YENEPOYA

(DEEMED TO BE UNIVERSITY)
Recognized under Sec 3(A) of the UGC Act 1956
Accredited by NAAC with 'A' Grade

YENEPOYA (DEEMED TO BE UNIVERSITY)

Deralakatte, Mangaluru -575018

REGULATIONS AND CURRICULUM GOVERNING

UNDERGRADUATE PROGRAM

BACHELOR IN AUDIOOLOGY AND SPEECH LANGUAGE PATHOLOGY (B.ASLP)

(CURRICULUM - EFFECTIVE FROM 2020-21)

ATTESTED

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Ref: No. Y/REG/ACA/ACA/42-ACM/2021

13.04.2021

NOTIFICATION

Sub: Regulations and Curriculum approval of Bachelor in Audiology and Speech Language Pathology (B. ASLP)

Ref: Minutes of the 42nd Academic Council meeting held on 22.03.2021, vide agenda - 14

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The Regulations and Curriculum of Bachelor in Audiology and Speech Language Pathology (B. ASLP) program have been approved at the 42nd Academic Council meeting held on 22.03.2021 and 53rd Board of Management meeting held on 23.03.2021.

This notification is issued for implementation with effect from the academic year 2020-2021.

REGISTRAR

To:

The I/c Head, department of Speech & Language Pathology

Copy to:

1. Controller of Examinations
2. Principal, YMC
3. File copy

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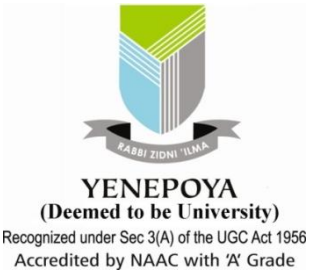
The Emblem

The Yenepoya (Deemed to be) University emblem reflects the rich ideals and the core values upon which the very foundations have been built. The colours on the shield are a salutation to the three key facets of the University – the mentor, the materials and the medium – through which this increase takes place and are also representative of them.

Green embodies life and the giver thereof. Green is the colour of paradise, the ultimate destination for all knowledge seekers. Just as to azure sky, wraps the Earth, blue symbolizes protection. **Blue** is synonymous with scholastic achievements and the success the institution has to its credit.

Moreover, last but not least, **grey** symbolizes stability and dependability. It stands for the staunch guiding (governing) principles and discipline that our students and hence our institutions are known for.

The shield, symbolic of a reputed seat of learning is adorned with (emblazoned with) the motto **"Rabbi Zidni 'llma"** on the ribbon below. The words is in Arabic, taken from the Holy Quran, literally translate into the meaningful phrase – **"Lord, increase me in knowledge"** – indeed the very frame, the life plasma and the purpose of the institution, all its faculties and facilities.



YENEPOYA DEEMED TO BE UNIVERSITY

DERALAKATTE, MANGALORE

Vision

To provide access to quality higher education, ensuring equity, to create inspiring leaders of tomorrow who can take this country to the forefront of the developed nation.

Mission

- To achieve academic excellence and global competencies among students.
- To create an environment for the generation of new knowledge through meaningful research, adopting the latest methods of pedagogy and incorporating modern principles of academics integrated with high esthetical standards.
- To extend the knowledge acquired and new knowledge generated for the development of the community.

Vision and Mission of Faculty of Allied and Health Care Professionals

Yenepoya (Deemed to be) University

Vision

To be the Leading Allied and Health care professional Institute in India where knowledgeable, competent, skilled and caring professionals are produced by integrated clinical practice, education and research.

Mission

To provide quality education based on scientific research, which will groom an individual to be a member of the health care delivery team with good communication skills, who will take part in patient care with utmost attention and dedication.

To provide education and training of skills that will encourage and enable the practice of scientific and ethical health care with a high level of Skill and Social Responsibility.

To create a teaching and learning environment to help the students develop their own learning styles and ability to use academic resources while reflecting on their experience.

BACHELOR IN AUDIOLOGY AND SPEECH – LANGUAGE PATHOLOGY (B. ASLP)

INTRODUCTION

NATURE AND EXTENT OF THE PROGRAM

Background and need for the program:

Audiology is a branch of science that deals with hearing, balance and related disorders. Speech and Language Pathology deals with the normal and abnormal aspects of voice, speech, language and swallowing. Students of Bachelors in Audiology and Speech Language Pathology are educated regarding the anatomy and physiology of the normal and abnormal auditory and various systems involved in the production of speech, language and swallowing. They are trained in assessing & identifying individuals with hearing loss, differential diagnosis of auditory disorders encompassing disorders of the middle ear, inner ear, auditory nerve and the central auditory nervous system. They are also trained in diagnosis, differential diagnosis and management of voice, speech language and swallowing disorders, which include misarticulation, stuttering, speech and language problems associated with hearing impairment, mental retardation, cerebral palsy, cleft palate, autism spectrum disorders, laryngectomy, stroke/paralysis, dysphagia and learning disorders. The students are trained to develop expertise in audiological rehabilitation, which includes the recommendation of amplification devices such as hearing aids, cochlear implants and speech language therapy for individuals with hearing impairment. They also learn to cater to the needs of individuals with special needs such as those with tinnitus, auditory processing disorders etc.

Scope of the program (career opportunities):

As per the Rehabilitation Council of India (RCI), the statutory body regulating training programs in the speciality, the minimum entry level qualification for professional practice is a bachelor's degree in Audiology and Speech Language Pathology. With a degree obtained from RCI recognized institutions, the graduates can register under RCI to get a CRR number, which is mandated for practice. Job opportunities are available for audiologists and Speech Language Pathologists, both in India and overseas, in the following setups:

- Academic Universities, colleges as Faculty, Clinical Supervisors, Researchers
- Medical Hospitals/Clinics (General hospitals, Ear Nose Throat, Paediatric or Neurology clinics)
- Special Schools for children with hearing impairment, mental retardation, cerebral palsy, autism, learning disability or others

- Normal schools
- Hearing aid/cochlear implant industries
- Hearing conservation program in industries (as industrial audiologist)
- Private practice

Expected skills to be acquired by the end of the program:

The University, in its academic planning has kept an excellent balance between theoretical and clinical training to develop both professional judgment and scientific competence for the trained Audiologist and Speech Language Pathologist. The program aims to train a competent Audiologist and/or Speech Language Pathologist who can practice Audiology and Speech Language Pathology.

- Possess and acquire **scientific knowledge** to work as Audiologist and/or Speech Language Pathologist
- Demonstrate and possess **clinical/practical skills** to provide quality health care services for speech, language, swallowing and hearing disorders
- Demonstrate **teamwork skills** to support shared goals with the interdisciplinary health care team to improve societal health
- Possess and demonstrate **ethical values and professionalism** within the legal framework of the society and statutory regulations
- **Communicate effectively** and appropriately with the interdisciplinary health care team and the society
- Demonstrate high quality **evidence-based practice** that leads to excellence in professional practice in speech, language, swallowing and hearing disorders
- Enhance knowledge and skills with the use of advancing technology for the **continual improvement** of professional practice in speech, language, swallowing and hearing disorders
- Display **entrepreneurship, leadership and provide training** skills to practice as Audiologist and/or Speech Language Pathologist independently as well as in collaboration with the interdisciplinary health care team

Regulations and Curriculum for Bachelor in Audiology and Speech-Language Pathology under Credit Based Semester System

1. Nomenclature

As per UGC Notification of 2014, the nomenclature of the program shall be Bachelor in Audiology and Speech-Language Pathology. B. ASLP is the abbreviation.

2. Objectives of the B. ASLP program

To produce skilled professionals with a strong scientific foundation who has knowledge, confidence, values, and skills to perform and assist diagnostic and therapeutic services. The objectives of the B. ASLP program are to equip the students with knowledge and skills to

- Function as audiologists and speech-language pathologists in different work settings
- Understand concepts in speech, language, communication, hearing and disability screening; evaluate, diagnose and assess the severity of different disorders related to speech, language, swallowing and hearing
- Manage speech, language, swallowing and hearing disorders across the life span
- Counsel persons with disorders of communication and their family members
- Rehabilitate persons with speech, language, swallowing and hearing disorders
- Prevent speech, language, swallowing and hearing disorders
- Liaise with professionals in allied fields and other stakeholders
- Implement public awareness and education program
- Undertake advocacy measures on behalf of and for persons with speech-language, swallowing and hearing disorders
- Receiving phenomena – willing to listen and experience
- Responding to phenomena - participate willingly
- Valuing – attach value and express opinion
- Organizing values – organize and develop a personal value system
- Internalizing values – adapt the value system into behaviour

3. Duration of the course

The duration of the B. ASLP Program shall extend over six Semesters of course work (three academic years) plus Two Semesters (one academic year) of internship, a total of 4 years. Each semester shall consist of 16 weeks of study (excluding the time spent for the conduct of the final examination of each semester). The course should be completed within 6 years from the date of admission.

There shall be examinations at the end of each semester. There shall be a vacation of a minimum of 1 week after the examinations at the end of odd semesters and 3 weeks after the examinations at the end of even semesters. The number of working days in a semester shall not be more than 100 days.

4. Medium of instruction

The medium of instruction and examination shall be English.

5. Age

17 years and above as on 31st December of the year of admission.

6. Maximum Period for Completion of Course

A candidate shall complete the course within 6 years from the date of admission, failing which re- registration shall be mandatory.

7. Eligibility for admission

The candidate applying for admission to B. ASLP program should have passed the 10+2 examination or an equivalent examination conducted by the Pre-University Board of Education of the respective State Government securing a minimum of 50% marks.

The applicant/candidate should have studied Physics, Chemistry and any one of Biology / Mathematics / Computer Science / Statistics / Electronics / Psychology. Applicants shall not be older than 25 years as on the 1st July of the year of admission.

Selection of eligible candidates: Selection to the course shall be based on a merit list prepared by Yenepoya University based on the marks obtained in the Pre-University or equivalent exams.

8. Withdrawal from the Course- Temporary and Permanent

8.1. A candidate who has been admitted to the course may be permitted to withdraw **temporarily** for a period of one year on the grounds of prolonged illness, grave calamity in the family etc., provided

i. He applies stating the reason of withdrawal with supporting documents, endorsement by parent/guardian.

ii. The institution is satisfied that without counting the period of withdrawal, a candidate is likely to complete his requirement of the degree within the maximum time specified.

iii. There are no outstanding due or demands with the department, library, hostel, Institution etc.

iv. The tuition fee for the subsequent year may be collected in advance based on the severity of the case before giving approval for any such temporary withdrawal.

v. Scholarship holders are bound by the appropriate rules as applicable.

vi. The decision of the institution/ University regarding the withdrawal of a candidate is final and binding.

8.2. Permanent withdrawal

i. A candidate who withdraws from the course after admission before the closing date of admission for the academic session is eligible for the refund of the deposit only, and the fees once paid will not be refunded.

ii. Once the admission for the year is closed, and if a candidate wants to leave the Institution, he will be permitted to do so and take the Transfer Certificate from the Institution, only after remitting all the tuition fees for the remaining years.

iii. Those candidates who have received any scholarship/stipend/other forms of assistance from the institution shall repay all such amounts in addition to those mentioned in the clause above.

iv. The decision of the Institution/University regarding the withdrawal of the candidate is final and binding.

9. Program structure

Time structure of the program shall be as follows			
16 weeks/ semester		16 weeks	
Semester 1	Theory	6 papers x 60 hours 1 paper x 15 hours	360 hours 15 hours
	Clinical		200 hours
Semester 2	Theory	4 papers x 60 hours 1 paper x 30 hours	240 hours 30 hours
	Clinical		320 hours
Semester 3	Theory	4 papers x 60 hours	240 hours
	Clinical		320 hours
Semester 4	Theory	4 papers x 60 hours	240 hours
	Clinical		320 hours
Semester 5	Theory	4 papers x 60 hours	240 hours
	Clinical		320 hours
Semester 6	Theory	4 papers x 60 hours	240 hours
	Clinical		320 hours

Theory	360 + (240 x 5)+30+15		1605 hours
Clinicals	200+320+(320x4)		1800 hours
	Sub total		3405 hours
Total	6 semesters 576 x 6 semesters		3456 hours
	Balance (to be used for various academic activities)		51 hours
Internship	18 weeks per semester		36 weeks
	6 days/week		216 days
	7 hours/day		1512 hours
Total	Theory	(6 semesters)	1605 hours
Total	clinicals	(6 semesters + internship)	3312 hours
Grand Total			4917 hours

10. Attendance

Each semester shall be taken as a unit for the purpose of calculating attendance in every subject.

Candidates should have attendance not be less than 80% in theory and 90% in Clinical/ Practical's in each semester including subsidiary subjects, to be eligible to appear for the End of semester examinations. Candidates lacking a prescribed percentage of attendance in **any subject shall not be eligible** to appear for the End of semester examination in **that subject**. Once a candidate gets **eligibility** to write an exam in a particular subject, this eligibility is sufficient to **write the exam again** if the candidate fails in that subject or remains absent for the Exam.

If a candidate is not allowed to appear for end semester examination in a particular subject due to a shortage of attendance. In that case, he/she must attend classes, practical/clinics in that subject during inter semester vacation and/or complete the assignments given by the particular department to be eligible to appear in the end semester examination of that subject in the **subsequent semester**.

Attendance at the start of the study holidays will be considered for eligibility. Attendance taken prior to this will only be considered for examination planning at the

university. Payment and filling of the examination forms do not guarantee to take the examination.

Candidates who cannot appear for the examination due to a shortage of attendance will be declared as failed for the subject. The shortage of attendance of the student whose attendance is 60% and above but below 80% in theory subjects may be condoned in genuine cases shall be from the Vice-Chancellor of the University by following the rules prescribed for condonation and payment of condonation fee as prescribed by the University.

11. Scheme of examination

There shall be an end semester examination at the end of each semester in addition to the periodical tests conducted by the college for internal assessment**.**

11.1 Evaluation is based on formative evaluation (Attendance, Internal assessment test, Seminars, Assignments, Case Studies) and summative evaluation (End semester examination in Theory, Practical).

11.2 **Internal Assessment Marks:** Internal assessment marks will be calculated based on -internal assessment tests, seminars, assignments, and case studies, -whichever is applicable for the subject.

- There shall be two internal assessment examination in each semester for each Core subject.
- There shall be only one internal assessment test for the Subsidiary subject.
- If a candidate is absent for the Internal Assessment examination due to illness or genuine and satisfactory reason, re-examination to that candidate may be considered and conducted within a fortnight of the examination at the discretion of the head of the Institute.
- Average marks of the two internal assessment tests along with marks obtained in seminars, assignments and case studies will be considered to calculate the internal assessment marks**.**
- Practical exams at the end of the 2nd semester shall be University exam and shall be conducted by an external examiner along with an internal examiner. Record of practicals maintained by the students shall also be evaluated by the examiners.
- All clinical examinations shall be conducted by one internal and one external examiner. B7.1 and B7.2 in the above table shall be conducted at the end of the internship (8th semester).
- Following is the distribution of weightage given for theory and practical/clinical postings from the 3rd semester onwards

Theory: For the subjects with Internal Assessment Component (IAC) = 25 marks.

Component	Marks
Sessional examination (Average of marks obtained in the two sessional exams. Normalized to 25 marks)	25 marks
Total	25 marks

- Practical:

Component (continuous assessment)	Marks
Participation	05
Report submission	10
Assessment (quiz, spotters etc)	10
Total	25

- Clinical Posting:

Component (continuous assessment)	Marks
Participation	05
Clinical Practicum	10
Clinical Competency	10
Total	25

Marks of the IA examination shall be submitted to the University as per notification issued by the Controller of Examinations before the commencement of the end semester university examination. The University shall have access to the records of IA examinations. The marks of the IA examinations must be displayed on the notice board of the respective departments within a fortnight from the date of IA examination.

12. Pattern of Question Paper

12.1 Equal representation of each unit. Four credit course and above will be the 3-hour duration and 75 marks. Two/three credit course will be the 11/2-hour duration and for 50 marks.

12.2 Any changes in the question paper pattern approved by BOS will be effective.

Type of Question	Number& Marks for each question	Total Marks
Long Essay Question (LAQ)	**3x10**	**30**
Short Essay (SEQ)	**10x5**	**50**
Short Answer Questions (SAQs)	**10x2**	**20**

13. Scheme of Practical Examination: Practical Examination will consist of Skill Demonstration, Case based discussion, Management and Viva Voce.

14. End Semester examinations

a) There shall be two sessions of University examinations in each academic year. The University shall conduct end semester examination for core Courses at the end of each semester. End semester examination for the 1st and 3rd and 5th semester will be held only in the middle of each academic year. End semester examination for the 2nd, 4th and 6th semester will be held at the end of each academic year.

b) All subsidiary subjects will have final exams at the end of each semester conducted by the college depending on the candidates appearing for the exam and marks obtained by the candidate shall be sent to the controller of examinations as notified by the University. The marks of subsidiary subjects shall be incorporated in the marks card issued by the University.

15. Scheme of curriculum and examination pattern

CREDIT DISTRIBUTION TABLE

(L -Lectures, T – Tutorials, P – Practicals, CL – clinical, C – total Credits,
IAC – Internal Assessment Component, ESE – End Semester Exam)

1 credit Lecture (L) = 15 hours
1 credit Tutorial(T)/Practical(P) = 15 hours
1 credit Clinical (45) = 45 hours

The examination pattern and papers shall be as shown in the table below:

Semester 1

Course Code	Course Title	Credit Distribution (L, T/P & CL are hours per week, C is total credits)				Marks Distribution		Total marks
		L	T	CL	C	IAC	ESE	
B 1.1	Communication Sciences Part A Speech - Language Pathology Part B Audiology	3	1		4	25	75	100
B 1.2	Anatomy and Physiology of Speech and Hearing	3	1		4	25	75	100
B 1.3	Clinical Psychology	3	1		4	25	75	100
B 1.4	Linguistics and Phonetics	3	1		4	25	75	100
B 1.5	Electronics and Acoustics	3	1		4	25	75	100
B 1.6	Research Methods and Statistics	3	1		4	25	75	100
B 1.7	Constitution of India	1			1	10	40	50
B 1.8	Clinical – Speech Language Pathology	-	-	2	2	25		
B 1.9	Clinical – Audiology			2	2	25		
Total		20	6	4	29	160	490	650

Semester II

Course Code	Course Title	Credit Distribution (L, T/P & CL are hours per week, C is total credits)				Marks Distribution		Total marks
		L	T	CL	C	IAC	ESE	
B 2.1	Neurology	3	1		4	25	75	100
B 2.2	Otolaryngology	3	1		4	25	75	100
B 2.3	Speech-Language Pathology	3	1		4	25	75	100
B 2.4	Audiology	3	1		4	25	75	100
B 2.5	Practical (Speech-language Pathology)	-	-	3	3	25	75	100
B 2.6	Practical (Audiology)	-	-	3	3	25	75	100
B 2.7	Environmental Studies	2			2	10	40	50
Total		14	4	6	24	160	490	650

Semester - III

Course Code	Course Title	Credit Distribution (L,T/P & CL are hours per week, C is total credits)				Marks Distribution			Total marks
		L	T	CL	C	Prac	IAC	ESE	
B 3.1	Voice and its Disorders	3	1		4	25	25	50	100
B 3.2	Speech Sound Disorders	3	1		4	25	25	50	100
B 3.3	Diagnostic Audiology - Behavioral Tests	3	1		4	25	25	50	100
B 3.4	Amplification Devices	3	1		4	25	25	50	100
B 3.5	Clinicals in Speech-Language	-	-	3	3		25	75	100
B 3.6	Clinicals in Audiology	-	-	4	4		25	75	100
Total		12	4	7	23	100	150	350	600

Semester – IV

Course Code	Course Title	Credit Distribution (L,T/P & CL are hours per week, C is total credits)				Marks Distribution			Total marks
		L	T	CL	C	Prac	IAC	ESE	
B 4.1	Motor Speech Disorders in children	3	1		4	25	25	50	100
B 4.2	Child Language Disorders	3	1		4	25	25	50	100
B 4.3	Diagnostic Audiology - Physiological Tests	3	1		4	25	25	50	100
B 4.4	Implantable Hearing Devices	3	1		4	25	25	50	100
B 4.5	Clinicals in Speech-Language	-	-	4	4		25	75	100
B 4.6	Clinicals in Audiology	-	-	3	3		25	75	100
Total		12	4	7	23	100	150	350	600

Semester – V

Course Code	Course Title	Credit Distribution (L, T/P & CL are hours per week, C is total credits)				Marks Distribution			Total marks
		L	T	CL	C	Prac	IAC	ESE	
B 5.1	Structural Anomalies & Speech Disorders	3	1		4	25	25	50	100
B 5.2	Fluency and its Disorders	3	1		4	25	25	50	100
B 5.3	Paediatric Audiology	3	1		4	25	25	50	100
B 5.4	Aural Rehabilitation in Children	3	1		4	25	25	50	100
B 5.5	Clinicals in Speech-Language	-	-	3	3		25	75	100
B 5.6	Clinicals in Audiology	-	-	4	4		25	75	100
Total		12	4	7	23	100	150	350	600

Semester – VI

Course Code	Course Title	Credit Distribution (L,T/P & CL are hours per week, C is total credits)				Marks Distribution			Total marks
		L	T	CL	C	Prac	IAC	ESE	
B 6.1	Motor Speech Disorders in Adults	3	1		4	25	25	50	100
B 6.2	Language Disorders in Adults	3	1		4	25	25	50	100
B 6.3	Aural Rehabilitation in Adults	3	1		4	25	25	50	100
B 6.4	Audiology in Practice	3	1		4	25	25	50	100
B 6.5	Clinicals in Speech-Language	-	-	3	3		25	75	100
B 6.6	Clinicals in Audiology	-	-	4	4		25	75	100
Total		12	4	7	23	100	150	350	600

Internship**

Course Code	Course Title	Credit Distribution (L, T/P & CL are hours per week)				Marks Distribution			Total marks
		L	T	CL	C	Prac	IAC	ESE	
B 7.1	Clinicals in Speech-language Pathology	--		21	7	--		100	100
B 7.2	Clinicals in Audiology	--		21	7	--		100	100

**All clinical examinations shall be conducted by one internal and one external examiner. B7.1 and B7.2 in the above table shall be conducted at the end of internship (8th semester).

16. Criteria for pass

- The student is required to obtain a minimum of 50% in each of the theory papers, internal assessment, practical and/or clinical exams for a pass.
- Students will not be able to appear for the University theory exam if they do not pass in practical, internal assessment or clinical component.
- Students will have to pass the clinical examination of the given semester to proceed to the next semester.
- Candidate is declared to have passed in a subject, if he/she secures 50% of marks in the end semester examination and internal assessment added together in that subject.
- If the subject has both theory and practical, then the candidate must pass separately in theory and practical to pass the exam.
- If a candidate fails in either theory and/or practical, he is declared as failed in that subject. He must reappear for both theory and practical exam of that subject to pass that subject.
- If a candidate fails in one of the subjects, then he/she must re appear only in that subject.

Subsidiary Subjects:

- Language allied and skill enhancement subjects are considered as subsidiary subjects.
- For subsidiary subjects, the college will conduct the end semester exam and send the marks to the examination Section.
- The candidate should get 50% aggregate in internal assessment and end semester exam added together to pass the exam. There is no practical exam in subsidiary subjects.

Declaration of Pass

A candidate who passes all the subjects of all six semesters will be declared passed in the BASLP program and will be enrolled for one academic year (10 months) of mandatory Internship to enhance skills in practical management.

17. Grading of performances

17.1. Letter grades and grade points allocations are based on the performance of each student. Each student shall be awarded a final letter grade at the end of the semester for each course. The letter grades and their corresponding grade points are given in below Table

Percentage of Marks obtained	Letter Grade	Grade Point	Performance
90.00 – 100	O	10	Outstanding
80.00 - 89.99	A	9	Excellent
70.00 - 79.99	B	8	Very Good
60.00 - 69.99	C	7	Good
50.00 - 59.99	D	6	Satisfactory
Less than 50	F	0	Fail
Absent	AB	0	Fail

17.2. A candidate who remains absent for any end semester examination shall be assigned a letter grade of AB and a corresponding grade point of zero. He/she should reappear for the said evaluation/examination in due course.

17.3 The Semester Grade Point Average (SGPA)

The performance of a student in a semester is indicated by a number called 'Semester Grade Point Average' (SGPA). The SGPA is the weighted average of the grade points obtained in all the courses by the student during the semester.

For example, if a student takes five courses (Theory/Practical) in a semester with credits C1, C2, C3, C4 and C5 and the student's grade points in these courses are G1, G2, G3, G4 and G5, respectively, and then students' SGPA is equal to:

$$SGPA = \frac{C1G1 + C2G2 + C3G3 + C4G4 + C5G5}{C1 + C2 + C3 + C4 + C5}$$

The SGPA is calculated to two decimal points. It should be noted that, the SGPA for any semester shall take into consideration the F and ABS grade awarded in that semester. For example, if a student has a F or ABS grade in course 4, the SGPA shall then be computed as:

$$SGPA = \frac{C1G1 + C2G2 + C3G3 + C4 * ZERO + C5G5}{C1 + C2 + C3 + C4 + C5}$$

17.4 Cumulative Grade Point Average (CGPA)

The CGPA is calculated with the SGPA of all the VI semesters to two decimal points and is indicated in final grade report card/final transcript showing the grades of all VI semesters and their courses. The CGPA shall reflect the failed status in case of F grade(s), till the course(s) is/are passed. When the course(s) is/are passed by obtaining a pass grade on subsequent examination(s) the CGPA shall only reflect the new grade and not the fail grades earned earlier. The CGPA is calculated as:

$$CGPA = \frac{C1S1 + C2S2 + C3S3 + C4S4 + C5S5 + C6S6}{C1 + C2 + C3 + C4 + C5 + C6}$$

where C1, C2, C3,…. is the total number of credits for semester I, II, III,…. and S1, S2, S3,….is the SGPA of semester I,II,III,…

Calculation of GPA & CGPA: An example (1st semester)

Course Code	Subject	Credits (a)	Grade Obtained	Credit Value (b)	Grade Points (a x b)
	Subject 1	4	B	8	32
	Subject 2	4	B	8	32
	Subject 3	4	O	10	40
	Subject 4	2	C	7	14
	Subject 5	2	A	9	18
	Total	16	-	-	136

1st Semester GPA = Total Grade Points / Total Credits = 136 / 16 = 8.5
2nd Semester GPA = 7 with respect to 18 Credits
Then 1st Year CGPA = (8.5 x 16) + (7 x 18) / 16 + 18 = 7.7

18. Declaration of class

The class shall be awarded on the basis of CGPA as follows:

- First Class with Distinction = CGPA of. 7.50 and above
- First Class= CGPA of 6.00 to 7.49
- Second Class = CGPA of 5.00 to 5.99

19. Promotion Criteria and Carry over Benefit

- If a candidate fails in any of the subject in any of the semesters, he/she shall be permitted to carry over the subjects up to 6th semester.
- Candidate should clear all subjects (Core subjects and Subsidiary subjects) of all the semester, to be eligible to start one year of mandatory internship.
- A fail in any one subject will mean that the student has to reappear for the exam in that subject only.
- A candidate who passes the semester examinations in parts is eligible for only CGPA and letter grade but not for ranking/award/medal from the University.

20. Improvement sessional

Conducted only for those who have failed to secure a minimum of ‘D’ grade for a course and wish to improve their IA marks.

20.1 It will be conducted along with the mid semester exam of the subsequent batch.
20.2 Student has to pay a fee as prescribed by the Institute/University
20.3 The marks obtained in other components of internal assessment can be carried forward without re assessment.

21. A candidate who remains absent for any end semester examination shall be assigned a letter grade of AB and a corresponding grade point of zero. He/she should reappear for the said evaluation/examination in due program.

22. Internship

The internship time period provides the students the opportunity to continue to develop confidence and increased skill in simulation and treatment delivery. The students can start internship after the 6^{th} semester exams. However, students who fail in their clinical exam of 6^{th} semester will have to discontinue their internship.

Objectives of the clinical internship

- To facilitate the transition from academic training to independent clinical responsibility,
- To provide additional inputs to attain and maintain competence in the clinical management of persons with communication disorders,
- To initiate group and individual action focusing on prevention/early identification and intervention in individuals with speech, hearing and language impairments at the level of the individual, family and community, and
- To provide training to understand professional responsibilities and ethical practices including:
    - Rights and dignity of patients.
    - Consultation and referral to other professionals.
    - Conduct and professional obligations to peers/patients/families and the community at large.

Guidelines

a) Internship is mandatory.
b) Duration: One academic year (10 months) split into two semesters (VII & VIII).
c) Eligibility: Internship will start immediately after the candidate completes the academic and clinical training till the 6thsemester. Students can start internship after the 6thsemester exams. However, students who fail in their clinical exam of 6th semester will have to discontinue their internship.
d) Structure and duration of posting

- The institute shall decide about the setups where students will be posted for internship. Attempts will be made to provide clinical training to students in a variety of setups. However, students will be posted for internship only at the institutes approved by the Rehabilitation Council of India.
- Students will do an internship at the parent institute for one semester and at an institute(s) outside the parent institute for one semester. The internship can be done at setups like hospitals, special educational centers/schools, centres with clinical facilities for the management of ASD, cochlear implantation, AVT etc., centers which undertake empowering of mothers, centers for CP, and centers for LD, etc.
- It shall be mandatory to provide additional clinical training to students in areas as management of neurologically afflicted persons, prevention and early intervention programs, community-based rehabilitation, occupational health programs, structural abnormalities related to speech and hearing, etc. will be provided during the internship.

e) Mode of supervision during the internship:

Supervision will generally be provided by a Speech-language Pathologist and Audiologist. However, in institute/centres where this is not feasible, supervision can be done by a specialist from an allied area like Otolaryngology, Neurology, Mental Health, Paediatrics, among others.

f) Maintenance of records by students:

Every student shall maintain records of the number of hours of clinical work in different areas and institutions. This should be certified by the head of the institution or his/her nominee where the student is undergoing an internship.

g) Leave:

Candidates should have an attendance of at least 90% during the internship period. The internship shall be extended by the number of days the student falls short of 90% attendance. Compensatory work for the shortage of attendance must be completed before the final clinical exams of the 8^{th} semester.

h) Stipend:

As per the norms of the University.

i) Grading and evaluation of student:

All interns will be assessed based on their attendance, performance in the postings and presentation of logbooks. The mode of assessment and frequency of assessment will be prescribed by the parent institute. The student is required to repeat those postings in which

his/her performance is below 40%. Interns will be evaluated at the end of their internship duration (of 10 months) for 100 marks. Report submission and material development (20 marks) and clinical competency ratings for each clinical area (80 marks).

j) Certification:

Internship completion certificate will be issued from the college after successfully clearing all assessment exams and obtaining a satisfactory completion certificate from the head/ In-charge of the department at the end of the internship

The certificates of classification and grading of the candidates by the university will be issued only after the submission of the certificate of successful completion of the internship and clinical examination of the candidate by the principal of the college. Supervised clinical hours spent during internship shall be included in the clinical competence certificate issued to students.

k) The University shall award the degree only after the successful completion of the clinical internship.

23. Eligibility for the award of Degree

A candidate shall have passed in all the subjects of all six semesters and should have successfully completed the 1 academic year (10 months) of the mandatory internship. Candidates are allowed one Casual Leave each month. Other missed days have to be repeated to complete the Mandatory Internship.

24. Maximum Period for Completion of Course

A candidate shall complete the course within 6 years from the date of admission, failing which re- registration is mandatory.

25. Conduct and discipline

- Candidates shall conduct themselves within and outside the premises of the institution in a manner befitting to the student of an educational institution.
- As per the order of the Honorable Supreme Court of India, ragging in any form is considered as a criminal offence and is banned. Any form of ragging will be severely dealt with.
- The following acts of commission and/or omission shall constitute the gross violation of code of conduct and are liable for invoking of disciplinary measure
- Ragging as defined and described by the supreme court/Government.

- Lack of courtesy and decorum; indecent behaviour anywhere within or outside the campus.
- Willful damage, disfigurement or stealthy removal of any property /belongings of the institution/hostel or of fellow candidates/citizens.
- Possession, consumption or distribution of alcoholic drinks or any kind of hallucinogenic drugs.
- Mutilation or unauthorized possession of library books.

11.3.6. Noisy or unseemly behaviour, disturbing studies of the fellow candidates.

11.3.7. Hacking of computer systems (such as entering into other person's domain without prior permission, manipulation and/or damage to the computer hardware or software or any other cybercrime etc.)

11.3.8. Plagiarism of any nature.

11.3.9. Any other act of gross indiscipline as decided by the board of management from time to time.

11.4. Commensurate with the gravity of the offense, the punishment may be: reprimand, fine, expulsion from the hostel, debarment from an examination, disallowing the use of certain facilities of the Institution, rustication for a specific period or even outright expulsion from the institution, or even handing over the case to appropriate law enforcement authorities or the judiciary, as required by the circumstances.

11.5. For any offence committed in (i) a hostel (ii) a department or iii) in a classroom and elsewhere, the Chief Warden, the head of the department and the head of the institution, respectively, shall have the authority to reprimand or impose fine.

11.6. All cases involving punishment other than reprimand shall be reported to the Pro Vice-Chancellor.

11.7. Cases of adoption of unfair means and/or any malpractice in an examination shall be reported to the controller of Examinations for taking appropriate action.

26. Graduation requirements

A candidate shall be declared eligible for the award of the degree if he/she has:

- Fulfilled Degree Requirement.
- No dues to the university, institution, department, hostels, Library, etc.
- No disciplinary action pending against him/her.

27. Convocation

Degrees will be awarded in person for the candidates who have graduated during the preceding academic year. Degrees will be awarded in absentia to such candidates who are unable to attend the convocation. Candidates are required to apply for the convocation along with the prescribed fee within the specified date, after having satisfactorily completed all the requirements of the course.

A provisional pass certificate will be issued by the University provided the candidate fulfils the requirements mentioned in clause (10) above. The provisional certificate will be issued on submission of an application through the college and will be valid until the convocation.

Infrastructure requirements for B. ASLP programs

The following are the minimum requirements for starting/continuing a B. ASLP program. This should be read and interpreted along with the guidelines of RCI for inspectors for inspection of new/existing programs for recognition.

Personnel

	B.ASLP (Intake : 20/ year)	**BASLP Intake 20 plus 20 students**
Core Faculty		
Professor- Speech Pathology & Audiology	**--**	**1**
Associate Professor- Speech Pathology & Audiology	**1**	**2**
Assistant Professor - Speech Pathology	**2**	**1**
Assistant Professor - Audiology	**2**	**2**
Clinical Staff		
Speech Pathologist - Gr. I	**1**	**1**
Speech Pathologist - Gr. II	**1**	**1**
Audiologist - Gr. I	**1**	**1**
Audiologist - Gr. II	**1**	**1**
Allied Faculty (Part time)		
Asst. Prof in Cl. Psychology	**1**	**1**
Asst. Prof in Electronics	**1**	**1**
Asst. Prof in Otolaryngology	**1**	**1**
Asst. Prof in Linguistics	**1**	**1**
Asst. Prof in Statistics	**1**	**1**
Asst. Prof in Neurology	**1**	**1**

Supporting staff - Technical		
Earmold technician	**1**	**0**
Bio-medical technician	**1**	**1**
Computer technician	**1**	**1**
Library & Information Officer	**1**	**1**
Library Assistant	**1**	**1**
Supporting staff - Administrative		
Secretary - Academics	**1**	**1**
Secretary - Clinic	**1**	**1**
Secretary - Admin	**1**	**1**

A minimum of 2 faculty members in the core areas of Speech-language Pathology and Audiology is a must to get approval to start the B. ASLP program. Two more faculty members in the core areas must be added before the commencement of the second year. A full contingent of staff must be in place before the commencement of the third year.

The B. ASLP program should be conducted by an independent institute/ college/ department in a university/department in a hospital/rehabilitation unit headed and coordinated (administrative/academic and clinical) by a full-time Audiologist and Speech Language Pathologist professional only. His/her qualification and experience should not be less than that of an Associate Professor.

Only on completion of two batches of B. ASLP, an institution becomes eligible to increase the intake subject to the availability of recommended infrastructure.

All aided and Government institutions shall implement reservations in admission as per Government rules from time to time. However, there shall be an increase in infrastructure commensurate with the increase in the number of seats as per reservation policy.

Note: All training institutions must have given infrastructure and faculty and professional requirement before the commencement of academic session 2018-19.

Faculty and Professional qualification of in the core areas

Designation	**Qualifications**	**Pay Scale**
Professor	Essential	As per UGC guidelines
	a) M.Sc.(Sp & Hg)/MASLP/equivalent and Ph.D.	
	(in core areas)	
	b) 10 years teaching experience at PG/UG level	
	c) PhD (in core areas*)	
	d) Minimum of five Publications with cumulative impact factor of 05.	
	e) Valid RCI registration	

	Desirable:	
	Experience of running under-graduate training programs	
Associate Professor	Essential	As per UGC guidelines
	a) M.Sc. (Sp & Hg)/M. ASLP/equivalent	
	b) 8 years of teaching experience at graduate/ post graduate level;	
	c) Minimum of five Publications with cumulative	
	impact factor of 05.	
	d) Valid RCI registration	
	Desirable:	
	Experience of running under-graduate training programs	
Assistant Professor-Audiology	Essential	As per UGC guidelines
	a) M.Sc. (Sp & Hg)/M. ASLP or its equivalent /	
	M.Sc. (Audiology)	
	b) 2 years teaching/ clinical / research experience	
	c) Valid RCI registration	
	Desirable:	
	a) Ph.D. (in core area*)	
	b) Publications	
Assistant Professor-Speech Language Pathology	Essential	As per UGC guidelines
	a) M.Sc(Sp & Hg)/M.ASLP or its equivalent /	
	M.Sc.(Speech Language Pathology)	
	b) 2 years teaching/ clinical / research experience	
	c) Valid RCI registration	
	Desirable:	
	a) Ph.D (in core area*)	
	b) Publications	
Audiologist Grade I	Essential	
	M.Sc(Sp & Hg) / M.ASLP or its equivalent	
	M.Sc.(Audiology)	
	Valid RCI registration	
	Desirable: 1 year experience in the field	
Speech Pathologist Grade I	Essential	
	M.Sc(Sp & Hg) / M.ASLP/ or its equivalent M.Sc. (Speech Language Pathology) Valid RCI registration	
	Desirable: 1 year experience in the field	

Speech Pathologist/ Audiologist Grade II	Essential B.Sc (Sp & Hg)/B.ASLP or its equivalent Valid RCI registration	

***Audiology & Speech Language Pathology**

Clinical

Facility for diagnosis, management and rehabilitation of all types of speech, language, hearing and swallowing disorders in clients of all age groups from infancy to geriatrics.

The size of the clinical population shall be 2 per student per semester in a given area (read in consonance with the above clause).

Library

- Library should accommodate at least 30% of the staff and students of the institute at any given time.
- Library should have internet and photocopying facilities.
- Books mentioned under 'Recommended reading' under each paper must be available. There shall be addition of a minimum of two books every year for each subject of study.
- There should be at least 5 journals (2 each in Speech-language pathology and Audiology, and 1 general) for the B. ASLP program

Library Staff

- Library and Information Officer – 1
- Qualification: Bachelor's in library science with one year of experience in managing a technical library
- Library Assistant – 1
- Qualification: Diploma in Library Science

Space

S. No	Size	Minimum Size required	Number Required
Academic Space			
a)	Class Rooms	Space @ 10 sq. ft per student + 20 Sq. ft for the teacher: Room with a minimum area of 220 sq. ft.	2 class rooms for every 20 students
b)	Seminar hall	Space to accommodate 50% of total student strength	1
c)	Labs to transact practical	Space to accommodate 50% of total student strength	2
d)	Computer lab/multipurpose hall	Space to accommodate 50% of total student strength	1
e)	Library	Space to accommodate 50% of total student strength	1
Clinical Space			
f)	Rooms for reception where patients are registered	10’ X 10’	1 room for every 20 students
g)	Room for case history, diagnostic room and interviews	6’ X 8’	2 rooms for every 20 students
h)	Speech lab (quiet room) for diagnostic purpose	15’ X 20’	1 room for every 20 students
i)	Recording room (Sound proof)	6’ X 8’	1 room for every 20 students
j)	Speech therapy rooms/cabins (completely partitioned/sound isolated	10’ X 16’	5 rooms for every 20 students
k)	Two room audiometric suite with control and test room situation. (Sound Proof. ANSI 1977)	10’ x 16’	1 for every 20 students
l)	Room for hearing aid fitting	10’ x 15’	1 room for every 20 students
m)	Earmold Lab & Hearing aid repair lab	12’ x 12’	1 room for every 20 students
n)	Electro-physiological room	10’ x 10’	1 room for every 20 students
o)	Staff Room	15’ x 20’	1
p)	Individual work space (with provision for storage facilities)	10’ x 10’	1 room for every 2 faculty/staff members
q)	Academic/administrative office	10’ x 10’	1
r)	Principal’s Office room	10’ x 10’	1
Other facilities			
s)	Sanitary facilities	Separate facility for males and females, staff/students and clinical population	
t)	Hostel	Separate hostel for Men and Women with dining facility. Accommodation for at least 50% of the student population.	

Audio-visual Instruments, Furniture in classrooms, clinical areas, labs and other administrative areas and internet access: Appropriately.

Laboratory

S. No.	Equipment	For a batch of 20 students (Clinical)
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 for Lab
b)	Portable audiometer with provision of A.C. and B.C. testing : desirable screening audiometer	1
c)	Clinical immittance audiometer (Desk model) with accessories.	1+1 for Lab
d)	Portable/Screening impedance audiometer	1
e)	Clinical BSEAR	1+1 for Lab
f)	Otoacoustic emission	1+1 for Lab
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 listening devices.	A representative sample of hearing aids and assistive devices
i)	IGO and HAT for hearing aid trial and making electroacoustic measurements.	1
j)	Stop watch	2
k)	Otoscope	4
l)	Auditory training and Screening material	
m	Ear Mould Lab-fully equipped	

Sl. No.	Equipment	For a batch of 20 students
a)	Speech and Language Tests (Tests for differential diagnosis) (English and local language)	As per course requirement
b)	Proformae	As per course requirement
c)	Speech Therapy material (Indian, Language and English)	As per course requirement
d)	Toys and Books	
e)	Mirrors - Size 2' x 3'	4
f)	Speech Trainer	1
g)	Portable and Digital tape recorders	2
h)	Hi-Fi Ampli Deck with speakers and good microphone	1
i)	Spirometer	1 (+1 for lab)
j)	Computer PC-AT with VGA Color Monitor & printer for clinic administration	1
k)	Software for diagnostic/therapeutic use and computer with necessary accessories	1 (+1 for lab)
l)	Stroboscope/VL scope/ FEES (by possession or access)	1
m)	Electroglottograph	1
n)	Audio cassettes for training/CDs	
o)	Pitch pipe	
p)	Tongue depressors	3

[2020]

Syllabus

Bachelors in Audiology & Speech- Language Pathology

YENEPOYA
(Deemed to be University)
Recognized under Sec 3(A) of the UGC Act 1956
Accredited by NAAC with 'A' Grade

YENEPOYA DEEMED TO BE UNIVERSITY
MANGALORE

ACADEMIC YEAR | 2020 onwards

Appendix- I
Course content
Semester I

B 1.1 Communication Sciences

Hour - 60 Marks -100

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

- Basic concepts in speech, hearing, language and communication
- Basic concepts of hearing sensitivity and acoustics

Part A Speech-Language Pathology

Unit 1: Speech, language and communication

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

Unit 2: Bases of speech and language

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

Part B Audiology

Unit 3: Sound intensity and concept of decibel

- Acoustic energy and power, absolute and relative units – importance of reference sound intensity and intensity levels –absolute and relative measurements and Bel and decibels, sound pressure and decibel sound pressure levels, relationship between intensity and pressure characteristics and application of decibels

Unit 4: Audibility & hearing

- Hearing range –intensity and frequency
- Up-down and staircase procedure of estimating minimum audible levels Minimum audible pressure and field, Missing six dB and related issues

- Reference equivalent threshold sound pressure levels and hearing levels Sensation levels, Threshold of pain, Most comfortable levels

Unit 5: Introduction to Audiology and Speech-language Pathology

Part A: Speech and language

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

Part B: Audiology

- Audiology – historical aspects, development of instrumentation in audiology Development of audiology: Indian and global context
- Branches of audiology
- Scope of audiology

Recommended Reading

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

B1.2 Anatomy and Physiology of Speech and Hearing

Hours - 60 Marks - 100

Objectives: After completing this course, the student will be able to understand the anatomy of the auditory system anatomy of the speech mechanism physiology of hearing mechanism functioning of speech and swallowing mechanism

Unit 1: Introduction

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

Unit 2: Embryology

- Basic terminologies related to embryology
- Development of external ear
- Development of middle ear
- Development of Inner ear and the auditory system
- Five examples of embryonic anomalies affecting speech-language & hearing Development of respiratory structures
- Development of larynx
- Development of facial region and palate
- Development of tongue and teeth

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

- Mechanisms of breathing with emphasis on speech breathing
- Supportive frame work of larynx
- Anatomy of larynx
- Anatomy of oesophagus
- Brief mechanisms of swallowing Mechanisms of phonation
- Anatomy of articulators and associated structures
- Contribution of articulatory structures to speech production
- Anatomy of resonatory mechanisms
- Contribution of resonatory mechanisms to speech production

Unit 4: Anatomy and physiology of external and middle ear

- Anatomy of the external ear
- Physiology of external ear including localization
- Head shadow effect, inter-aural intensity and time differences
- Brief anatomy of temporal bone
- Anatomy of tympanic membrane and associate structures
- Anatomy of middle ear and ossicles

- Anatomy of Eustachian tube and middle ear muscles
- Physiology of Eustachian tube
- Middle ear transformer action
- Physiology of middle ear muscles

Unit 5: Anatomy and physiology of labyrinth

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

Recommended Reading

1. Seikel, J. A., King, D. W., & Drumright, D. G. (2010). Anatomy & Physiology for Speech, Language, and Hearing (4th edition). Delmar, Ceenage Learning, Division of Thomson Learning. NY.

2. Zemlin, W. R. (2010). Speech and Hearing Science: Anatomy and Physiology: International Edition (4 editions.). Boston: Pearson.

3. Chaurasia, B.D (2004). Human Anatomy, vol 3. Head Neck and Brain 4th Eds, CBS Publishers and Distributors, New Delhi. ISBN 81-239-1157-2.

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

B1.3 Clinical Psychology

Hour - 60 Marks -100

Objectives:

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

- Scope of clinical psychology and its significance for speech and hearing
- Concept of normality, abnormality and classification of abnormal behavior cognitive, motor, emotional and social development theories of learning and therapy techniques based on learning principles
- Neuropsychological assessment and rehabilitation
- Application of neuropsychology in the field of speech and hearing basics of counselling

Unit 1: Introduction to psychology

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

Unit 2: Assessment procedures in clinical psychology

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

Unit 3: Developmental psychology

- Child and developmental psychology: meaning, definition and scope
- Meaning of growth, development & maturation
- Principles of child development
- Motor development: general principals of motor development

- Stages in motor development: early motor development, motor development during later childhood and adolescence, decline with age
- Cognitive development: growth from early childhood to adolescence
- Piaget's theory of cognitive development
- Emotional development
- Social development

Unit 4: Principles of learning and behavior modification

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

Unit 5: Neuropsychology and its relevance to study of speech

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

Recommended Reading

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

B1.4 Linguistics and Phonetics

Hour - 60 Marks -100

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

- Different branches and aspects of linguistics characteristics and functions of language
- Different branches of phonetics, applied linguistics, and phonology morphology, syntax, semantics, pragmatics acquisition of language and factors affecting it bi/multilingualism and related issues

Unit 1: Linguistics

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

Unit 2: Phonetics and Phonology

- Introduction to phonetics
- Articulatory, acoustic, auditory and experimental phonetics – an introduction
- Articulatory classification of sounds – segmental and supra-segmental
- Classification description and recognition of vowels and consonants
- Pathological aspects of speech sound production
- Transcription systems with special emphasis on IPA.
- Transcription of samples of normal and disordered speech
- Introduction to phonology, classification of speech sounds on the basis of distinctive features and phonotactics
- Application of distinctive feature theory to speech pathology and speech therapy, phonotactics, phonotactic patterns of English and Indian languages
- Phonemic analysis – Principles and practices; their practical implications for speech pathologists

- Common phonological processes - assimilation, dissimilation, metathesis, haplology, epenthesis, spoonerism, vowel harmony, nasalization, neutralization

Unit 3: Morphology, syntax, semantics and applied linguistics

- Morphology – concepts of morph, allomorph, morpheme, roots, compound forms - endocentric and exocentric constructions, free and bound morphemes, inflection and derivation, principles and practices of morphemic analysis
- Syntax – different methods of syntactic analysis
- IC analysis, phrase structure, grammar, transformational generative grammar
- Introduction to the major types of transformations
- Sentence types, notions about competence versus performance
- Deep structure versus surface structure
- Acceptability versus grammaticality language versus parole etc.
- A brief introduction to semantics – semantic feature theory, pragmatics
- Processes of word formation, content and function words, form classes, grammatical categories
- Syntax – concepts of phrases and clauses, sentence and its types
- Different methods of syntactic analysis – Immediate constituent analysis, Phrase structure, grammar, transformational generative grammar– deep structure versus surface structure, acceptability versus grammaticality; Introduction to the major types of transformations
- Usefulness of morphemic and syntactic analysis in planning speech and language therapy
- A brief introduction to semantics, semantic relations, semantic feature theory
- A brief introduction to pragmatics and discourse.

Unit 4: Language acquisition

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

Unit 5: Bi/multilingualism

- Introduction to the language families of the world and India

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

Recommended Reading

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

B1.5 Electronics and Acoustics

Hours - 60 Marks - 100

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

- Concept and types of power supply for biomedical instruments basic aspects of digital signal processing theoretical basis of acoustics required for audiologists functioning of computers and computing systems.

Unit 1: Electronic components and power supply

- Resistors, capacitors, inductors
- Transformers and potentiometers,
- Semiconductor diodes and transistors
- Light emitting devices, seven segment displays,
- Liquid crystal displays
- Principles of operations and working of Field Effect Transistors, Uni-junction transistors and thyristors
- Introduction to linear and digital integrated circuits
- Block diagram of a DC power supply
- Linear regulated power supplies, line regulation and load regulation, specifications of a DC power supply unit, Switched Mode Power Supply
- AC power supply, stabilizers, Uninterrupted Power Supply, and inverters Basic electronic concepts such as Polarity, Grounding

Unit 2: Introduction to acoustics

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

Unit 3: Acoustical treatment, transducers and basics of computers

- Introduction to audiometric rooms Absorption coefficient, Sabine’s formula
- Materials for construction of audiometric rooms
- Lighting, grounding and other miscellaneous issues related to audiometric rooms
- Evaluation of efficiency of sound proofing in the audiometric rooms
- Amplifiers
- Microphones, loudspeakers - types and function
- Fundamentals of digital electronics, binary number system, Hex code, bit, byte, logic gates, counters, flip-flops etc.

- Introduction to computers
- Operating systems, hard ware, software, memory devices and other peripherals, care and preventive maintenance of computers

Unit 4: Digital signal processing

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

Unit 5: Instrumentation in speech and hearing

- Introduction to electronic instrumentation in speech and hearing
- Electrodes, filters and preamplifiers
- Principle of operations, block diagram, calibration, maintenance and troubleshooting of audiometers, immittance meters, oto-acoustic emissions, hearing aids, evoked potential system, speech and voice analyses systems, artificial larynx, electroglottograph

Recommended Reading

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

B1.6 Research Methods and Statistics

Hours - 60 Marks - 100

Objectives: After completing this course, the student will be able to understand the basic concept of research in the field of audiology and speech-language pathology design and execution of research ethical guidelines for conducting research

Part A: Research Methods

Unit I: Introduction to research methods

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

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

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

Part B: Statistics

Unit III: Introduction to statistics and data collection

- Application of statistics in the field of Audiology and speech-language pathology. Scales of measurement: nominal, ordinal, interval, ratio
- Classification of data: class intervals, continuous and discrete measurement

- Normal distribution: general properties of normal distribution, theory of probability, area under normal probability curve
- Variants from the normal distribution: skewness and kurtosis Measure of central tendency: mean, median, mode
- Measures of variability: range, deviation (average and standard deviation), variance

Unit IV: Statistics and research designs

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

Unit V: Epidemiology

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

Recommended Reading

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

Allied 1 - CONSTITUTION OF INDIA

Subsidiary 1: Constitution of India **Theory: 15 hours**

Syllabus

1. Meaning of the team 'Constitution' making of the Indian Constitution 1946-1940.
2. The democratic institutions created by the constitution Bicameral system of Legislature at the Centre and in the States.
3. Fundamental Rights and Duties their content and significance.
4. Directive Principles of States Policies the need to balance Fundamental Rights with Directive Principles.
5. Special Rights created in the Constitution for: Dalits, Backwards, Women and Children and the Religious and Linguistic Minorities.
6. Doctrine of Separation of Powers legislative, Executive and Judicial and their functioning in India.
7. The Election Commission and State Public Service commissions.
8. Method of amending the Constitution.
9. Enforcing rights through Writs
10. Constitution and Sustainable Development in India.

Semester II

B 2.1 Neurology

Hour - 60 Marks -100

- **Objectives**: After completing this course, the student will be able to understand
- Basic concepts, anatomy and physiology of nervous system related to speech and hearing neural organization –different structures and functions of various systems neurosensory and neuromotor controls in speech, language and hearing mechanisms
- Cerebral plasticity and dominance and its relevance for speech, language and hearing disorders
- Various neural diseases, lesions, nutritional and metabolic conditions affecting speech, language and hearing
- Basic principles and assessment procedures used in speech, language and hearing disorders associated with neurological conditions
- Basic principles and management procedures used in speech, language and hearing disorders associated with neurological conditions

Unit 1: Anatomy and physiology of the nervous system

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

Unit 2: Neural organization of speech and hearing processes

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

- Swallowing mechanism and neural control
- Screening and bedside neurological examination

Unit 3: Neural disorders associated with speech and hearing disorders - I

- Neural infections – meningitis, encephalitis
- Developmental anomalies – spinal cord defects, syringomalacia and bulbia, Arnold chian malformations
- Hydrocephalus – source and circulation of CSF, types and etiopathogenesis UMN lesions – spastic dysarthria
- LMN lesions –flaccid dysarthria
- Mixed lesions
- Extra pyramidal lesions – dyskinetic dysarthria
- Cerebellum and cerebellar pathway lesions – ataxic dysarthria
- Other diverse lesions and dysarthrias

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

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

Unit 5: Speech-language and swallowing disorders

- Central language mechanism and its disorders
- Developmental motor speech disorders – cerebral palsy, muscular dystrophy Neurologic disorders with primitive reflexes, diagnosis and management Clinical neurological syndromes associated with speech and language disorders
- Childhood language disorders associated with neurologic disorders
- Swallowing associated with neurogenic disorders and assessing mastication and deglutition
- Agnosia and other conditions associated with speech and hearing disorders
- Cognitive disorders associated with neurologic disorders
- General management principles and options for childhood neurogenic speech, language and hearing disorders
- General management principles and options for adult neurogenic speech, language and hearing disorders

Recommended Reading

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

B2.2 Otolaryngology

Hour - 60 Marks -100

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

- Causes, signs, symptoms, pathophysiology and management of diseases of external, middle and inner ear leading to hearing loss
- Causes, signs, symptoms, pathophysiology and management of diseases of laryngeal and articulatory systems

Unit 1: External and middle ear and their disorders

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

Unit 2: Inner ear and its disorders

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

Unit 3: Oral cavity and its disorders

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

Unit 4: Larynx and its disorders

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

Unit 5: Esophagus and its disorders

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

Recommended Reading

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

B2.3 Speech-Language Pathology

Hour - 60 Marks -100

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

- Different speech and language disorders basic concepts and tools required for diagnosing speech and language disorders
- Basics of assessment procedures for speech and language disorders
- Basic principles and intervention procedures for speech and language disorders
- Clinical requirements to practice, different laws, social-cultural and ethical issues
- Identification and prevention of speech and language disorders
- Basic principles of providing counselling and guidance to clients and caregivers

Unit 1: Basic concepts and methods of diagnostics

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

Unit 2: Basic concepts and methods of therapeutics

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

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

- Causes of speech disorders

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

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

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

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

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

Recommended Reading

1. Owens. Jr, Kimberly, A. Metz, F.E. (2014). 5th Ed. Introduction to Communication Disorders: A life span based Perspective. Pearson Communication Science and Disorders Series.
2. Hegde, M. N., & Davis, D. (2005). Clinical methods and practicum in speech- language pathology (4th ed.). Australia; Clifton Park, NY: Thomson Delmar Learning.
3. Shipley, K. G., & Roseberry-McKibbin, C. (2006). Interviewing and counselling in communicative disorders : Principles and procedures (3rd ed.). Austin, Tex: Pro-Ed.
4. Brookshire, R. H. (2003). Introduction to neurogenic communication disorders (6th ed.). St. Louis, Mo: Mosby.
5. Hulit, L.M., Marle. R., Kathleen, R. H., & Fowey (2010). Born to Talk. Pearson Communication Science and Disorders Series 5th Ed.
6. Roth, F. P., & Worthington, C. K. (2005). Treatment resource manual for speech language pathology (3rd ed.). Australia; Clifton Park, NY: Thomson Delmar Learning.
7. Shipley, K. G., & McAfee, J. G. (2004). Assessment in speech-language pathology: A resource manual (3rd ed.). Australia; Clifton Park, NY: Delmar Learning.
8. Ysseldyke, J. E., & Algozzine, R. (2006). Teaching students with communication disorders : A practical guide for every teacher. Thousand Oaks, Calif.: Corwin Press.

B2.4 Audiology

Hour - 60 Marks -100

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

- Understand and carryout experiments to measure differential sensitivity loudness and pitch take case history,
- Administer the tuning fork tests and interpret the results administer pure tone audiometry including masking on clinical population and appreciate the theoretical back ground of it
- Carryout different tests involved in speech audiometry and appreciate the theoretical back ground
- Carryout subjective calibration and daily listening checks of the audiometer
- Get adequate theoretical information necessary to understand concepts involved in objective calibration

Unit 1: Differential sensitivity

- Concept of differential sensitivity, just noticeable difference
- Weber's fraction
- Intensity discrimination
- Frequency discrimination
- Duration discrimination and temporal resolution
- Applications of JND's
- Magnitude estimation and production
- Loudness – equal loudness level contours and its application
- Loudness scales - sone, phone, Steven's power law
- Pitch- scales of pitch

Unit 2: Case history and tuning fork tests

- Need for case history Basics of history taking
- Essential factors to be included in case history for adults
- Essential factors to be included in case history for children
- Interpretation of case history
- Audiological evaluation – rationale and purpose
- Principles, procedure, interpretation, advantages and disadvantages of Rinne and Schwabach tuning fork test
- Principles, procedure, interpretation, advantages and disadvantages of Weber and Bing tuning fork test
- Audiometric version of Weber and Bing test

Unit 3: Pure tone audiometry

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

Unit 4: Speech audiometry

- Importance and purpose
- Different types of stimuli used in speech audiometry Concept of phonetically and phonemically balanced Speech detection thresholds – procedure and application Speech reception thresholds – procedures and application Word recognition scores –procedure and applications PIPB function – procedure and applications
- Factors affecting speech audiometry
- BC speech audiometry – procedure and its application Test materials available in various languages

Unit 5: Clinical masking and instrumental calibration

- Definition and different terminologies Purpose and rationale of clinical masking
- Different types of stimulus employed in clinical masking
- Interaural attenuation and factors affecting interaural attenuation
- When to mask and how much to mask – importance of adequate noise levels Different procedures for masking
- Masking for speech audiometry
- Calibration definition and purpose
- Daily listening checks and subjective calibration Objective calibration of air conduction

Reference

1. Durrant, J. D., &Feth, L. L. (2012). Hearing Sciences: A Foundational Approach (1 edition.). Boston: Pearson.
2. Emanuel, D. C., &Letowski, T. (2008). Hearing Science (1 edition.). Philadelphia:
3. Lippincott Williams and Wilkins.
4. Gelfand, S. A. (2009). Hearing: An Introduction to Psychological and Physiological Acoustics (5 edition.). London: CRC Press.
5. Kaplan, H., Gladstone, V. S., & Lloyd, L. L. (1993). Audiometric Interpretation: A Manual of Basic Audiometry (2 edition.). Boston: Pearson.
6. Katz, J. (2014). Handbook of Clinical Audiology (7th International edition edition.). Lippincott Williams and Wilkins.
7. Martin, F. N., & Clark, J. G. (2014). Introduction to Audiology. Boston: Pearson. Silman, S., & Silverman, C. A. (1997). Auditory Diagnosis: Principles and Applications (Reissue edition.). San Diego: Singular Publishing Group

B2.5 Practicals (Speech-language Pathology)

Marks -100

Practicals

- Demonstrate normal aspects of speech and analyse perceptually variations in voice, articulation and fluency in different recorded speech samples of typical individuals at different age groups (children, adults and older adults) and sex.
- Demonstrate normal aspects of language and analyse perceptually variations in language in different recorded samples of typical individuals at different age groups (children, adults and older adults) and sex.
- Demonstrate stress, rhythm and intonation and variations in rate of speech and analyse perceptually variations in prosody in different recorded samples of typical individuals at different age groups (children, adults and older adults) and sex.
- Use IPA to transcribe spoken words.
- Record a standard passage, count number of syllables and words, identify syllable structure, syntactic structures in the passage.
- Oral mechanism examination on 5 normal children and 5 normal adults.
- Prepare a chart and show the developmental stages of speech and language behavior. Administer standardized tests for assessment of delayed speech and language development such as REEL, SECS, LAT, 3DLAT, ALD each on any 2 children.
- Study the available normative data (Indian/Western) of speech such as respiratory, phonatory, resonatory and articulatory parameters.
- Measure the following in 5 normal subjects: (a) Habitual frequency (b) Frequency range (c) Intensity (d) Intensity range (e) Phonation duration (f) rate of speech (g) Alternate Motion Rates and Sequential Motion Rates (h) s/z ratio.
- Study the available normative data (Indian/Western) of language such as phonology, semantics, syntax, morphology and pragmatic measures.
- Perceptual analysis of speech and language parameters in normal (2 children and 2 adults and persons with speech disorders (3 adults + 3 children).
- Prepare a model diagnostic report of a patient with speech and language disorder. Prepare a diagnostic and therapy kit.
- Make a list of speech language stimulation techniques and other therapy techniques for various speech disorders.
- Familiarize with the sources for referral and parent counseling procedures.
- Prepare a report on the available audiovisual material and printed material/pamphlets relating to speech-language pathology, public education of communication and hearing disorders, etc.
- Prepare a report on the available clinical facilities and clinical activities of the institute.

Clinical Practicum

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

B2.6 Practicals (Audiology)

Practicals **Marks - 100**

Calculate/derive the answers for following

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

Perform the following experiments

- Calculate reference equivalent sound pressure levels (RETSPL) for head phones and bone vibrator for any two frequencies using 30 participants.
- Measure most comfortable level on 10 participants with normal hearing sensitivity. Measure uncomfortable levels on 10 participants with normal hearing sensitivity. Calculate the sensation levels of MCL and UCLs in above 10 participants.
- Measure difference limen of intensity, frequency and duration on 10 normal hearing adults and plot it in graphical form and interpret the results.
- Measure equal loudness level contours at minimum level, 40 dB SPL, 70 dB SPL (1 kHz) in 5 normal hearing adults.
- Measure sone and mel in 5 normal hearing adults using scaling techniques.
- Take case history on 5 adults and 5 children with hearing problem and correlate the information from case history to results of pure tone audiometry.
- Administer different tuning fork tests on 5 simulated conductive and 5 sensori neural hearing loss individuals.
- Carry out pure tone and speech audiometry on 10 normal hearing individuals.
- Carry out clinical masking on 10 normal hearing individuals with simulated conductive hearing loss and carry out clinical masking on 5 individuals with conductive hearing loss and 5 individuals with sensori-neural hearing loss.
- Carryout daily listening checks and subjective calibrations 20 times and observe objective calibration once
- Perform otoscopy and draw the tympanic membrane of 10 healthy normal individuals Measure difference limen of intensity, frequency and duration on 10 normal hearing adults and plot it in graphical form and interpret the results
- Measure equal loudness level contours at minimum level, 40 dB SPL, 70 dB SPL (1 kHz) in 5 normal hearing adults
- Measure sone and mel in 5 normal hearing adults using scaling techniques
- Take case history on 5 adults and 5 children with hearing problem and correlate the information from case history to results of pure tone audiometry

- Administer different tuning fork tests on 5 simulated conductive and 5 sensori neural hearing loss individuals
- Carry out pure tone and speech audiometry on 10 normal hearing individuals
- Carry out clinical masking on 10 normal hearing individuals with simulated conductive hearing loss and carry out clinical masking on 5 individuals with conductive hearing loss and 5 individuals with sensori-neural hearing loss
- Carryout daily listening checks and subjective calibration 20 times and observe objective calibration once

Clinical Practicum

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

Allied 2 –ENVIRONMENTAL STUDIES

Allied 2: Environmental Studies **Theory 30 hours**

Syllabus

Unit 1: Multidisciplinary nature of Environmental Studies **1 hours**

- Multidisciplinary nature of Environmental Studies
- Concept of sustainability and sustainable development

Unit 2: Ecosystems **4 hours**

- What is an ecosystem? Structure and function of an ecosystem; Energy flow in the ecosystem; Food chains, food webs and ecological succession. Case studies of the following ecosystems:

a. Forest ecosystem

b. Grassland ecosystem

c. Desert ecosystem

d. Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)

1. History of ecosystem ecology
2. Ecosystem services

Unit 3: Natural Resources: **5 hours**

Renewable and Non-renewable resources

- Land resources and land use change; Land degradation, soil erosion and desertification.
- Deforestation: Causes and impacts due to mining, dam building on environment, forests, biodiversity and tribal populations.
- Water: Use and over-exploitation of surface and ground water, floods, droughts, conflicts over water (international & inter-state).
- Energy resources: Renewable and non-renewable energy sources, use of alternate energy sources, growing energy needs, case studies.

Unit 4: Biodiversity and its conservation **6 hours**

- Levels of biological diversity: genetic, species and ecosystem diversity; Biogeographic zones of India; Biodiversity patterns and global biodiversity hotspots
- India as a mega-biodiversity nation; Endangered and endemic species of India
- Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts, biological invasions; Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.

- Ecosystem and biodiversity services: ecological, economic, social, ethical, aesthetic and informational value.
- Nature Reserves, tribal populations and rights, Human wildlife conflicts in Indian context

Unit 5: Environmental Pollution **6 hours**

- Definition
    - Cause, effects and control measures of:-
      a. Air pollution
      b. Water pollution
      c. Soil pollution
      d. Light pollution
      e. Noise pollution
      f. Thermal pollution
      g. Nuclear hazards
- Climate change, Greenhouse effect, Global warming, Acid rain, Ozone layer depletion.
- Solid waste Management: control measures of urban and industrial wastes.
- Pollution case studies.

Unit 6: Environmental Policies & Practices **3 hours**

- Environmental Laws: Environment Protection Act.
- Air (Prevention and Control of Pollution) Act.
- Water (Prevention and control of Pollution) Act
- Wildlife Protection Act
- Forest Conservation Act
- International Agreements: Montreal protocol, Kyoto protocol, Convention on Biological Diversity (CBD)
- Environmental Impact Assessment
- Carbon footprint
- Sustainable Development Goals

Unit 7: Human communities and the environment **3 hours**

- Human Population growth – impacts on environment
- Resettlement and rehabilitation of project affected persons: case studies
- Disaster management – floods, earthquake, cyclone and landslides
- Environmental movements: Chipko, Silent Valley, Bishnois of Rajasthan
- Environmental ethics
- Consumerism and Environment
- Environmental communication and public awareness, case studies.

Unit 8: Field work (Equal to 5 lecture hours) **2 hours**

- Visit to a local area to document environmental assets river/ forest/grassland/hill/mountain
- Visit to a local polluted site-Urban/Rural/Industrial/Agricultural
- Study of common plants, insects, birds.
- Study of simple ecosystems-pond, river, hill slopes, etc.

Semester III

B3.1 Voice and its Disorders

Hour - 60 Marks -100

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

- Describe characteristics of normal voice and identify voice disorders
- Explain etiology related to voice problems, and its pathophysiology
- Assess voice disorders, provide counselling and therapy to individuals with voice disorders

Unit 1: Basic concepts in voice and its production

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

Unit 2: Characteristics and pathophysiology of voice disorders

- Pathologies of the laryngeal mechanism: classification of voice disorders, incidence, and prevalence
- Etiology of voice disorders: voice misuse and abuse, medical related etiologies, primary disorder etiologies and personality related etiologies
- Pathologies of vocal fold cover (infective and trauma related secondary conditions) and muscular dysfunction
- Non-organic voice disorders: functional disorders, psychosomatic- functional aphonia and physiological- voice abuse, puberphonia)
- Congenital voice disorders
- Neurological voice disorders
- Voice problems in systemic illnesses and endocrine disorders
- Voice problems in transgenders
- Voice problems in the elderly
- Voice problems in professional voice users: teachers and singers

Unit 3: Assessment of voice

- Referral sources, medical examination and team approach

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

Unit 4: Management of voice

- Voice therapy orientation: basic principles, goal setting and approaches Vocal hygiene and preventive counselling
- Symptomatic voice therapy – voice facilitation techniques
- Psychological approaches to voice therapy – psychoanalysis, rational emotive therapy and cognitive behavior therapy
- Physiological approach – breathing and postural techniques
- Holistic voice therapy approaches -1: accent therapy, confidential voice therapy, Holistic voice therapy approaches - 2: vocal function exercises, resonant voice therapy, Lee Silverman voice therapy
- Medical and surgical procedures in the treatment of benign vocal fold lesions: pharmaceutical effects on voice, phono surgery : re-innervation techniques, laryngeal framework surgeries, micro laryngeal excision
- Professional voice care

Unit 5: Intervention strategies for voice disorders

- Vocal trauma related disorders
- Functional voice disorders – inappropriate vocal components Functional aphonia
- Puberphonia/mutational falsetto Muscle tension dysphonia Sulcus vocalis
- Vocal fold palsy Spasmodic dysphonia GERD/LPR
- Benign vocal fold lesions requiring surgical intervention Post-operative care for benign vocal fold lesions disorders Documenting voice therapy outcomes

Practicals

- Record phonation and speaking samples (counting numbers) from five children, adult men, adult women, geriatric men and geriatric women. Note recording parameters and differences in material.
- Make inferences on age and sex differences across the samples obtained in the previous experiment using perceptual voice profiling. Make a note of

differences in pitch, loudness, quality and voice control. Explain how voice reflects ones personality and other social needs.

- Perform an acoustic voice analysis on phonation sample and generate a voice report based on acoustic findings. Compare findings between men & women.
- Perform MPT and s/z ratio. Infer differences across age and sex.
- Perform spirometry or any other appropriate aerodynamic procedure. Infer differences across age and sex.
- Perform acoustic analysis on five abnormal voice samples.
- Observe and document findings from five laryngeal examinations (pre-recorded or live) such as VLS, stroboscopy or any other relevant.
- Administer a PROM on five individuals. Prepare a vocal hygiene checklist.
- Demonstrate therapy techniques such as vocal function exercise, resonant voice therapy, digital manipulation, push pull, relaxation exercises.

Recommended Reading

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

B3.2 Speech Sound Disorders

Hour - 60 Marks -100

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

- Describe normal speech sound development and characterization of individuals with speech sound disorders.
- Perform phonological analysis and assessment of speech sound disorders and plan intervention for individuals with speech sound disorders.

Unit 1: Speech sound acquisition and development

- Fundamentals of articulatory phonetics - phonetic description of vowels & consonants.
- Phonology & phonological theories – generative phonology, natural phonology. Phonology & phonological theories – non-linear phonology, optimality theory. Methods to study speech sound acquisition – diary studies, cross sectional studies and longitudinal studies.
- Speech sound acquisition
- birth to one year (development of infant speech perception, early speech production).
- one to two years (consonant inventories, influence of phonological knowledge on vocabulary acquisition).
- two to five years (growth of phonetic, phonemic, phonotactic inventory – consonants, clusters, phonological patterns).
- above five years (speech sound mastery and development of literacy – phonological awareness).
- Factors influencing speech sound acquisition Acoustics of speech sounds
- Speech intelligibility, factors affecting speech intelligibility, assessment of speech intelligibility
- Co articulation: types and effects
- Phonological development in bilingual children. Phonological development in Indian languages.

Unit 2: Assessment of speech sound disorders - I

- Current concepts in terminology and classification of speech sound disorders Organically-based speech sound disorders, childhood apraxia of speech. Speech sound disorders of unknown origin, classification by symptomatology.
- Factors related to speech sound disorders
- structure and function of speech & hearing and oro-sensory mechanisms. cognitive – linguistic, psychosocial and social factors.
- metalinguistic factors related to speech sound disorders.
- Introduction to assessment procedures: aims of assessment, screening and comprehensive assessment.
- Speech sound sampling procedures - issues related to single word and connected speech samples; imitation and spontaneous speech samples, contextual testing, recording of speech samples.

- Review of tests in English and other Indian languages - Single word articulation tests, deep articulation of articulation, and computerized tests of phonology.
- Influence of language and dialectal variations in assessment.
- Transcription of speech sample - transcription methods –IPA and extension of IPA; broad and narrow transcription.

Unit 3: Assessment of speech sound disorders - II

- Introduction to independent and relational analysis.
- Independent analyses – phonetic inventory, phonemic inventory and phonotactic inventory (utility of independent analysis for analysis of speech of young children and children with severe speech sound disorders).
- Relational analyses – SODA, pattern analysis, (distinctive features, phonological process analysis).
- Phonological processes analyses - language specific issues, identification and classification of errors.
- Assessment of oral peripheral mechanism.
- Speech sound discrimination assessment, phonological contrast testing. Stimulability testing.
- Determining the need for intervention – speech intelligibility and speech severity assessment.
- Factors influencing target selection – stimulability, frequency of occurrence, developmental appropriateness, contextual testing, and phonological process analysis.
- Case study – Documenting the assessment findings and determining the need for intervention.

Unit 4: Management – I

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

Unit 5: Management – II

- Core vocabulary approach.
- Introduction to linguistically-based treatment approaches- Distinctive feature therapy. Minimal pair contrasts therapy.
- Metaphon therapy, Cycles approach. Broad-based language approaches.

- General guidelines for linguistically-based approaches. Phonological awareness and phonological disorders.
- Phonological awareness intervention for preschool children.
- Adapting intervention approaches to individuals from culturally and linguistically diverse backgrounds.
- Role of family in intervention for speech sound disorders.

Practicals

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

Recommended Reading

1. Bernthal, J.E., Bankson, N.W., & Flipsen, P. (2013). Articulation and phonological disorders.(7th Ed.). Boston, MA: Pearson.
2. Dodd, B. (2013). Differential diagnosis and treatment of children with speech disorder.(2nd Ed). NJ: Wiley.
3. Rout, N (Ed)., Gayathri, P., Keshree, N and Chowdhury, K (2015). Phonics and Phonological Processing to Develop Literacy and Articulation; A Novel Protocol. A publication by NIEPMED, Chennai. Freely downloadable from http://niepmd.tn.nic.in/publication.php. ISBN 978-81-928032-9-5
4. Vasanta, D. (2014). Clinical applications of phonetics and phonology. ISHA Monograph.Vol 14, No. 1.Indian Speech & Hearing Association.
5. Velleman, S. L (2003). Resource guide for Childhood Apraxia of Speech.Delmar/Thomson Learning.
6. Williams, A., McLeod, S., & McCauley, R. (2010). Interventions for speech sound disorders in children. Baltimore: Brookes.

B3.3 Diagnostic Audiology: Behavioral Tests

Hours - 60 Marks - 100

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

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

Unit 1: Introduction to diagnostic audiology

- Characteristics of a diagnostic test, difference between screening and diagnostic test, functions of a diagnostic test in Audiology
- Need for test battery approach in auditory diagnosis and integration of results of audiological tests, cross-check principle
- Concept of sensitivity, specificity, true positive, true negative, false positive, false negative, hit rate
- Definition of behavioural and physiological tests and their characteristics in diagnostic audiology
- Theories and physiological bases of recruitment
- Theories and physiological bases of adaptation
- Clinical indications for cochlear pathology, retro-cochlear pathology, central auditory processing disorders, functional hearing loss, vestibular disorders

Unit 2: Tests to identify cochlear and retro cochlear pathology

- ABLB, MLB and SISI tests Behavioral tests of adaptation Bekesy audiometry
- Brief tone audiometry PIPB function Glycerol test
- Test to identify dead regions of cochlea

Unit 3: Tests to diagnose functional hearing loss

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

Unit 4: Assessment of central auditory processing

- Definition, different behavioral processes
- Behavioral and clinical indicators of central auditory processing disorders
- Bottle neck and subtlety principles and their implications in
- Tests to detect central auditory processing disorders
- Monaural low redundancy tests - filtered speech tests, time compressed speech test, speech-in-noise test, SSI with ICM, other monaural low redundancy tests.
- Dichotic speech tests – Dichotic digit test, Staggered spondaic word test, Dichotic CV test, SSI with CCM, Competing sentence test, other dichotic speech tests.
- Binaural interaction tests – RASP, BFT, MLD, other binaural interaction tests
- Tests of Temporal processing – pitch pattern test, duration pattern tests, other temporal ordering tests, gap detection test, TMTF
- Variables influencing the assessment of central auditory processing: Procedural and subject variables
- Test findings of important tests in subjects with central auditory disorders: brainstem lesion, cortical, CAPD in children.

Unit 5: Assessment of persons with vestibular disorder, tinnitus, hyperacusis

- Introduction to structure and function of vestibular system
- Vestibular ocular reflex and vestibulo spinal reflex Overview on other systems involved in balance
- Signs and Symptoms of vestibular disorders
- Team in the assessment and management of vestibular disorders
- Behavioral tests to assess vestibular functioning: Fukuda stepping test, tandem gait test, finger nose pointing, Romberg test, Sharpened Romberg test, Dix-Hallpike test, Log-roll test
- Overview of tinnitus and hyperacusis and tests for assessment
- Pitch matching, loudness matching, residual inhibition, Feldman masking curves Johnson Hyperacusis Dynamic Range Quotient

Practicals

- Administer ABLB, MLB and prepare ladder gram (ABLB to be administered by blocking one ear with impression material)
- Administer classical SISI on 3 individuals and note down the scores Administer tone decay tests (classical and its modifications) and note down the results (at least 3 individuals)
- Administer Bekesy audiometry Administer Brief tone audiometry
- Plot PIPB function using standardized lists in any 5 individuals
- Administer the tests of functional hearing loss (both tone based and speech based) by asking subject to malinger and having a yardstick of loudness.
- Administer CAPD test battery to assess different processes on 3 individuals and note down the scores

- Administer Fukuda stepping test, Tandem gait test, Finger nose pointing, Romberg test, Sharpened Romberg test, Dix-Hallpike test, Log-roll test on 5 of the individuals each and note down the observations.
- Estimate the pitch and loudness of tinnitus in 2 persons with tinnitus (under supervision). Assess the residual inhibition in them.
- Plot Feldman masking curves for a hypothetical case
- Administer Johnson Hyperacusis Dynamic Range Quotient on any 2 of the individuals and note down the scores.

Recommended Reading

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

B.3.4 Amplification Devices

Hours - 60 Marks - 100

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

- Assess the candidacy for hearing aids and counsel accordingly evaluate the listening needs and select the appropriate hearing aid
- Independently program digital hearing aids as per the listening needs of the client
- Independently assess the benefit from the hearing aid using subjective and objective methods
- Make all types of ear molds
- Counsel the parents/care givers at all stages

Unit 1: Types of hearing aids

- Historical development of hearing aids: development of concept of amplification, development of different types of amplification devices
- Review of basic elements of hearing aids: Microphone, Amplifier, Receiver/vibrator, Cords, Batteries.
- Classification and Types of hearing aids
- Body level, ear level, in the ear, ITC, invisible in the canal, CIC Binaural, pseudo binaural, monaural
- Programmable, trimmer digital and digital hearing aids Directional hearing aids, modular hearing aids
- RIC hearing aids Implantable hearing aids Master hearing aids CROS hearing aids
- Group amplification – hard wired, induction loop, FM, infrared
- Assistive listening devices – types and selection (Telephones, Television, typing technology)

Unit 2: Technological aspects in hearing aids

- Routing of signals, head shadow/baffle/diffraction effects
- Output limiting and issues related to them: peak clipping, compression
- Concept and use of compression in hearing aids: BILL, TILL, PILL, Wide Dynamic Range Compression, Syllabic Compression, Dual Compression
- Signal processing in hearing aids – BILL, TILL, PILL Signal enhancing technology
- Noise reduction algorithms
- Extended low frequency amplification, frequency lowering technology (transposition, compression)
- Recent advances in hearing aids

Unit 3: Electro-acoustic measurements for hearing aids

- Purpose and Parameters to be considered: OSPL90, SSPL90,HFA SSPL90, Gain, Full on Gain, HFA Full on Gain, Reference test Gain, Basic Frequency Response, Total Harmonic distortion, Intermodulation Distortion, input Output functions, instrumentation, procedure, variables affecting EAM
- Electro-acoustic measurements, BIS, IEC and ANSI standards Environmental tests.
- Care, maintenance and troubleshooting of hearing aids
- Counselling and orienting the hearing aid user (Client and significant others)

Unit 4: Selection of hearing aids

- Pre-selection factors; Prescriptive and comparative procedures; Functional gain and insertion gain methods; Use of impedance, OAEs and AEPs audiometry; Hearing aids for conductive hearing loss; Hearing aids for children; Hearing aids for elderly; Selection of non-linear programmable and digital hearing aids
- Hearing aid programming
- Methods for assessing hearing aid benefit
- Real ear insertion measurements for verification of hearing aid benefit: REIG, REUR, REAR, REOR, RESR, REIG, REAG, RECD
- Acoustic feedback in hearing aids

Unit 5: Mechano-acoustic couplers (Ear molds)

- Different types of molds
- Procedure for hard molds and soft mold UV curing methods
- Special modifications in the ear molds: Vents (diagonal and parallel), deep canal molds, short canal, horns, Libby horn, reverse horn, acoustic modifier
- Effects of mechano-acoustic couplers on the hearing aid output

Practicals

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

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

Recommended Reading

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

B3.5 Clinicals in Speech Language Pathology

Marks - 100

General considerations:

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

Know:

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

Know-how:

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

Show:

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

Do

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

Evaluation:

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

B3.6 Clinicals in Audiology

Marks - 100

General considerations:

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

Know:

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

Know-how:

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

Show:

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

Do

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

Evaluation:

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

Semester IV

B.4.1 Motor Speech Disorders in Children

Hours - 60 Marks - 100

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

- Describe the characteristics of motor speech disorders in children such as cerebral palsy, childhood apraxia of speech and other childhood dysarthrias
- Assess the speech and non-speech aspects associated with the above conditions plan and execute therapy strategies for children with motor speech disorders

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

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

Unit 2: Assessment of motor speech disorders in children

- Case history and developmental neurological evaluation – primitive postural and oro-pharyngeal reflexes, cranial nerve examination
- Assessment of oral sensory and motor capacity – Oral peripheral mechanism examination, neuro- muscular status
- Assessment of speech sub-systems – quantitative and qualitative
- Assessment of speech intelligibility and comprehensibility
- Assessment of associated problem
- Speech assessment with specific reference to childhood apraxia of speech – Phonetic and phonemic inventory, phonotactics and syllable sequencing, variability of errors, speech intelligibility, fluency and prosody
- Test materials – checklist for childhood apraxia of speech, screening test for developmental apraxia of speech
- Protocols for non-verbal and verbal praxis specific to Indian Languages
- Differential diagnosis- dysarthria and other developmental disorders
- Differential diagnosis - childhood apraxia of speech and other developmental disorders

Unit 3: Management of childhood dysarthria

- Team approach in rehabilitation of motor speech disorders in children Neuro-developmental therapy
- Non speech oral-motor exercises: its application for children with dysarthria
- Management of drooling
- Behavioral management of respiratory, phonatory, resonatory and articulatory subsystems
- Prosthetic appliances in treatment of childhood dysarthria
- AAC in management of motor speech disorders- role of devices, AAC team, candidacy and pre-requisites, symbol selection, techniques, assessment for AAC, effective use of AAC
- Case studies: Planning intervention for children with dysarthria

Unit 4: Management of childhood apraxia of speech

- Principles of motor learning
- Integral stimulation – dynamic temporal cueing
- Multisensory and tactile cueing techniques (moto kinesthetic speech training, sensory motor approach, PROMPTS, Touch cue method & speech facilitation)
- Gestural cueing techniques (signed target phoneme therapy, adapted cueing techniques, cued speech, visual phonics, & Jordon's gestures)
- Miscellaneous techniques (melodic intonation therapy, multiple phonemic approach, & instrumental feedback)
- Cognitive/conceptual/ linguistic /phonological remedial approaches - phonotactics Other approaches: Vowel and diphthong remediation techniques (Northampton (Yale) vowel chart and Alcorn symbols), Nancy Kauffman's speech praxis treatment kit
- Use of AAC in childhood apraxia of speech
- Evidence-based practice in intervention for childhood apraxia of speech Case studies: Planning intervention for childhood apraxia of speech

Unit 5: Feeding and swallowing disorders in children

- Embryology- periods and structures of development
- Anatomical structures of swallowing- upper aero digestive system, anatomic difference between adults and children
- Physiology of swallowing- swallow phases, neural control of swallowing, reflexes related to swallowing, suckling and sucking, airway and swallowing
- Terms involved in dysphagia and development of feeding skills
- Causes of dysphagia in children
- Signs and symptoms of dysphagia in children
- Assessment – inferences from neural developmental assessment, cranial nerve examination, assessment scales, nutritive and non-nutritive assessment, instrumental assessment (VFS, cervical auscultation), gastrointestinal evaluation
- Management: positioning, oral- motor treatment, team approach, non-oral feeding, transitional feeding, modifications in feeding

- Role of speech-language pathologist in neonatal intensive care with reference to feeding and swallowing

Practicals

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

Recommended Reading

- Arvedson, J.C., and Brodsky, L. (2002) (2nd Ed.). Pediatric swallowing and feeding. San Diego, Singular publishing.
- Caruso, F. J. and Strand, E. A. (1999). Clinical Management of Motor Speech Disordersin Children. New York: Thieme.
- Hardy, J. (1983). Cerebral Palsy. Remediation of Communication Disorder Series by
- F.N. Martin. Englewood Cliffs, Prentice Hall Inc.
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- Rosenthal. S., Shipp and Lotze (1995). Dysphagia and the child with developmental disabilities. Singular Publishing Group.
- Velleman, S. L (2003). Resource guide for Childhood Apraxia of Speech. Delmar/Thomson Learning.

B.4.2 Language Disorders in Children

Hours - 60 Marks - 100

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

- Explain the process of acquisition of language and factors that influence its development in children.
- Identify and assess language delay and deviance in children. select appropriate strategies for intervention.
- Counsel and provide guidance to parents/caregivers of children with language disorders.

Unit 1: Bases of language acquisition, development and disorders

- Theories of language acquisition 1: Biological, Psycholinguistic/syntactic theory Theories of language acquisition 2: Cognitive, social interaction/pragmatic, information processing, behavioral
- Pre-cursors for normal development of language
- Development of components of language from birth to two years (pre-linguistic/pre-symbolic to symbolic)
- Development of components of language during preschool period
- Development of components of language during early school age and beyond
- Basic concepts and terminologies of language development in bilingual children – simultaneous versus sequential language acquisition, additive and subtractive bilingualism, process of second language acquisition, variables influencing second language acquisition
- Development of language in culturally diverse environments and exceptional circumstances – neglect and abuse, twins, low-socio economic background
- Over view of language disorders – definition and classification based on ICD, DSM
- Application of ICF in language disorders

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

- Intellectual disability: definition, classification, causes and characteristics
- Autism spectrum disorders: definition, classification, causes and characteristics
- Attention deficit hyperactive disorder: definition, classification, causes and characteristics
- Language impairment - mixed receptive and expressive language disorder, specific language impairment: definition, classification, causes and characteristics
- Learning disability: definition, classification, causes and characteristics
- Acquired childhood aphasia: definition, classification, causes and characteristics
- Sensory impairments and language disorders: types, causes and characteristics
- Syndromic conditions leading to language difficulties: William syndrome, fragile x syndrome, Down syndrome

- Other developmental disabilities: deaf-blind, cerebral palsy and multiple disabilities.

Unit 3: Assessment of language in children

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

Unit 4: Management of language disorders in children - I

- General principles and strategies of intervention in children with language impairment – purpose of intervention, basic approaches to language intervention (developmental or normative approach, functional approach)
- Types of service delivery models - Individuals versus group; direct versus tele-rehabilitation; structure of therapy session, setting the environment, furniture, seating arrangements
- Reinforcement in language therapy, types and schedules of reinforcement
- Choice of language for intervention, incorporating principles of multiculturalism into treatment activities
- Choosing and framing goals and Objectives: SMART Objectives Specific treatment techniques
- Incidental teaching, self-talk, parallel talk, expansion, extension, recasting, joint routines, joint book reading,

- whole language, modifying linguistic input, communicative temptations drill, modelling
- Focused stimulation, vertical structuring, milieu teaching, and model Caregivers and family in intervention: Structured and informal approaches

Unit 5: Management of language disorders in children - II

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

Practicals

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

Recommended Reading

1. Roseberry-McKibbin, C. (2007). Language Disorders in Children: A multicultural and case perspective. Boston: Pearson Education, Inc.
2. Paul, R. (2013). Language disorders from infancy through adolescence (4th ed.). St.Louis, MO: Mosby.Dwight, D.M. (2006). Here's how to do therapy: Hand-on core skills in speech language pathology. San Diego, CA: Plural Publishing
3. Hegde, M.N. (2005). Treatment protocols for language disorders in children – Vol. 1
4. 2. San Diego: Plural Publishing
5. Owens, R.E. (2008). Language development: An introduction (7th ed.). Boston: Pearsons
6. Reed, V.A. (2004). An Introduction to children with language disorders (3rd Ed.) New York: Allyn & Bacon
7. Rout, N and Kamraj, P (2014). Developing Communication - An Activity Book, A publication by NIEPMED, Chennai. Freely downloadable from http://niepmd.tn.nic.in/publication.php. ISBN 978-81-928032-41.

B.4.3 Diagnostic Audiology: Physiological Tests

Hours - 60 Marks - 100

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

- Justify the need for using the different physiological tests in the audiological assessment
- Independently run the tests and interpret the results to detect the middle ear, cochlear and retro cochlear pathologies and also differentially diagnose
- Design tailor-made test protocols in immittance, aeps and oaes as per the clinical need
- Make appropriate diagnosis based on the test results and suggest referrals.

Unit 1: Immittance evaluation

- Clinical significance of physiological tests in audiology
- Immittance evaluation: Principle of immittance evaluation: Concept of impedance and admittance, their components,
- Tympanometry: definition, measurement procedure, response parameters, their measurement and normative, classification of tympanogram, clinical significance of tympanometry
- Eustachian tube functioning tests of tympanometry: basics of pressure equalization function of ET, Valsalva, Toynbee, William's pressure swallow, inflation-deflation test.
- Overview on multicomponent and multi-frequency tympanometry Overview on wide band reflectance and wide band tympanometry
- Reflexometry: definition, acoustic reflex pathway, measurement procedure, clinical applications of acoustic reflexes, special tests

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

- Introduction and classification of AEPs Instrumentation
- Principles of AEP recording techniques:
- Auditory brainstem response generators
- Protocol and procedure of recording auditory brainstem response Factors affecting auditory brainstem responses
- Clinical applications of ABR ABR in the paediatric population
- Role of ABR in infant hearing screening

Unit 3: Overview of other AEPs

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

Unit 4: Otoacoustic emissions

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

Unit 5: Physiological tests for assessment of vestibular system

- Electronystagmography: procedure, interpretation, clinical applications Videonystagmography, videoocculograph
- Vestibular Evoked Myogenic Potentials
- Overview of Rotatory chair test, video Head Impulse Test, Overview of Dynamic Posturography

Practicals

- Measure admittance in the calibration cavities of various volumes and note down the observations
- Calculate Equivalent ear canal volume by measuring static admittance in an uncompensated tympanogram (10 ears)
- Do tympanogram in the manual mode and measure peak pressure, peak admittance and ear canal volume manually using cursor (10 ears).
- Measure gradient of the tympanogram (10 ears)
- Administer Valsalva and Toynbee and William's pressure swallow test(5 ears) Record acoustic reflex thresholds in the ipsi and contra modes, (10 ears)
- Plot Jerger box pattern for various hypothetical conditions that affect acoustic reflexes and interpret the pattern and the corresponding condition.
- Carry out Acoustic reflex decay test and quatify the decay manually using cursor (5 individuals).
- Trace threshold of ABR (in 5 dB nHL steps near the threshold) for clicks and tone bursts of different frequencies (2 persons) and draw latency intensity function.

- Record ABR using single versus dual channels and, note down the differences Record ABR at different repetition rates in 10/sec step beginning with 10.1/11.1 per second. Latency-repetition rate function needs to be drawn.
- Record with each of three transducers (HP, insert phones and bone vibrator) and polarities and draw a comparative table of the same. Students should also record with different transducers without changing in the protocol in the instrument and calculate the correction factor required.
- Record ASSR for stimuli of different frequencies and estimate the thresholds
- Record TEOAEs and note down the amplitude, SNR, noise floor and reproducibility at octave and mid-octave frequencies. Note down the stimulus stability and the overall SNR (10 ears).
- Record DPOAEs and note down the amplitude, SNR, noise floor and reproducibility at octave and mid-octave frequencies (10 ears)

Recommended Reading

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

B.4.4 Implantable Hearing Devices

Hours - 60 Marks - 100

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

- Assess candidacy for bone anchored hearing devices, middle ear implants, cochlear implants, and ABI
- Select the appropriate device depending on the audiological and non-audiological findings
- Handle post-implantation audiological management assess the benefit derived from implantation, and
- Counsel the parents/care givers during different stages of implantation

Unit 1: Implantable hearing devices – basics

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

Unit 2: Bone anchored hearing devices and middle ear implants

- Types, components
- Surgical approaches, risks, complications
- Audiological evaluations for candidacy, contraindications Assessment of benefits

Unit 3: Cochlear implant and brain stem implants – basics

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

Unit 4: Cochlear implants and brainstem implants

- Signal coding strategies, classification, types Intraoperative monitoring by audiologists
- Objective measures: ESRT, ECAP, prom stim, EABR, aided cortical potentials

- Post implant Mapping: schedule, pre-requisites, switch-on, mapping parameters, impedance, compliance, role of objective and subjective measures in mapping, post mapping audiological evaluation
- Assessment of benefits
- Optimization of hearing aid on contralateral ear

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

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

Practicals

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

Recommended Reading

- Clark, G., Cowan, R. S. C., & Dowell, R. C. (1997). Cochlear Implantation for Infants and Children: Advances. Singular Publishing Group.
- Cooper, H., & Craddock, L. (2006). Cochlear Implants: A Practical Guide. Wiley. Dutt, S. N. (2002). The Birmingham Bone Anchored Hearing Aid Programme: Some Audiological and Quality of Life Outcomes. Den Haag: Print Partners Ipskamp.
- Eisenberg, L. S. (2009). Clinical Management of Children with Cochlear Implants.Plural Publishing.
- Gifford, R. H. (2013). Cochlear Implant Patient Assessment: Evaluation of Candidacy, Performance, and Outcomes. Plural Publishing.
- Hagr, A. (2007). BAHA: Bone-Anchored Hearing Aid. International Journal of Health Sciences, 1(2), 265–276.
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- Kompis, M., &Caversaccio, M.-D.(2011). Implantable Bone Conduction Hearing Aids.Karger Medical and Scientific Publishers.
- Mankekar, G. (2014). Implantable Hearing Devices other than Cochlear Implants. Springer India.
- Møller A.R. (2006). Cochlear and Brainstem Implants (Vol. 64).
- Niparko, J. K. (2009). Cochlear Implants: Principles & Practices. Lippincott Williams & Wilkins.
- Ruckenstein, M.J. (Ed.).(2012). Cochlear Implants and Other Implantable Hearing Devices. Plural.

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

B4.5 Clinicals in Speech-language Pathology

Marks – 100

General considerations:

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

Know:

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

Know-how:

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

Show:

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

Do:

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

Evaluation:

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

B4.6 Clinicals in Audiology

Marks – 100

General considerations:

- Exposure is primarily aimed to be linked to the theory courses covered in the semester, however, not just limited to these areas.
- After completion of clinical postings in auditory diagnostics and auditory rehabilitation, the student will Know (concept), know how (ability to apply), show (demonstrate in a clinical diary/log book), and do (perform on patients/ client contacts) the following:
- Indications to administer speciPractical tests Procedures to assess the listening needs
- National and international standards regarding electroacoustic characteristics of hearing aids

Know-how:

- To administer at least 1 test for adaptation, recruitment and functional hearing loss. Counsel hearing aid user regarding the use and maintenance hearing aids
- To troubleshoot common problems with the hearing aids
- To select test battery for detection of central auditory processing disorders.
- Select different types of ear moulds depending on type of hearing aid, client, degree, type and configuration of hearing loss
- Electroacoustic measurement as per BIS standard on at least 2 hearing aids How to process 2 hard and 2 soft moulds
- How to preselect hearing aid depending on listening needs and audiological findings on at least 5 clinical situations (case files)
- How select test battery depending on case history and basic audiological information
- Tone decay test – 2 individuals with sensori-neural hearing loss Strenger test – 2 individuals with unilateral/asymmetrical hearing loss
- Dichotic CV/digit, Gap detection test – 2 individuals with learning difficulty or problem in hearing in noise
- Hearing aid fitment for at least 5 individuals with mild to moderate and 3 individuals with mod-severe to profound

- Hearing aid selection with real ear measurement system on 3 individuals with hearing impairment

Evaluation:

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

Semester V

B5.1 Structural Anomalies and Speech Disorders

Hours - 60 Marks - 100

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

- Understand the characteristics of disorders with structural anomalies including speech evaluate and diagnose the speech characteristics seen in these disorders
- Learn about the techniques for the management of speech disorders in these conditions

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

- Types, characteristics and classification of cleft lip and palate Causes of cleft lip and palate: genetic, syndrome and others Velopharyngeal inadequacy: types, causes and classification
- Associated problems in persons with cleft lip and palate: speech, language, feeding, dental and occlusion, hearing, psychological

Unit 2: Assessment and management of cleft lip and palate speech

- Team of professionals in the management of persons with cleft lip and palate: their roles in diagnosis and management.
- Assessment of persons with cleft lip and palate for speech language functions: Subjective assessment of speech characteristics and speech intelligibility: proforma, tests, scales and others.
- Objective assessment of phonatory, resonatory and articulatory features Diagnosis and differential diagnosis of speech related functions Subjective assessment of language and communication functions Reporting test results using Universal Parameters
- Management of persons with cleft lip and palate Surgical and prosthetic management
- Techniques and strategies to correct speech sound disorders Techniques and strategies to improve feeding
- Counselling and guidance

Unit 3: Structural anomalies of tongue and mandible - Characteristics, assessmentand management

- Types, classification and characteristics of structural anomalies of tongue and mandible
- Causes for structural anomalies of tongue and mandible
- Team of professionals in the management of persons with structural anomalies of tongue and mandible and their roles.
- Associated problems in persons with structural anomalies of tongue and mandible: Speech
- Feeding
- Dental and occlusion Psychological and others
- Management of persons with structural anomalies of tongue and mandible
- Surgical and prosthetic management
- Techniques and strategies to improve speech intelligibility Techniques and strategies to improve feeding
- Counselling and guidance for persons with glossectomy and mandibulectomy

Unit 4: Characteristics & assessment of laryngectomy

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

Unit 5: Management of speech and communication in laryngectomies

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

Practicals

- Identify the different types of cleft lip and palate by looking at illustrations and images
- Listen to 10 speech samples of children with cleft lip and palate and rate their nasality/ speech (articulation and cleft type errors) based on universal reporting parameters.

- Identify the type of closure of velopharyngeal port for 5 normal individuals and 5 individuals with cleft lip and palate using videos of nasoendoscopy/ videofluroscopy. Perform oral peripheral mechanism examination on 10 individuals and document the structure and functions of the articulators.
- Analyse the different types of occlusion in 10 individuals.
- Identify the type of glossectomy by looking at pictures/illustrations.
- Identify the different types of prosthesis in the management of head and neck cancer. Analyse the speech profile of 5 individuals with laryngectomy.
- Identify parts of an artificial larynx and explore its use.
- Prepare a checklist / pamphlet illustrating care of the stoma and T- tubes invernacular.

Recommended Reading

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

B5.2 Fluency and its Disorders

Hours - 60 Marks - 100

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

- understand the characteristics of fluency and its disorders evaluate and diagnose fluency disorders
- learn about the techniques for the management of fluency disorders

Unit 1: Fluency

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

Unit 2: Stuttering and other fluency disorders

- Stuttering: Definition and causes for stuttering
- Characteristics of stuttering: core and peripheral characteristics, primary and secondary stuttering, effect of adaptation and situation
- Development of stuttering
- Normal non fluency: characteristics and differential diagnosis
- Theories of stuttering: organic, functional, neurogenic, diagnosogenic and learning Cluttering: Definition, causes and characteristics
- Neurogenic stuttering: Definition, causes and characteristics

Unit 3: Assessment and differential diagnosis

- Assessment of fluency disorders: stuttering, cluttering, neurogenic stuttering and normal non fluency:
- Subjective methods: protocols and tests Objective methods
- Qualitative and quantitative assessment Differential diagnosis of fluency disorders

Unit 4: Management of stuttering

- Approaches to management
- Changing scenario in management of stuttering
- Different techniques and strategies used in management with their rationale

- Relapse and recovery from stuttering Issues of speech naturalness in stuttering

Unit 5: Management of fluency-related entities

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

Practical's

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

Recommended Reading

1. Assessment and management of fluency disorders. Proceedings of the national workshop on "Assessment and management of fluency disorders", 25-26 Oct 2007. All India Institute of Speech & Hearing, Mysore. 2007.
2. Bloodstein, O., & Ratner, N. B. (2008). A Handbook on Stuttering (6th Ed.). Clifton Park, NY, Thomson Demer Learning.
3. Guitar, B. (2014). Stuttering-An Integrated Approach to its Nature and Treatment. 4th Ed. Baltimore, Lippincott Williams & Wilkins.
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7. Wall, M. J., & Myers F. L. (1995). Clinical Management of Childhood Stuttering. Texas, PRO-ED, Inc.
8. Ward, D. (2006). Stuttering and Cluttering: Frameworks for Understanding & Treatment. NY, Psychology Press.
9. Yairi, E., & Seery, C. H. (2015). Stuttering - Foundations and Clinical Applications. 2nd Ed. USA, Pearson Education, Inc.

B5.3 Paediatric Audiology

Hours - 60 Marks - 100

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

- List etiology and relate them to different types of auditory disorders that may arise
- Explain different hearing screening/identification procedures and their application elaborate on different aspects of pediatric behavioral and physiological / electrophysiological evaluation

Unit 1: Auditory development

- Review of Embryology of the ear
- Development of auditory system from periphery to cortex Neuroplasticity
- Prenatal hearing
- Normal auditory development from 0-2 years Infant speech perception
- Incidence and prevalence of auditory disorders in children

Unit 2: Auditory disorders

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

Unit 3: Early identification of hearing loss

- Principles of early hearing detection and intervention programs Principles and history of hearing screening
- Joint Committee on Infant Hearing position statement (2000, 2007,2013)

- High risk register/ checklists for screening Sensitivity and specificity of screening tests
- Hearing screening in infants and toddlers: Indian and Global context Hearing screening in preschool children: Indian and Global context
- Hearing screening in school-age children (including screening for CAPD): Indian and Global context

Unit 4: Paediatric assessment I

- Behavioral observation audiometry Conditioned orientation reflex audiometry
- Visual reinforcement audiometry, TROCA, play audiometry
- Pure tone audiometry in children: Test stimuli, response requirement and reinforcement
- Speech audiometry (SRT, SDT); Speech recognition and speech perception tests developed in India)
- Bone conduction speech audiometry Immittance evaluation in pediatric population
- Central auditory processing disorders assessment

Unit 5: Paediatric assessment II

- Recording and interpretation of OAE in pediatric population Factors affecting OAE in pediatric population
- Recording and interpretation of click evoked and tone burst evoked ABR in pediatric population
- Factors affecting ABR in pediatric population Recording ASSR in pediatric population Recording AMLR, ALLR in pediatric population Assessment of hearing loss in special population Diagnostic test battery for different age groups Diagnosis and differential diagnosis

Practical's

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

- Observe OAE in a child with normal hearing and a child with hearing loss. Write a report on the instrumentation, protocol used and interpretation
- Observe ABR in a child with normal hearing and a child with hearing loss. Write down a report on the instrumentation, protocol used and interpretation
- Observe immittance evaluation in a child with normal hearing and a child with hearing loss. Write a report on the instrumentation, protocol used and interpretation
- Using role play demonstrate how the results of audiological assessment are explained to caregiver in children with the following conditions
- Child referred in screening and has high risk factors in his history Child with chronic middle ear disease
- Child with CAPD
- Child with severe bilateral hearing impairment

Recommended Reading

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

B5.4 Aural Rehabilitation in Children

Hours - 60 Marks - 100

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

- describe the different communication options available for young children with hearing impairment
- explain the impact of hearing impairment on auditory development and spoken language communication
- describe factors that effect of acoustic accessibility and strategies to manage them at home and in classroom
- design activities for auditory learning at different levels

- enumerate how the needs of individuals with hearing impairment using sign language and spoken language as form of communication in India are being met

Unit 1: Auditory development, spoken communication and acoustic accessibility

- Sensitivity period for auditory development
- Impact of hearing impairment on auditory development, spoken language acquisition, parent child communication
- Factors affecting auditory development
- Hearing loss implications for speech perception: acoustics of speech Optimizing hearing potential through hearing aids
- Optimizing hearing potential through cochlear implants
- Barriers to acoustic accessibility: distance, signal to noise ratio, reverberation Managing the listening environment for infants, toddlers' schools
- Signal to noise ratio enhancing technologies personal FM, loop systems, desktop group systems, blue tooth connectivity

Unit 2: Communication options

- Detecting and confirming hearing loss
- Parent support counselling, individual family service plan Choosing communication options
- Auditory oral approach Auditory verbal therapy
- Manual/sign language: Indian and Global context Cued speech and total communication
- Listening devices hearing aid/cochlear implant Early intervention programs

Unit 3: Optimal listening and learning environments infancy and early childhood

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

Unit 4: Auditory - speech reading training and literacy

- Candidacy for auditory training and speech reading
- Auditory training/learning four design principles skill, stimuli, activity, and difficulty level
- Early training Objectives
- Analytic and Synthetic training Objectives Formal and informal training
- Auditory training for infants and very young children Outcomes of training
- Speech and language and literacy characteristics Speech language and literacy evaluation assessment Speech language therapy

Unit 5: Indian perspectives

- Prevalence of hearing impairment in children Education of the deaf in India historical perspectives
- Available resources for education of the hearing impaired
- Early intervention programs and centers
- Schools for the hearing impaired; day schools, residential schools Beyond school: college and vocational training
- Training manpower resources for service delivery Indian sign language
- Training sign language interpreters Cued speech in India
- Assessment and therapy tools developed for individuals with hearing impairment in India.

Practical's

- Watch documentaries such as "Sound and Fury" (2001). Write a reflection of why parents made communication choices for their children
- Follow on links to the above film that shows the status of the children with hearing impairment after a few years.
- Learn at least 50 signs across different categories of Indian sign language. Make a video of you signing 10 sentences. Have a class mate interpret them
- Interview a parent of a child with hearing impairment on how they adapted their child to wear the hearing aids and /or implant. What were the first responses to sound they observed and how language and speech develop?
- Complete a functional auditory evaluation on one child with hearing loss. Do a speech and language evaluation and also write a report on the child strengths and weakness.
- Design and demonstrate auditory learning activities at the four levels awareness, discrimination, identification and comprehension. Ensure that the activities encompass different skill level and difficulty levels.

- Develop a short audio/film/pamphlet for parents in your local language on one of the following: teaching parent to trouble shooting the hearing aid/cochlear implant, establishing consistent use of listening device, activities to facilitate language across different age groups
- Visit a school for the deaf. Document your observation about the acoustic environment in the class, strategies used by the teacher to promote listening and spoken language

Recommended Reading

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

B5.5 Clinicals in Speech Language Pathology

Marks - 100

General considerations:

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

Know:

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

Know-how:

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

Show:

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

Do:

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

Evaluation:

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

B5.6 Clinicals in Audiology

Marks - 100

General considerations:

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

Know

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

Know-how:

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

Show

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

Do

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

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

Evaluation:

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

Semester VI

B6.1 Motor Speech Disorders in Adults

Hours - 60 Marks - 100

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

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

Unit 1: Causes & Characteristics of dysarthria

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

Unit 2: Assessment and diagnosis of dysarthria

- Subjective assessment of dysarthria:
- Assessment of respiratory, phonatory, resonatory, articulatory errors Assessment of prosodic features
- Assessment of speech intelligibility
- Scales, protocols and tests used for subjective assessment of dysarthria Instrumental analysis of speech in dysarthria: Acoustic, kinematic and physiological Advantages and disadvantages of subjective and instrumental procedures in the assessment of dysarthria in adults

- Differential diagnosis of acquired motor speech disorders in adults: Dysarthria and verbal apraxia
- Dysarthria and functional articulation disorders Dysarthria and aphasia
- Apraxia of speech and aphasia
- Dysarthria from other allied disorders such as agnosia, alexia, agraphia etc. Apraxia from other allied disorders such as agnosia, alexia, agraphia etc.
- Assessment of feeding, swallowing and related issues in persons with dysarthria

Unit 3: Management of dysarthria

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

Unit 4: Assessment and management of apraxia in adults

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

Unit 5: Management related issues in motor speech disorders

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

Practical's

- Identify the cranial nerves and mention its origin and insertion from a picture/ model. Demonstrate methods to assess the cranial nerves.
- Assess the respiratory system using speech and non-speech tasks in 10 healthy adults.

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

Recommended Reading

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

B.6.2 Language Disorders in Adults

Hours - 60 Marks - 100

Objectives: After completing the course, the student will be able to understand the characteristics of language disorders in adults

- evaluate and diagnose speech characteristics in adults with language disorders
- learn about the techniques for the management of speech and related errors in language disorders seen in adults

Unit 1: Neural bases of language

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

Unit 2: Language disorders in adults

- Definition, causes and characteristics of speech, language and cognition in Aphasia: cortical and subcortical
- Primary progressive aphasia Traumatic brain injury
- Right hemisphere damage Schizophasia
- Dementia
- Differential diagnosis of various language disorders seen in adults.

Unit 3: Assessment and diagnosis of language disorders

- Assessment of the following in aphasia, primary progressive aphasia, traumatic brain injury, right hemisphere damage, schizophasia and dementia
- Linguistic behavior including speech: scales, tests, protocols. Assessment of cognitive, social, behavioral characteristics Medical Investigation: Neuroimaging

Unit 4: Management of language disorders

- Medical, linguistic and programmed intervention for persons with Aphasia: cortical and subcortical
- Primary progressive aphasia Traumatic brain injury Right hemisphere damage Schizophasia
- Dementia

Unit 5: Rehabilitation issues relating to adult language disorders

- Team involved in the rehabilitation of persons with adult language disorders Factors influencing the assessment and intervention for language in the context of bilingual and multilingual influences.
- Factors influencing the assessment and management of language in persons who are preliterate, illiterate and literate.
- Assessment of quality of life

- Recovery patterns and prognosis in adults with language disorders Age related influence in adults with language disorders Counselling and guidance for adults with language disorders
- Generalization and maintenance issues in adults with language disorders Augmentative and alternative strategies for adults with language disorders

Practical's

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