persons with Hearing Disorders	75	3	80	20	100
SH 208	DISSERTATION	Accepted/Accepted with modification/Rejected				
SH 209	Clinical Practicum- Speech Language Pathology	15 hours/week		50	50	100

SH 210	Clinical Practicum- Audiology	15hours/week		50	50	100
Total Marks						900

1st Year MASLP

SH. 101: STATISTICS AND RESEARCH METHODS (75 hrs)

A. Statistics:

- 1) Statistics – purpose – approach-method-measures of central tendency dependability of these measures-research applications.
- 2) Measures of variability – types and meaning of various measures – research applications.
- 3) Standard scores – I scores – normal distribution deviations – skewness and kurtosis – conditions of applications – limitations in interpretation.
- 4) Theory of probability – principles and properties of normal distribution – binominal distribution – interpretation of data using the normal probability curve – causes of distribution – deviations from the normal forms.
- 5) Correlation – meaning – coefficient of correlation – linear correlation – product – moment correlation – rank correlation, biserial correlation, tetracoric correlation partial and multiple correlation – regression equation.
- 6) Variance – concept – foundations – assumptions – one way classification. ANOVA, MANOVA, ANCOVA, MANCOVA.
- 7) Item analysis – item pool – its selection – item difficulty item variance – item conduction – time validity – difficulty index.
- 8) Non-parametric statistics – its nature and condition and application – non- parametric analysis of variance and measures of association – tests of difference with correlated and uncorrelated data – tests of similarity.
- 9) Selection appropriate statistical methods in the research.

B. Research Methods:

- 1) Methods of research in behavioural sciences – research designs – measuring – purpose – principles – needs – applications between group designs and single subject research designs.
- 2) Basic of research – science scientific approach – problems – hypothesis – constructs – variables.
- 3) Types of research – empirical rationale – experimental and ex post-factor research – laboratory experiments – field studies – survey research – fundamental research – epidemiology – clinical and applied research.

- 4) Techniques of sampling – sampling and randomness – principles of randomization– random assignment – methods – random sampling – stratified sampling, incidental sampling – purposive samples of one to one matched sampling – size of sample.
- 5) Measurement – foundations – types – reliability – validity
- 6) Variance – Implication to research – variance control.
- 7) Techniques of equation - experimental and control groups – matching and randomization – advantages, disadvantages and limitations.
- 8) Research designs – poor designs, good designs – various types of group designs – various types of single subject research designs.
- 9) Analysis and interpretation – principles, indices – cross – breaks – factor analysis – multivariate statistics – time series analysis.
- 10) The research report – cardinal characteristics – purpose – structure presentation and writing style

LIST OF BOOKS

STATISTICS AND RESEARCH METHODS

Essential:

- 1) Clinical Research in Communicative Disorders. (2nd Edition). Principles and Strategies. M.N. Hegde.
- 2) Introduction to Clinical Research in Communication Disorders. Mary and Grace.
- 3) Pannbacker, M.H. and Middleton, G.F. (1994). Introduction to Clinical Research in Communication Disorders. San Diego: Singular Publishing. ISBN 1-56593 – 219-6.
- 4) Maxwell, D.L. and Satake, E. (1997). Research and Statistical Methods in Communication. Baltimore: Williams and Wilkins, ISBN 0-683-05 655-7.
- 5) Stein, F. and Cutler, S.K. (1996). Clinical Research in Allied Health and Special Education. San Diego: Singular Publishing Group Inc. ISBN 1-56593-631-0.

Additional:

- 1) Portney, L.G. and Walkins, M.P. (1993). Foundations of Clinical Research. Connecticut: Appleton and Lange. ISBN 0 –8385-1065-5.
- 2) Woods, A., Fletcher, P. and Hughes, A. (1986). Statistics in Language Studies. Cambridge: University Press. ISBN 0-521-253268.

SH 102: ADVANCES IN SPEECH SCIENCES (75 hrs.)

1. Life span changes in speech mechanism including developmental milestones (3 hrs.)
2. Physiology of Speech production.
 - a) Respiratory System: Fundamentals of aerodynamics. Aerodynamic (6 hrs.) events in speech. Passive and active forces in respiratory function. Breathing for speech and song. Speech breathing kinematics and mechanism inferences. Kinematics of the chest wall during speech production.

b) Laryngeal System: Molecular and cellular structure of vocal fold tissue. (6hrs.)

Laryngeal biomechanics, Models of vocal fold vibration (onemass model, multi-mass model etc.). Co-ordination of respiratory and laryngeal systems in phonation. Control of fundamental frequency, vocal intensity and efficiency. Fluctuations and Perturbations in vocal output.

c) Articulatory and Resonatory systems. Patterns of velopharyngeal (5 hrs.) closure, Effects of vowel height on velopharyngeal airway resistance. Oral sensory perception. Orofacial force physiology.

3) Theories and models of speech production. (12 hrs)

Closed loop model, Kozharnikov and Chistovich model, Associative chain model, Wickelgren's model, McNeilage's model, Garrett's model,

Dell's activating model, Shatuck – Huffman's model, Acoustic theory of Speech Production.

4) Principles, instrumentation and measurement procedures – Digital

Filters – FIR and IIR – Basic algorithms – DFT and FFT – short-time (25 hrs.) analysis – Auto-correlation – Cepstrum – Linear Prediction.

a) Aerodynamic analysis of speech.

b) Acoustic analysis of speech (Fo and Intensity measurement techniques – Jitter and shimmer measurements) – Inverse filtering, LTAS.

c) Articulation measurements x-ray microbeam and NMR methods – electropalatography.

d) Perceptual analysis of speech (including segmental and supra- segmental aspects and speech intelligibility).

5) Speech recognition, Speaker identification. Forensic Speech Analysis. (5hrs)

6) Speech Analysis and Synthesis – Techniques, limitations and applications.

7) Application of perceptual and instrumental techniques to analysis of (6 hrs.) infant cry, vocalizations, babbling and pre-speech vocal skills. Interpretation, Diagnostic and therapeutic significance.

8) Recent trends in speech science measurement and application. (2 hrs.)

LIST OF BOOKS

ADVANCES IN SPEECH SCIENCES

Essential:

Fundamentals of Speech Synthesis and Speech Recognition. Basic concepts, State of the Art and future challenges. Keller, E. (1994). England: John Wiley and Sons Ltd. ISBN 471 94449.

A Basic Introduction to Speech Perception. Speech Science Series. Ryalls, J. (1996).

California: Singular Publishing Group, Inc. ISBN 56593 – 617 – 5.

The Acoustics of Speech Communication. Fundamentals, Speech Perception Theory and

Technology. Picket, J.M. (1999). USA: Allyn and Bacon. ISBN 0-205-19887-2.nd
 Speech Science Primer. Physiology, Acoustics and Perception of Speech. 2 Edition.
 Borden, G.J. and Harris, H.S. (1984). Baltimore: Williams and Wilkins. ISBN 0-683-009427.
 Clinical Examination of Voice. Disorders of Communication Series. Hirano, M. (1981). New
 York: Springer-Verlag Wien. ISBN 3-211-81659-3.
 Clinical Measurement of Speech and Voice. 2 Edition. Baken, R.J. (1996). California:
 Singular Publishing Group, Inc. ISBN 1-56593-809-7.
 Handbook of Clinical Speech Physiology. Barlow, S.M. with Collaborators, (1999). San Diego:
 Singular Publishing Group, Inc. ISBN 1-565-93267-6.
 Respiratory Function in Speech and Song. Hixon, T.J. and collaborators. (1991). San Diego:
 Singular Publishing Group, Inc. ISBN 1-879105-1.
 Producing Speech: Contemporary Issues for Katherine Stafford Harris. Bell – Berti, F. and
 Raphael, L.J. (Eds.). (1999). AIP Press, New York. ISBN 1-56396-286-1.
 Readings in Clinical Spectrography of Speech. Baken, R.J. and Daniloff, R.G. (Eds.). (1991).
 California: Singular Publishing Group, Inc. ISBN 1-879105-04-7.
 Infant Communication: Cry and Early Speech. Murray, T. and Murray, J. (1980). Texas:
 College Hill Press. ISBN 0-933014-62-7.

SH 103: CLINICAL LINGUISTICS (75 hrs.)

1) Fundamentals of Linguistics for clinicians: (12 hrs.)

a) Terminologies and concepts of linguistics: Linguistic dichotomies – selection and combination – competence and performance – Language and Parol etc.

b) Semantic relationships: associations, fields and features – categories, complexes and retrieval

c) Pragmatics: Theoretical issues – Deixis and anaphora –
 Definiteness – Discourse (focus on understanding normal and disordered language)

2) Psycholinguistics and language acquisition - Issues involved in (12 hrs.) language acquisition
 - Motherese - Second language acquisition - Language acquisition in bi & multi - lingual
 environments.

3) Language and Thought. Their relationship and dependency in (5 hrs.) language acquisition.

4) Neurolinguistics – Language and the brain – Localization – Left brain – (15 hrs.) right brain
 differences – Coding and decoding – Neuroanatomical and
 Neurophysiological bases of language learning and dysfunction – Linguistic and Psycho-
 neurological models of language pathology.

5) Scope of clinical linguistics –

a) Linguistics and assessment of speech language impairment (12 hrs.)

Speech production - Speech perception - Phonology – Syntactic assessment – Semantics -
 Pragmatics - Prosody - Determining
 speech intelligibility using segmental, phonological, prosodic and
 electropalatography studies - Linguistic profiling for language
 impairments.

b) Application of linguistics to the study of speech-language (12 hrs.)
 impairments - Acquired aphasia - stuttering - developmental
 language disorders - developmental speech disorders and
 acquired neurogenic disorders.

c) Application of psycholinguistics to intervention. (5 hrs)
 Theoretical issues and clinical applications.

6) Review of current literature and research designs in clinical linguistics (2 hrs.)

LIST OF BOOKS

CLINICAL LINGUISTICS

Essential:

Linguistics in Clinical Practice. Grundy, K. (2Ed.). (1995). Whurr Publishers. ISBN 1-897635-52-4.

Advances in Applied Psycholinguistics Vol.1 and 2. Disorders of First Language Development and Reading, Writing and Language learning. Rosen berg, S. (Ed.). (1987). Cambridge University Press. ISBN 0-521-31732 – 0 V.1: Paper Back, ISBN 0-521-31733-9 V.2: Paper Back.

Theoretical Linguistics and Disordered Language. Ball, M.J. (Ed.). (1988). London: Croom Helm. ISBN 0-7099-5012-8.

Pragmatics of Language. Clinical Practice Issues. (Ed.). Gallagher, T.M. (1991). Singular Publishing Group, Inc. ISBN 1-879105-10-1.

Case Studies in Clinical Linguistics. (Ed.). Perkins, M. and Howard, S. (1995). UK: Whurr Publication. ISBN 1-897635-75-3.

Linguistics and Aphasia: Psycholinguistic and Pragmatic Aspects of Intervention. Lesser R. and Milroy L. (1993). Longmann. ISBN 0-582-02221-5

The clinician's guide to linguistic profiling of language impairment. Ball, M.J. (1992). Great Britain: Far Communication Ltd. ISBN 0-9514728-8-7.

Additional:

1) Child Language and Developmental Dysphasia – Clahsen, H. Studies in Speech Pathology and Clinical Linguistics. (1988). Amsterdam: John Benjamins Publishing Co. ISBN 90-272-4332-8.

2) First and Second Language Phonology. Yavas M. (Ed.). (1994). San Diego: Singular Publishing Group. ISBN 1-56593-167-X.

SH 104 AUDITORY PHYSIOLOGY (75 hrs)

1) EXTERNAL EAR - ANATOMY and PHYSIOLOGY (6 hrs)

Phylogeny and ontogeny of development. Role of pinna and external auditory meatus, Resonance and diffraction properties.

2) MIDDLE EAR-ANATOMY & PHYSIOLOGY (10 hrs)

Phylogeny and ontogeny of development. Middle ear impedance matching transformer action, Acoustic and non-acoustic reflex pathways, Eustachian tube function.

3) COCHLEA - ANATOMY & PHYSIOLOGY (10 hrs)

Phylogeny and ontogeny of development. Macro & Micro-anatomy including cochlear fluids, blood supply, innervation.

Cochlear mechanics - basilar membrane mechanics - Historical and current status, Cochlear electrophysiology, Cochlear potentials-their generation and properties, Cochlear transduction, Otoacoustic emission, Other recent advances.

4) AUDITORY NERVE - ANATOMY & PHYSIOLOGY (10 hrs)

Structure and tonotopic organization. Physiology: Neurotransmitters in the auditory system: type of synapses, NeurotransmittersVsNeuro-modulators, properties and functions of neurotransmitters. Afferent & efferent neurotransmitters.

Electrophysiology - Action potential generation, properties, Stimulus coding in auditory nerve. Frequency, intensity and temporal coding, Single nerve and compound tuning curves.

5) THEORIES OF HEARING (8 hrs)

Critical Evaluation

6) CENTRAL AUDITORY PATHWAYS &PHYSIOLOGY (8 hrs)

Afferent (Ascending) pathway and anatomy and tonotopic organization in central auditory system.

Neuro-physiology of the central auditory pathway, stimulus coding at various levels in the CANS.

7) AUDITORY CORTEX - ANATOMY & PHYSIOLOGY (8 hrs)

Anatomy and tonotopic organization of the primary and secondary auditory area. Neuro-physiology of auditory area.

8) EFFERENT PATHWAYS - ANATOMY & PHYSIOLOGY (7 hrs)

Function of efferent Pathways. Effect on cochlear physiology and auditory nerve and C.N. Perception of auditory stimulus, protective function.

9) VESTIBULAR SYSTEM - ANATOMY & PHYSIOLOGY (8 hrs)

- Afferent vestibular pathways

- Physiology of human balance functions

LIST OF BOOKS

AUDITORY PHYSIOLOGY

Sahley, T.L., Nodas, R. H. and Musiek, F.E. (1997). Efferent Auditory System: Structure and Function. San Diego: Singular Publishing Group, Inc.

Berlin, C. (Ed). (1984). Hearing Science, San Diego, California: College Hill Press.

Berlin, C. (Ed). (1996). Hair cells and Hearing Aids. London: Singular Publishing Group

Dallos, P. (1973). Auditory Periphery: Biophysics and Physiology. New York: Academic Press rd

Durrant, J. D. and Lovrinic, J. H. (1995). Bases of Hearing Science, 3 ed., Baltimore: Williams and Wilkins.

Evans, E.F. and Wilson, J.P. (1977). Psychophysics and Physiology of Hearing, London: Academic Press.nd

- Gelfand, S.A. (1990). Hearing: An Introduction to Psychological Acoustic 2 Ed. New York: Marcel Dekker.
- Gullick, W.L. (1971). Hearing Physiology and Psychophysics. New York: Oxford University Press.Nd
- Moore, B.C.J. (1982). An Introduction to Psychology of Hearing, 2 Ed. London: Academic Press.
- Moore, B. C. J. (Ed). (1995). Hearing.San Diego, California; Academic Press.
- Pickles, J. D. (1992).An introduction to Physiology of Hearing. New York: Academic Press.
- Tobias J. V. (Ed). (1970). Foundation of Modern Auditory Theory, Vol. I. New York: Academic Press.
- Tobias, J. V. (Ed.). (1972). Foundations of Modern Auditory Theory, Vol. II. New York: Academic Press.nd 14. Yost, W.A. and Nilesen, D.W. (1985).Fundamentals of Hearing.2 Ed. New York: C.B.S. College Publishing.
- Gullick, W.L., Gescheider, G.A. and Frisina, R.A. (1989). Hearing: Physiological Acoustics, Neural Coding and Psycho-acoustics. New York: Oxford Univ. Press.
- John, F. and Santos, S. (Eds.). (1989). Physiology of the Ear. New York: Academic Press.
- Yost A.W. (1994). Fundamentals of Hearing. California: Academic Press Inc.
- Aitkin, L. (1990). Auditory Cortex: Structural and Functional Basis of Auditory perception. London: Chapman & Hall.
- Keidel, W.D. and Neff, W.D. (Eds).(1975). Auditory System. Handbook of Sensory Physiology.Vol. 1 & 2. New York: Springer Verlag.
- Kahane.J.C. and Folkins. J. G. (1984). Atlas of Speech and Hearing Anatomy. Ohio: Charles Merrill Publishers.
- Moller.A.R. (1983).Auditory Physiology. New York: Academic Press.
- Musiek.F.E. and Hoffman.D.W. (1990). An introduction into the functional neurochemistry of the auditory system. Ear and Hearing, 11 (6). 395 - 402.
- Musie k F. E. (1986).Neuroanatomy, Neuro physiology and Central Auditory assessment. Part I. Brain stem.Ear and Hearing.7. 202 - 219.
- Museik F. (1986). Neuroanatomy, Neuro physiology and Central Auditory Assessment. Part II. The Cerebrum.Ear and Hearing .7. 349 - 358.
- Museik F. (1986). Neuro anatomy, neuro physiology and Central Auditory Assessment. Part III. Corpus Collosum and Efferent Pathways. Ear and Hearing. 7. 349 - 358.
- Zemlin W.R. (1988). Speech and Hearing Sciences.Anatomy and Physiology. New Jersey: Prentice Hall.
- Altschuler, R.A. and Hoffman, D.W. (1986).Neurobiology of Hearing- The Cochlea. New York: Academic Press.
- Busser, P., Imbert M. and Kay, R.H. (1992). Audition. Cambridge: MIT Press.

SH 105 PSYCHOPHYSICS OF AUDITION (75 hrs)

1) PSYCHOACOUSTICS – REVIEW: (3 hrs)

Psychophysical Methods – Classical and Adaptive psychophysical methods.

2) THEORY OF SIGNAL DETECTION: (8 hrs)

Basic concepts - application of signal detection theory/neural Networks and ROC.

3) LOUDNESS: (10 hrs)

Absolute Threshold of Hearing. MAP & MAF in air and water.

Loudness level, Loudness scaling - ordinal (Phon) and ratio (Sone), Need, applications. Psychophysical power laws :- Fechner's Law, Steven's Power Law and their derivation. Effect of time, frequency and bandwidth. Role of cochlea, auditory nerve & CNS. Role of acoustic reflex. Temporal integration. Loudness of complex sounds/tones. Loudness growth. Parameters of loudness, recruitment in normal ears, relationship between loudness and pitch.

4) PITCH: (8 hrs)

Factors affecting pitch perception (intensity, frequency, duration), Pitch scales (ordinal and ratio) Equal pitch contours. Pitch of complex tones. Pitch of missing fundamental and periodicity pitch. Theories of pitch perception. Abnormalities in pitch perception. JND for frequency. Effects of phase on the pitch of complex sounds. Ohm's acoustical law, beats, aural harmonics and combination tones.

5) DIFFERENTIAL SENSITIVITY FOR FREQUENCY AND INTENSITY (8 hrs)

Absolute and Relative differential sensitivities, Methods for measuring differential sensitivity, Weber's Law, Clinical applications.

6) MASKING AND CRITICAL BAND CONCEPT: (8 hrs)

Masking -types, psychophysical tuning curves. Critical band concept. Critical Band Vs Critical ratio. Methods of measurement of critical band. Concept of auditory filters, frequency resolution, masking and excitation pattern, central and non-simultaneous masking, two-tone suppression.

7) PERCEPTION OF QUALITY/TIMBRE (8 hrs)

Factors affecting perception of timbre. Helmholtz's theory of quality,

8) ADAPTATION:(8 hrs)

Definition, Adaptation Vs Fatigue, Methods of studying adaptation, Stimulus parameters affecting adaptation, Neuro-physiological process in adaptation.

Fatigue: Definition, NITTS, TLS, (Temporary Loudness shift) PTS.

9) TEMPORAL PERCEPTION:(4 hrs)

Temporal aspects of hearing, Temporal integration in sensitivity and loudness. Effect on Pitch and DL, Time-intensity trade, gap detection, Temporal DL

10) BINAURAL HEARING :(10 hrs)

Sensitivity (absolute and differential), loudness & pitch. Temporal dimension in binaural hearing. Binaural phenomenon - beats, rotating tones, time separation pitch. Time-intensity trade, Masking level difference. Localization vs Lateralization, Factors affecting localization, Neuro-physiological process. Clinical application of localization. Binaural phenomenon, Binaural fusion of pulsed stimuli, stereophonic effect, JND for dichotic phase.

LIST OF BOOKS

PSYCHOPHYSICS OF AUDITION

Stevens, S.S. and Warshofsky, F. (1971). Sound and Hearing. Netherlands: Time Inc.

Dallos, P.(1973). Auditory Periphery: Biophysics and Physiology. New York: Academic Press

Davis, H. and Silverman S.R. (Eds.).(1978). Hearing and Deafness. 4 Ed. New York: Holt, Rinehart and Winston.

- Evans, E.F. and Wilson, J.P. (1977). *Psychophysics and Physiology of Hearing*. London: Academic Press.
- Gelfand, S.A. (1990). *Hearing: An Introduction to Psychological Acoustic*. (2 Eds.). New York: Marcel Dekker.
- Gullick, W.L. (1971). *Hearing Physiology and Psychophysics*. New York: Oxford University Press.
- Yost, W.A. and Neilsen, D.W. (1985). *Fundamentals of Hearing*. 2 Ed. New York: C.B.S. College Publishing.
- Gullick, W.L., Gescheider, G.A. and Frisina, R.A. (1989). *Hearing: Physiological Acoustics, Neural Coding and Psychoacoustics*. Oxford Univ. Press.
- Speaks, C.E. (1996). *Introduction to Sound: Acoustics for the Hearing and Speech Sciences*. San Diego: Singular Publishing Group Inc.
- Yost A.W. (1994). *Fundamentals of Hearing*. California: Academic Press Inc.
- Stuart, R and Howell, D. (1991). *Signal and Systems for Speech and Hearing*. California: Academic Press Inc.
- Warren, R.M. (1999). *Auditory Perception - A New Analysis and Synthesis*. U.K.: Cambridge University Press.
- Little, J.S. (1965). *Physics of the Ear*. Oxford: Pergamon Press.
- Busser, P., Imbert, M. and Kay, R.H. (1992). *Audition*. Cambridge: MIT press.

SH 106: PERSPECTIVES IN DISORDERS OF FLUENCY AND VOICE (75 hrs.)

A) FLUENCY DISORDERS (37 hrs.)

- 1) Neurophysiological and neuropsychological bases of normal fluency. (2 hrs)
- 2) Neurophysiological bases for the formation of developmental (4 hrs.) stuttering. Neuropsychological bases for stuttering behaviours
- 3) Different perspectives of stuttering. (15 hrs.)
Linguistic aspects of stuttering. Auditory processing in stutterers. Auditory feed back and stuttering. Motor processes in stuttering. Laryngeal behaviour in stutterers (VOT, VRT, VTT, STT, Laryngeal muscle activity). Perspectives on stuttering as a motor speech disorder. Articulatory dynamics of stutterers. CNS characteristics in stuttering. Stuttering as a prosodic disorder. Stuttering as temporal processing disorder. Respiratory function in stutterers. Stuttering and anxiety.
- 4) Theoretical issues in measurement of stuttering. (3 hrs.)
Treatment outcomes in stuttering – Relapse, Prognosis and maintenance. The nature of recovery
Prevention of stuttering.
- 5) Recent advances in management of stuttering. (6 hrs.)
Group therapy. PsychoTherapy. Drug Therapy. Behavior Therapy.
- 6) Neurogenic Stuttering (3 hrs.)
- 7) Cluttering – Etiology, relationship between cluttering and stuttering. (2 hrs.)
Treatment of cluttering.
- 8) Review of current literature and research designs in fluency disorders. (2 hrs.)

LIST OF BOOKS

FLUENCY DISORDERS

Nature and Treatment of Stuttering: New Directions. (1985). Curlee, R.F. and Perkins, W.H. California: College – Hill Press, Inc. ISBN 0-85066-566-3.

The Neuropsychology of Developmental Stuttering. (1994). Hartman, B.T. London: Whurr Publishers Ltd. ISBN 1-897635-46-x.

A Handbook of Stuttering.(1955). (5 Ed.).Bloodstein O. California: Singular Publishing Group, Inc. ISBN 1-56593-395-8.

Disorders of Fluency.(1989). (2 Ed.). Dalton P. and Hardcastle W.J. London: Whurr. ISBN 1-871381-07-x

Treatment Efficacy for Stuttering – A Search for Empirical Bases. (1998). Cordes, A.K. and Ingham, R.J. (Eds.). California: Singular Publishing Group. ISBN 1-56593-904-2.

Clinical Management of Motor Speech Disorders in Children. (1999). Caruso, A.J. and Strand, E.A. (Eds.). N.Y: Thieme. ISBN 0-86577-762-4.

Clinical Management of Stuttering in Older Children and Adults. (1999). Ham R.E. Maryland: Aspen Publishers, Inc. ISBN 0-8342-1117-3.

Producing Speech: Contemporary Issues.(1995). Bell-Berti, F. and Raphael, L.J. (Eds.). N.Y: AIP Press. ISBN 1-56396-286-1.

The Three Dimensions of Stuttering – Neurology, Behavior and Emotion. (2 Ed.). (1999). Logan, R. London: Whurr. ISBN 1-86156-073-7.

Behavioral Management of Stuttering. (1996). Onslow, M. SanDiego: Singular Publishing Group, Inc. ISBN 1-56593-633-7.

B) VOICE DISORDERS (38 hrs.)

1) Neuroanatomy and Neurophysiology of larynx. (3 hrs.)

2) Brief review of voice disorders in children and adults. Classification.(8 hrs.)

Perceptual, acoustic, aerodynamic and physiological characteristics of pathological voices. (emphasis on voice of transsexual, aging and voice, endocrine disorders, tracheostomized speakers, etc.).

Differential diagnosis of voice disorders.

3) Recent advances in measurement of voice and vocal fold function. (7 hrs.)

Introduction to clinical measurement of voice.EGG, Laryngeal electromyography, Videoscropy, imaging and other techniques.

Measurement of resonance.History-taking, and perceptual assessment in voice evaluation.

4) Recent advances in voice therapy including instrumentation, (6 hrs.)

introduction to phonosurgical techniques. Treatment outcome in voice disorders.

5) Professional voice users – Assessment and management. (8 hrs.)

Improving the professional voice.

6) Analyzing and comparing different types of alaryngeal speech. (4 hr.)

Intermediate and advanced stages of teaching alaryngeal speech.

7) Review of current literature and research designs in voice disorders. (2 hrs.)

8) Need for psychological approaches to treatment – psychotherapy – definition – types – general principles – applications in disorders of speech and hearing

VOICE DISORDERS

- 1) Vocal Fold Physiology – Frontiers in Basic Science. (1993). Titze, I.R. (Ed.). San Diego: Singular Publishing Group, Inc. ISBN 1-879105-86-1.
Principles of Voice Production. (1994). Titze, I.R. NJ: Prentice Hall, Inc. ISBN 0-13-717893x.
Neurolaryngology: Recent Advances. (1991). Hirano, M; Kirchner, J.A. and Bless, D.M. (Eds.). California: Singular Publishing Group, Inc. ISBN 1-879105-19-5
- 4) Diagnosis and Treatment of Voice Disorders. (1995). Rubin, J.S; Sataloff, R.T.; Korovin, G.S. and Gould, W.J. NY: IGAKU-SHOIN Medical Publishers, Inc. ISBN 0-89640-276-2
Medical Speech-Language Pathology – A Practitioner’s Guide. (1998). Johnson, A.F. and Jacobson, B.H. NY: Thieme. ISBN 0-86577-688-1
- 6) Clinical Measurement of Speech and Voice. (1996). Baken, R.J. California: Singular Publishing Group, Inc. ISBN 1-56593-809-7
- 7) Professional Voice – The Science and Art of Clinical Care. (1991). Sataloff, R.T. NY: Raven Press. ISBN 0-88167-737-X.
Clinical Manual for Laryngectomy and Head and Neck Cancer Rehabilitation. (1993). Casper, J.K. and Colton, R.H. California: Singular Publishing Group, Inc. ISBN : 1-879105-61-6

PSYCHOTHERAPY

Psychotic Disorders in Children and Adolescents – Robert L. Findling S. Charles Schulz, Javad H. Kashani, Elena Harlan. Volume 44 – Developmental Clinical Psychology and Psychiatry. 2001 SAGE Publication, Inc. Thousand Oaks, London, New Delhi.
Introduction to Counselling and Psychotherapy. Edited by Stephen Palmer. 2000 First Publication, SAGE Publications, London, Thousand Oaks, New Delhi.

SH 107 SPEECH & LANGUAGE PROCESSING (75 hours)

1. Phonetic perception

Perception of vowels - formants, F0, band width, duration, factors affecting vowel perception, static and dynamic cues, effect of co articulation. Consonant perception, cues for different consonants, static and dynamic cues, factors affecting consonant perception, effect of co articulation. (15 hrs)

2. Spoken word recognition- 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 modal priming Issues (15 hrs)

3. Stages and word recognition -lexical concept, lexical access, phonological encoding, production. The input to the lexicon-lexical access from spectra, constraints of temporal structure- Cohort models, interactive models of spoken word recognition –Logogen model lexical and phonetic processing-phonetic characterization task, phoneme restoration studies, phoneme monitoring task, sentence and word processing, Neighbourhood activation model. (15 hrs)

4. Visual word recognition - models and theories; word and non-word naming, acquired dyslexia and role of phonology in word recognition. Sentence comprehension and processing of components of language – parallel and serial models of processing, modularity and information

sources, accounts of parsing, parsing issues, ambiguity in parsing, strategies for disambiguation. Reference and anaphora. Discourse comprehension and expression. (15 hrs)

5. Sentence processing – basic capacities for perceiving phonetic contrasts - native

Language contrasts, foreign language contrasts, coping with variability in speech signal.

- Role of memory and attention
- Prosodic organization in native language
- Related developments in speech perception
- Processing of phonological, morphological, syntactic, semantic and pragmatic aspects of language.

LIST OF BOOKS

SPEECH & LANGUAGE PROCESSING

Arbib, M.A. Caplan, D., & Marshall, J.C., (Ed) (1982). Neural Models of Language Processes, Academic Press, New York.

Durrand, and Laks, B., (Ed) (1999). Phonetics, Phonology and Cognition. Oxford University Press, US.

Hardcastle, W.J., & Laver, J., (Ed) (1999). The Handbook of Phonetic Sciences. Blackwell Publishers, Oxford.

Kroeger, R.P. (2004). Analyzing Syntax. Cambridge University Press, UK.

O' Shaughnessy, D., (2 Edition) (2001). Speech Communication, Human and Machine. New Universities Press, India.

Saeed, I.J. (1997). Semantics. Blackwell Publishers, Massachusetts.

CLINICAL PRACTICUM IN SPEECH LANGUAGE PATHOLOGY

Objectives:

At the end of the year the student will be able to:

- 1) Acquire skills to put the theoretical concepts into practical application.
- 2) Develop proficiency in administering special tests.
- 3) Develop proficiency in independently carrying out a case study.
- 4) Develop skills to envisage a project in a particular sphere of activity.
- 5) To develop skills in documentation.

Clinical Practicum Work:

- 1) To independently carry out assessment for various communication disorders.
- 2) To independently carry out intervention program effectively.
- 3) To develop skills in documenting diagnostic and intervention information.
- 4) To develop proficiency in instrumental assessment and interpretation.
- 5) To plan and execute a program for clinical use / public education in a particular Sphere including appropriate material.
- 6) To present a comprehensive case study utilizing relevant theoretical concepts.

CLINICAL PRACTICUM IN AUDIOLOGY

1. Calibration of audiometer. Rise-decay time. Measurement, distortion measurement, Calibration of warble tone.
2. Preparation of case reports.
3. Knows to - select appropriate diagnostic test,
 - administer ABR Independently,
 - interpret test profile,
 - design simple experiments with the help of supervisor.
4. Independently carryout hearing aid evaluation using functional gain measures including (1) Selection and administration of appropriate test procedures (2) select hearing aids (3) make appropriate recommendations.
5. Measuring electro- acoustic characteristics of hearing aid as per the established standards for:
 - Body level hearing aids
 - Ear level (behind the ear) hearing aid
 - Hearing aids with AVC Circuit
6. Preparation of speech reading lessons and activities for auditory training
7. Necessary instrumentation for recording calibration tone, tape recording with noise.

SECOND YEAR POST GRADUATE COURSE

SH 201: ADVANCES IN LANGUAGE ACQUISITION AND CHILDHOOD (75 hrs.) LANGUAGE DISORDERS

- 1) Critical review of current theories of language acquisition and its applications to assessment and intervention.(6 hrs)
- 2) Overview of neuroanatomical, neurophysiological and neurochemical correlates of language acquisition.(4 hrs)
- 3) Models of language processing (Lichtheim's model, Logogen model, and Microgenetic model) (5 hrs)
- 4) Overview of: (15 hrs.)
 - a) Word recognition and production - Spoken, Visual.
 - b) Sentence Comprehension and production.
 - c) Processing of phonological, morphological, syntactic, semantic and pragmatic aspects of language
 - d) Information processing skills.
- 5) Memory in communication and communication disorders. Short term memory, working memory, and their importance in language processing. Serial and long-term

memory. Visuospatial perception, motion perception. Attention – Types of attention, Development of attention. (10 hrs.)

6) Language development in exceptional circumstances: extreme deprivation, bilingual language exposure, twins, visual handicap, Williams syndrome (disassociation between language and cognitive functions), Hearing loss, Dyspraxia, Learning disabilities, Dysphasia, Acquired childhood aphasia. (10 hrs.)

7) Contemporary concepts and issues in Autism, SLI and LLD. (6 hrs.)

8) Cross-cultural considerations in assessment and management of developmental language disorders. (4 hrs)

9) Specific assessment and intervention approaches for various developmental language disorders. (10 hrs)

10) Reading, Spelling and Writing Disorders. Neurobiology of reading and writing. Phonological Awareness and Reading. Evaluation. Treatment approaches. (5 hrs.)

11) Counseling – meaning, scope – principles of counseling – types of counseling – individual, group and family, parental, vocational, educational, rehabilitative – behavioral counseling in the context of speech, language disorders.

12) Special psychotherapies – play therapy, group therapy, family therapy, psychodrama – intensive psychotherapy, brief psychotherapy to children with speech and language disorders.

LIST OF BOOKS

ADVANCES IN LANGUAGE ACQUISITION AND CHILDHOOD LANGUAGE DISORDERS

Intervention Planning for Children with Communication Disorders – A Guide for Clinical Practicum and Professional Practice (1994) Prentice – Hall, Inc. New Jersey. ISBN 0-13-138421-X.

Cross Cultural Perspectives in Language Assessment and Intervention. Topics in Language Disorders Series. Butler, K.G. (1994). U.S.A.: Aspen Publication. ISBN 0-8342-0594-7, Series 0-8342-0590-4.

Differential Diagnosis in Speech-Language Pathology – Philips, B.J. and Scello, D. (1998). Butterworth – Heinemann, ISBN 0-7506-9675-3.

Language Development in Exceptional Circumstances. Bishop, D & Mogford, K. (Eds.) (1993). U.K.: Erlbaum Associates Ltd., Publishers. ISBN 0-86377-308-7.

Language Disorders : A Functional Approach to Assessment and Intervention. Owens, R.E. (Jr.). (1991). U.S.A.: Macmillan Publishing Company. ISBN. 0-675-20773-8
Developmental Disorders of Language. (2 Ed.). Adams, C., Brown, B. and Edwards, M. (1999). London: Whurr Publishers Ltd. ISBN 1-86156-020-6.

Children with Specific Language Impairment. Leonard, L.B. (1998). MA: MIT Press. ISBN 0-262-12206-5.

An Integrative Approach to Language Disorders in Children. Carrow – Wool Folk, E. & Lynch, J.I. (1982). USA: Grune and Stratton, Inc. ISBN 0-8089-1406-5
0-8089-1713-7 (pbk).

Memory and Language Impairment in Children and Adults. New Perspectives. Gillam, R.B. (1998). U.S.A.: Aspen Publishers, Inc. ISBN 0-8342-1213-7.

Developmental Cognitive Neuropsychology. Temple. C. (1997). U.K.: Psychology Press. ISBN 0-86377-401-6 (pbk)

Medical Speech Language Pathology. Johnson. A.F. and Jacobson B.H. (1998). New York: Thieme. TNY ISBN 0-86577-688-1, GTV ISBN 3-13-110531-3.
 Evaluating Theories of Language - Evidence from disordered communication. Dodd.B., Campbell. R. and Worrall. L. (Eds.). (1996). London: WhurrPublishers.nd
 Speech, Language and Communication. Handbook of Perception and Cognition(2 Ed.). Miller,J.L. and Eimas, P.D (Eds.). (1995). California: Academic Press, Inc. ISBN 0-12-497770-7.

COUNSELING

Testing and Assessment in Counselling Practice, 2 Edition – Edited by – C. Edward Watkins, JR., Vieki L. Campbell. 2000 by Lawrence Erlbaum Associates, Publishers Mahwah, New Jersey, London.

Counselling People with Communication Problems – Peggy Dalton – 1994 – SAGE Publications, London, Thousand Oaks, New Delhi.

Introduction to Counselling and Psychotherapy. Edited by Stephen Palmer. 2000 First Publication, SAGE Publications, London, Thousand Oaks, New Delhi.

Introduction to Counselling Skills – Richard Nelson – Jones – 2000 SAGE Publications Ltd., London, Thousand Oaks, New Delhi.

SH202: SPEECH PERCEPTION (75 hrs)

- 1) Introduction to speech perception, Acoustics of speech in relation to production. Coding of speech in the auditory pathway.(5 hrs)
- 2) Theories of speech perception: Acoustic theory, Neurological theories, motor theory, Analysis by Synthesis, Quantum theory.(8 hrs)
- 3) Methods used to study speech perception: Analysis by Synthesis, Parametric Synthesis, Articulatory synthesis.(8 hrs)
- 4) A) Perception of vowels and consonants in infants and adults
 B) Effects of co-articulation on speech perception(6 hrs)
- 5) Perception of speech through the visual and tactile modes and through cochlear implants(6 hrs)
- 6) Dichotic listening: Definition, theories, factors affecting, application to speech and hearing(6 hrs)
- 7) Short term memory and speech perception. Stages of memory, Theories of short-term memory, perception of consonant and vowels, in short term memory.(8 hrs)
- 8) Speech intelligibility (8 hrs)
 - a) Methods of predicting and measuring speech intelligibility
 - b) Factors influencing speech intelligibility
 - c) Application to speech and hearing
- 9) Perception of speech in the hard of hearing - Vowels, consonants, (6 hrs)
 Coarticulation, supra- segmentals. Perception of speech through visual and tactile modality, through cochlear implants. Speech perception in adverse listening conditions - comparison of normal Vs hearing impaired

10) Information processing skills (6 hrs)

- a) Sequential processing skills
- b) Simultaneous processing skills

11) a) Word recognition - spoken - visual (8 hrs)

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

LIST OF BOOKS

SPEECH PERCEPTION

- Keller, E. (1994). Fundamentals of Speech Synthesis and Speech Recognition-Basic Concepts, State of the Art and Future Challenges. New York: John Wiley and Sons.
- Kuhl, P.K. (1980). Infant Speech Perception: Reviewing Data on Auditory Category Formation. In P.L. Levinson and C. Sloan (Eds). Auditory Processing and Language- Clinical and Research Perspectives. New York: Grune & Stratton.
- Kuhl, P.K. (1979). The perception of speech in early infancy. In N. Lass (Ed). Speech and language Advances in basic research and practice. Vol. I. New York: Academic Press.
- Kuhl, P.K. (1982). Perceptual constancy of speech-sound categories. In G.H. Yeni-Konoshian, J.F. Kavanaugh and C. Ferguson (Eds.) Child Phonology, Vol. 2, Perception, New York: Academic Press.
- 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, Philadelphia: W.B. Saunders Company.
- Lass, N.L. (Ed). (1976). Contemporary issues in experimental phonetics. New York. Academic Press
- Lehiste, I. (1972). The units of speech perception. In J.H. Gilbert (Ed). Speech and cortical functioning. New York: Academic Press
- Lieberman and Mattingly (1985). Motor theory revised. Haskins laboratory report.
- Lingard, R. (1985). Electronics synthesis of speech. Cambridge: Cambridge University Press.
- Ainsworth, W.A. (1976). Mechanisms of speech recognition. International series in natural philosophy. Vol. 85, Oxford: Pergamon press.
- Borden, G.J. and Harris K.S. (1980). Speech Science Primer: Physiology, Acoustics and Perception of Speech. London: Williams and Wilkins. Cohen, A and Nooteboom, S. G. (Eds). (1975). Structure and process in speech perception. New York: Springer - Verlag
- Cole R.A. (1977). Invariant feature and feature detectors: Some developmental implications. In S.J. Segalowitz and F.A. Gruber (Eds.) Language development and neurological theory. New York: Academic Press.
- Eimas, P. and Miller, J.L. (Eds). (1981). Perspectives on the study of speech. New Jersey: Lawrence Erlbaum Associates.
- Fant, G., and Tatham, M.A. (Eds). (1975). Auditory analysis and perception of speech. New

York: Academic Press.

Fry, D.B. (1979). *Physics of speech*. Cambridge: Cambridge University Press.

Keller, E. (1994). *Fundamentals of speech synthesis and speech recognition Basic concepts, state of the art and future challenges*. New York: John Wiley & Sons.

Miller, J.L. and Eimas.P.D. (1995). (Eds). *Speech, language and communication*. New York: Academic Press.

Nakagawa S., Shikano K. and Tohdura.Y. (1995).*Speech, hearing and neural network models*.Ohmsha IOS Press, Amsterdam.

Nygaards L.C. and Pisoni D.B. (1995). *Speech perception: New directions in research and theory*. In. J.L. Miller & P.D. Eimas (Eds.) *Speech language and communication*. San Diego: Academic Press.

Pickett. J. M. (1980). *The sounds of speech communication: A primer of acoustic phonetics and speech perception*. Boston: Allyn and Bacon Press.

Mody M., Studdert Kennedy, M., and Brady S., (1994 - 95). *Speech perception deficits in poor readers: Auditory processing or phonological coding*. Haskins Laboratories Status Report on Speech Research, SR - 119/120, 1-24

Saito S. (1992). (Ed). *Speech science and technology*. Tokyo: Oshmsa Ltd. Sanders D.A. (1977). *Auditory perception of speech - An introduction to principle and problems*. New Jersey: Prentice Hall.

Stevens. K.N. and Blumstein, S.E. (1981). *The search for invariant acoustic correlates of phonetic features*. In P. Eim as and J.L. Miller. (Eds). *Perspectives on the study of speech*. New Jersey: Lawrence Erlbaum Associates.

Tohkura, Y., Vatikiotis-Bateson, E. and Sagisaka, Y. (1992).*Speech perception, production and linguistic structure*. Tokyo: Ohmsha, IOS Press.

Wathen-Dunn, W. (Ed).(1967). *Models for the perception of speech and visual form*. Proceedings of a symposium Cambridge: The MIT Press.

Pavlovic, C.V. (1987). *Derivation of primary parameters and procedures for use in speech intelligibility prediction*. JASA, 82, 413-422.

Pickett, J.M. and E.M. Danaher. (1975). *On discrimination of formant transitions by persons with severe sensorineural hearing loss*. In G. Fant and M.A. Tatham (Eds.). *Auditory analysis and perception of speech*. New York. Academic Press.

Pickett, J.M. Ravoile S.G.(1979). *Feature discrimination by persons with sensorineural hearing impairment*. In B. Lindblom& S. Ohman (Eds.) *Fronties of speech communication research*.

Warren, R.M. (1999). *Auditory perception-A new analysis and synthesis*. UK: Cambridge University Press.

Anisworth, W. A. (1990). *Advances in speech, hearing and language processing Vol. I*. London: Jai Press Ltd.,

Cox.R.M. and McDaniel, D.M. (1989). *Development of Speech intelligibility rating test for hearing aid comparisons*. JSJR, 32, 347-352.

Flanagan J. L., (1972).*Speech analysis, synthesis and perception*. 2Ed. New York: Springer-Verlag.Denes, P. and Pinson, E. (1964).*Speech chain*.Beltone Lab.

Durant, J.D. and Lovrinic, J. H. (1977).*Bases of hearing science*. Baltimore, William & Wilkins.

SH203: CLINICAL PHONOLOGY AND NEUROMOTOR SPEECH DISORDERS

(75 hrs.)

A) CLINICAL PHONOLOGY

- 1) An overview of clinical phonology. From articulation to clinical phonology. Medical and Linguistic models. (2 hrs.)
- 2) Critical overview of current theories of phonology. (3 hrs.)
- 3) Phonological Awareness: Linking speech and literacy problems. (4 hrs.)
- 4) Disorders of phonology in different clinical populations. (6 hrs.)
- 5) Overview and recent developments in evaluation of phonology. (7hrs.)
- 6) Treatment Practices (6 hrs.)

a Traditional and Phonological Intervention.

b Motor Vs Cognitive learning.

c Procedures based on minimal pairs.

d Procedures based on Imagery.

- 7) Current literature and research designs in clinical phonology. (2 hrs.)

B) NEUROMOTOR SPEECH DISORDERS

- 1) Neurophysiology and functional development of motor control. (3 hrs.)
- 2) Assessment Procedures. Perceptual, Acoustic, and aerodynamic analysis. Formal and Informal tests. (Structural, oro-sensory examination, non-speech, speech). Electromyography and speech imaging. (10 hrs.)
- 3) Review of different types of dysarthria and apraxia (8 hrs.)
- 4) Differential diagnosis of motor speech disorders: dysarthria, apraxia and secondary to hearing loss. (2 hrs.)
- 5) Prognostic issues and treatment procedures for the different types of dysarthrias. (5 hrs.)
- 6) Treatment of developmental dysarthria, apraxia and phonological disorders with motor speech involvement. (4 hrs.)
- 7) Future needs in treatment outcome and efficacy research in motor speech disorders (3 hrs.)
- 8) AAC: overview of AAC for motor speech disorders. (2 hrs.)
- 9) Current literature and research designs in neuromotor speech disorders. (2 hrs.)
- 10) Dysphagia. (4 hrs.)

1. Issues in pediatric feeding and swallowing.

2. Neurogenic swallowing disorders. Causes, symptoms and clinical types. Assessment. Intervention.

LIST OF BOOKS***CLINICAL PHONOLOGY AND NEUROMOTOR SPEECH DISORDERS*****Essential:**

- Perspectives in Applied Phonology. (1997). Hodson, B.W and Edwards, M.L. Maryland: An Aspen Publication. ISBN 0-8342-0881-4.
- Clinical Phonology. Assessment of Articulation Disorders in Children and Adults. (1996). Klein, E.S. California: Singular Publishing Group, Inc. ISBN 1-56593-602-7.
- Phonological Theory and the Misarticulating Child. ASHA Monographs. (1984). (Number 22 Ed.) Elbert, M., Dinnsen, D.A. and Weismer, G. ISBN 0066-071X. nd
- Phonological Disability in Children. (2 Ed.). Studies in Disorders of Communication. (1989) Ingram. Cole and Whurr Limited. ISBN 1-871381-05-3.
- Clinical Management of Motor Speech Disorders in Children. (1999). Caruso, F. J. and Strand, E. A. New York: Thieme. ISBN 86577 – 7624 (TNY). ISBN 3-13-111381-2 G.T.V.
- Motor Speech disorders - A Treatment guide. (1991). Dworkin, P.J. St. Louis: Mosby Year Book. Inc. ISBN 155664-223-7.
- Clinical Management of Neurogenic Communication Disorders. (1985). Johns, D.E. Boston: Allyn & Bacon.
- Motor Speech Disorders: Substrates, Differential diagnosis and Management. (1995). Duffy, J. R. St. Louis: Mosby.
- Neuromotor Speech Disorders – Nature, Assessment and Management. (1998). Cannito, M.P., Yorkston, K.M. and Beukelman, D.R.
- Evaluation and Treatment of swallowing Disorders. (1983). Logemann, J.
- Medical Speech-Language Pathology: A Practitioner's Guide. (1998). Johnson, A.F. and Jacobson, B.H. NY: Thieme. ISBN 0-86577-688-1.

Additional:

- Targetting Intelligible Speech. A Phonological approach to remediation. (1983) Hodson B.W. and Paden E.P. California: College Hill Press. ISBN 0-933014-28-7.
- Developmental Speech Disorders. Clinical Issues and Practical Implications. (Ed.). (1990). Grunwell, P. UK. ISBN: 0-443-03992-5.
- The Nature of Phonological Disability in Children. (1981). Grunwell P. London: Academic Press Inc. ISBN 0-12-305250-5.

SH 204: SEMINARS IN DIAGNOSTIC AUDIOLOGY

(75hrs)

- 1) Audiological Diagnostic Instruments : Procurement, installation, calibration and Maintenance. (6 hrs)
- 2) Hearing Screening: (6 hrs)
Definition, justification/need for screening types/techniques of Screening, Sensitivity, Specificity, Cost-benefit analysis, Screening procedures with regard to Indian context. Limitations and benefits of screening. Implications with regard to prevention of hearing loss.
Issues of abortion, genetic counseling, hearing conservation programs, public awareness programs. Community based prevention approaches. Efforts of WHO and Government of India
- 3) Audiological (Puretone, speech & immittance audiometry, Evoked potentials & OAE) and Histopathological findings in : (10 hrs)
 - i) External ear and middle ear diseases

- ii) Meniere's diseases
- iii) Acoustic neuroma
- iv) NIHL and Acoustic Trauma
- v) Ototoxicity
- vi) Presbycusis
- vii) Sudden hearing loss
- viii) Hearing loss of vascular origin
- ix) Hearing loss associated with systemic diseases
- x) Hereditary deafness - syndromes - advances in genetics
- xi) Auditory neuropathy

4) Non - Audiological tests in the diagnosis of auditory disorders: (8 hrs)

- i) Radiological techniques
- ii) ENG
- iii) CT Scan
- iv) Caloric Tests
- v) Other

5) Assessment of Auditory Disorders in Special Population : Such as deaf-blind, MR, Autism, cerebral palsy, Specific languagedisorders, attention deficient disorder, hyperacusis.(6 hrs)

6) Central Auditory Disorder; (8 hrs)

Theoretical basis, Classifications, conditions in which CAPD exist in adults and in children, behavioral tests, objective tests, co-relation of audiological with non audiological findings in CAPD, influences of linguistic variation in assessment.

7) Evaluation of patients with vestibular disorders : Harmful effects of vibration on balance mechanism.(6 hrs)

8) Tinnitus: Condition associated with tinnitus, types of tinnitus, tinnitus evaluation. (6 hrs)

9) Non-organic hearing loss. (8 hrs)

10) Comprehensive reporting of audiological findings. Audiologist as a witness in medico-legal cases.(3 hrs)

11) Audiological practice in rural areas, Pediatric set up, Otolaryngological setup, Neurological setup, Industrial setup, School setup. Audiologist as a Private Practitioner. Role and scope of Forensic Audiologist. Medico-legal aspects. Legislations related to the field of Audiology(8hrs)

LIST OF BOOKS

SEMINARS IN DIAGNOSTIC AUDIOLOGY

Alford, B.R. and Jerger, S. (Ed) (1993). Clinical Audiology: The Jerger Perspective. San Diego: Singular Publishing Group, Inc.

Biswas, A. (1995). Clinical audio-vestibulometry for otologists and neurologists. Bombay: Bhalani Publishing House.

Hall, J. W. and Mueller, H.G. (1997) Audiologists' Desk Reference Volume 1: Diagnostic Audiology Principles, Procedures and Protocols, San Diego: Singular Publishing Group.

- Hayes, D and Northern J.L. (1996). *Infants and Hearing*, San Diego: Singular Publishing Group
- Luxon, L.M. and Davis, R.A. (Eds.).(1997). *Handbook of vestibular rehabilitation*. San Diego:SingularPublishing Group, Inc.
- Mencher, G.T., Gerber, S.E. and McCombe, A. (1997).*Audiology and Auditory Dysfunction*.Boston:Allyn and Bacon.
- Mendel L.L. and Danhaurer, J.L. (1997).*Audiologic evaluation and management and speech perception assessment*. San Diego: Singular Publishing Group, Inc.
- Musiek, F. E., Baran, J. A. and Pinherio, M.L. (1994).*Neuroaudiology: Case studies*, San Diego: Singular Publishing Group.
- Roland, P.S., Marple, B.F. and Meyerhoff, W.L. (1997).*Hearing loss*. New York:Thieme.
- Ross R. J. (1996). *Roeser's Audiology Desk reference: A guide to the Practice of Audiology*. New York: Thieme
- Sataloff. R.T. and Sataloff, J. (1993) *Hearing Loss*. New York: Marcel Dekker.
- Soucek, S. and Michaels, L. (1990). *Hearing Loss in the Elderly: Audiometry, Electrophysiologic and Histopathologic aspects*. London: Springer-Verlang.
- Van De Water. T. R., Popper, A.N. and Fay. R.R. (Ed) (1996). *Clinical aspects of hearing*. New York:Springer.
- Hall. J. W. (1992). *Handbook of Auditory Evoked Responses*.Massachussetts.Allyn and Bacon.
- Ferraro. J. A. (1997). *Laboratory exercises in auditory evoked potentials*. San Diego: Singular Publishing Group, Inc.
- Hood, L.J. (1998). *Clinical applications of auditory brainstem response*. San Diego: Singular Publishing Group, Inc.
- Jacobson, J.T. (Ed). (1985). *Auditory Brainstem Response*. London: Taylor and Francis.
- McPherson, L.D. (1995). *Late potentials of the auditory system*, London: Singular Publishing Group.
- Katz J. (Eds.) (1994). *Handbook of clinical audiology*. Baltimore. Williams & Wilkins.
- Popelka G.R. (1981). *Hearing assessment with the acoustic reflex*. New York. Grune& Stratton.
- Robinette M. S. and Glatke T.J. (Eds.).(1997). *Otoacoustic emissions. Clinical applications*. New York :Thieme.
- Jerger, J. (1973). *Modern Developments in Audiology*. New York: Academic Press 45
- Katz, J. Stecker, N.A. and Henderson, D. (Eds.). (1992). *Central auditory processing: A transdisciplinary view*. St. Llouis. Mosby year book.
- Rintleman, W.F. (2000). *Hearing Assessment*.Boston :Allyn and Bacon
- Silm an, S. and Silverman, C.A. (1991). *Auditory diagnosis: Principles and Applications*. San Diego: Academic Press.
- Wiley, T.L. and Fowler, C.G. (1997). *Acoustic immittance measures in clinical audiology:A primer*. San Diego: Singular Publishing Group, Inc.
- Dunn, H.H., Dunn, D.R. and Harford, E.R. (1995). *Audiology Business and practice management*. San Diego: Singular Publishing Group, Inc.
- Katz, J. Stecker N. A. and Henderson, D (Eds). *Central auditory processing: A transdisciplinary view*. St. Louis: Mosby Year Book..nd
- Schow, L.R, and Nerbonne, A.M. (1989).*Perspectives in Audiology series*. 2 Ed. Boston: Allynand Bacon

SH 205 HEARING DEVICES (75 hrs)

1. Fundamentals of Digital Signal processing and communication system (15hrs)

a. Analogue and digital system

- i. Analogue signal and digital signals
- ii. Analogue to digital and digital to analogue converters
- iii. Need and advantages of digital systems and digital signal processing

b. Principles of digital signal processing

- i) Digital signal processor – how it works?
- ii) Basics of HR and FIR filters and their applications in speech and hearing

c. Fundamentals of communication systems

- i) AM transmission and reception and its application in speech and hearing
- ii) FM transmission and reception and its application in FM hearing aids
- iii) Digital modulation techniques such as delta modulation, PCM, PPM, PWM and
- iv) Their application in speech analysis
- v) Satellite communication and its application in tele-rehabilitation

2. Advances in technology of hearing aids (15 hrs)

a. Principles and working of

- i) Analog, programmable and DSP based hearing aids.
- ii) Technology of channel separation
- iii) Techniques of non linear amplification and their implementation in hearing aids.
- iv) Noise reduction using microphone technology

b. Evaluation of hearing aids

- i) Electro acoustic characteristics
- ii) National and international standards
- iii) Hearing aid evaluation systems and recent advances

3. a. Selection of special features in hearing aids with reference to specific clients(15 hrs)

b. Tinnitus maskers and their utility

c. ALDs

- i) Types: Auditory based, visual based and tactile based ALDs
- ii) Recent advances

4. a. Cochlear implant(15 hrs)

- i) Description, types designs and features
- ii) Surgical procedure and biological safety in brief
- iii) Speech processing strategies
- iv) Assessment strategies
- v) Post operative measurement – NRT.ESRT, EABR
- vi) Mapping
- vii) Outcomes

5. a . Middle ear implant, BAHA, Brainstem implant(15hrs)

- i) Description
- ii) Selection
- iii) Assessment
- iv) Management
- v) Outcomes.

LIST OF BOOKS

Hearing Devices

- Clark G.M; Cowan B.S; Dowel R. C1997. Cochlear Implantation for infants and children: Advances Singular Publishing group Inc
- Mueller H.G.; Hawkins D; Northern C.J 1992. Probe microphone measurements; Hearing aid selection and assessment Singular Publishing group Inc
- Hersh M.A; Johnson M.A. 2003 - Assistive technology for the hearing impaired, Deaf and deaf blind, springer, London
- Sandlin E.R. (Ed) 1995, Handbook of hearing aid amplifications. Volume 1. Theoretical & Technical considerations Singular Publishing Group Inc, London.
- Sandlin E.R. (Ed) 1995, Handbook of hearing aid amplifications, Volume II. Clinical Consideration and fitting practices. Singular Publishing group Inc, London
- Studenbaker G.A.; Hochberg I 1993. Acoustical factors affecting hearing aid performance. edition Allyn & Bacon U.S.A n d
- Velene M 1994 Strategies for selecting and verifying hearing aid fittings Thieme N.Y.
- Velente M 1996 Hearing aids standards, option and limitations, Thieme N.Y

SH 206: ADVANCES IN ADULT LANGUAGE DISORDERS (75 hrs.)

- 1) Neurological Examination – Cranial nerve examination, motor examination, reflexes. (3 hrs.)
- 2) Neurological Tests and neuroimaging procedures (EEG, EMG, CT Scan, MRI, Transcranial Doppler Ultra-sonography, PET). Applications to communication disorders. (2 hrs.)
- 3) Neurobehavioural Testing (Attention, Arousal, Memory, Affect, Visuospatial function, Language, Praxis, Gnosis). (3hrs.)

- 4) Neurophysiology of aphasia and related disorders. Language and Cerebral dominance. Connectionist explanation of Aphasia. Lesion size, lesion location and aphasia syndrome. Speech-language and the brain. (3 hrs.)
- 5) Assessment and Diagnosis in Neurocommunication disorders. General Principles, Testing of verbal comprehension, non-verbal skills, verbal expression, functional communication. Test interpretation. Testing right hemisphere function. Assessing the bilingual client. (10 hrs.)
- 6) Different perspectives in aphasia. (10 hrs.)
- Linguistic investigations of aphasia, semantic studies, phonological studies.
 - Pragmatics and aphasia (including discourse ability).
 - Aspects of bilingual aphasia.
 - Aphasia in the illiterate.
- 7) Advances in aphasia rehabilitation. (10 hrs.)
- Psychosocial aspects and sociolinguistic perspectives.
 - Pragmatic approaches to aphasia rehabilitation.
 - Rehabilitation of the bilingual aphasic.
 - Assessment of treatment efficacy in aphasia.
- 8) Acquired reading and writing disorders. (5 hrs.)
- 9) Behavioral and Cognitive symptoms of right hemisphere brain damage. Treatment of patients with right hemisphere brain damage. Prognosis, treatment efficacy and outcome. (5 hrs.)
- 10) Dementia and communication. Causes of dementia, Types of dementia (Cortical, subcortical, vascular, metabolic, toxic etc.). Language changes in dementia. Senile dementia. Bilingual dementia. Assessment and diagnosis. Treatment. Long-term management. (5 hrs)
- 11) Traumatic Brain Injuries. Penetrating and Non penetrating injuries. Secondary consequences of TBI, Assessment of TBI patients, Rehabilitation of TBI patients, Treatment outcome. (3 hrs.)
- 12) Characteristics, Assessment, Intervention and Issues in (6 hrs.)
- Primary Progressive aphasia
 - Sub-cortical aphasias
 - Schizophasia
- 13) Alternative and Augmentative Communication for the language disordered. (5 hrs.)
- 14) Review of current literature and research designs in neurogenic language disorders. (5 hrs.)

LIST OF BOOKS

ADVANCES IN ADULT LANGUAGE DISORDERS

An Introduction to Neurogenic Communication Disorders. (4Ed.). (1992). Brookshire, R.H.

St. Louis: Mosby Year Book. ISBN 0-8151-1295-5

Aphasia.(1988). Rose, F.C. Whurr, R. and Wyke, M.A. (Eds.) London: Whurr. ISBN 1-870332-66-0

Medical Speech-Language Pathology: A Practitioner's Guide. (1998). Johnson, A.F. and Jacobson, B.H. NY: Thieme. ISBN 0-86577-688-1.

Aspects of Bilingual Aphasia.(1995). Paradis, M. (Ed.). Great Yarmouth: Galliard (Printers) Ltd. ISBN 0-08-0425704

Pragmatics in Neurogenic Communication Disorders.(1998). Paradis, M. Great Yarmouth: Galliard (Printers) Ltd. ISBN 0-08-043065-1.

Linguistic Investigations of Aphasia.(2 Ed.). (1989). Lesser, R. London: Whurr. ISBN 1-870332-77-6.

Right Hemisphere Communication Disorders: Theory and Management. (1995). Tompkins, C.A. California: Singular Publishing Group, Inc. ISBN 1-56593-176-9.

Dementia – A Clinical Approach.(2 Ed). (1992). Cummins, J.L. and Benson, D.F. US: Butterworth – Hienemann. ISBN 0-7506-9065-8.

Pragmatic Approaches to Aphasia Therapy. (1994) Carlomagno, S. London: Whurr. ISBN 1-870332-94-6.

SH 207: SEMINAR IN MANAGEMENT OF THE HEARING IMPAIRED (75 hrs.)

- 1) Definitions and classifications of the persons with hearing impairment (2 hrs)
 2) Needs of the hearing impaired: (3 hrs)

a) Infants & children

b) Adults

c) Geriatric population

(Communication, social, educational, economic and vocational needs)

3) Principles of Amplification. Analysis of Amplification Devices.Coupler-gain.Real ear gain.Standards for Hearing aid EAC.Critical evaluation on Indian standards.Hearing aid selection.Procedures including SII (AI), Real ear aided performances,Comparison of various prescriptive formulae, considerations inprescribing: a) Ear level Vs body level aids, b) Digital &programmable Vs analog hearing aids. c) Monaural Vs binaural aids

d) bone receiver aids. (10 hrs)

4) Assistive Listening Devices, Tactile Devices, Alarm Devices: candidates, components & assessment of benefit and the aid. (4 hrs)

5) Ear mould review, types, preparation, selection, modification and current trends.(4 hrs)

6) Implantable Devices for the Hearing Impaired:

i) Bone anchored aids ii) Middle ear implants iii) Cochlear implants iv) Brainstem

implants. Candidacy, components and assessment of benefit foreach type listed.Cochlear Implants : Types design and features, Speech processorand strategies,Post - operative mapping and follow – up (10 hrs)

7) Audiological Rehabilitation Programs for infants and children. Hearing aid selection, adjustments of hearing aids, acceptance ofhearing aids.Auditory training, pre auditory training assessment -Speech perception Tests. Critical evaluation of various methods of auditory training, speech reading and other communicationstrategies. (8 hrs)

- 8) Therapeutic Consideration: (8 hrs)
Purpose of Language: Communication, Education, Entertainment. Language for Pre-school hearing impaired child - Verbal, Sign or bilingualism? Effect of conductive loss on language development. Parent-Infant Programs.
- 9) Educational Placement: Options available. Means/medium of communication in the class room. Controversies over different approaches. Choice of placement. Design and acoustics of classrooms for the hearing impaired. (8 hrs)
- 10) Management of CAPD Cases: Choice of management based on audiological test results, environmental modification, devices. Auditory perceptual training, communication strategies, cognitive/language management, recording improvement in therapy. (8 hrs)
- 11) Audiological Rehabilitation Programs for adults and geriatrics. Hearing aid adjustment, selection of Assistive Listening Devices. Speech reading and other communication strategies. Occupational noise exposure, DRC, provision of EPDS. Factors to be considered for selection of EPDS. (6 hrs)
- 12) Process, care and issues in disability evaluation and certification, Implications. Counter Test, high and low predictability words (SPINtest), MAC test etc. (4 hrs)
- 13) Counseling – meaning, scope – principles of counseling – types of counseling – individual, group and family, parental, vocational, educational, rehabilitative – behavioral counseling in the context of hearing impairment. (4 hrs)
- 14) Special psychotherapies – play therapy, group therapy, family therapy, psychodrama – intensive psychotherapy, brief psychotherapy to children with hearing impairment. (3 hrs)

LIST OF BOOKS

SEMINAR IN MANAGEMENT OF THE HEARING IMPAIRED

- Markides, A. (1977). Binaural Hearing Aids. London: Academic Press.
- Richard, M. W. (1999). Auditory Perception - A new analysis and synthesis. UK: Cambridge University Press.
- Goodman, J.C. and Nusbaum. (Eds). (1994). The Development of Speech Perception: The Transition from Speech Sounds to Spoken Words. London: A Bradford Book, The MIT Press
- Kent R.D. and Read C. (1995). The Acoustic Analysis of Speech. New Delhi: A.I.T.B.S. Publishers and Distributors.
- Crowder, R.G. (1990). The Role of Auditory Memory in Speech Perception and Discrimination. SR 621 P. 187-205. Statue Report on Speech Research, Haskins Laboratories, New Haven, Conn.
- Nerbonne, M.A. and Schow R.K. (1989). Auditory Stimuli in Communication. In R.L. Scho and M. A. Nerbonne (Eds.), 2 edition, Introduction to Aural Rehabilitation. Boston: Allyn and Bacon.
- Schouten, M.E.H (1992). (Ed). The Auditory processing of Speech- From Sound to Words. Berlin: Mouton de Gruyter.
- Paransis, I. and Samar, V.J. (1982). Visual Perception of Verbal Information by deaf people. In D.G. Sims, G.G. Walter and R.L. Whitehead (Eds). Deafness and Communication. Baltimore: Williams and Wilkins.
- Owens E. and Kessler D.K. (1989). (Eds.) Cochlear Implants in Young Deaf Children. Boston: College-Hill Publication, Little, Brown and Company.

- Plant, G. and Spens, K. E. (1995) (Ed). Profound Deafness and Speech Communication. London: Whurr Publishers Ltd.,
- Revoile, S. G. and Pickett, L.M. (1982). Speech Perception by the Severely Hearing Impaired. In D.G. Sims, D.G. Walter and R.L. Whitehead (Eds). Deafness and Communication. Baltimore: Williams and Wilkins.
- Sanders, D.A. (1982). Aural Rehabilitation. A Management Model. (2Ed.). New Jersey: Prentice-Hall, Inc.
- Summerfield, A.Q. (1983). Audio-Visual Speech Perception, lip reading, and Artificial Stimulation : In M.E. Lutman, M.P. Haggard (Eds.). Hearing Science and Hearing Disorders. London: Academic Press.
- Tyler, R.S. (1993). Ed. Cochlear Implants- Audiological Foundations. San Diego: Singular Publishing Group, Inc. (Chapters 4 & 5).
- Balley, P. J. (1983). Hearing for Speech: The Information Transmitted in Normal Impaired and Speech. In M.E. Lutman and M.P., Haggard (Eds.), Hearing Science and Hearing Disorders. London: Academic Press.
- Clark, G.M. Cowan, R.S.C. And Richard, C.D. (1997). Cochlear Implantation for Infants and Children. Advances, London: Singular Publishing Group, Inc.
- Cooper, H. (1991). (Ed). Cochlear implants- A practical guide. London: Whurr Publishers Ltd.
- De Filippo, C.L. (1982). Tactile perception. In D.G. Sims, G.C. Water and R.L. Whitehead. (Eds.). Deafness and communication. Baltimore: Williams & Wilkins.
- Erber, N. P. (1982). Auditory Training. Washington D.C: A.G. Bell Association for the Deaf. (Chapter 2).
- Ling D. (1976). Speech and the hearing impaired child - theory and practice. Washington: The Alexander Graham Bell Association for the Deaf.
- Miller, J.L. and Eimas, P.D. (1995). (Eds.). Speech, language and communication. New York: Academic Press.
- Bellis, T.J. (1996). Assessment and management of central auditory processing disorders in the educational setting - from science to practice. London: Singular Publishing Group, Inc.
- Chermak, G.D. and Musiek, F.E. (1997). Central Auditory processing disorders - New Perspectives, San Diego: Singular Publishing Group, Inc.
- Heasley, B.E. (1980). Auditory processing disorders and remediation, (2Ed.) Illinois. Charles C. Thomas Publisher.
- Valente, M (1996) Hearing Aid standards, options and limitations. New York: Thieme Medical Publishers, Inc.
- Willeford, J. A., Burleigh, J.M. (1985). Handbook of CAPD in children. Orlando: Grune & Stratton Inc.
- Studebaker, G.A. and Hochberg, I. (1993). Acoustical factors affecting hearing aid performance. 2 Ed. Boston: Allyn & Bacon.
- Summers R.I. (1992). Tactile aids for the hearing impaired. London: Whurr Publishers.
- Valente, M. (1994). Strategies for selecting and verifying hearing aid fittings. New York: Thieme Medical Publishers.
- Davis, J.M. and Hardick, E.J. (1981). Rehabilitative audiology for children and adults. Canada: John Wiley and sons, Inc.
- Flexer, C (1994). Facilitating hearing and listening in young children. San Diego: Singular Publishing Group, Inc.
- Geoff, P., Karl-Erick, S. (1995). Profound deafness and speech communication. London:

Whurr Publishers Ltd.

Levitt, H, Pickett, J.M. and Houde, R.A. (1980). Sensory aids for the hearing impaired. New York: IEEE Press Inc.

Mueller, H.G., Hawkins D. and Northern, L.J. (1992). Probe microphone measurements: Hearing aid Selection and assessment. San Diego: Singular Publishing Group, Inc.

Sanders, A.D. (1993), Management of hearing handicapped-infants to elderly. New Jersey: Prentice Hall, Inc.

Sanders, A, D, (1982).Aural rehabilitation-A management model. 2Ed. New Jersey. Prentice-Hall, Inc.

Sandlin, E.R. (1994).Understanding digitally programmable hearing aids. Boston: Allyn& Bancon.

Sandlin, E. R. (Ed.). (1995). Handook of hearing aid amplification - Clinical considerationsand fitting practices. Vol. II. San Diego: Singular Publishing Group, Inc.

Sandlin, E. R. (Ed.). (1995). Handbook of hearing aid amplification - theoretical and technical considerations Vol. I. San Diego: Singular Publishing Group, Inc.

Stokes, J. (Ed.). (2000). Hearing impaired infants: Support in the first 18 months London: Whurr publishers.

Clark, G.M. Cowan, B.S. and Dowell, R.C. (1997). Cochlear implantation for infants and children: Advances. San Diego:Singular Publishing Group, Inc.

Owens, E., Kessler, K.D. (Edrs.) (1989). Cochlear implants - in young deaf children. Boston: Little Brown & Co.

Narasimhan N.C. and Mukherjee, A.K. (1986). Disability - a continuing challenge, Bangalore:Wiley Eastern Ltd.

Pandey, R and Advani, L. (1995). Perspectives in disability and rehabilitation, New Delhi: Vikas publication house.

Status of the disability in India 2000, RCI Publications.

COUNSELING

Testing and Assessment in Counselling Practice, 2Edition – Edited by – C. Edward Watkins, JR., Vieki L. Campbell. 2000 by Lawrence Erlbaum Associates, Publishers Mahwah, New Jersey, London.

Counselling People with Communication Problems – Peggy Dalton – 1994 – SAGE Publications, London, Thousand Oaks, New Delhi.

Introduction to Counselling and Psychotherapy.Edited by Stephen Palmer. 2000 First Publication, SAGE Publications, London, Thousand Oaks, New Delhi.

Introduction to Counselling Skills – Richard Nelson – Jones – 2000 SAGE Publications Ltd., London, Thousand Oaks, New Delhi.

CLINICAL PRACTICUM IN SPEECH-LANGUAGE PATHOLOGY

Objectives:

At the end of the year the student will be able to:

- 1) Handle special clinical population for group therapy.
- 2) Acquire proficiency in counseling clients and families.
- 3) Acquire skills in imparting information to student groups.
- 4) To develop skills in presentation of research papers.

Clinical Practicum Work:

- 1) Plan and execute minimum of 5 group therapy sessions for any communication disordered group (aphasics / autistic / stutterers / voice disorders / hearing impaired toddlers).
- 2) To develop proficiency in planning and executing counseling / guidance sessions for groups of caregivers / clients.
- 3) To take up one specific topic as a teaching assignment for graduates.
- 4) To present a journal article in a students' forum.
- 5) To demonstrate ability to function as an independent clinician.

CLINICAL PRACTICUM IN AUDIOLOGY

- 1) The operation of all the equipment's used for evaluation and calibration.
- 2) Thorough in administration and interpretation of all special tests.
- 3) Explanation of atypical findings and differentiation between artifacts and atypical findings
- 4) Trouble shoot the audiometer and ability to rectify independently.
- 5) Be familiar with recording and interpreting auditory evoked potentials such as MLR, LLR and P 3000 Evaluate and trouble shooting of hearing aids.
- 6) a) Be able to suggest ways of modifying electroacoustic output of hearing aid to suit the needs of the patient.
b) Have knowledge in and assist in carrying out insertion gain measurement.
- 7) Counseling the client/parent/regarding home training/hearing aid care/speech reading and auditory training.
- 8) Trouble shooting of hearing aids. To apply knowledge of electroacoustics for classification of hearing aids and recommendation for different types of patients. In addition to clinical examination, evaluation and management in terms of choice is specificity of the procedures used, they shall comply with the following specific requirements.

- 1) Preparing audio-cassettes for (i) increasing public awareness with respect to profession (ii) counseling of the case & or SOPs.
- 2) Comparison of behavioral and biophysical evaluation of hearing on two normal individuals and one each of conductive and sensori-neural loss.
- 3) Comparison of psychoacoustic and objective evaluations of hearing aids in two individuals (one child and one adult with hearing impairment).
- 4) Improving public awareness in the profession by paying visits to schools talking to X and XII Standard students regarding the profession and orienting other professional groups i.e. pediatricians neurologists, GP etc.
- 5) Screening programs in schools.
- 6) One detailed report (in a format for journal publication) in one of the following categories (I) Diagnostic (II) Hearing Aid Evaluation (III) Other Rehabilitative Management.

**LIST OF JOURNALS FOR REFERENCE IN SUBJECTS RELATED TO SPEECH –
LANGUAGE PATHOLOGY**

1. Asia Pacific Journal of Sp, Lan & Hearing
2. Brain
3. Brain and Language
4. The cleft palate – Craniofacial journal
5. Cortex
6. Edn & Trg in MR & Developmental Disabilities
7. Folia Phoniatrica et Logopaedica
8. International Journal of Lang & Communication Disorders
9. Journal of Acoustical Society of America
10. Journal of Child language
11. Journal of Communication Disorders
12. Journal of Learning Disabilities
13. Journal of Sp. Lang and Hg Research
14. Journal of Voice
15. Language Learning – A journal of research in language studies.
16. language, Sp and Hg Service in School
17. Linguistics and language Behaviour Abstract
18. Otolaryngologic Clinics of North America
19. Phonetica
20. Seminars in Speech & Language
21. Speech Communication
22. J. of Medical Sp Lang. Pathology

LIST OF JOURNALS FOR REFERENCE IN SUBJECTS RELATED TO AUDIOLOGY

1. JASA (Journal of the Acoustical Society of America)
2. Ear and Hearing
3. Trends in Amplification
4. Scandinavian Audiology
5. American Journal of Audiology
6. Audiology and Otoneurology
7. Hearing Research
8. Journal of Speech and Hearing Research
9. Seminars in Hearing
10. Archives of Otolaryngology
11. Volta review
12. Journal of American Academy of Audiology
13. The Hearing Journal
14. Annals of Otology, Rhinology & Laryngology
15. Journal of Speech and Hearing Disorders

