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SRI RAMACHANDRA MEDICAL COLLEGE & RESEARCH INSTITUTE (DU)

(Declared under Section 3 of the UGC Act, 1956)

Porur, Chennai - 600 116

REGULATIONS AND SYLLABUS FOR

Bachelor in Audiology and Speech Language Pathology (B. ASLP)

DEGREE PROGRAMME

(Credit Based Semester System)

Effective from the Academic year 2017 – 2018

REGULATIONS FOR BACHELOR IN AUDIOLOGY AND SPEECH LANGUAGE PATHOLOGY

In exercise of the powers conferred by rule 12.1 (iv) of the Memorandum of Association & Rules and clause 21 of Bye-Laws of Sri Ramachandra University, Porur, Chennai-600 116, the Academic Council of the University hereby makes the following Regulations:

SHORT TITLE AND COMMENCEMENT

These regulations may be called as "THE REGULATIONS FOR BACHELOR IN AUDIOLOGY AND SPEECH LANGUAGE PATHOLOGY DEGREE PROGRAMME OF SRI RAMACHANDRA UNIVERSITY, PORUR, CHENNAI- 600116".

These regulations shall be deemed to have come into force from the academic year 2017-2018. These regulations are subject to such modifications as may be approved by the Academic Council from time to time.

1. 0 NOMENCLATURE

As per RCI, the nomenclature of the program shall be BACHELOR IN AUDIOLOGY AND SPEECH-LANGUAGE PATHOLOGY – Abbreviated as B. ASLP Degree Program.

2.0 ELIGIBILITY FOR ADMISSION

a) The candidate applying for admission to B. ASLP Degree Program should have passed 10+2 examination or an examination conducted by the Pre University Board of Education of the respective State Government recognized as equivalent thereto and securing a minimum of 50% marks with the following subjects at (b) & (c). However for SC / ST / OBC category of candidates the minimum qualifying marks for admission shall be 45%:

b) Physics, Chemistry and any one of following:-
   i. Biology or Mathematics or Computer Science or Statistics or Electronics or Psychology or Biotechnology or any Science subject.

2.1 Age Limit for Admission

Every candidate should have completed the age of 17 years as on 1st December of the year of admission

2.2 Medical Fitness Certificate

A candidate shall, at the time of admission, submit to the Head of the Institution, a Certificate of Medical Fitness from an authorized Medical Officer certifying that the candidate is physically fit to undergo the academic program.

2.3 Eligibility Certificate

Candidates who have passed any qualifying examination other than the Higher Secondary examination conducted by the Government of Tamil Nadu shall obtain by paying the prescribed fee, an Eligibility Certificate from Sri Ramachandra University and produce it at the time of admission.

2.4 Registration

A candidate admitted to the program shall register his/her name with the University by submitting application form for registration duly filled in, along with the prescribed fee, through the Head of the Institution within the stipulated date.

3.0 DURATION OF THE COURSE

a) The duration of the B. ASLP Degree Program shall be of 4 academic years including 1 year of internship and should be completed within six years from the date of admission.(inclusive of internship).

b) An academic year consists of two semesters, and each semester shall extend over a minimum period of sixteen weeks excluding examination days. The semesters shall be spread out as follows:

i.	Odd semester – 1	July – December
ii.	Odd semesters – 3, 5, 7	June – October/November
iii.	Even semesters – 2, 4, 6, 8	December – April

c) There shall be University examinations at the end of each semester. There shall be a vacation of minimum 1 week after the examinations at the end of odd semesters and 3 weeks after the examinations at the end of even semesters.

d) Number of working days per semester shall be 100 days (inclusive of exams).

4.0 COMMENCEMENT OF THE PROGRAM

The program shall commence ordinarily from 1st July of the academic year.

5.0 COMMENCEMENT OF THE EXAMINATIONS

There shall be two sessions of University examinations in an academic year, viz., April (end of even semesters) and November/ December (End of odd semesters).

6.0 MEDIUM OF INSTRUCTION

English shall be the medium of instruction and examinations.

6.1 Curriculum

The curriculum and the syllabus for the program shall be as prescribed from time to time by Rehabilitation Council of India, New Delhi and approved by the Academic Council of this University, on the recommendations of Board of Studies. The program will be conducted on a credit based semester pattern as described below:

CREDITS:

The term credit is used to describe the quantum of syllabus for various courses in terms and hours of study. It indicates differential weightage given according to the contents and duration of the course in the curriculum design. The amount of credit associated with a course/program is dependent upon the number of hours of instruction per week in that course/program. Similarly, the credit associated with any of the other academic, co/extra-curricular activities is dependent upon the quantum of work expected to be put in for each of these activities per week. Courses are broadly classified as Theory, Practical, and Clinical/Lab. Theory programs consist of lecture (L) and /or tutorial (T) hours; Practical (P) programs consist of hours spent in the laboratory, Clinical/Lab (CL) programs consists of hours spent in the clinics. Credits (C) for a course/program is dependent on the number of hours of instruction per week in that program, and is obtained by using a multiplier of one (1) for lecture, and a multiplier of half (1/2) for practical and tutorial hours, multiplying by 1/3rd for clinicals/lab. Thus, For example, a course/program carrying one credit for lectures will have instruction of one period per week during the semester, if three hours of lecture is necessary in each week for that program, then 3 credits will be the weightage shown as:

Lecture: (1 credit = 15 hours)
Tutorial/practical: (1 credit = 30 hours)
Clinical: (1 credit = 45 hours)

GRADING SYSTEM

Letter grades and grade points allocations:

Based on the performances, each student shall be awarded a final letter grade at the end of the semester for each program. The letter grades and their corresponding grade points are given below

Letter grades and grade points equivalent to Percentage of marks and performances

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	Good
60.00 – 69.99	C	7	Fair
50.00 – 59.99	D	6	Average
Less than 50	F	0	Fail
Absent	AB	0	AB

A student who remains absent for any University 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 of time.

Example: **Grades and Grade Points**

Category	Course Title	Credits (C)	Grade Letter	Grade Point	Credit Point (Credit x Grade)
CT-12	Language disorders in Children	4	A	9	4x 9= 36
CT-13	Speech Sound Disorders	4	O	10	4x 10=40
CT-14	Diagnostic Audiology – Behavioral tests	4	B	8	4x 8=32
CT-15	Pediatric Audiology	4	C	7	4x7=28
CR-1	Clinicals in Speech Language Pathology	3	D	6	3x6=18
CR-2	Clinicals in Audiology	3	A	9	3x9=27
	Total	**22**			**181**
Thus, SGPA = 181/22 = **8.23**					

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 programs 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 programs are G1, G2, G3, G4 and G5, respectively, and then students' SGPA is equal to:

Computation of SGPA and CGPA

i. The SGPA is the ratio of sum of the product of the number of credits with the grade points scored by a student in all the courses taken by a student and the sum of the number of credits of all the courses undergone by a student, *i.e.*,
SGPA (Si) =∑(CixGi) /∑Ci
where Ci is the number of credits of the ith course and Gi is the grade point scored by the student in the ith course.

ii. The CGPA is also calculated in the same manner taking into account all the courses undergone by a student over all the semesters of a programme, *i.e.*,
CGPA = ∑(Ci x Si) / ∑ Ci where Si is the SGPA of the ith semester and Ci is the total number of credits in that semester.

iii. The SGPA and CGPA shall be rounded off to 2 decimal points and reported in the transcripts.

Illustration of Computation of SGPA and CGPA and Format for Transcripts

i. Computation of SGPA
ii. Computation of CGPA

Semester 1	**Semester 2**	**Semester 3**	**Semester 4**
Credit: 26 SGPA: 7.42	Credit: 24 SGPA: 6.8	Credit: 25 SGPA: 6.6	Credit: 25 SGPA: 6.0

Semester 1	**Semester 2**	**Semester 3**	**Semester 4**
Credit: 26 SGPA: 7.42	Credit: 24 SGPA: 6.8	Credit: 25 SGPA: 6.6	Credit: 25 SGPA: 6.0
Illustration for CGPA **CGPA =** $\frac{26 \times 7.42 + 24 \times 6.8 + 25 \times 6.6 + 25 \times 6.0}{100}$ **= 6.71**			

8.0 EXAMINATIONS and ASSESSMENT:

i. For all category of courses offered (Core Theory, Core Lab, and Clinicals), the assessment will comprise of Internal Assessments (IA) and the University examination. For each course the total of 100% per course is determined from the IA evaluation weighted at 50% and the ES weighted at 50%.
ii. Evaluation for a course shall be done on a continuous basis. The uniform procedures to be adopted under the SBCS is to conduct atleast three internal assessments (IA) followed by one University examination (ES) for each course.
iii. Evaluation for a course with clinical training or internship will be done on a continuous basis.
iv. Candidates having ≥ 80% - 90% attendance and obtaining 50% in the theory and/ or practical; clinical - internal assessments in each of the courses can alone qualify to appear for the University examinations.
v. A candidate who does not pass in any course in the University examination shall be provided an opportunity to improve his/her internal marks (theory or practical only) this will be called "Improvement I.A."
vi. If such a candidate does not appear for such "Improvement I.A. " for internal marks in the said course(s), the internal marks (both theory, practical, lab, clinical) already secured by him/her shall be carried over for his/her subsequent appearance(s)
vii. IA Marks shall be submitted to the University for each course separately by the Head of the department/ program chairperson 15 days prior to the commencement of the University examinations

8.1 INTERNAL ASSESSMENT

The Internal Assessment for each course will be conducted as per the category indicated in the scheme:

Theory Courses only: Three evaluations, with minimum of two written internal examinations shall be conducted in each course during a semester. The format of the third evaluation will be at the discretion of the faculty teaching the course in consultation and approval of the HOD. The average/best marks of these three evaluations shall be taken into consideration for the award of internal marks for the theory component.

Theory with Practical component Courses: Three evaluations, with minimum of one written internal test and one practical test shall be conducted in each course during a semester. The format of the third evaluation will be at the discretion of the faculty teaching the course in consultation and approval of the HOD. The average/best marks of these three evaluations shall be taken into consideration for the award of internal marks for such courses.

Practical courses: Practical IA will be provided based on submission of practical record for each course and examination. One practical examination shall be conducted in each course (wherever practicals have been included in the curriculum) during a semester.

Clinical courses: This will be provided based on submission of clinical/lab records and an OSCE/OSPE.

8.2 UNIVERSITY SEMESTER EXAMINATIONS:

There shall be University Examinations for 3 hours duration carrying 100 marks for each course covering the entire syllabus. It may be in the form of written exams (EST) or laboratory based examination (ESP) or Viva or clinicals. There shall be two sessions of University Examinations in an academic year *viz.*, Apr/ Jun and Oct/ Nov/Dec.

Eligibility for Admission to Examinations

8.2.1 Attendance Requirements

a) No candidate shall be permitted to appear for the University examinations, unless he/she attends the program for the prescribed period and produces the necessary certificate of attendance and progress and also satisfactory conduct from the Head of the Institution.
b) Every candidate is required to put in a minimum of 80% of attendance in theory course and 90% in each lab/ clinical course in the semester concerned for admission to the examination.
c) A candidate lacking in the prescribed attendance as provided in 8.2.1(b) shall not be allowed to appear for University examination in that course only.

8.2.2 Internal Examination related Requirements (IA for all theory courses in all semesters and Lab/ clinical courses in III and V semester)

a) For theory courses or theory with practical component, a candidate should obtain a minimum of 50% marks in IA tests and practicals (wherever applicable) combined together to be eligible to appear for University examination of each course in a semester.
b) For clinical/Lab courses, a candidate should obtain a minimum of 50% marks in Lab/Clinical internal assessments to be eligible to appear for the University examinations.

9.0 Assessments in Examinations:

i. The process of assessment in examinations for all the theory or lab courses offered in this programme shall be undertaken by internal and /external or interdepartmental examiners who will be appointed by the Controller of Examinations based on the panel of examiners provided by the respective department heads / BoS.

ii. Evaluation of clinical/lab courses would be conducted as University examinations. The evaluation would be carried out by appropriate internal and /external examiners who will be appointed by the Controller of Examinations based on the panel of examiners provided by the respective department heads / BoS.

iii. Lab (B2.5 & B2.6) and Clinical (B3.5, B3.6, B5.5, B5.6) Examinations at the end of II, III, and V Semesters shall be conducted by two internal examiners appointed by the Controller of Examinations.

iv. B7.1 and B7.2 in the above table shall be conducted at the end of internship (8^{th} semester) by one internal and one external examiner appointed by the Controller of Examinations.

10.0 PATTERN OF QUESTION PAPER – UNIVERSITY EXAM (3 hours duration)

Questions type	100 marks	100 marks	
		Section–A 50 marks	Section –B 50 marks
Objective type questions – 10 [Define/give reasons/clarify/list any two (advantages; functions; applications)]	10x2=20	5x2=10	5x2=10
Short essay questions 8 out of 10	8x5=40	4x5=20	4x5=20
Essay question 2 out of 4	2x10=20	1x10=10	1x10=10
Objective type questions -20 [True/false; match the following] to be marked on the OMR sheet	20x1=20	10x1=10	10x1=10
Grand Total	**100**	**50**	**50**

Note: - For B 1.3 -Section A will have questions related to Anatomy of Speech and Hearing Organs.
Section B will have questions related to Physiology of Speech and Hearing Organs.
For B 1.7 - Section A will have questions related to Epidemiology and Research Methods.
Section B will have questions related to Statistics.

10.2 Lab/Clinical Exams Carrying 50 Marks (II – VI Semester)

I Viva-voce – 50 Marks

10.3 Clinical Exam carrying 100 marks (VIII Semester)

I Evaluation of records – 25 marks
II Portfolio presentation – 25 marks
III Case presentation – 25 marks
IV Viva – Voce – 25 marks

11.0 CRITERIA FOR PASSING

11.1 Marks Qualifying for a Pass

A candidate shall be declared to have passed the examination if he/she obtains the following minimum qualifying marks:-

a) 50% of marks in the University theory examinations and 50% of marks in the aggregate in university theory and internal assessment (Theory and practical for each course) taken together.
b) 50% of marks in University Lab/Clinical examination and 50% marks in the aggregate in university Lab/clinical and internal lab/clinical assessment taken together.
c) If a candidate is declared as "FAIL" in university theory or lab/clinical examination, the candidate has to reappear for the failed theory or lab/clinical examination only.

11.2 Carry-over of courses

a) Each course should be successfully completed within 3 attempts including the first one. Provided that absence in the University examination or detention from appearing in University examination will not be treated as an attempt.

b) The candidates are permitted to carry over all theory and lab courses of I, II and III semesters until the end of the fourth semester.

c) A candidate has to complete all theory/practical and lab exams of I & II semester and successfully complete clinical exams (B4.5, B4.6) of IV semester to appear for V semester university examination.

d) Internship (VII & VIII semester) will commence only after successful completion of all courses until and including VI semester examinations.

12.0 INTERNSHIP

Objectives of the clinical internship are to:

a) Facilitate transition from academic training to independent clinical responsibility,
b) Provide additional inputs to attain and maintain competence in the clinical management of persons with communication disorders,
c) 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
d) Provide training to understand professional responsibilities and ethical practices including :
   i) Rights and dignity of patients.
   ii) Consultation and referral to other professionals.
   iii) Conduct and professional obligations to peers/patients/families and the community at large.
   iv) Fund raising and professional practice.

Guidelines

i. Internship is mandatory
ii. Duration: Two semesters (VII & VIII).
iii. Structure and duration of posting: Students will complete their internship at the department of Speech Language and Hearing Sciences, Sri Ramachandra University for one semester, and outside the department for one other semester.
iv. Mode of supervision during internship: Supervision should generally be provided by a Speech-language Pathologist and Audiologist. However, in institute/centers where this is not feasible, supervision will be done by a specialist from an allied area like Otolaryngology, Neurology, Mental Health, Pediatrics, among others.

v. 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 internship.
vi. Leave: Candidates should have an attendance of at least 90% during the internship period. Internship shall be extended by the number of days the student falls short of 90% attendance (7^{th} & 8^{th} semesters together). Compensatory work for shortage of attendance must be completed before the final clinical exams of 8^{th}semester.
vii. Stipend: As per the norms of Sri Ramachandra University.
viii. Grading and evaluation of student: All internees will be assessed based on their attendance, performance in the postings and presentation of log books. The mode of assessment and frequency of assessment will be prescribed by the university.
ix. Certification: The University will award a certificate after successful completion of the internship and clinical examination (7.1 and 7.2 in the Scheme of examination). Supervised clinical hours spent during internship shall be included in the clinical competence certificate issued to students.
x. The University shall award the degree only after the successful completion of clinical internship.

13.0 CLASSIFICATION OF SUCCESSFUL CANDIDATES

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

CGPA	**Classification**	**Remarks**
≥ 7.50	First Class with Distinction	First attempt only
6.00 to 7.49	First Class	Class will be awarded only when the course is completed within the stipulated period. All others would be declared as '**pass'**
5.00 to 5.99	Second Class	

All assessments of B.ASLP program on an absolute mark basis will be considered and passed by the respective results passing Boards in accordance with the rules of the University. Thereafter the Controller of Examinations shall convert the marks for each program to the corresponding letter grade as follows, compute the grade point average and cumulative grade point average, and prepare the grade and mark sheets. On satisfactory completion of the courses, a candidate earns credits.

14.0 AWARD OF RANKS

Candidates who pass all the university examinations at the 1^{st} attempt within the minimum period of the progress prescribed, are eligible to be awarded rank or medals on inter-se merit based on final CGPA.

15.0 AWARD OF DEGREE

The university will award the degree and issue the certificate after a candidate successfully completes the required University examinations (all semesters) and the compulsory Internship. A certificate of completion of internship shall also be awarded on the recommendations of the head/ Course chairperson.

16.0 RE-ADMISSION AFTER BREAK OF STUDY

a) Candidates having a break of study of five years and above from the date of admission and more than two spells of break will not be considered for re-admission.
b) The five years period of break of study shall be calculated from the date of first admission of the candidate to the program inclusive of all the subsequent spells of break of studies.
c) Candidates having break of study shall be considered for re-admission provided that they are not subjected to any disciplinary action and no charges are pending or contemplated against them.
d) All re-admissions of candidates are subject to the approval of the Vice-Chancellor.

SUMMARY SCHEME FOR SEMESTER BASED CREDIT SYSTEM
Category of Courses
Bachelor in Audiology and Speech Language Pathology

SEMESTER	CORE COURSE (27)		CORE LAB (CL) (2)	CLINICAL POSTINGS (CR) (8+2)	Total Credits
	THEORY	With PRACTICAL			
I	CT1	CT1		-	
	CT2	CT2			
	AT1				
	AT2				
	AT3				
	AT4				
	AT5				
	22	2			24
II	AT6		CL1	-	
	AT7		CL2		
	CT3	CT3			
	CT4	CT4			
	12	2	10		24
III	CT5	CT5		CR1	
	CT6	CT6		CR2	
	CT7	CT7			
	CT8	CT8			
	12	4		6	22
IV	CT9	CT9		CR3	
	CT10	CT10		CR4	
	CT11	CT11			
	CT12	CT12			
	12	4		6	22
V	CT13	CT13		CR5	
	CT14	CT14		CR6	
	CT15	CT15			
	CT16	CT16			
	12	4		6	22
VI	CT17	CT17		CR7	
	CT18	CT18		CR8	
	CT19	CT19			
	CT20	CT20			
	12	4		6	22
VII	-	-	-	IN-1	
VIII	-	-	-	IN-2	30
					166

SCHEME OF CURRICULUM AND EVALUATION OF THE PROGRAM, 2017

Bachelor in Audiology and Speech Language Pathology

	Bachelor in Audiology and Speech Language Pathology Year 1 – Semester-I, 2017																		
						Credits/ Week				Hours/ semester (Credits x 15 weeks)						University Exam		Grand Total
Course code	Course Number	Course Code	Category	Course Title		Lecture (L)	Tutorial(T)/ Clinical Training(CT)	Practical (P)/Research Project	Credits(C)	Lecture	Tutorial(T)/ Clinical Training(CT)	Practical	Total hours	Attendance (%)	Internal assessment (IA) – Theory / Practical (a)	Theory (b)	Practical/ Viva (c)	Theory: a+(b÷2) = 100 Practical: a + c = 100
																T	P	
AUAS1.1	1	B 1.1	CT-1	Introduction to Speech Language Pathology		2	1	1	4	30	30	30	90	80	50	100	-	100
AUAS1.2	2	B 1.2	CT-2	Introduction to Audiology		2	1	1	4	30	30	30	90	80	50	100	-	100
AUAS1.3	3	B 1.3*	AT-1	Anatomy and Physiology related to Speech & hearing organs		2	2	-	4	30	60	0	90	80	25	75	-	100
AUAS1.4	4	B 1.4*	AT-2	Clinical Psychology related to Communication Sciences		2	1	-	3	30	30	0	60	80	25	75	-	100
AUAS1.5	5	B 1.5*	AT-3	Linguistics and Phonetics		2	1	-	3	30	30	0	60	80	25	75	-	100
AUAS1.6	6	B 1.6*	AT-4	Electronics and Acoustics		2	1	-	3	30	30	0	60	80	25	75	-	100
AUAS1.7	7	B 1.7*	AT-5	Epidemiology, Research Methods and Statistics		2	1	-	3	30	30	0	60	80	25	75	-	100
Year 1 – Semester-I				**Total**		14	8	2	24	210	240	60	510		225	575	0	700

	Bachelor in Audiology and Speech Language Pathology **Year 1 – Semester-II, 2017**																	
						Credits/ Week				Hours/ semester (Credits x 15 weeks)						University Exam		Grand Total
Course code	Course Number	Course Code	Category	Course Title		Lecture (L)	Tutorial(T)/ Clinical Training(CT)	Practical (P)/Research Project	Credits(C)	Lecture/	Tutorial(T)/ Clinical Training(CT)	Practical	Total hours	Attendance (%)	Internal assessment (IA) – Theory / Practical (a)	Theory (b)	Practical/ Viva (c)	Theory: a+(b÷2) = 100 Practical: a + c = 100
																T	P	
AUAS2.1	1	B 2.1*	AT-6	Neurology		2	1	-	3	30	30	0	60	80	25	75	-	100
AUAS2.2	2	B 2.2*	AT-7	Otorhinolaryngology		2	1	-	3	30	30	0	60	80	25	75	-	100
AUAS2.3	3	B 2.3	CT-3	Speech Language Diagnostics & Therapeutics		3	-	1	4	45	0	30	75	80	50	100	-	100
AUAS2.4	4	B 2.4	CT-4	Audiological Evaluation		3	-	1	4	45	0	30	75	80	50	100	-	100
AUAS2.5	5	B 2.5	CL-1	Speech Language Pathology (Practicals)		-	-	5	5	0	0	150	150	90	50	-	50	100
AUAS2.6	6	B 2.6	CL-2	Audiology (Practicals)		-	-	5	5	0	0	150	150	90	50	-	50	100
Year 1 – Semester-II				**Total**		10	2	12	24	150	60	360	570		250	350	100	600

	Bachelor in Audiology and Speech Language Pathology **Year 2– Semester-III, 2017**																	
Course code	Course Number	Course Code	Category	Course Title		Credits/ Week				Hours/ semester (Credits x 15 weeks)				Attendance (%)	Internal assessment (IA) – Theory / Practical (a)	University Exam		Grand Total
						Lecture (L)	Tutorial(T)/ Clinical	Practical (P)/Research Project	Credits(C)	Lecture	Tutorial(T)/ Clinical Training(CT)	Practical	Total hours			Theory (b)	Clinical / Viva (c)	Theory: a+(b÷2) = 100 Clinical: a + c = 100
																T	C	
AUAS3.1	1	B 3.1	CT-5	Language disorders in Children		3	-	1	4	45	-	30	75	80	50	100	-	100
AUAS3.2	2	B 3.2	CT-6	Speech Sound Disorders		3	-	1	4	45	-	30	75	80	50	100	-	100
AUAS3.3	3	B 3.3	CT-7	Diagnostic Audiology – Behavioral tests		3	-	1	4	45	-	30	75	80	50	100	-	100
AUAS3.4	4	B 3.4	CT-8	Pediatric Audiology		3	-	1	4	45	-	30	75	80	50	100	-	100
AUAS3.5	5	B 3.5	CR-1	Clinicals in Speech Language Pathology - I		-	3	-	3	0	135	-	135	90	50	-	50	100
AUAS3.6	6	B 3.6	CR-2	Clinicals in Audiology - I		-	3	-	3	0	135	-	135	90	50	-	50	100
Year 2 – Semester-III				**Total**		**12**	**6**	**4**	**22**	**180**		**120**	**570**		**300**	**400**	**100**	**600**

	Bachelor in Audiology and Speech Language Pathology **Year 2 – Semester-IV, 2017**																		
						Credits/ Week				Hours/ semester (Credits x 15 weeks)						University Exam		Grand Total
Course code	Course Number	Course Code	Category	Course Title		Lecture (L)	Tutorial(T)/ Clinical Training(CT)	Practical (P)/Research Project	Credits(C)	Lecture/ Tutorial	Tutorial(T)/ Clinical Training(CT)	Practical	Total hours	Attendance (%)	Internal assessment (IA) – Theory / Practical (a)	Theory (b)	Clinical / Viva (c)	Theory: a+(b÷2) = 100 Clinical: a + c = 100
																T	C	
AUAS4.1	1	B 4.1	CT-9	Motor Speech Disorders in Children		3	-	1	4	45	0	30	75	80	50	100	-	100
AUAS4.2	2	B 4.2	CT-10	Voice and its Disorders		3	-	1	4	45	0	30	75	80	50	100	-	100
AUAS4.3	3	B 4.3	CT-11	Amplification devices		3	-	1	4	45	0	30	75	80	50	100	-	100
AUAS4.4	4	B 4.4	CT-12	Diagnostic Audiology – Physiological tests		3	-	1	4	45	0	30	75	80	50	100	-	100
AUAS4.5	5	B 4.5	CR-3	Clinicals in Speech Language Pathology - II		-	3	-	3	0	135	0	135	90	50	-	50	100
AUAS4.6	6	B 4.6	CR-4	Clinicals in Audiology - II		-	3	-	3	0	135	0	135	90	50	-	50	100
Year 2 – Semester-IV				**Total**		**12**	**6**	**4**	**22**	**180**	**270**	**120**	**570**		**300**	**400**	**100**	**600**

	Bachelor in Audiology and Speech Language Pathology **Year 3 – Semester-V, 2017**																		
Course code	Course Number	Course Code	Category	Course Title		Credits/ Week				Hours/ semester (Credits x 15 weeks)				Attendance (%)	Internal assessment (IA) – Theory / Practical (a)	University Exam		Grand Total
						Lecture (L)	Tutorial(T)/ Clinical	Practical (P)/Research	Credits(C)	Lecture/ Tutorial	Tutorial(T)/ Clinical Training(CT)	Practical	Total hours			Theory (b)	Clinical / Viva (c)	Theory: a+(b÷2) = 100 Clinical: a + c = 100
																T	C	
AUAS5.1	1	B 5.1	CT-13	Structural Anomalies & Speech Disorders		3	-	1	4	45	0	30	75	80	50	100	-	100
AUAS5.2	2	B 5.2	CT-14	Fluency and its Disorders		3	-	1	4	45	0	30	75	80	50	100	-	100
AUAS5.3	3	B 5.3	CT-15	Aural Rehabilitation in Children		3	-	1	4	45	0	30	75	80	50	100	-	100
AUAS5.4	4	B 5.4	CT-16	Implantable hearing devices		3	-	1	4	45	0	30	75	80	50	100	-	100
AUAS5.5	5	B 5.5	CR-5	Clinicals in Speech Language Pathology - III		-	3	-	3	0	135	0	135	90	50	-	50	100
AUAS5.6	6	B 5.6	CR-6	Clinicals in Audiology - III		-	3	-	3	0	135	0	135	90	50	-	50	100
Year 3 – Semester-V				**Total**		12	6	4	22	180	270	120	570		300	400	100	600

	Bachelor in Audiology and Speech Language Pathology																		
	Year 3 – Semester-VI, 2017																		
Course code	Course Number	Course Code	Category	Course Title		Credits/ Week				Hours/ semester (Credits x 15 weeks)				Attendance (%)	Internal assessment (IA) – Theory / Practical (a)	University Exam		Grand Total
						Lecture (L)	Tutorial(T)/ Clinical Training(CT)	Practical (P)/Research Project	Credits(C)	Lecture/ Tutorial	Tutorial(T)/ Clinical Training(CT)	Practical	Total hours			Theory (b)	Clinical / Viva (c)	Theory: a+(b÷2) = 100 Clinical: a + c = 100
																T	C	
AUAS6.1	1	B 6.1	CT-17	Motor Speech Disorders in Adults		3	-	1	4	45	0	30	75	80	50	100	-	100
AUAS6.2	2	B 6.2	CT-18	Language Disorders in Adults		3	-	1	4	45	0	30	75	80	50	100	-	100
AUAS6.3	3	B 6.3	CT-19	Aural Rehabilitation in Adults		3	-	1	4	45	0	30	75	80	50	100	-	100
AUAS6.4	4	B 6.4	CT-20	Audiology in Practice		3	-	1	4	45	0	30	75	80	50	100	-	100
AUAS6.5	5	B 6.5	CR-7	Clinicals in Speech Language Pathology - IV		-	3	-	3	0	135	0	135	90	50	-	50	100
AUAS6.6	6	B 6.6	CR-8	Clinicals in Audiology - IV		-	3	-	3	0	135	0	135	90	50	-	50	100
Year 3 – Semester-VI				**Total**		**12**	**6**	**4**	**22**	**180**	**270**	**120**	**570**		**300**	**400**	**100**	**600**

	Bachelor in Audiology and Speech Language Pathology **Year 4 – Semester – VII & VIII, 2017**																			
Course code	Course Number	Course Code	Category	Course Title		Credits/ Week				Hours/ semester (Credits x 15 weeks)				Attendance (%)	Internal assessment (IA) - Theory / Practical (a)	University Exam		Grand Total
						Lecture (L)	Tutorial(T)/ Clinical Training(CT)	Practical (P)/Research Project	Credits(C)	Lecture/ Tutorial	Tutorial(T)/ Clinical Training(CT)	Practical	Total hours			Theory (b)	Clinical/ Viva (c)	Theory: a+(b÷2) = 100 Clinical: a + c = 100
																T	C	
AUAS7.1	1	B 7.1	IN-1	Clinicals in Speech Language Pathology- INTERNSHIP		-	15	-	15	-	675	-	675	90	50	-	100	150
AUAS7.2	2	B 7.2	IN-2	Clinicals in Audiology- INTERNSHIP		-	15	-	15	-	675	-	675	90	50	-	100	150
Year 4 – Semester- VII & VIII				**Total**		**0**	**30**	**0**	**30**	**0**	**1350**	**0**	**1350**		**100**	**0**	**200**	**300**
GRAND TOTAL						72	64	30	166	080	2460	900	4710	0	1950	2700	700	4000
a: IA Theory & Practical (eligibility for ES Min. 50 %)																		
b: T (Pass Min 50%, IA & ESE Aggregate 50%)																		
c: P/C (Pass Min 50%, IA & ESE Aggregate 50%)																		
d. *T {a+(b x 0.75)} = 100																		

Semester I

B 1.1 Introduction to Speech Language Pathology

Total hours – 90 (Lecture: 30hrs, Tutorial: 30hrs, Practical: 30hrs)
Marks -100

Objectives

To have an appreciation of origin and scope of speech-language pathology
To learn about relationship between speech, language and communication
To gain knowledge on how speech is produced including physical, biological, social, and psychological bases of speech
To become familiar with normal speech and language development
To become familiar with basic characteristics of speech, language and swallowing disorders

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

Demonstrate knowledge of fundamental concepts related to speech, language and communication
Demonstrate knowledge of normal aspects of speech and language development and identify disorders of communication in children and adults.

Unit 1: Introduction to Speech-language Pathology

a) Historical aspects of the field of speech-language pathology
b) Development of speech and language pathology: Indian and global context
c) Scope of practice in speech-language pathology: Work setting and activities
d) Interdisciplinary nature of speech-language pathology

Unit 2: Speech, language and communication

a) Definitions of speech, language and communication
b) Components of speech, language and communication
c) Distinctions, similarities and functions of speech, language and communication
d) Speech chain

Unit 3: Bases of speech and language

a) Overview of speech production – speech sub-systems
b) Speech mechanism as a sound generator, vocal tract, periodic and aperiodic sounds
c) Acoustic theory of speech production
d) Social bases of speech and language
e) Cognitive bases of speech and language
f) Neurological bases of speech and language
g) Genetic bases of speech and language

Unit 4: Development of speech and language

a) Normal speech and language milestones
b) Development of components of language: Phonology, Morphology, Syntax, Semantics, Pragmatics
c) Development of components of speech: Voice, Articulation, Fluency, Prosody and Resonance
d) Pre-requisites for normal development of speech and language
e) Factors influencing the development of speech and language

Unit 5: Overview of speech, language and swallowing disorder

a) Voice disorders
b) Articulation and resonance disorders
c) Fluency and prosody disorders
d) Language disorders in children
e) Language disorders in adults
f) Feeding and swallowing disorders

Practicals

a) Prepare a report on the available clinical facilities and clinical activities of the institute.
b) 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.
c) Prepare a chart and show the developmental stages of speech and language behavior.
d) Record a standard passage and count the number of syllables and words, identify syllable structure, syntactic structures.
e) Demonstrate normal aspects of speech and analyse perceptual variations in voice, articulation and fluency parameters in different recorded speech samples of typical individuals at different age groups (children, adults and older adults) and sex.
f) 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.
g) Demonstrate normal aspects of language and analyse perceptual variations in language in different recorded samples of typical individuals at different age groups (children, adults and older adults) and sex.
h) Identify the number of phonemes and syllables in a list of words/passage.
i) Recording normal speech sample and analyse parameters such as phonology, morphology, syntax, semantics; voice, fluency, articulation and resonance.

Recommended Reading

Karanth, P. (2010). Children with communication disorders. New Delhi: Orient Blackswan Pvt.Ltd.

Subba Rao, T A. (1992). Manual for developing communication skills. NIMH. ISBN: 81-86594-03-5.

Owens, R.E. (2016). Language development: An introduction. Harlow: Pearson Education Limited.

Khara L. Pence, T., Laura M. & Justice (2011). Language development: From theory to practice (2nd ed.), Allyn & Bacon Communication Sciences and Disorders.

Semester I

B 1.2 Introduction to Audiology

Total hours- 90 (Theory: 30 hrs, Tutorial: 30 hrs, Practical: 30 hrs)
Marks – 100

Objectives:

To have an appreciation of the origin of audiology
To learn about physical properties of sound and its psychophysical correlates
To understand pathological conditions that would cause hearing loss
To understand the different types of hearing loss

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

Demonstrate knowledge about the origin of audiology
Give examples of physical properties of sound and its psychophysical correlates
Demonstrate knowledge about the different types of hearing loss and give examples of pathological conditions that would cause hearing loss

Unit 1: Historical aspects and Introduction to Audiology and Speech-language Pathology

a) History of Audiology
b) Medical and non-medical fields associated with audiology
c) Development of audiology: Indian and global context
d) Branches of audiology
e) Scope of Audiology

Unit 2: Properties of sound

a) Frequency: Concept, octave frequency, psychophysical correlates, Factors affecting pitch
b) Intensity: Concept, psychophysical correlates, phons and sones, relation between phons and sones, use of phon and sone graph, computation of relative loudness of two given sounds using these graphs.
c) Duration: Basic concept
d) Differential sensitivity for intensity, frequency and duration

Unit 3: Audibility & hearing

a) Threshold of audibility
b) Hearing range - intensity and frequency
c) Up-down and staircase procedure of estimating minimum audible levels
d) Sensation levels, Threshold of pain, Most comfortable levels

Unit 4: Concept of dB and differential sensitivity

a) Different aspects of the dB
b) Power and pressure formulae, zero dB reference for pressure and power
c) Calculation of dB values from absolute values and vice-versa
d) Calculation of overall dB when two signals are superimposed, hearing level, sensation level
e) Application of dB
f) MAP and MAF and its application
g) Applications of JND's
h) Loudness - equal loudness level contours and application
i) Loudness scales - sone, phone, Steven's power law

Unit 5: Causes and types of Hearing Loss

a) Different types of hearing loss, general characteristics of conductive, mixed and sensorineural hearing loss
b) Causes of hearing impairment, classification of causes of hearing loss: hereditary hearing loss, congenital hearing loss, acquired hearing loss in children and adults, causes of central auditory disorders**.**

Practicals

a) Getting familiar with different types of clinical audiometers, parts of audiometers and their functions
b) To familiarize with different signals/stimuli used for audiometry
c) Generation of simple sine wave with different frequencies, amplitudes and phases
d) Measurement of threshold of audibility in individuals with normal hearing using MAP and MAF
e) Measurement of DLI, DLF in individuals with normal hearing
f) Familiar with the generation of stimuli for DLI & DLF
g) Familiarization with different symbols used on audiogram for unmasked and masked AC, BC, SRT, and SIS for different transducers for right and left ear.
h) Familiarization with materials used for speech audiometry in different Indian languages and English for adults and children
i) To observe counselling before and after audiological testing

Recommended reading:

Martin, F. N., & Clark, J. G. (2014). Introduction to Audiology (12th ed.). Boston: Pearson Education.

Bess, F. H., & Humes, L. E. (2008). Audiology: The Fundamentals (Fourth.). US: Lippincott Williams & Wilkins.

Newby, H. A. (2008). Audiology (3rd ed.). New York: Thieme.

Semester I
B 1.3 Anatomy and Physiology related to Speech and Hearing Organs
Total hours – 90 (Lecture: 30hrs, Tutorial: 60hrs)
Marks -100

Objectives:

To learn about the anatomy of the auditory system
To learn about the anatomy of the speech mechanism
To learn about the physiology of hearing mechanism
To gain knowledge on functioning of speech and swallowing mechanism

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

To use and explain the concepts in anatomy and physiology of speech and hearing organs for communication

Section A - Anatomy

Unit 1: Introduction

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

Unit 2: Embryology

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

Unit 3: Anatomy of speech production systems and swallowing

a) Mechanisms of breathing with emphasis on speech breathing
b) Supportive frame work of larynx
c) Anatomy of larynx and pharynx
d) Anatomy of oesophagus
e) Anatomy of articulators and associated structures
f) Anatomy of resonatory mechanisms

Unit 4: Anatomy of external and middle ear

a) Anatomy of the external ear
b) Brief anatomy of temporal bone
c) Anatomy of tympanic membrane and associate structures
d) Anatomy of middle ear and ossicles
e) Anatomy of Eustachian tube and middle ear muscles

Unit 5: Anatomy of labyrinth

a) Anatomy of bony and membranous labyrinth
b) Macro anatomy of cochlea
c) Micro anatomy of cochlea
d) Innervations and blood supply to cochlea
e) Overview to anatomy of central auditory pathway

Section B - Physiology

Unit 1: Introduction

a) Introduction to human physiology, homeostasis and special senses.
b) Structure of cell & functions
c) Transport across cell membrane
d) Body fluid compartments
e) Bio-Electric Potentials

Unit 2: Physiology of speech production systems and swallowing

a) Swallowing mechanisms in brief
b) Mechanisms of phonation
c) Contribution of articulatory structures to speech production
d) Contribution of resonatory mechanisms to speech production
e) Central speech mechanism (Physiology of Language)

Unit 3: Physiology of external and middle ear

a) Physiology of external ear including localization
b) Head shadow effect, inter-aural intensity and time differences
c) Physiology of Eustachian tube
d) Middle ear transformer action
e) Physiology of middle ear muscles

Unit 4: Physiology of labyrinth

a) Physiology of cochlea
b) Electrical potentials of the cochlea
c) Physiology of hearing through bone conduction
d) Overview of central auditory mechanism
e) Overview of theories of hearing
f) Overview to physiology of balancing mechanisms

Recommended Reading

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

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

Chaurasia, B.D (2013). Human Anatomy (Vol.3). Head Neck and Brain (4th ed.). CBS Publishers and Distributors, New Delhi. ISBN 81-239-1157-2.

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

Tuli, B. S. (2005). Text book of ear, nose and throat. Jaypee Pub.

Semester I
B 1.4 Clinical Psychology related to Communication Sciences
Total hours – 60 (Lecture: 30hrs, Tutorial: 30hrs)
Marks -100

Objectives:

To become familiar with the scope of clinical psychology and its significance for speech and hearing

To understand the concept of normality, abnormality and classification of abnormal behavior

To learn about cognitive, motor, emotional and social development

To become familiar with theories of learning and therapy techniques based on learning principles

To think about neuropsychological assessment and rehabilitation including basics of counseling and application of neuropsychology in the field of speech and hearing

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

Demonstrate understanding of application of clinical psychology for communication sciences

Unit 1: Introduction to psychology

a) Introduction to psychology: definition, history and schools of psychology
b) Scope of psychology
c) Meaning and definition of clinical psychology
d) Historical development, modern clinical psychology
e) Significance of clinical psychology in health sciences
f) Role of clinical psychology in speech and hearing
g) Concept of normality
h) Concept of abnormality
i) Models of mental disorders: biological, psychological social models

Unit 2: Developmental psychology

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

Unit 3: Assessment procedures in clinical psychology

a) Methods in clinical psychology: case history, clinical interviewing, clinical observation, definition and types of psychological testing
b) Assessment of cognitive functions
c) Adaptive functions,
d) Personality
e) Behavioural assessment
f) Classification of abnormal behavior
g) History, need & rationale of classification
h) Current classificatory system: DSM, ICD

Unit 4: Principles of learning and behaviour modification

a) Learning: meaning, definition and characteristics

b) Theories of learning: introduction
c) Pavlov's classical conditioning: experiments and principles
d) Skinner's operant conditioning: experiments and principles
e) Therapeutic techniques based on learning principles
f) Skill behavior techniques
g) Problem behavior techniques

Unit 5: Neuropsychology and its relevance to study of speech

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

Recommended Reading

Morgon C.T., King R.A., Robinson N.M. (1986) Introduction to Psychology. Tata McGraw Hill Publishing Co.

Hurlock, E.B. (1981 – Reprint in 2008). Developmental Psychology: A lifespan approach. Tata McGraw Hill Publishing Co.

Anastasi, A. (1999). Psychological testing, London: Freeman

Baura, M (2004). Human Development and Psychology, Rehabilitation Council of India, New Delhi. ISBN: 81-7391-868-6

Coleman J.C. (1974). Abnormal Psychology and Modern Life, Taraporevala Sons & Co.

Gregory, R.J. (2000). Neuropsychological and geriatric assessment in Psychological Testing: History, Principles, and Applications (3rd ed.). New York: Allyn & Bacon.

Hurlock, E.B. (1981). Child development. (VI Ed.). Mc Graw Hill International Book Co.

Kline, P. (1993). The Handbook of Psychological Testing. Routledge

Lezak, M., Loring, D.W., and Hannay, H.J. (2004). Neuropsychological Assessment. Fourth Edition. New York: Oxford University Press

Siegal M.G. (Ed). (1987). Psychological Testing from Early Childhood Through Adolescence. International Universities Press.

Semester I

B 1.5 Linguistics and Phonetics
Total hours – 60 (Lecture: 30hrs, Tutorial: 30hrs)
Marks -100

Objectives:

To have an appreciation of different branches and aspects of linguistics
To learn about characteristics and functions of language
To learn about different branches of phonetics, applied linguistics, and phonology
To learn about basic concepts in phonology, morphology, syntax, semantics and pragmatics
To think about Bi/multilingualism and related issues such as acquisition of language and factors affecting it

Outcomes: After completing this course, the student will be able to apply basic principles in linguistics and phonetics for analysis of speech and language.

Unit 1: Linguistics

a) Introduction to linguistics and different branches of linguistics: applied linguistics, sociolinguistics, psycholinguistics, metalinguistics, neurolinguistics and clinical linguistics
b) Language: Definition, characteristics and functions,
c) Difference between animal communication systems and human language
d) Langue versus parole dial
e) Competence vs. performance

Unit 2: Phonetics and Phonology

a) Introduction to phonetics and its branches - articulatory, acoustic, auditory and experimental phonetics
b) Articulatory classification of sounds – segmental and supra-segmental; Classification, description and recognition of vowels and consonants
c) Pathological aspects of speech sound production
d) Transcription systems with special emphasis on IPA. Transcription of samples of normal and disordered speech
e) Introduction to phonology, classification of speech sounds on the basis of distinctive features
f) Phonotactics, phonotactic patterns of English and Indian languages
g) Phonemic analysis – Principles and practices; their practical implications for speech pathology and speech therapy
h) Common phonological processes - assimilation, dissimilation, metathesis, haplology, epenthesis, spoonerism, vowel harmony, nasalization, neutralization

Unit 3: Morphology, syntax, semantics and applied linguistics

a) Morphology – concepts of morph, allomorph, morpheme, roots, compound forms, processes of word formation, content and function words, form classes, grammatical categories
b) Morphology - endocentric and exocentric constructions, free and bound morphemes, inflection and derivation, principles and practices of morphemic analysis
c) Syntax – different methods of syntactic analysis, Immediate Constituent Analysis, phrase structure grammar, transformational generative grammar - deep structure versus surface structure
d) Syntax - concepts of phrases and clauses, sentence types, acceptability versus grammaticality, ambiguity both semantic and syntactic, introduction to the major types of transformations

e) Usefulness of morphemic and syntactic analysis in planning speech and language therapy
f) A brief introduction to semantics – semantics, semantic relations, semantic feature theory
g) A brief introduction to pragmatics and discourse

Unit 4: Language acquisition

a) Issues in first language acquisition
b) Pre-linguistic stages, linguistic stages
c) Acquisition of phonology, morphology, syntax, semantics, and pragmatics
d) Language and cognition
e) An integrated approach to theories communicative competence and its development
f) Applied linguistics with special reference to communication disorders

Unit 5: Bi/multilingualism

a) Introduction to the language families of the world and India
b) Issues related to second language acquisition & factors influencing it
c) Inter-language theory, language transfer and linguistic interference
d) Differences between first and second language acquisition/learning
e) Bilingualism/Multilingualism
f) Writing systems – types of writing systems and their history
g) Indian writing systems

Recommended Reading

Fromkin, V., & Rodman, R. (1998). An Introduction to Language. Harcourt Brace College Publishers.

Owens, Jr. R.E. (2008). Language development: An introduction (7th ed.). Boston: Pearsons

Yule, G. (1985). The Study of Language. Cambridge Uni. Press (Indian students edition)

Ladefoged, P. (1982). A Course in Phonetics. New York: Harcourt Brace Jovanorich Inc.

Shriberg, L.D., & Kent, R. D. (1982). Clinical Phonetics. New York: John Wiley & Sons.

Ball & Martin (1995). Phonetics for Speech Pathology. Delhi: AITBS Publishes, India.

Ball, Rahilly & Tench (1996). The Phonetic Transcription of Disordered Speech. San Diego: Singular Publishing Group Inc.

Clark & Yallop (1999). An Introduction to Phonetics and Phonology. Oxford: Blackwell Publishes Inc.

Karanth, P. (2003). Cross-linguistic Study of Acquired reading disorders. Sage Publications, New Delhi. ISBN: 0-306-48319-X

Semester I

B 1.6 Electronics and Acoustics
Total Hours – 60 (Lecture: 30hrs, Tutorial: 30hrs)
Marks - 100

Objectives:

To learn about concepts and types of power supply for biomedical instruments
To learn about basic aspects of digital signal processing
To think about theoretical basis of acoustics required for audiologists
To understand the functioning of computers and computing systems

Outcomes: After completing this course, the student will be able to apply basic principles of electronics and acoustics to signals and instrumentation in speech and hearing

Unit 1: Electronic Devices

a) Resistors, capacitors and inductors
b) Transformers and potentiometers,
c) Semiconductor diodes and transistors
d) LED devices, seven segment displays and LCDs
e) Operation principle of FET, UJT & Thyristors
f) Introduction to linear and digital integrated circuits.
g) AC power supply
h) DC power supply
i) Linear Regulated power supply, stabilizers, UPS and Inverter
j) Electric shock and Earthing.

Unit 2: Introduction to acoustics

a) Generation and propagation of sound
b) Vibrations and their characteristics
c) Characteristics of sound - Frequency, Intensity, Wavelength
d) Amplitude, peak to peak amplitude, RMS amplitude
e) Amplitude, frequency and phase of pure tone and complex tones
f) FFT & Impulse response
g) Impedance & admittance
h) Reflection, Interference and absorption of sound.

Unit 3: Transducers and Acoustics of buildings.

a) Types of microphones
b) Classes and characteristics of microphones
c) Loudspeakers – types and working
d) Acoustics - Reverberation & Reverberation time
e) Absorption co-efficient – Sabine's formula
f) Factors affecting good acoustics
g) Basic requirements for good acoustics
h) Sound level meters & Acoustic measurements.

Unit 4: Basics of computers & Digital signal processing

a) Introduction to computers - Hardware, software, memory devices & types of storage media
b) Operating systems
c) Microprocessors & microcomputers
d) Fundamentals of digital electronics - Binary number system, Hex code, bit and byte
e) Logic gates, counters and flip-flops
f) Digital signal processing - Analog signal and digital signal
g) Analog to digital converters, sampling and quantization.
h) Digital filters – Fundamentals

i) Infinite Impulse response and Finite impulse response filters
j) Advantages of digital signal processing over analog signal.
k) Applications of DSP in communication sciences and disorder
l) Time and frequency domain methods of speech processing.

Unit- 5: Instrumentation in Speech, Language and Hearing

a) Introduction to Electronic system - Amplifiers and Preamplifiers
b) Filters – Different types and their frequency response
c) Principle of operation, Block diagram of Basic technology of Analog & Digital hearing aids
d) Audio-meters
e) Immittance meters
f) Evoked potential system
g) Speech & voice analysis systems and artificial larynx
h) Electroglottograph

Recommended Reading

Decker, T.N. & Carrell. T.D. (2004). Instrumentation – An introduction for students in the speech and hearing sciences (third edition) Lawrence rlbaum Associates, Publishers, London.

Haughton, P., & Haughton, P. M. (2002). Acoustics for Audiologists (1st edition.). San Diego, Calif: Emerald Group Publishing Limited.

Moser, P. (2015). Electronics and Instrumentation for Audiologists. Psychology Press.

Rout, N and Rajendran, S. (2014). Hearing aid trouble shooting and Maintenance, Published by National Institute for Empowerment of Persons with Multiple Disabilities, Chennai. Freely downloadable from http://niepmd.tn.nic.in/publication.php. ISBN 978-81-928032-1-0.

Speaks, C. E. (1999). Introduction To Sound: Acoustics for the Hearing and Speech Sciences (3 edition.). San Diego: Cengage Learning.

Villchur, E. (1999). Acoustics for Audiologists (1 edition.). San Diego, Calif: Delmar Cengage Learning.

Semester I

B 1.7 Epidemiology, Research Methods and Statistics
Total hours – 60 (Lecture: 30hrs, Tutorial: 30hrs)
Marks -100

Objectives:

To learn about basic concept of research in the field of audiology and speech-language pathology
To gain an appreciation of design and execution of research
To think about ethical guidelines for conducting research

Outcomes: After completing this course, the student will be able to give examples of conduct of research and use of statistics in research related to speech and hearing

Section A: Research Methods and Epidemiology

Unit 1: Introduction to research methods

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

Unit 2: Research design in audiology and speech-language pathology

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

Unit 3: Epidemiology

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

Section B: Statistics

Unit 4: Introduction to statistics and data collection

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

Unit 5: Statistics and research designs

a) Choosing statistics for different research designs

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

Recommended Reading

Dane F. C. (2011). Sampling and Measurement. In Evaluating research: Methodology for people who need to read research. New Delhi: SAGE publication.

Field, A. (2009). Discovering Statistics Using IBM SPSS (4th ed.). SAGE Publications.

Hegde M. N. (2010). A course book on Scientific and professional writing for speech language pathology (4thEdition), Singapore: Delmar publication.

Hegde, M. N. (2003). Clinical research in communicative disorders: Principles and strategies. (3rd Edition), Austin: Pro-ed

Hesse-Biber, S. N. & Leavy, P. (2011). The Ethics of social research. In The Practice of qualitative research. (2nd Edition), New Delhi: SAGE publication.

Jekel, F. J., Katz, L.D., & Elmore, G.J (2001). Basic Epidemiologic Concepts and Principles in epidemiology, Biostatistics, and Preventive Medicine (2nd Edition). Pennsylvian: Saunders

Meline, T. (2010). A research primer for communication sciences and disorders. Singapore: Pearson publication

Semester II

B 2.1 Neurology
Total hours – 60 (Lecture: 30hrs, Tutorial: 30hrs)
Marks -100

Objectives:

To learn about basic concepts of anatomy and physiology of nervous system related to speech and hearing

To have an appreciation of neural organization –different structures and functions of various systems, neurosensory and neuromotor controls in speech, language and hearing mechanisms

To think about cerebral plasticity and dominance and its relevance for speech, language and hearing disorders

To learn about various neural diseases, lesions, nutritional and metabolic conditions affecting speech, language and hearing

To learn about basic principles and assessment procedures used in speech, language and hearing disorders associated with neurological conditions

Outcomes: After completing this course, the student will be able

To demonstrate knowledge about neuroanatomy and physiology related to speech and hearing

To give examples of various neurological conditions affecting communication

Unit 1: Anatomy and physiology of the nervous system

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

Unit 2: Neural organization of speech and hearing processes

a) Neurosensory organization of speech and hearing
b) Central auditory nervous system
c) Anatomy of oral sensation and oral sensory receptors
d) Neuromotor control of speech
e) The pyramidal, extra-pyramidal system, basal ganglia and cerebellar system
f) Lower and upper motor neuron
g) Alpha and gamma motor neurons
h) Sensory and motor examination, oral, peripheral and other reflexes
i) Swallowing mechanism and neural control
j) Screening and bedside neurological examination

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

a) Neural infections – meningitis, encephalitis
b) Developmental anomalies – spinal cord defects, syringomalacia and bulbia, Arnold chian malformations
c) Hydrocephalus – source and circulation of CSF, types and etiopathogenesis
d) UMN lesions –spastic dysarthria
e) LMN lesions –flaccid dysarthria
f) Mixed lesions
g) Extra pyramidal lesions – dyskinetic dysarthria
h) Cerebellum and cerebellar pathway lesions – ataxic dysarthria

i) Other diverse lesions and dysarthrias

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

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

Unit 5: Speech-language and swallowing disorders

a) Central language mechanism and its disorders
b) Developmental motor speech disorders – cerebral palsy, muscular dystrophy
c) Neurologic disorders with primitive reflexes, diagnosis and management
d) Clinical neurological syndromes associated with speech and language disorders
e) Childhood language disorders associated with neurologic disorders
f) Swallowing associated with neurogenic disorders and assessing mastication and deglutition
g) Agnosia and other conditions associated with speech and hearing disorders
h) Cognitive disorders associated with neurologic disorders
i) General management principles and options for childhood neurogenic speech, language and hearing disorders
j) General management principles and options for adult neurogenic speech, language and hearing disorders

Recommended Reading

Bhatnagar, S.C. (2012). Neuroscience for the Study of Communicative Disorders. Lippincott, Williams & Wilkins

Duffy, J. R. (2013). Motor Speech Disorders: Substrates, Differential Diagnosis, and Management (3rd Ed.). University of Michigan, Elsevier Mosby.

Adams, R.D. & Sidman, R.L. (1968). Introduction to neuropathology. New Jersey: McGraw-Hill.

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.

Semester II

B 2.2 Otorhinolaryngology
Total hours – 60 (Lecture: 30hrs, Tutorial: 30hrs)
Marks -100

Objectives:

- To learn about causes, signs, symptoms, pathophysiology and management of diseases of external, middle and inner ear leading to hearing loss.
- To learn about causes, signs, symptoms, pathophysiology and management of diseases of laryngeal and articulatory systems.

Outcomes:
After completing this course, the student will be able to demonstrate knowledge about the diseases of ear, nose and throat.

Unit 1: External and middle ear and their disorders

a) Clinical anatomy of the ear
b) Anomalies of the ear
c) Diseases of the external ear
d) Tumors of the external ear
e) Perforation and ruptures of tympanic membrane
f) Eustachian tube dysfunction
g) Otitis media with effusion
h) Chronic otitis media and its types
i) Otosclerosis
j) Trauma to temporal bone
k) Facial nerve and its disorder

Unit 2: Inner ear and its disorders

a) Congenital anomalies
b) Meniere's disease
c) Ototoxicity
d) Presbyacusis
e) Disorders of vestibular system including vestibular schwannoma
f) Tinnitus and its treatment

Unit 3: Oral cavity, pharynx, nose and their disorders

a) Anatomy of the oral cavity
b) Common disorders of the oral cavity
c) Clinical anatomy and physiology of pharynx
d) Inflammatory conditions of the pharynx, tonsils and adenoids
e) Tumors of the oral cavity and pharynx
f) Anatomy of nose and paranasal sinus
g) Physiology of nose and paranasal sinus

Unit 4: Larynx and its disorders

a) Clinical anatomy of larynx
b) Difference between adult and infant larynx
c) Clinical examination of larynx
d) Congenital laryngeal pathologies
e) Inflammatory conditions of the larynx
f) Vocal nodule and other disorders of the vocal folds
g) Benign and malignant tumours of the larynx
h) Airway management procedures – Tracheostomy – implications on speech and swallowing.

Unit 5: Esophagus and its disorders

a) Clinical anatomy and physiology of esophagus
b) Clinical examination of esophagus and esophageal dysphagia
c) Congenital anomalies of esophagus
d) Structural conditions of esophagus
e) Inflammatory conditions of esophagus
f) Benign and malignant conditions of esophagus

Recommended Reading

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

Semester II
B 2.3 Speech Language Diagnostics and Therapeutics
Total hours – 75 (Lecture: 45hrs, Tutorial: 30hrs)
Marks -100

Objectives: To learn about

Various types of speech and language disorders
Concepts and tools required for diagnosing speech and language disorders
Basics of assessment procedures for speech and language disorders
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
Principles of providing counselling and guidance to clients and caregivers

Outcome: After completing this course, the student will be able to demonstrate knowledge about fundamental principles of speech-language diagnostics and therapeutics for assessment and management of communication disorders

Unit 1: Basic concepts and methods of diagnostics

a) Introduction to speech and language disorders
b) Definition and descriptions of delay, deviancy and disorder; impairment, disability and handicap
c) Incidence and prevalence of speech and language disorders
d) Causes of speech and language disorders
e) Basic principles in assessment, evaluation and appraisal
f) Tools for diagnosis: Case history, interview, self-reports, questionnaire & observations
g) Diagnostic models: Speech Language Processing Model [SLPM], Bloom and Lahey model
h) Types of diagnoses: Clinical diagnosis, direct diagnosis, differential diagnosis, diagnosis by treatment, diagnosis by exclusion, team diagnosis, instrumental diagnosis, provocative diagnosis, tentative diagnosis advantage/limitations
i) Characteristics of a diagnostic clinician
j) Organization and basic requirements for clinical set up and team approach
k) DSM, ICD and ICF based classifications

Unit 2: Basic concepts and methods of therapeutics

a) Basic concepts and terminologies in speech therapeutics
b) General principles of speech and language therapy
c) Speech therapy set-up
d) Individual and group therapy
e) Procedures and types of speech-language therapy
f) Approaches to speech and language therapy – formal, informal and eclectic approaches
g) Planning for speech and language therapy – goals, steps, procedures and activities
h) Importance of reinforcement principles and strategies in speech and language therapy, types and schedules of rewards and punishment
i) Augmentative & Alternative Communications (AAC) and other nonverbal methods of therapy

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

a) Causes of speech disorders
b) Overview of assessment procedures for voice disorders; articulation and phonological disorders; and fluency disorders
c) Overview of management procedures for voice disorders; articulation and phonological disorders; and fluency disorders
d) Early identification and prevention of speech disorders

e) Basic concepts in assessment and management of swallowing disorders

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

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

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

a) Professional code of conduct: Social, cultural and other ethical issues
b) Scope of practice: Different set ups and prerequisites
c) Documentation of diagnostic, therapeutic and referral reports
d) Counselling, guidance, facilitation of parent participation and transfer of skills
e) Evaluation of therapy outcome and follow up
f) Evidence based practice
g) Community based rehabilitation
h) Role of itinerant speech therapist, Anganwadis, resource teachers etc.
i) PWD act, National Trust, Consumer protection Act, Noise Pollution Act and other public laws, RCI, ISHA and other organizations controlling the field
j) Facilities and concessions available for individuals with speech and hearing disability

Recommended Reading

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

Shipley, K. G., & McAfee, J. G. (2004). Assessment in speech-language pathology: A resource manual (3rd ed.). Australia; Clifton Park, NY: Delmar Learning.

Hegde, M. N., & Davis, D. (2005). Clinical methods and practicum in speech- language pathology (4th ed.). Australia; Clifton Park, NY: Thomson Delmar Learning.

Shipley, K. G., & Roseberry-McKibbin, C. (2006). Interviewing and counselling in communicative disorders : Principles and procedures (3rd ed.). Austin, Tex: Pro-Ed.

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

Hulit, L.M., Marle. R., Kathleen, R. H., & Fowey (2010). Born to Talk. Pearson Communication Science and Disorders Series 5th Ed.

Roth, F. P., & Worthington, C. K. (2005). Treatment resource manual for speech language pathology (3rd ed.). Australia; Clifton Park, NY: Thomson Delmar Learning.

Ysseldyke, J. E., & Algozzine, R. (2006). Teaching students with communication disorders: A practical guide for every teacher. Thousand Oaks, Calif.: Corwin Press.

Semester II

B 2.4 Audiological Evaluation
Total hours – 75 (Theory: 45 hrs, Practical: 30)
Marks – 100

Objectives:

To learn about case history, otoscopy and tuning fork tests
To familiarize with different types of audiometers and different signals/stimuli used for audiometry
To appreciate the theoretical background of basic audiological tests in identification of different types of hearing loss

Outcomes: After completion of this course, the student should be able to

Take case history, perform otoscopy and tunning fork tests.
Carryout pure tone audiometry including masking
Carryout different tests involved in speech audiometry
Carryout subjective calibration and daily listening checks of the audiometer

Unit 1: Case history, Otoscopy and Tuning Fork Tests

a) Need for case history
b) Essential factors to be included in case history for adults and children
c) Usefulness and interpretation of case history
d) Otoscopic examination and findings
e) Nature and properties of tuning fork
f) Tuning fork tests: Qualitative tests- Rinne, Weber and Bing
g) Quantitative test: Schwabach
h) Interpretation, advantages and disadvantages
i) Audiometric version of Weber and Bing test.
j) Tuning fork tests findings in different degrees and type of hearing loss.

Unit 2: Pure tone Audiometry

a) Classification of audiometers and instrumentation: Components and parts of an audiometer, audiogram, construction of an audiogram, symbols used, interpretation of an audiogram (degree, type & configuration), usefulness of an audiogram
b) Bone conduction (BC) Audiometry: Importance, challenges in bone conduction testing, Theories of bone conduction
c) Methods to find threshold (AC & BC): Method of limits, Hughson & Westlake method, Modified Hughson Westlake Method, ASHA guidelines, ANSI guidelines
d) Factors affecting AC and BC threshold, Limitations of Pure tone Audiometry

Unit 3: Speech Audiometry

a) Rationale, objectives, purpose
b) Different type of speech tests - Speech detection threshold (SDT), Speech recognition threshold(SRT), speech identification scores (SIS) - Definition, Material used, Procedure for obtaining SDT, SRT and SIS, Response mode and their clinical applications. BC speech Audiometry
c) Correlation between PTA and speech audiometry results
d) PIPB function, Articulation Index
e) Factors affecting speech audiometry, Limitations of speech Audiometry
f) Speech materials available in English and Indian languages for Speech Audiometry (SRT & SIS)
g) Loudness based tests - MCL, UCL, Dynamic range - Definition, Materials used, Procedure, and Clinical Applications

Unit 4: Masking

a) Definition, Terminology related to masking: Test ear, non-test ear, masker, maskee, cross over, cross hearing and shadow curve
b) Types of masking, Different types of stimuli used as maskers, Critical Band Concept
c) Interaural attenuation (IA), factors affecting IA. Criteria for masking during AC, BC and factors considered.
d) Factors determining amount of masking noise- Minimum and Maximum effective masking level for AC and BC, speech.
e) Procedures for masking – Methods to find masked threshold and factors to be considered in adequate masking, Naunton's Dilemma

Unit 5: Transducers and calibration

a) Different types of transducers, their performance and technical specifications – Head phones (TDH-39, TDH-49, TDH-50, HDA-200, HDA-500), Bone vibrators (B71, B -72, KH 70 & A 20), Speakers, Insert ear phones (ER-3A, ER-5A), Microphones (Talk forward & Talk back), VU meter, Ear cushions
b) Artificial ear, Acoustic couplers and artificial mastoid
c) National and International standards related to Pure tone and Speech Audiometry (ANSI, ISO, IEC, ASHA & IS/BIS), Permissible Ambient Noise levels in audiometric test room
d) Calibration of audiometers: 1. Subjective/real ear calibration methods for AC and BC 2. Objective/Electro-acoustic calibration of the output intensity of Puretone, NBN, WBN and Speech noise through the headphones, insert receiver, loud speaker and bone vibrators and frequency calibration
e) Calibration of speech stimulus
f) Daily listening checks, application of correction factors

Practicals

a) Case history on normal hearing individuals
b) Administration and interpretation of tuning fork tests on individuals with normal hearing
c) Perform otoscopy and draw tympanic membrane of healthy normal individual
d) Daily listening check and trouble shoot of different clinical audiometers
e) Preparation of correction factor chart after biological calibration on individuals with normal hearing
f) Appropriate placement of various transducers on clients during Audiometry including masking
g) Familiarization with instructions for carrying out pure tone audiometry, Speech audiometry and masking
h) Familiarization with different types of stimuli used in audiometry
i) Establishment of PT thresholds (AC & BC) using ascending, descending and modified Hughson Westlake procedures in 5 individuals with normal hearing
j) Plot the audiogram, calculate the pure tone average and write the provisional diagnosis of observed clients.
k) Administration of clinical masking on individuals with normal hearing
l) Establishing UCL, MCL, SRT, SDT & SIS on individuals with normal hearing
m) Familiarization with different equipment and procedure used for objective calibration of audiometers

Recommended reading:

Katz, J. (2015). Handbook of clinical audiology. 7th Ed. Baltimore: Lippincott Williams & Wilkins.

Martin, F. N., & Clark, J. G. (2014). Introduction to Audiology (12th ed.). Boston: Pearson Education.

Silman, S. & Silverman, C.A. (1997). Auditory diagnosis principles and applications. New York: Academic Press Inc.

Roeser, R. J., Valante, M. & Hosford – Dunn, H. (2007). Audiology Diagnosis. 2nd edition. New York: Thieme Medical Publishers, Inc.

Valente, and Maureen, G. M. D. (2009). Pure tone audiometry and masking. San Diego, Plural Publishing.

Kramer, S., Guthrie, L. A. (2014). Audiology workbook. 2nd edition. San Diego, Plural Publishing, Inc.

Semester II
B 2.5. Speech-language Pathology – Lab
Marks -100

Objectives

To learn about skills required to assess speech and language

To understand the principles, instrumentation, tools and procedure to measure parameters of speech and language

To be familiar with various therapy approaches and strategies for counseling individuals (and family) with speech and language disorders

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

Transcribe speech using IPA

Perform analysis of speech and language

Administer tests to assess speech and language abilities

To prepare diagnostic report, write therapy goals, plan activities for therapy and develop an appropriate therapy kit

General

1. Use IPA to transcribe spoken words.
2. Perform oral mechanism examination on five typically developing children and five typical adults.
3. Measure the following in five 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.
4. Study the available normative data (Indian/Western) of language based on its components: phonology, semantics, syntax, morphology and pragmatics.

Speech Diagnostics

1. List the available test material in the clinic for assessing various parameters of speech and language.
2. Administer standardized tests for assessment of delayed speech and language development such as Language Assessment Tool, 3- Dimensional Language Assessment Tool, Assessment of Language Development, Scales of Early Communication Skills (SECS) for the Hearing Impaired, ComDEALL Developmental Checklist (CDDC), each on one typically developing child and one child with language disorder.
3. Perceptual analysis of speech and language parameters in persons with communication disorders (3 adults, 3 children).
4. Prepare a model diagnostic report for a patient with speech and language disorder.
5. Prepare diagnostic kit.
6. Observe the evaluation process and counselling of at least five different speech and
7. language disorders in children.
8. Observe the evaluation process and counselling of at least three different speech and language disorders in adults.
9. Take case history of a minimum of five individuals (three typical & two clients with
10. complaints related to speech and or language) with language, fluency, voice and articulation disorders.
11. Observation of diagnostic procedures.

Speech Therapy

1. Prepare therapy kit.
2. Make a list of speech language stimulation techniques and other therapy techniques for various speech disorders.
3. Familiarize with the sources for referral and parent counseling procedures.
4. Observe various therapeutic methods carried out with a minimum five children and three adults with speech and language disorders (language, fluency, voice and articulation disorders).

Semester II

B 2.6 Audiology- Lab
Marks -100

Objectives

learn about concept of dB and its application in testing hearing acuity

To learn about psychophysical experiments to understand the nature of sound and its perception

To understand the instrumentation and procedure to test hearing

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

Perform calculations applying concept of dB

Perform basic psychophysical experiments to calculate RETSPL, MCL, UCL, equal loudness contours

Carry out basic hearing tests including puretone audiometry, speech aduiometry with masking

Calculate/derive the answers for following

1. Calculate the relative intensities with different reference intensities.
2. Calculate decibels when sound intensities are doubled and increased by 4 times
3. Add decibels when two sounds with different intensities are produced simultaneously

Perform the following experiments

1. Calculate reference equivalent sound pressure levels (RETSPL) for head phones and bone vibrator for any two frequencies using 10 participants.
2. Measure most comfortable level on 5 participants with normal hearing sensitivity.
3. Measure uncomfortable levels on 5 participants with normal hearing sensitivity.
4. Calculate the sensation levels of MCL and UCLs in above 5 participants.
5. Measure difference limen of intensity, frequency and duration on 5 normal hearing adults and plot it in graphical form and interpret the results.
6. Measure equal loudness level contours at minimum level, 40 dB SPL, 70 dB SPL (1 kHz) in 5 normal hearing adults.
7. Measure sone and mel in 5 normal hearing adults using scaling techniques.
8. Administer different tuning fork tests on 5 simulated conductive and 5 sensori neural hearing loss individuals.(256,512,&1024 Hz)
9. Carry out pure tone and speech audiometry on 5 normal hearing individuals.
10. Carry out clinical masking on 2 individuals with conductive hearing loss and 2 individuals with sensori-neural hearing loss.
11. Carryout daily listening checks and subjective calibrations 5 times and observe objective calibration once

Clinical Practicum

1. Observe the pure tone audiometry being carried out on 20 clients.
2. Plot the audiogram, calculate the pure tone average and write the provisional diagnosis of observed clients.

Semester III

B 3.1 Language Disorders in Children
Total hours – 75 (Lecture: 45hrs, Practical: 30hrs)
Marks - 100
Objectives

To understand the development of language in children and factors affecting language acquisition

To learn about classification and symptom complex of language disorders in children

To think about formal and informal methods of assessment of language disorders in children

To have an appreciation of general principles and approaches to management of language disorders in children.

Outcomes: 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 disorders 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

a) Theories of language acquisition 1: Biological, Psycholinguistic/syntactic theory
b) Theories of language acquisition 2: Cognitive, Social interaction/pragmatic, Information processing, Behavioural
c) Pre-cursors for normal development of language
d) Development of components of language from birth to two years (pre-linguistic/pre-symbolic to symbolic)
e) Development of components of language during preschool period
f) Development of components of language during early school age and beyond
g) Basic concepts and terminologies of language development in bilingual children – simultaneous versus sequential language acquisition, additive and subtractive bilingualism, process of second language acquisition, variables influencing second language acquisition
h) Development of language in culturally diverse environments and exceptional circumstances – neglect and abuse, twins, low-socio economic background

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

a) Overview of language disorders – definition and classification
b) Intellectual disability: definition, classification, causes and characteristics
c) Autism spectrum disorders: definition, classification, causes and characteristics
d) Attention deficit hyperactive disorder: definition, classification, causes and characteristics
e) Language impairment - mixed receptive and expressive language disorder, specific language impairment: definition, classification, causes and characteristics
f) Learning disability: definition, classification, causes and characteristics
g) Acquired childhood aphasia: definition, classification, causes and characteristics
h) Sensory impairments (Hearing impairment, visual impairment) and language disorders: types, causes and characteristics
i) Syndromic conditions leading to language difficulties: William syndrome, Fragile X syndrome, Down syndrome
j) Other developmental disabilities: Cerebral palsy and multiple disabilities.

Unit 3: Assessment of language in children

a) Preliminary components of assessment: Case history, screening, evaluation of environmental, linguistic & cultural variables.

b) Methods to assess children with language disorder: Formal versus informal assessment; types of assessment materials: assessment scales, observational checklists, developmental scales; standardization, reliability, validity, sensitivity and specificity of test materials
c) Informal assessment: Pre-linguistic behaviour, play, mother-child interaction
d) Language sampling: Planning and collecting representative sample; strategies to collect language sample, audio-video recording, transcription
e) Analysis of language sample: Specific to various components of language such as phonology, morphology, syntax, semantics and pragmatics.
f) Test materials for assessing language skills: Assessment of Language Development (ALD), 3D-Language Assessment Test, Linguistic Profile Test, Com-DEALL checklist, other Indian and global tests
g) Test materials used for children with developmental delay, intellectual disability: Madras Developmental Program Scale, Bayley's Scale for infant and toddler development
h) Test materials used for children with autism spectrum disorder: Modified-Checklist for Assessment of Autism in Toddlers, Childhood Autism Rating Scale, Indian Scale for Assessment of Autism, INDT-ASD
i) Other test materials used for children with ADHD, ACA, LD (NIMH battery for assessment of Learning Disability)
j) Documenting assessment results: diagnostic report, summary report and referral report specific to disorder
i) Differential diagnosis of language disorders in children - based on ICD, DSM and application of ICF in language disorders

Unit 4: Management of language disorders in children – I

a) General principles and strategies of intervention in children with language impairment – purpose of intervention, basic approaches to language intervention (developmental or normative approach, functional approach)
b) Types of service delivery models - Individuals versus group; direct versus tele-rehabilitation; structure of therapy session, setting the environment, furniture, seating arrangements
c) Reinforcement in language therapy: Types and schedules of reinforcement
d) Choice of language for intervention, incorporating principles of multiculturalism into treatment activities
e) Choosing and framing goals and objectives: SMART Objectives
f) Specific treatment techniques
    i. Clinician-Directed: Drill, drill Play, modelling
    ii. Child-Centred approaches: Self-talk, parallel talk, imitation, expansion, extension, buildup breakdown, recast sentences
    iii. Hybrid: Focussed stimulation, vertical structuring, milieu communication training, script therapy
g) Others: Whole language, communicative temptations, binary choice
h) Caregivers and family in intervention: Structured and informal approaches such as Hanen programmes, Relationship Development Intervention, Floor time, PECS, ABA and other relevant approaches

Unit 5: Management of language disorders in children – II

a) Team approach to intervention
b) Augmentative and alternative communication – types (aided and unaided) and application in child language disorders
c) Specific approaches to management of children with Autism: PECS, Lovaas, TEACCH, Com-DEALL, ABA, Facilitated Communication
d) Approaches to management of children with LD
e) Strategies to facilitate language skills in children with disorders such as intellectual disability: Redundancy, chunking, chaining
f) Use of technology in language intervention

g) Home plan and counselling for children with language disorders
h) Documentation specific to the disorder: pre-therapy; lesson plan; SOAP notes
i) Documentation specific to the disorder: summary report, referral report
j) Decision making in therapy: transition to next objective, termination of therapy

Practicals

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

Recommended Reading

Roseberry-McKibbin, C. (2007). Language Disorders in Children: A multicultural and case perspective. Boston: Pearson Education, Inc.

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

Hegde, M.N. (2005). Treatment protocols for language disorders in children – Vol. 1 & 2. San Diego: Plural Publishing

Owens, Jr. R.E. (2008). Language development: An introduction (7th ed.). Boston: Pearsons

Reed, V.A. (2004). An Introduction to children with language disorders (3rd Ed.) New York: Allyn & Bacon

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.

Semester III

B 3.2 Speech Sound Disorders

Total hours – 75 (Lecture: 45hrs, Practical: 30hrs)
Marks - 100

Objectives:

To understand speech sound acquisition and development
To learn methods to conduct assessment for speech sound disorders
To have an appreciation of general principles and approaches to management of speech sound disorders

Outcomes: 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.
Plan intervention for individuals with speech sound disorders.

Unit 1: Speech sound acquisition and development

a) Fundamentals of articulatory phonetics - phonetic description of vowels & consonants.
b) Phonology & phonological theories – generative phonology, natural phonology.
c) Phonology & phonological theories – non-linear phonology, optimality theory.
d) Methods to study speech sound acquisition – diary studies, cross sectional studies and longitudinal studies.
e) Speech sound acquisition
    i. Birth to one year (development of infant speech perception, early speech production).
    ii. One to two years (consonant inventories, influence of phonological knowledge on vocabulary acquisition).
    iii. Two to five years (growth of phonetic, phonemic, phonotactic inventory – consonants, clusters, phonological patterns).
    iv. Above five years (speech sound mastery and development of literacy – phonological awareness).
    v. Factors influencing speech sound acquisition
f) Acoustics of speech sounds
g) Co-articulation: types and effects
h) Phonological development in bilingual children.
i) Phonological development in Indian languages.

Unit 2: Assessment of speech sound disorders - I

a) Current concepts in terminology and classification of speech sound disorders
    i. Organically-based speech sound disorders
    ii. Speech sound disorders of unknown origin, classification by symptomatology.
b) Factors related to speech sound disorders
    i. Structural, sensory factors
    ii. Cognitive – linguistic, psychosocial and social factors.
    iii. Metalinguistic factors related to speech sound disorders.
c) Assessment of oral peripheral mechanism.
d) Introduction to assessment procedures: aims of assessment, screening and comprehensive assessment.
e) Speech sound sampling procedures - issues related to single word and connected speech samples; imitation and spontaneous speech samples, contextual testing, recording of speech samples.
f) Speech intelligibility, factors affecting speech intelligibility
g) Review of tests in English and other Indian languages - Single word articulation tests, deep test of articulation , and computerized tests of phonology.

h) Influence of language and dialectal variations in assessment.
i) Transcription of speech sample - transcription methods –IPA and extension of IPA; broad and narrow transcription.

Unit 3: Assessment of speech sound disorders – II

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

Unit 4: Management – I

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

Unit 5: Management – II

a) Core vocabulary approach.
b) Introduction to linguistically-based treatment approaches- Distinctive feature therapy.
c) Minimal pair contrasts therapy.
d) Metaphon therapy, Cycles approach.
e) Broad-based language approaches.
f) General guidelines for linguistically-based approaches.
g) Phonological awareness and phonological disorders.
h) Phonological awareness intervention for preschool children.
i) Adapting intervention approaches to individuals from culturally and linguistically diverse backgrounds.
j) Role of family in intervention for speech sound disorders.

Practicals

a) List the vowels and consonants in your primary language and provide phonetic and acoustic descriptions for the speech sounds.
b) Identify the vowels and consonants of your language on the IPA chart and practice the IPA symbols by transcribing 25 words.
c) Make a list of minimal pairs (pairs of words which differ by only one phoneme) in English.

d) Make a list of minimal pairs in any language other than English.
e) Identify the stages of speech sound acquisition by observations from videos of children from birth to 5 years of age.
f) Record the speech of a two year old typically developing child, transcribe and analyze the speech sample.
g) Record the speech of one typically developing child from 3-5 years of age (include single word and connected speech samples), transcribe the sample, and perform phonological assessment.
h) Analyze transcribed speech samples of typically developing children – practice independent and relational analysis.
i) Practice instructions for phonetic placement of selected sounds.
j) Develop a home plan with activities for any one section of phonological awareness in English and in one Indian language.

Recommended Reading

Bernthal, J.E., Bankson, N.W., & Flipsen, P. (2013). Articulation and phonological disorders.(7th Ed.). Boston, MA: Pearson.

Dodd, B. (2013). Differential diagnosis and treatment of children with speech disorder.(2nd Ed). NJ: Wiley.

Rout, N (Ed)., Gayathri, P., Keshree, N and Chowdhury, K (2015). Phonics and Phonological Processing to Develop Literacy and Articulation; A Novel Protocol. A publication by NIEPMED, Chennai. Freely downloadable from http://niepmd.tn.nic.in/publication.php. ISBN 978-81-928032-9-5

Vasanta, D. (2014). Clinical applications of phonetics and phonology. ISHA Monograph.Vol 14, No. 1.Indian Speech & Hearing Association.

Velleman, S. L (2003). Resource guide for Childhood Apraxia of Speech.Delmar/Thomson Learning.

Williams, A., McLeod, S., & McCauley, R. (2010). Interventions for speech sound disorders in children. Baltimore: Brookes.

Semester III

B 3.3 Diagnostic Audiology - Behavioural Tests
Total hours - 75 (Theory: 45 hrs, practical: 30 hrs)
Marks - 100
Objectives:

To have an appreciation of the scope and theoretical background of diagnostic audiology
To learn about tests to identify cochlear and retrochoclear pathology
To learn about tests to identify functional hearing loss, central auditory processing disorders and
To learn about assessment of persons with vestibular disorder, tinnitus, hyperacusis

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

Select individualized test battery for assessing cochlear pathology, retro cochlear pathology, functional hearing loss, CAPD, vestibular dysfunctions, tinnitus and hyperacusis
Demonstate knowledge of the procedures to carry out the above tests
Make appropriate diagnosis based on the test results and suggest referrals.
Select test parameters to improve sensitivity and specificity of tests.

Unit 1: Introduction to diagnostic audiology

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

Unit 2: Tests to identify cochlear and retro cochlear pathology

a) ABLB, MLB and SISI
b) Behavioural tests of adaptation
c) Bekesy audiometry
d) Brief tone audiometry
e) PIPB function
f) Glycerol test
g) Test to identify dead regions of cochlea

Unit 3: Tests to diagnose functional hearing loss

a) Behavioural and clinical indicators of functional hearing loss
b) Pure tone tests including tone in noise test, Stenger test, BADGE, puretone DAF
c) Speech tests including Lombard test, Stenger test, lip-reading test, Doerfler-Stewert test, Low level PB word test, Yes-No test, DAF test
d) Identification of functional hearing loss in children: Swinging story test, Pulse count methods

Unit 4: Assessment of central auditory processing

a) Definition, different behavioral processes
b) Behavioral and clinical indicators of central auditory processing disorders
c) Bottle neck and subtlety principles and their implications
d) Tests to detect central auditory processing disorders
e) Monaural low redundancy tests - filtered speech tests, time compressed speech test, speech-in-noise test, SSI with ICM, other monaural low redundancy tests

f) Dichotic speech tests - dichotic digit test, staggered spondaic word test, Dichotic CV test, SSI with CCM, Competing sentence test, other dichotic speech tests.
g) Binaural interaction tests - RASP, BFT, MLD, other binaural interaction tests
h) Tests of Temporal processing – pitch pattern test, duration pattern tests, other temporal ordering tests, gap detection test, TMTF
i) Variables influencing the assessment of central auditory processing: Procedural and subject variables
j) Test findings of important tests in subjects with central auditory disorders: brainstem lesion, cortical, CAPD in children.

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

a) Introduction to structure and function of vestibular system
b) Overview on other systems involved in balance
c) Vestibular ocular reflex and vestibulo spinal reflex
d) Signs and symptoms of vestibular disorders
e) Team approach in the assessment of vestibular disorders
f) Behavioral tests to assess vestibular functioning: Fukuda stepping test, tandem gait test, finger nose pointing, Romberg test, Sharpened Romberg test, Dix-Hallpike test, Log-roll test
g) Overview of tinnitus and hyperacusis and tests for assessment
h) Pitch matching, loudness matching, residual inhibition, Feldman masking curves
i) 2 AFC, octave confusion method, psychoacoustic and functional impact measures,THI
j) Johnson Hyperacusis Dynamic Range Quotient

Practicals

a) Administer ABLB, MLB and prepare ladder gram (ABLB to be administered by blocking one ear with impression material)
b) Administer classical SISI on individuals and note down the scores
c) Administer tone decay tests (classical and its modifications) and note down the results
d) PIPB function using standardized lists
e) Administer the tests of functional hearing loss (both tone based and speech based) by asking subject to malinger and having a yardstick of loudness
f) Administer any one of the CAPD test processes on normal hearing individuals and note down the scores
g) Administer Fukuda stepping test, Tandem gait test, Finger nose pointing, Romberg test, Sharpened Romberg test, Dix-Hallpike test, Log-roll test and note down the observations.
h) Match the pitch and loudness of simulated tinnitus
i) Plot Feldman masking curves for a hypothetical case

Recommended Reading:

Hall, J. W. (2014). Introduction to Audiology Today. Pearson Education, Inc.

Hall, J. W. & Mueller, H.G. (1997). Audiologists' desk reference volume 1: Diagnostic audiology principles: Procedures and protocols. San Diego: Singular Publishing Group.

Roeser, R. J., Valente, M., & Hosford-Dunn, H. (2007). Audiology: Diagnosis. Thieme.

Katz, J. (2015). Handbook of clinical audiology. 7th Ed. Baltimore: Lippincott Williams & Wilkins.

Gelfand, S. A. (2009). Essentials of Audiology. Thieme.

Jerger, J. (1993). Clinical Audiology: The Jerger Perspective. Singular Publishing Group.

Katz, J., Medwetsky, L., Burkard, R. F., & Hood, L. J. (Eds.). (2007). Handbook of Clinical

Audiology (6th revised North American edition). Philadelphia: Lippincott Williams and Wilkins.

Martin, F. N., & Clark, J. G. (2014). Introduction to Audiology (12 edition). Boston: Pearson.

Stach, B. A. (2010). Clinical audiology: an introduction (2nd ed). Clifton Park, NY: Delmar Cengage Learning.

Semester III
B 3.4 Paediatric Audiology
Total hours - 75 (Theory: 45 hrs, Practical: 30 hrs)
Marks - 100

Objectives

To have an appreciation of development of auditory system
To learn about different auditory disorders in children
To become familiar with history, principles and procedures of hearing screening in children
To become familiar with different assessments procedures for testing children

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

Describe auditory development
List etiologies 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 paediatric behavioural, physiological/ electrophysiological evaluation

Unit 1: Auditory development

a) Review of Embryology of the ear
b) Development of auditory system from periphery to cortex
c) Neuroplasticity
d) Prenatal hearing
e) Normal auditory development from 0-2 years
f) Infant speech perception

Unit 2: Auditory disorders

a) Incidence and prevalence of auditory disorders in children
b) Congenital and acquired hearing loss in children
c) Permanent minimal and mild bilateral hearing loss and its impact on auditory skills, speech-language, educational and socio-emotional abilities
d) Moderate to profound sensorineural hearing loss and its impact on auditory skills, speech-language, educational and socio-emotional abilities
e) Signs, symptoms and audiological characteristics of unilateral hearing loss
f) Signs, symptoms and audiological characteristics of auditory Neuropathy Spectrum Disorders
g) Signs and symptoms of central auditory processing disorders
h) Signs, symptoms and audiological characteristics of pseudohypacusis
i) Auditory disorders in special population and multiple handicap

Unit 3: Early identification of hearing loss

a) Principles of early hearing detection and intervention programs
b) Principles and history of hearing screening
c) Joint Committee on Infant Hearing position statement (2000, 2007,2013)
d) High risk register/ checklists for screening
e) Sensitivity and specificity of screening tests
f) Hearing screening in infants and toddlers: Indian and Global context
g) Hearing screening in preschool children: Indian and Global context
h) Hearing screening in school-age children (including screening for CAPD): Indian and Global context

Unit 4: Paediatric assessment I

a) Behavioral observation audiometry
b) Conditioning audiometry:
   Conditioned orientation reflex audiometry
   Visual reinforcement audiometry

TROCA
Play audiometry
Peep show audiometry

c) Pure tone audiometry in children: Test stimuli, response requirement and reinforcement
d) Modifications required for multiple disabilities
e) Speech audiometry
   Modifications required while carrying out speech audiometry in children
   Speech detection threshold
   Speech recognition threshold
   Speech recognition scores- PBK, WIPI, NU CHIP, Early speech perception tests, Ling six sounds test, auditory number test,
   Tests available in Indian language
   Bone conduction speech audiometry

Unit 5: Paediatric assessment II

a) Immittance audiometry
b) Recording and interpretation of OAE
c) Factors affecting OAE
d) Recording and interpretation of click evoked and tone burst evoked ABR
e) Factors affecting ABR
f) Recording of ASSR
g) Recording of AMLR and ALLR
h) Assessment of hearing loss in special population
i) Diagnostic test battery for different age groups
j) Diagnosis and differential diagnosis of auditory disorders

Practicals

a) From the given video, observe the behavioural responses to sound in a child with normal hearing and write a report on the responses.
b) From the given video, observe the behavioural responses to sound in a child with with and without amplification device and write a report on the responses.
c) Administer high risk register on infants/ children
d) Compare ABR waveforms in children of varying ages from birth to 24 months.
e) 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.
f) Observe OAE in a child with normal hearing and a child with hearing loss. Write a report on instrumentation, protocol used and interpretation
g) Observe ABR in a child with normal hearing and child with hearing loss. Write a report on instrumentation, protocol used and interpretation
h) Observe immittance evaluation in a child with normal hearing and a child with hearing loss. Write a report on instrumentation, protocol used and interpretation
i) Using role play demonstrate how the results of audiological assessment are explained to caregiver in children with the following conditions
   Child with refer result 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:

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

Seewald, R., and Thorpe, A.M. (2011). Comprehensive Handbook of Paediatric Audiology, San Diego: Plural Publishing.

Finitzo, T., Sininger, Y., Brookhouser, P., & Village, E. G. (2007). Year 2007 position statement: Principles and guidelines for early hearing detection and intervention programs. Paediatrics, 120(4), 898–921. http://doi.org/10.1542/peds.2007-2333

Madell, J.R., & Flexer, C. (2008). Paediatric Audiology: Diagnosis, Technology, and Management. Ney York NY: Thieme Medical Publishers.

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Semester III

B 3.5 Clinicals in Speech Language Pathology
Marks – 100
General considerations:

Exposure is primarily aimed at linking theory courses covered in this and previous semester(s).

After completion of clinical postings in Speech–language diagnostics and therapy, 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:

A. Speech Diagnostics

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

B. Speech Therapy

5. General and specific language stimulation techniques for children with language disorders
6. Activities for facilitating specific language skills in children with language disorders.
7. Therapy techniques for improving clarity of speech in children with speech sound disorders
8. Practice instructions for phonetic placement of selected sounds.

Know-how:

A. Speech Diagnostics

1. To evaluate speech and language components using informal assessment methods.
2. To administer at least two standard tests (ALD, 3D LAT, LPT, ComDEALL, CCC-2) for childhood language disorders.
3. To administer at least two standard tests of articulation/ speech sounds.
4. To assess speech intelligibility.

B. Speech Therapy

5. To conduct therapy for children with language disorders through clinican directed, child oriented and hybrid approaches to language therapy
6. To conduct articulation therapy for children and adults with speech sound disorders

Show:

A. Speech Diagnostics

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

B. Speech Therapy

5. Language stimulation techniques – minimum of five
6. Articulation therapy techniques – minimum of two

Do:

A. Speech Diagnostics

1. Case history – minimum of three individuals with speech & language disorders.
2. Oral peripheral examination – minimum of three individuals
3. Language evaluation report – minimum of three individuals
4. Speech sound evaluation report – minimum of two individuals

B. Speech Therapy

5. Therapy for individuals with language disorders minimum of 10 sessions
6. Demonstration therapy or home plan for minimum of 1 individual with speech and language disorders
7. Develop a home plan with activities for any one section of phonological awareness in English and in one Indian language.

Evaluation:

Internal evaluation shall be based on attendance, clinical diary, log book, spot test, OSCE, record, and case work.

University evaluation: Viva-voce

Semester III

B 3.6 Clinicals in Audiology
Marks - 100
General considerations:

Exposure is primarily aimed to be linked to the theory courses covered in the semester, however, not just limited to these areas.

After completion of clinical postings in auditory diagnostics and auditory rehabilitation, the student will Know (concept), know how (ability to apply), show (demonstrate in a clinical diary/log book), and do (perform on patients/ client contacts) the following:

Know:

1. Methods to calibrate audiometer
2. Calculation of pure tone average, % of hearing loss, minimum and maximum masking levels.
3. Indications to administer special tests
4. High risk register used in children
5. Different types of OAE tests
6. Different types of hearing loss and its common causes
7. Protocols for screening and diagnostic otoacoustic emissions
8. Tests to assess vestibular system

Know-how:

1. To administer at least 1 test for adaptation, recruitment and functional hearing loss.
2. To select test battery for detection of central auditory processing disorders.
3. To match pitch and loudness of tinnitus
4. To prepare individuals for ABR testing
5. To perform BOA, VRA, TROCA, play audiometry
6. To administer high frequency tympanometry and calculate resonance frequency
7. To administer high risk register

Show:

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

Do:

1. Case history on at least 5 adults and 3 children with hearing disorders
2. Tuning fork test on at least 2 individuals with conductive and 2 individuals with sensori-neural hearing loss
3. Pure tone audiometry with appropriate masking on 5 individuals with conductive hearing loss, 5 individuals with SN hearing loss and 3 individuals with unilateral hearing loss and 5 with asymmetric hearing loss
4. Speech audiometry tests to find speech reception threshold, speech identification scores, most comfortable and uncomfortable levels on adults.

Evaluation:

Internal evaluation shall be based on attendance, clinical diary, log book, spot test, OSCE, record, and case work.

University evaluation: Viva-voce

Semester IV

B 4.1 Motor Speech Disorders in Children

Total hours – 75 (Lecture: 45hrs, Practical: 30hrs) **Marks - 100**

Objectives

To understand neurodevelopmental processes in speech production and motor speech disorders

To learn about assessment procedures in motor speech disorders in children and differential diagnosis of motor speech disorders

To learn about general principles and management approaches for childhood dysarthria and childhood apraxia of speech

To learn about assessment and management of dysphagia in children

Outcomes: 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

Unit 1: Neuro-developmental processes in speech production and motor speech disorders

a) Review of neuro-anatomy (cerebral cortex, sub-cortical structures)
b) Review of neuro – anatomy (brainstem, cerebellum, spinal cord & cranial nerves)
c) Review of pyramidal and extra-pyramidal systems
d) Sensory-motor integration of speech production (Spatial temporal planning, motor planning and feedback)
e) Anatomic development of speech production systems
f) Development of neural pathways of speech motor control (brain maturation, reflexes, sensory and motor)
g) Dysarthria in children – Cerebral palsy – disorders of tone (spastic, flaccid): definition, etiology, characteristics and associated problems
h) Dysarthria in children – Cerebral palsy – disorders of movement (Hyperkinetic, Hypokinetic) and disorder of balance (ataxia): definition, etiology, characteristics and associated problems
i) Dysarthria in children – Lower motor neuron and other syndromes with motor speech disorders
j) Childhood Apraxia of Speech and Nonverbal oral apraxia: definition & characteristics

Unit 2: Assessment of motor speech disorders in children

a) Case history and developmental neurological evaluation – primitive postural and oro-pharyngeal reflexes, cranial nerve examination
b) Assessment of oral sensory and motor capacity – Oral peripheral mechanism examination, neuro- muscular status
c) Behavioural assessment of speech sub-systems – Tasks, observations and measures
d) Assessment of speech intelligibility and comprehensibility
e) Cognitive-linguistic assessment, assessment of language skills
f) Speech assessment with specific reference to childhood apraxia of speech – Phonetic and phonemic inventory, phonotactics and syllable sequencing, variability of errors, speech intelligibility, fluency and prosody
g) Test materials – Protocols/checklists for childhood apraxia of speech, screening test for developmental apraxia of speech
h) Protocols for non-verbal and verbal praxis specific to Indian languages
i) Differential diagnosis- childhood dysarthria, childhood apraxia of speech and other developmental disorders

Unit 3: Management of childhood dysarthria

a) Team approach in rehabilitation of motor speech disorders in children
b) Neuro-developmental therapyNonspeech oral-motor exercises: its application for children with dysarthria
c) Management of drooling
d) Behavioral management of respiratory and phonatory subsystems
e) Behavioral management of resonatory and articulatory subsystems
f) Prosthetic management in treatment of childhood dysarthria
g) AAC in management of motor speech disorders - role of devices, AAC team, candidacy and pre-requisites
h) AAC in management of motor speech disorders- symbol selection, techniques, assessment for AAC, effective use of AAC
i) Case studies: Planning intervention for children with dysarthria including language intervention

Unit 4: Management of childhood apraxia of speech

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

Unit 5: Dysphagia in children

a) Embryology- periods and structures of development
b) Anatomical structures of swallowing- upper aero digestive system, anatomic difference between adults and children
c) Physiology of swallowing- swallow phases, neural control of swallowing, reflexes related to swallowing, suckling and sucking, airway and swallowing
d) Terms involved in dysphagia and development of feeding skills
e) Causes of dysphagia in children
f) Signs and symptoms of dysphagia in children
g) Assessment – inferences from neural developmental assessment, cranial nerve examination, Oral peripheral Mechanism Examination, Clinical Swallow Examination, nutritive and nonnutritive assessment, instrumental assessment (cervical auscultation, Video Fluoroscopic Swallow Study/Modified Barium Swallow, Flexible Endoscopic Evaluation of Swallowing (FEES), gastrointestinal evaluation
h) Treatment – positioning, oral- motor treatment, team approach
i) Treatment- non oral feeding, transitional feeding, modifications in feeding
j) Role of speech-language pathologist in neonatal intensive care

Practicals

a) With the help of models, charts and software, identify the motor control centers in the brain.
b) Perform oro-motor examination in five children and adults and compare
c) Identify oro-motor reflexes (rooting, suckling, & phase bite) in 5 infants.
d) Demonstrate normal posture and breathing patterns required for varied speech tasks. Alter the postures and breathing patterns and notice changes in speech patterns.
e) Assess DDK rate in five typically developing children.

f) Rate intelligibility of speech in five typically developing children. Discuss factors that influenced speech intelligibility and their ratings.

g) Observe and record (a) physical status, (b) oral sensory motor abilities and vegetative skills, (c) respiration, (d) phonation, (e) resonation, (f) articulation and (g) language abilities in five typically developing children. Compare these with observations made from children with motor speech disorders.

h) Perform oro-motor exercises – isotonic and isometric. Discuss strategies to modify exercises for children.

i) Identify from video the AAC system such as low technology vs high technology systems and different symbol system, that is, Bliss symbols, IICP symbols and different signing systems – Makaton.

j) Observe feeding and swallowing skills in different age groups of children: 2 newborns; 2 infants, 2 toddlers, and 2 older children. Identify the differences in feeding methods, food consistencies, texture, quantity, feeding habits, feeding appliances used by these children.

Recommended Reading

Love, R.J. (2000) (2nd Ed). Childhood Motor Speech Disorders. Allyn & Bacon.

Arvedson, J.C., and Brodsky, L. (2002) (2nd Ed.). Paediatric swallowing and feeding. San Diego, Singular publishing.

Caruso, F. J. and Strand, E. A. (1999). Clinical Management of Motor Speech Disorders in Children. New York: Thieme.

Hardy, J. (1983). Cerebral Palsy. Remediation of Communication Disorder Series by F.N. Martin. Englewood Cliffs, Prentice Hall Inc.

Love, R.J. and Webb, W.G. (1993). (2nd ed.) Neurology for the Speech-Language Pathologist. Reed Publishing (USA)

Rosenthal. S., Shipp and Lotze (1995). Dysphagia and the child with developmental disabilities. Singular Publishing Group.

Velleman, S. L. (2003). Resource guide for Childhood Apraxia of Speech. Delmar/Thomson Learning.

Semester IV

B 4.2 Voice and its Disorders
Total hours – 75 (Lecture: 45hrs, Practical: 30hrs)
Marks - 100

Objectives

To understand basic concepts in voice and its production
To learn about terminologies and classification of different voice disorders
To learn about assessment of voice disorders
To have an appreciation of general principles and approaches to management of voice disorders

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

Describe characteristics of normal voice
Explain etiology related to voice problems, and its pathophysiology
Identify and assess voice disorders
Provide counseling and therapy to individuals with voice disorders

Unit 1: Basic concepts in voice and its production

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

Unit 2: Characteristics and pathophysiology of voice disorders

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

Unit 3: Assessment of voice

a) Referral sources, medical examination and team approach
b) Protocol for voice assessment: components and philosophies (ICF, ICD)
c) Clinical voice laboratory: principles of instrumental measurements – electrical error, electrical safety, hygiene safety; recording of data; storage; patented soft wares, free wares
d) Perceptual evaluation of voice: GRBAS, CAPE -V

e) Visualization procedures- indirect laryngoscopy, video laryngoscopy, stroboscopy & high speed imaging
f) Acoustic analysis of voice: F0 related measures, intensity related measures, quality related measures, phonetogram, DSI
g) Electroglottography and inverse filtering procedures
h) Aerodynamic analysis of voice: static & dynamic measures
i) Self-evaluation of voice : PROM, VHI, V-DOP
j) Reporting of voice findings, normative comparisons, differential diagnosis

Unit 4: Management of voice

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

Unit 5: Intervention strategies for voice disorders

a) Vocal trauma related disorders
b) Functional voice disorders – inappropriate vocal components
c) Functional aphonia
d) Puberphonia/mutational falsetto
e) Muscle tension dysphonia
f) Sulcus vocalis
g) Vocal fold palsy
h) Spasmodic dysphonia
i) GERD/LPR
j) Benign vocal fold lesions requiring surgical intervention
k) Post-operative care for benign vocal fold lesions disorders
l) Documenting voice therapy outcomes

Practicals

a) Record phonation and speaking samples (counting numbers) from five children, adult men, adult women, geriatric men and geriatric women. Note recording parameters and differences in the samples.
b) Make inferences on age and sex differences across the samples obtained in the previous experiment using perceptual voice profiling. Make a note of differences in pitch, loudness, quality and voice control.
c) Perform an acoustic voice analysis on phonation sample and generate a voice report based on acoustic findings. Compare findings between men & women.
d) Perform MPT and s/z ratio. Infer differences across age and sex.
e) Perform spirometry or any other appropriate aerodynamic procedure. Infer differences across age and sex.
f) Make perceptual voice profiling using GRBAS scale on five abnormal voice samples.
g) Perform acoustic analysis on five abnormal voice samples.
h) Observe and document findings from five laryngeal examinations (pre-recorded or live) such as VLS, stroboscopy or any other relevant.
i) Administer PROM on five individuals.
j) Prepare a vocal hygiene checklist.

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

Recommended Reading

Stemple, J. C., Glaze, L. E., & Gerdeman, B, K. (2014). Clinical voice pathology: Theory & Management (5th Ed.). San Diego: Plural publishers.

Aronson, A.E. & Bless, D. M. (2009). Clinical Voice Disorders.(4th Ed.). New York: Thieme, Inc.

Boone, D. R., McFarlane, S. C, Von Berg, S. L. & Zraick, R, I. (2013): The Voice and Voice Therapy. (9th Ed.). Englewood Cliffs, Prentice-Hall, Inc. New Jersy.

Professional Voice: Assessment and Management. Proceedings of the national workshop on "Professional Voice: Assessment and management", 9-10 Dec 2010. All India Institute of Speech & Hearing, Mysore. 2010.

Andrews, M. L. (2006). Manual of Voice treatment: Pediatrics to geriatrics (3rd Ed.). Thomson Delmar Learning.

Colton, R. H, Casper, J. K. & Leonard, R. (2006). Understanding voice problems. Baltimore: Williams & Wilkins.

Sapienza, C. M., & Ruddy, B H. (2013). Voice Disorders. (2nd Ed.). San Diego: Plural Publisher.

Voice: Assessment and Management. Proceedings of the national workshop on "Voice: Assessment and management", 14-15 Feb 2008. All India Institute of Speech & Hearing, Mysore. 2008.

Semester IV
B.4.3 Amplification Devices
Total hours - 75 (Theory: 45 hrs, Practical: 30 hrs)
Marks – 100
Objectives:

To learn about different types of hearing aids and its technology
To learn about electroacoustic measurements for hearing aids
To think about procedures for selection, care and maintenance of hearing aids
To understand the use of mechano acoustic couplers

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

Assess the candidacy for hearing aids and counsel the client accordingly
Evaluate the listening needs and select appropriate hearing aid
Program digital hearing aids as per the listening needs of client and assess the benefit from hearing aid using subjective and objective methods
Make different types of ear molds
Counsel the parents/caregivers

Unit 1: Types of hearing aids

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

Unit 2: Technological aspects in hearing aids

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

Unit 3: Electro-acoustic measurements for hearing aids

a) Purpose and parameters to be considered: OSPL90, SSPL90,HFA SSPL90, Gain, Full on Gain, HFA Full on Gain, Reference test Gain, Basic Frequency Response, Total Harmonic distortion, Intermodulation Distortion, input Output functions, instrumentation, procedure, variables affecting EAM
b) Electro-acoustic measurements, BIS, IEC and ANSI standards
c) Environmental tests.

Unit 4: Selection and care of hearing aids

a) Pre-selection factors; Prescriptive and comparative procedures; Functional gain and insertion gain methods; Use of impedance, OAEs and AEPs audiometry; Hearing aids for conductive hearing loss; Hearing aids for children; Hearing aids for elderly; Selection of non-linear programmable and digital hearing aids
b) Hearing aid programming
c) Methods for assessing hearing aid benefit
d) Real ear insertion measurements for verification of hearing aid benefit: REIG, REUR, REAR, REOR, RESR, REIG, REAG, RECD
e) Acoustic feedback in hearing aids
f) Care, maintenance and troubleshooting of hearing aids
g) Counselling and orienting the hearing aid user (Client and significant others)

Unit 5: Mechano-acoustic couplers (Ear molds)

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

Practicals

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

Recommended Reading

Dillon. (2012). Hearing Aids (2 edition). Thieme Medical and Scientific Publisher.

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

Kates, J. M. (2008). Digital Hearing Aids (1 edition). San Diego: Plural Publishing Inc.

Metz, M. J. (2014). Sandlin's Textbook of Hearing Aid Amplification: Technical and Clinical Considerations. Plural Publishing.

Mueller, H. G., Hawkins, D. B., & Northern, J. L. (1992). Probe Microphone Measurements: Hearing Aid Selection and Assessment. Singular Publishing Group.

Mueller, H. G., Ricketts, T. A., & Bentler, R. A. (2007). Modern Hearing Aids: Pre-fitting Testing and Selection Considerations: 1 (1 edition). San Diego, CA: Plural Publishing Inc.

Sandlin, R. E. (Ed.). (1989). Handbook of Hearing Aid Amplification: Clinical Considerations and Fitting Practices v. 2. Boston: Singular Publishing Group.

Sandlin, R. E. (Ed.). (1993). Understanding Digitally Programmable Hearing AIDS. Boston: Allyn & Bacon.

Tate, M. (2013). Principles of Hearing Aid Audiology. Springer.

Taylor, B., & Mueller, H. G. (2011). Fitting and Dispensing Hearing Aids (1 edition). San Diego: Plural Publishing Inc.

Valente, M. (2002). Hearing Aids: Standards, Options, and Limitations. Thieme.

Semester IV

B 4.4 Diagnostic Audiology - Physiological Tests

Total hours - 75 (Theory: 45 hrs, Practical: 30 hrs)
Marks - 100

Objectives:

To learn about principles, instrumentation and clinical application of immitance evaluation

To learn about principles, instrumentation and clinical application of auditory evoked potentials

To learn about principles, instrumentation and clinical application of otoacoustic emissions and vestibular evoked potentials

To learn about principles, instrumentation and clinical application of vestibular evoked potentials

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

Justify the need for using the different physiological tests in the audiological assessment

Interpret the results to detect the middle ear, cochlear and retro cochlear pathologies and also differentially diagnose among these pathologies

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

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

Unit 2: Auditory brainstem response (ABR)

a) Introduction and classification of AEPs
b) Instrumentation
c) Principles of AEP recording techniques:
d) Auditory brainstem response generators
e) Protocol and procedure of recording auditory brainstem response
f) Factors affecting auditory brainstem responses
g) Brainstem responses to speech and other complex signals
h) Clinical applications of ABR

Unit 3: Overview of other AEPs

a) ECochG
b) Generators, protocol for recording and analysis of Auditory Middle Latency Responses (AMLR), Auditory Long Latency Responses (LLR), P300, MMN, P600, N400, T-complex, CNV)
c) ASSR: Instrumentation, recording and clinical applications
d) Clinical applications of MLR, LLR and other cortical auditory evoked potentials

Unit 4: Otoacoustic emissions

a) Introduction to otoacoustic emissions
b) Origin and classification of OAEs
c) Instrumentation
d) Procedure of OAE measurement: SOAE, TEOAEs, and DPOAEs
e) Interpretation of results: SOAE, TEOAEs, and DPOAEs
f) Clinical applications of OAEs: SOAE, TEOAEs, and DPOAEs
g) Factors affecting OAEs: SOAE, TEOAEs, and DPOAEs
h) Contralateral suppression of OAEs and its clinical implications

Unit 5: Vestibular system and its assessment

a) Electronystagmography: procedure, interpretation, clinical applications
b) Videonystagmography and oculo nystagmography
c) Vestibular Evoked Myogenic Potentials (VEMP): c-VEMP and o-VEMP recording procedure and interpretation: tests for peripheral and central vestibular function
d) Overview of Rotatory chair test, video Head Impulse Test

Practicals

a) Measure admittance in the calibration cavities of various volumes and note down the observations
b) Calculate Equivalent ear canal volume by measuring static admittance in an uncompensated tympanogram
c) Do tympanogram in the manual mode and measure peak pressure, peak admittance and ear canal volume manually using cursor
d) Measure gradient of the tympanogram
e) Administer Valsalva and Toynbee and William's pressure swallow test
f) Record acoustic reflex thresholds in the ipsi and contra modes
g) Plot Jerger box pattern/reflex pattern for various hypothetical conditions that affect acoustic reflexes and interpret the pattern and the corresponding condition.
h) Carry out Acoustic reflex decay test and quantify the decay manually using cursor
i) Trace threshold of ABR (in 5 dB nHL steps near the threshold) for clicks and tone bursts of different frequencies and draw latency intensity function.
j) Record ABR using single versus dual channels and, note down the differences
k) Record ABR at different repetition rates in 10/sec step beginning with 10.1/11.1 per second. Latency-repetition rate function needs to be drawn.
l) Record with each of three transducers (Headphone, insert phones and bone vibrator) and polarities and draw a comparative table of the same. Students should also record with different transducers without changing in the protocol in the instrument and calculate the correction factor required.
m) Record ASSR for stimuli of different frequencies and estimate the thresholds
n) Record TEOAEs and note down the amplitude, SNR, noise floor and reproducibility at octave and mid-octave frequencies. Note down the stimulus stability and the overall SNR
o) Record DPOAEs and note down the amplitude, SNR, noise floor and reproducibility at octave and mid-octave frequencies

Recommended Reading

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.

Hood, L. J. (2006). New handbook of Auditory Evoked Response (1st editon) Boston, Mass: Pearson.

Hall, J. W., & Mueller, H. G. (1996). Audiologists' Desk Reference: Diagnostic audiology principles, procedures, and protocols. Cengage Learning.

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.

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

Semester IV

B 4.5 Clinicals in Speech-language Pathology
Marks – 100

General considerations:

Exposure is primarily aimed at linking theory courses covered in this and previous semester(s).

After completion of clinical postings in Speech–language diagnostics and therapy, 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:

A. Speech Diagnostics

1. Different samples /procedures required to analyse voice production mechanism. (acoustic/ aerodynamic methods / visual examination of larynx/ self evaluation)
2. Different samples /procedures required to analyse speech production mechanism in children with motor speech disorders.
3. Differential diagnosis of motor speech disorders in children.

B. Speech Therapy

1. Strategies for improving speech and language skills in children with MSD
2. Strategies for improving posture and swallowing in children with MSD
3. Techniques for improving quality of voice
4. Counselling for individuals with voice disorders

Know-how:

A. Speech Diagnostics

1. To record a voice sample for acoustic and perceptual analysis.
2. To assess parameters of voice and breathing for speech.
3. To assess children with motor speech disorders including reflex profile and swallow skills.
4. To assess posture and breathing for speech in children with motor speech disorders.
5. Procedures to assess laryngectomee and provide management options.

B. Speech Therapy

1. To set goals for therapy (including AAC) based on assessment/test results for children with language disorders.
2. To counsel children with speech-language disorders.
3. Management strategies for individuals with laryngectomy, glossectomy and mandibulectomy

Show:

A. Speech Diagnostics

1. Acoustic analysis of voice
2. Self evaluation of voice
3. Informal assessment of swallowing
4. Assessment of reflexes and pre linguistic skills

B. Speech Therapy

1. Pre-therapy assessment for children with motor speech disorders
2. Lesson Plan for children with motor speech disorders
3. Demonstrate vocal function exercise, relaxation exercises and other relevant techniques followed in the institute
4. Simulate a vocal hygiene counselling for an individual with voice disorders

Do:

A. Speech Diagnostics:

1. Case history - minimum of one individual with voice disorders.
2. Case history - minimum of one children with motor speech disorders
3. Oral peripheral examination - minimum of three children

B. Speech Therapy:

1. Apply speech language stimulation/therapy techniques on children with language disorders (with hearing impairment, specific language impairment & mixed receptive language disorder) - minimum of 20 sessions
2. Therapy session for individual with speech sound disorder – minimum of 2 sessions
3. Exit interview and counselling – minimum of one session for individuals with speech language disorders.

Evaluation:

Internal evaluation shall be based on attendance, clinical diary, log book, spot test, OSCE, record, and case work.

University evaluation: Viva-voce

Semester IV

B 4.6 Clinical in Audiology
Marks – 100
General considerations:

Exposure is primarily aimed to be linked to the theory courses covered in the semester, however, not just limited to these areas.

After completion of clinical postings in auditory diagnostics and auditory rehabilitation, the student will Know (concept), know how (ability to apply), show (demonstrate in a clinical diary/log book), and do (perform on patients/ client contacts) the following:

Know:

1. Different protocols in tympanometry and reflexometry.
2. Different protocols used in auditory brainstem responses
3. Procedures to assess the listening needs
4. National and international standards regarding electroacoustic characteristics of hearing aids
5. To administer auditory brainstem responses for the purpose of threshold estimation and site of lesion testing

Know-how:

1. Counsel hearing aid user regarding the use and maintenance hearing aids
2. To troubleshoot common problems with the hearing aids
3. Select different types of ear moulds depending on type of hearing aid, client, degree, type and configuration of hearing loss
4. How to select test battery depending on case history and basic audiological information – 2 situations

Show:

1. Analysis of ABR waveforms for threshold estimation- 5
2. OAE interpretation- 2

Do:

1. Threshold estimation on 2 infants (< 2 years) using ABR
2. TEOAE and DPOAE on 2 infants (<2 years)
3. BOA on 2 infants (<2 years)
4. VRA on 2 infants (6 month – 3 year)
5. Conditioned play audiometry – 2 children (3-6 years)

Evaluation:

Internal evaluation shall be based on attendance, clinical diary, log book, spot test, OSCE, record, and case work.

University evaluation: Viva-voce

Semester V

B 5.1 Structural Anomalies and Speech Disorders
Total hours – 75 (Lecture: 45hrs, Practical: 30hrs)
Marks - 100

Objectives:

To learn about the terminologies, classification and characteristics of disorders with structural anomalies of oro-facial structures

To learn about communication disorders and other associated problems after laryngectomy

To learn about assessment of laryngectomy

To have an appreciation of general principles and approaches to manage speech and communication disorders after laryngectomy

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

Demonstrate knowledge about speech characteristics of persons with cleft lip and palate, anomalies of tongue and mandible and laryngectomy

Evaluate and diagnose the speech characteristics seen in individuals with oro-facial anomalies and laryngectomy

Learn about the techniques for the management of speech disorders in these conditions

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

a) Classification of cleft lip and palate
b) Causes of cleft lip and palate: genetic, syndrome and others
c) Speech characteristics in individuals with CLP
d) Velopharyngeal dysfunction: types, causes and classification
e) Associated problems in persons with cleft lip and palate: speech, language, feeding, dental and occlusion, hearing, psychological

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

a) Team of professionals in the management of individuals with cleft lip and palate: their roles in diagnosis and management.
b) Assessment of feeding, language & speech skills in individuals with cleft lip and palate :
    i. Subjective assessment : Tools & test materials to assess speech and language skills
    ii. Objective assessment of articulation, resonance
c) Diagnosis and differential diagnosis of speech related functions
d) Reporting test results using Universal Parameters
e) Management of individuals with cleft lip and palate
f) Surgical and prosthetic management
g) Techniques and strategies to improve feeding ,language skills
h) Techniques and strategies to correct speech sound disorders/ resonance
i) Counselling and guidance

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

a) Types, classification and characteristics of structural anomalies of tongue and mandible
b) Causes for structural anomalies of tongue and mandible
c) Team of professionals in the management of persons with structural anomalies of tongue and mandible and their roles.
d) Associated problems in persons with structural anomalies of tongue and mandible:
    Speech
    Feeding
    Dental and occlusion

Psychological

e) Assessment of speech in individuals with
   Glossectomy
   Mandibulectomy

f) Management of persons with structural anomalies of tongue and mandible
   Surgical , medical, radiological & prosthetic management
   Techniques and strategies to improve speech intelligibility
   Techniques and strategies to improve feeding
   Counselling and guidance for persons with glossectomy and mandibulectomy

Unit 4: Characteristics & assessment of laryngectomy

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

Unit 5: Management of speech and communication in laryngectomies

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

Practicals

a) Identify the different types of cleft lip and palate by looking at illustrations and images
b) Listen to 10 speech samples of children with cleft lip and palate and rate their nasality/ speech (articulation and cleft type errors) based on universal reporting parameters.
c) Identify the type of closure of velopharyngeal port for 5 normal individuals and 5 individuals with cleft lip and palate using videos of nasoendoscopy/ videofluroscopy.
d) Perform oral peripheral mechanism examination on 10 individuals and document the structure and functions of the articulators.
e) Analyse the different types of occlusion in 10 individuals.
f) Identify the type of glossectomy by looking at pictures/illustrations.
g) Identify the different types of prosthesis in the management of head and neck cancer.
h) Analyse the speech profile of 5 individuals with laryngectomy.
i) Identify parts of an artificial larynx and explore its use.
j) Prepare a checklist / pamphlet illustrating care of the stoma and T- tubes in vernacular.

Recommended Reading

Kummer, A.W. (2014). Cleft Palate and Craniofacial Anomalies: The Effects on Speech and Resonance. Delmar, Cengage Learning.

Berkowitz. S. (2001). Cleft Lip and Palate: Perspectives in Management. Vol II. San Diego, London, Singular Publishing Group Inc.

Falzone. P., Jones. M. A., & Karnell. M. P. (2010). Cleft Palate Speech. IV Ed., Mosby Inc.

Ginette, P. (2014). Speech Therapy in Cleft Palate and Velopharyngeal Dysfunction. Guildford, J & R Press Ltd.

Karlind, M. & Leslie, G. (2009). Cleft Lip and Palate: Interdisciplinary Issues and Treatment. Texas, Pro Ed.

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

Semester V

B 5.2 Fluency and its Disorders
Total hours – 75 (Lecture: 45hrs, Practical: 30hrs)
Marks - 100

Objectives:

To learn about the terminologies, classification and characteristics of stuttering and other fluency disorders

To learn about communication disorders and other associated problems in individuals with stuttering and other fluency disorders

To learn about assessment of fluency and other associated problems

To have an appreciation of general principles and approaches to manage speech and communication disorders in indivuals with stuttering and other fluency disorders

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

Demonstrate knowledge about speech characteristics of persons with developmental stuttering and other fluency disorders

Evaluate and diagnose the speech characteristics seen in individuals with stuttering and other fluency disorders

Learn about the techniques for the management of speech disorders in these conditions

Unit 1: Fluency

a) Scope and definition of fluency
b) Factors influencing fluency
c) Definition and characteristics of features of suprasegmentals in speech: rate of speech, intonation, rhythm, stress and pause
d) Suprasegmental features in typical speech & in PWS
e) Developmental aspects of suprasegmentals of speech
f) Normal non-fluency

Unit 2: Stuttering and other fluency disorders

a) Stuttering: Definition and causes for stuttering
b) Characteristics of stuttering: core and peripheral characteristics, primary and secondary stuttering, effect of adaptation and situation
c) Development of stuttering
d) Normal non fluency: characteristics and differential diagnosis
e) Theories of stuttering: organic, functional, neurogenic, diagnosogenic and learning
f) Cluttering: Definition, causes and characteristics
g) Neurogenic stuttering: Definition, causes and characteristics

Unit 3: Assessment and differential diagnosis

a) Assessment of fluency disorders: stuttering, cluttering, neurogenic stuttering and normal non fluency:
b) Subjective methods: protocols and tests
c) Objective methods
d) Qualitative and quantitative assessment
e) Differential diagnosis of fluency disorders

Unit 4: Management of stuttering

a) Approaches to management
b) Changing scenario in management of stuttering (Evidenced Based Approaches)
c) Different techniques and strategies used in management with their rationale
d) Relapse and recovery from stuttering
e) Issues of speech naturalness in stuttering

Unit 5: Management of fluency-related entities

a) Management of cluttering: rationale, techniques and strategies
b) Management of neurogenic stuttering: rationale, techniques and strategies
c) Management of normal non-fluency: rationale, techniques and strategies
d) Relapse and recovery in cluttering and neurogenic stuttering.
e) Prevention and early identification of stuttering, and cluttering

Practicals

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

Recommended Reading

Logan K.J. (2015) Fluency disorders. San Deigo: Plural publishing.

Bloodstein, O., & Ratner, N. B. (2008). A Handbook on Stuttering (6th Ed.).Clifton Park, NY, Thomson Demer Learning.

Guitar, B. (2014). Stuttering-An Integrated Approach to its Nature and Treatment. 4th Ed. Baltimore, Lippincott Williams & Wilkins.

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.

Hegde, M. N. (2007). Treatment Protocols for Stuttering.CA Plural Publishing.

Howell, P. (2011). Recovery from Stuttering. New York, Psychology Press.

Packman, A., & Attanasio, J.S. (2004). Theoretical Issues in Stuttering. NY, Psychology Press.

Rentschler, G. J. (2012). Here`s How to Do: Stuttering Therapy. San Diego, Plural Publishing.

Wall, M. J., & Myers F. L. (1995). Clinical Management of Childhood Stuttering. Texas, PRO-ED, Inc.

Ward, D. (2006). Stuttering and Cluttering: Frameworks for Understanding & Treatment. NY, Psychology Press.

Yairi, E., & Seery, C. H. (2015). Stuttering - Foundations and Clinical Applications. 2nd Ed. USA, Pearson Education, Inc.

Semester V

B 5.3 Aural Rehabilitation in Children

Total hours - 75 (Theory: 45 hrs, Practical: 30 hrs)
Marks - 100

Objectives:

To have an appreciation about auditory development, spoken communication and acoustic accessibility

To learn about various communication options available to children with hearing loss in India and elsewhere

To have an appreciation of general principles and approaches to manage communication disorders in children with hearing loss

Outcomes: 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 affect 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

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

Unit 2: Communication options

a) Detecting and confirming hearing loss
b) Parent support counselling, individual family service plan
c) Choosing communication options
d) Auditory oral approach
e) Auditory verbal therapy
f) Manual/sign language: Indian and Global context
g) Cued speech and total communication
h) Listening devices hearing aid/cochlear implant
i) Early intervention programs

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

a) Involvement of family
b) Factors impacting family involvement, supporting families through information and education
c) Creating optimum listening and learning environment

d) Intervention: Assessment, auditory learning, listening and language facilitation techniques in infancy and early childhood
e) Issues with children with mild hearing loss, unilateral hearing loss,
f) Children with hearing loss, ANSD or APD: Children are intervened late
g) Children with hearing loss and other special needs
h) Listening and spoken language in school age: benefits of inclusion
i) Intervention at school age: Functional hearing assessment, communication assessment and intervention to integrate with academic targets

Unit 4: Auditory - speech reading training and literacy

a) Candidacy for auditory training and speech reading
b) Auditory training/learning four design principles skill, stimuli, activity, and difficulty level
c) Early training Objectives
d) Analytic and Synthetic training Objectives
e) Formal and informal training
f) Auditory training for infants and very young children
g) Outcomes of training
h) Speech and language and literacy characteristics
i) Speech language and literacy evaluation assessment
j) Speech language therapy

Unit 5: Indian perspectives

a) Prevalence of hearing impairment in children
b) Education of the deaf in India historical perspectives
c) Available resources for education of the hearing impaired
d) Early intervention programs and centers
e) Schools for the hearing impaired; day schools, residential schools
f) Beyond school: college and vocational training
g) Training manpower resources for service delivery
h) Indian sign language
i) Training sign language interpreters
j) Cued speech in India
k) Assessment and therapy tools developed for individuals with hearing impairment in India.

Practicals

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

Recommended Reading

Fitzpatrick, E.M., and Doucet S.P. (2013) (Eds). Paediatric Audiologic Rehabilitation. Thieme, New York

Tye-Murray, N., (2014) Foundations of Aural Rehabilitation: Children , adults and their family members 4th edition Plural Publishing San Diego

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

Semester V

B 5.4 Implantable Hearing Devices

Total hours - 75 (Theory: 45 hrs, Practical: 30 hrs)
Marks - 100

Objectives:

To understand basic concepts in fitting and instrumentation of implantable hearing devices including Bone anchored hearing devices, middle ear, brainstem and cochlear implants

To have an appreciation of general principles and approaches to trouble shoot and counsel individuals with implanted hearing devices

Outcomes: 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

Counsel the parents/care givers during different stages of implantation

Unit 1: Implantable hearing devices – basics

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

Unit 2: Bone anchored hearing devices and middle ear implants

a) Types, components
b) Surgical approaches, risks, complications
c) Audiological evaluations for candidacy, contraindications
d) Assessment of benefits

Unit 3: Cochlear implant and brain stem implants – basics

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

Unit 4: Cochlear implants and brainstem implants

a) Signal coding strategies, classification, types
b) Intraoperative monitoring by audiologists
c) Objective measures: ESRT, ECAP, prom stim, EABR, aided cortical potentials
d) Post implant Mapping: schedule, pre-requisites, switch-on, mapping parameters, impedance, compliance, role of objective and subjective measures in mapping,
e) post mapping audiological evaluation
f) Assessment of benefits
g) Optimization of hearing aid on contralateral ear

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

a) Post implant Counselling on care and maintenance and trouble shooting of the device
b) Overview of post implant rehabilitation including AVT

c) Factors affecting outcome of implantable devices in adults and children

Practicals

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

Recommended Reading

Niparko, J. K. (2009). Cochlear Implants: Principles & Practices. Lippincott Williams & Wilkins.

Clark, G., Cowan, R. S. C., & Dowell, R. C. (1997). Cochlear Implantation for Infants and Children: Advances. Singular Publishing Group.

Cooper, H., & Craddock, L. (2006). Cochlear Implants: A Practical Guide. Wiley.

Dutt, S. N. (2002). The Birmingham Bone Anchored Hearing Aid Programme: Some Audiological and Quality of Life Outcomes. Den Haag: Print Partners Ipskamp.

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

Gifford, R. H. (2013). Cochlear Implant Patient Assessment: Evaluation of Candidacy, Performance, and Outcomes. Plural Publishing.

Hagr, A. (2007). BAHA: Bone-Anchored Hearing Aid. International Journal of Health Sciences, 1(2), 265–276.

Kim C. S., Chang S. O., & Lim D. (Eds.). (1999). Updates in Cochlear Implantation :The 2nd Congress of Asia Pacific Symposium on Cochlear Implant and Related Sciences, Seoul, April 1999 (Vol. 57). Seoul: KARGER.

Kompis, M., &Caversaccio, M.-D.(2011). Implantable Bone Conduction Hearing Aids.Karger Medical and Scientific Publishers.

Mankekar, G. (2014). Implantable Hearing Devices other than Cochlear Implants. Springer India.

Møller A.R. (2006). Cochlear and Brainstem Implants (Vol. 64).

Ruckenstein, M.J. (Ed.).(2012). Cochlear Implants and Other Implantable Hearing Devices. Plural.

Suzuki J.L. (1988). Middle Ear Implant: Implantable Hearing Aids (Vol. 4). KARGER.

Thoutenhoofd, E. (2005). Paediatric cochlear implantation: evaluating outcomes. Whurr.

Valente, M. (2002). Strategies for selecting and verifying hearing aid fittings. 2nd Edn. Thieme.

Semester V

B 5.5 Clinicals in Speech Language Pathology

Marks - 100

General considerations:

Exposure is primarily aimed at linking theory courses covered in this and previous semester(s).

After completion of clinical postings in Speech–language diagnostics and therapy, 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:

A. Speech Diagnostics

1. Procedures to assess speech fluency and its parameters using standardized tests for children and adults.
2. Procedures to assess individuals with cleft lip and palate, and other oro-facial structural abnormalities.
3. Types of glossectomy and its speech characteristics

B. Speech Therapy

1. Various stuttering modification and fluency shaping techniques
2. Strategies for improving fluency in children with NNF and stuttering
3. Options for management of communication skills in individuals with glossectomy and mandibulectomy
4. Management options for individuals with laryngectomy

Know-how:

A. Speech Diagnostics

1. To record a speech sample for analysis of fluency skills (including blocks & its frequency, rate of speech, prosody, etc.).
2. To consult with inter-disciplinary medical/rehabilitation team and counsel the individual/family regarding management options and prognosis.

B. Speech Therapy

1. To counsel individuals with laryngectomy, glossectomy, mandibulectomy and their families.
2. To improve the fluency of speech in young children with stuttering
3. To counsel individuals with stuttering
4. To select short term objectives for individuals with stuttering based on self perception inventory

Show:

A. Speech Diagnostics

1. Rating of cleft, speech intelligibility and nasality – minimum of two individuals with cleft lip and palate.
2. Language assessment - minimum of two individuals with cleft lip and palate.
3. Transcription of speech sample and assessment of percentage dis/dysfluency– minimum of two individuals with stuttering.
4. Assessment of rate of speech on various speech tasks.

B. Speech Therapy

1. Therapy techniques: Airflow, prolongation, easy onset shadowing techniques.
2. Strategies for children with stuttering
3. Counselling an individuals with laryngectomy

Do:

A. Speech Diagnostics

1. Speech assessment report - minimum of two individuals with structural anamolies and speech disorders.
2. Fluency assessment report - minimum of one individual with fluency disorders.
3. Motor speech and swallowing assessment – minimum of two children with MSD

B. Speech Therapy

1. Language therapy for children with language disorders using child centered or hybrid approaches for a minimum of 15 sessions
2. Therapy for children with MSD - minimum of 2 sessions
3. Therapy for individual with voice disorder - minimum of 2 sessions.

Evaluation:

Internal evaluation shall be based on attendance, clinical diary, log book, spot test, OSCE, record, and case work.

University evaluation: Viva-voce

Semester V

B 5.6 Clinicals in Audiology
Marks - 100

General considerations:

Exposure is primarily aimed to be linked to the theory courses covered in the semester, however, not just limited to these areas.

After completion of clinical postings in auditory diagnostics and auditory rehabilitation, the student will Know (concept), know how (ability to apply), show (demonstrate in a clinical diary/log book), and do (perform on patients/ client contacts) the following:

Know:

1. Different indications for selecting implantable hearing devices
2. Various speech stimulation and auditory training techniques
3. Candidacy for auditory training
4. Levels of auditory training

Know-how:

1. To modify the given environment to suit the needs of hearing impairment
2. To design and demonstrate auditory training activities
3. How to process 2 hard and 2 soft moulds

Show:

1. ABR interpretation – 2 site of lesion
2. Electroacoustic measurement as per BIS standard on at least 2 hearing aids
3. How to preselect hearing aid depending on listening needs and audiological findings on at least 2 clinical situations (case files)
4. Analysis of immittance audiometry and relating to other tests – 2 individuals with conductive and 2 individuals with sensori-neural hearing loss

Do:

1. Tone decay test – 1 individual with sensori-neural hearing loss
2. Dichotic CV/digit, Gap detection test on 1 individual with learning difficulty
3. Estimated listening age of 3 children with hearing impairment
4. Hearing aid fitting on 2 children
5. Appropriate auditory training on 2 children with hearing loss

Evaluation:

Internal evaluation shall be based on attendance, clinical diary, log book, spot test, OSCE, record, and case work.

University evaluation: Viva-voce

Semester VI

B 6.1 Motor Speech Disorders in Adults
Total hours – 75 (Lecture: 45hrs, Practical: 30hrs)
Marks - 100

Objectives

To learn about terminologies, and classifications of speech and neuro- motor communication disorders in adults

To learn about assessment procedures in motor speech disorders in adults and differential diagnosis of motor speech disorders

To learn about general principles and management approaches for dysarthria and apraxia of speech

To learn about assessment and management of dysphagia in adults

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

Describe the characteristics of motor speech disorders in adults such as dysarthria and apraxia of speech

Assess the speech and non-speech aspects associated with the above conditions

Plan and execute therapy strategies for adults with motor speech disorders and dysphagia

Unit 1: Types of dysarthria: anatomical basis, etiology and speech characteristics

a) Review of the Speech Motor System
b) Definition and classification of dysarthria
c) Broad etiologic categories of dysarthria in adults (Degenerative diseases, inflammatory diseases, toxic-metabolic diseases, neoplastic diseases, traumatic diseases, vascular diseases)
d) Different dimensions of dysarthria (Age of onset, cause, natural course, site of lesion, pathophysiology, speech characteristics, speech characteristics, severity)
e) Anatomic and physiologic substrates, etiology and speech characteristics of different types of dysarthrias:
f) Spastic Dysarthria
g) Flaccid Dysarthria
h) Hypokinetic dysarthria
i) Hyperkinetic dysarthria
j) Ataxic Dysarthria and Unilateral Upper Motor Neuron Dysarthria
k) Mixed dysarthria

Unit 2: Assessment and diagnosis of dysarthria

a) Behavioral assessment speech subsystems in dysarthria: description of tasks, observations and measures
b) Respiratory subsystem
c) Phonatory Subsystem
d) Resonatory subsystem
e) Articulatory subsystem
f) Speech intelligibility and prosody
g) Formal/standard protocols for assessment of dysathria
h) Instrumental assessment of speech subsystems in dysarthria: Acoustic, kinematic and physiological assessment
i) Advantages and disadvantages of behavioural and instrumental assessment of dysarthria
j) Differential diagnosis of dysarthria from Apraxia of Speech and Aphasia.
k) Differential Diagnosis of types of dysarthria
l) Assessment of swallowing in persons with dysarthria

Unit 3: Management of dysarthria

a) Brief overview of medical intervention, surgical intervention for dysarthria on the speech in persons with acquired dysarthria.
b) Rationale for behavioral intervention
c) General principles for behavioral intervention including principles of motor learning
d) Facilitative approach: vegetative, sensorimotor and reflex based intervention Systems approach- Behavioral management of speech subsystems (Including use of prosthesis and AAC)
e) Respiratory subsystem
f) Phonatory subsystem
g) Resonatory subsystem
h) Articulatory subsystem
i) Prosody including rate of speech

Unit 4: Assessment and management of apraxia of speech (AOS)

a) Definition, and classification of acquired apraxia in adults – Nonverbal apraxia's and verbal apraxia/AOS
b) Anatomical and physiological substrates and etiologies of AOS
c) Characteristics of nonverbal apraxia
d) Characteristics of verbal apraxia
e) Behavioural Assessment of Apraxia of Speech – Tasks, observations and measures related to an assessment protocol
f) Formal assessment batteries/scales and protocols for assessment
g) Instrumental analysis of the speech of apraxia in adults: Acoustic, Kinematic and Physiological

Unit 5: Dysphagia

a) Overview on neuroanatomy of swallowing
b) Stages of swallowing
c) Causes of Dysphagia including, neurogenic, mechanical and motility
d) Signs and symptoms of dysphagia
e) Subjective and bedside evaluation of Dysphagia
f) Brief orientation on instrumental evaluation of swallowing
g) Facilitatory and compensatory techniques in treatment of Dysphagia

Practicals

a) Identify the cranial nerves and mention its origin and insertion from a picture/ model. Demonstrate methods to assess the cranial nerves using non speech and speech tasks.
b) View videos of persons with various neurological conditions resulting in dysarthria and analyze clinical signs and symptoms of the neurological conditions as appropriate.
c) Identify the signs of UMN and LMN based on video samples of persons with dysarthria
d) Perform assessment of respiratory system using speech and non-speech tasks in 10 healthy adults.
e) Record different types of speech samples (sustained phonation, continuous speech etc) from 10 healthy adults. Perform perceptual assessment of voice and acoustic analysis on the appropriate samples.
f) Perform complete perceptual assessment of different speech subsystems on the audio/video recordings of 5 healthy adults. Administer Duffy's intelligibility rating scale
g) Compare the perceptual assessments with the recorded speech samples of persons with dysarthria.
h) Administer Frenchay's Dysarthria Assessment on 5 healthy adults.
i) Prepare an informal list of speech stimuli in any Indian language for assessment of speech motor programming.
j) Prepare a low tech AAC for functional communication to be used by an individual with apraxia.

Recommended Reading

Duffy, J. R. (2013). Motor Speech Disorders: Substrates, Differential Diagnosis, and Management (3rd Ed.). University of Michigan, Elsevier Mosby.

Brookshire, R. H. (2007). Introduction to Neurogenic Communication Disorders. University of Virginia, Mosby.

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.

Semester VI

B 6.2 Language Disorders in Adults

Total hours – 75 (Lecture: 45hrs, Practical: 30hrs)
Marks - 100

Objectives

To understand neural bases of language, and language disorders in adults
To learn about assessment procedures for language disorders in adults
To learn about general principles, management approaches and issues in management of language disorders in adults

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

Describe the characteristics of language disorders in adults
Assess the speech, language and non-speech aspects associated with the above conditions
Plan and execute therapy strategies for adults with language disorders

Unit 1: Neural bases of language

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

Unit 2: Language disorders in adults

a) Definition, causes, classification and characteristics (linguistic and non-linguistic) of speech, language and cognition in
   Aphasia: Cortical and subcortical; Primary progressive aphasia; Traumatic brain injury; Right hemisphere damage; Dementia (Age related, Alzeimers, Lewy body Demetia)
b) Differential diagnosis of various language disorders seen in adults.

Unit 3: Assessment and diagnosis of language disorders

a) Assessment of the following in aphasia including bedside evaluation, primary progressive aphasia, traumatic brain injury, right hemisphere damage and dementia
b) Linguistic behaviour including speech: scales, tests, protocols.
c) Assessment of cognitive, social, behavioural characteristics
d) Medical Investigation: Neuroimaging
e) Test materials: WAB, BDAE, PICA, etc.
f) Assessment of quality of life using tests such as QoCL

Unit 4: Management of language disorders

a) General principles in management of aphasia and related communication disorders in adults
b) Medical and surgical intervention in adult neuro-communication disorders
c) Specific linguistic approaches to management of aphasia: Melodic Intonation Therapy, Visual Action Therapy, *Helm Elicited Language* Program for Syntax Stimulation, Deblocking, Voluntary Control of Involuntary Utterance, Constraint Induced Language Therapy (CILT), Oral reading for language in *aphasia* (*ORLA*), Promoting Aphasics' Communication Effectiveness'

d) Semantics feature analysis treatment, intervention for pragmatics, intervention for reading and writing
e) Medical, linguistic and programmed intervention for persons with Aphasia: cortical and subcortical Primary progressive aphasia, Traumatic brain injury, Right hemisphere damage, Dementia
f) Augmentative and alternative strategies for adults with language disorders

Unit 5: Rehabilitation issues relating to adult language disorders

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

Practicals

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

Recommended Reading

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

Lapointe, L. L. (2005). Aphasia and related neurogenic language disorders. (3rdEdn.). Thieme.

Davis, G. A. (2014). Aphasia and related Communication Disorders. Pearson Education Inc.

Edwards, S. (2005). Fluent Aphasia. Cambridge University Press.

Laine, M. & Martin, N. (2006). Anomia: Theoretical and Clinical Aspects. Psychology Press.

Lapointe, L. L., Murdoch, B. E., & Stierwalt, J. A. G. (2010). Brain based Communication Disorders. Plural Publishing Inc.

Stemmer, B., & Whitaker, H. A. (Eds.). (2008). Handbook of Neuroscience of Language. Elsevier.

Whitworth, A., Webster, J., & Howard, D. (2005). A cognitive neuropsychological approach to assessment and intervention in aphasia: A clinician's guide. Psychology Press.

Semester VI

B 6.3 Aural Rehabilitation in Adults

Total hours - 75 (Theory: 45 hrs, Practical: 30 hrs)
Marks – 100

Objectives:

To have an appreciation about concepts in aural rehabilitation for adults

To learn about various communication options, and strategies available to adults with hearing loss

To have an appreciation of general principles and approaches to manage communication disorders in older adults with hearing loss

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

Describe the impact on the quality of life of adults with hearing impairment

Explain the principles, benefits and limitations of auditory training and speech reading

Recognize factors that impair communication and suggest facilitative and repair strategies

Identify components of aural rehabilitation program for adults and older adults

Identify strategies used with older adult to implement a successful rehabilitation program

Administer different tools for assessment of hearing handicap, attitudes and beliefs that can impact aural rehabilitation

Unit 1: Aural rehabilitation

a) Definition
b) Scope of aural rehabilitation in adults
c) Prevalence of hearing loss in adults (global and Indian data)
d) Relationship between audiometric data, hearing difficulties and amplification considerations
e) Limitations of audiometric data
f) Quality of life and impact on income, education, employment;
g) Assessing communication handicap : interviews, questionnaires
h) Vocational rehabilitation

Unit 2: Listening training and speech reading for adults

a) Listening to speech with a hearing loss
b) Candidacy for auditory training
c) Listening training to improve speech perception
d) Listening training to improve music perception
e) Benefits of auditory training
f) Speech reading for communication
g) Characteristics of good lip readers versus good speech readers
h) Factors affecting speech reading
i) Assessing vision only auditory only processing
j) Traditional methods of speech reading training

Unit 3: Communication strategies

a) Factors that influence the reception of spoken message
b) Facilitative communication strategies
c) Repair strategies
d) Conversational styles
e) Communication strategies training formal instruction, guided learning, real world practice

Unit 4: Aural rehabilitation for adults

a) Principles of aural rehabilitation in adults

b) Psychological impact of hearing loss
c) Support through counselling
d) Orienting towards hearing aid use
e) Needs assessment for non-hearing and assistive technology for adults
f) Categories of assistive technology
g) Aural rehabilitation programs: Individual vs group
h) Components of aural rehabilitation program
i) Process of aural rehabilitation :
j) Communication under adverse listing conditions

Unit 5: Aural rehabilitation for older adults

a) Influence of aging on the older adults: quality of life and psychological perspectives
b) Influence of aging on the older adults: quality of life and social perspectives
c) Auditory barriers to communication
d) Non auditory barriers to communication
e) Barriers to aural rehabilitation
f) Factors influencing hearing aid use by the older adult
g) Aural rehabilitation for different populations of older adult: independent, semi-independent and dependent older adult
h) Aural rehabilitation in an old age home
i) Hearing aid orientation

Practicals

a) Listen to the speech recorded using hearing loss simulators (available on internet) and experience the sounds as heard by persons with different degrees of hearing loss. Write your observations on the same
b) Simulate hearing loss by plugging ears and administer sentence tests of word recognition. Write a report on the performance
c) Administer any self-report questionnaire on adults who have hearing loss
d) Administer any self-report questionnaire on adults who wear hearing aid
e) Administer the hearing belief questionnaire (Saunders, 2013) on an adult. Identify the positive and negative attitude and behavior that may impact the success of aural rehabilitation
f) Design a session of aural rehab program (Objectives, activities, outcomes assessment) for adults recently fitted with cochlear implant
g) Design an individualised program for an executive using a hearing aid for the first time, and an adult moving from an analog to a digital hearing aid
h) Develop a pamphlet in your local language that would address any topic in aural rehabilitation

Recommended Reading

Hull, R. H., (2014) ed. Introduction to Aural Rehabilitation 2nd edition Plural Publishing, San Diego

Schow, R.L. & Nerbonne, M.A., (2012). Introduction to Audiologic Rehabilitation (6th edition), Allyn & Bacon, Boston.

Tye-Murray, N., (2014). Foundations of Aural Rehabilitation: Children , adults and their family members 4th edition Plural Publishing San Diego Chapters 5-10

Semester VI

B 6.4 Audiology in Practice

Total hours - 75 (Theory: 45 hrs, Practical: 30 hrs)
Marks – 100

Objectives:

To have an appreciation about scope of practice for audiologists, legislation and ethics in audiology and tele-audiology

To learn about various strategies for prevention of hearing impairment including Noise Induced Hearing Loss

To have an appreciation of general principles and approaches to manage noise in industry and community

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

List and describe the highlights of legislations relating to hearing impairment and other disabilities

Incorporate ethical practices in professional service delivery.

Provide information on welfare measures, policies of government schemes

Describe different strategies to create awareness of hearing impairment and programs to address them

Explain the different clinical practice settings in audiology with reference to their requirement, protocols and role and responsibility of audiologist

Describe methods to measure the impact of noise on humans and strategies to address excessive noise exposure in industries and the community

Describe terminology, technology and methods used in tele practice, and their application in audiological service delivery

Unit 1: Scope, legislation and ethics in audiology

a) Scope of practice in audiology (National – ISHA & International body - AAA)
b) Professional ethics (ISHA, AAA)
c) Legislations and conventions relating to disability: need and historical aspects
d) Classification of hearing impairment and disability certification,
e) Rehabilitation Council of India Act (1992) and its amendments
f) Person with Disability Act (1995), The rights of person with disabilities act, 2016
g) National Trust Act (1999)
h) Right to Education (2012)
i) Biwako Millennium framework (2003) and Salamanca Statement 1994
j) UNCRPD
k) Concept of barrier free access and universal design relating to individuals with hearing impairment

Unit 2: Hearing health and strategies for prevention of hearing impairment

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

Unit 3: Audiological practice in different settings

a) Audiological Private practice
b) ENT clinics

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

Unit 4: Noise and hearing conservation in industry and community

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

Unit 5: Scope and practice of tele audiology

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

Practicals

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

Recommended Reading

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ISHA monograph. Get the acts together. ISHA

Kundu, C.L. (2007). Status of disability in India. RCI

Code of ethics: American Academy of Audiology

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BIS specifications relating to noise Measurements.- IS:7194-1973 Specification for assessment of noise exposure during work for hearing conservation purposes.

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http://www.asha.org/Practice-Portal/Professional-Issues/Audiology-Assistants/Teleaudiology-Clinical-Assistants/

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IS:10399-1982 Methods for measurement of noise emitted by Stationary vehicles

IS:6229-1980 Method for measurement of real-ear

IS:9167-1979 Specification for ear protectors. 95

IS:9876-1981 Guide to the measurement of airborne acoustical noise and evaluation of its effects on man- IS:7970-1981 Specification for sound level meters.

IS:9989-1981 Assessment of noise with respect to community response.

John Ribera. Tele-Audiology in the United States. In Clinical Technologies: Concepts, Methodologies, Tools and Applications (pp. 693-702), 2011. Hershey, PA: Medical Information Science Reference. doi:10.4018/978-1-60960-561-2.ch305

Lipscomb, D. M. (1994). Hearing conservation – In industry, schools and the military.

Mandke, K and Oza R.K (2014). Private practice in speech pathology and audiology, 2014 ISHA

Philippe Valentin Giffard. Tele-Audiology. Tort, 2012. ISBN 6139256615, 9786139256617

Rawool, V. W. (2012). Hearing conservation in occupational, recreational, educational and home setting. Thieme: New York

RCI, PWD and National Trust, and Right to education act

Richard Wootton, John Craig, Victor Patterson, editors. Introduction to telemedicine. Second edition. London: The Royal Society of Medicine Press Ltd. 2006. p. 206 ISBN: 1 85315 677 9.

Salamanca statement and framework for action

Scope of practice by RCI

Swanepoel de W, Hall JW 3rd .A systematic review of tele health applications in audiology. Telemed J E Health. 2010 Mar;16(2):181-200. doi: 10.1089/tmj.2009.0111.

UNCRPD

Semester VI

B 6.5 Clinicals in Speech-language Pathology
Marks – 100
General considerations:

Exposure is primarily aimed at linking theory courses covered in this and previous semester(s).

After completion of clinical postings in Speech–language diagnostics and therapy, 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:

A. Speech Diagnostics

1. Procedures to assess motor speech disorders in adults.
2. Differential diagnosis of motor speech disorders in adults.
3. Procedures to assess individuals with adult language disorders, and other related abnormalities.

B. Speech Therapy

1. Strategies to improve speech intelligibility in adults with MSD.
2. Strategies to improve swallowing in adults with MSD
3. Therapy techniques for the management of different types of aphasia

Know-how:

A. Speech Diagnostics

1. To administer standard tests for adult language disorders.
2. To administer standard tests/protocols for motor speech disorders in adults.
3. To record a sample for analysis of language and speech skills in adults with neuro-communication disorders.
4. To assess posture, breathing, speech and swallowing in adults with motor speech disorders.
5. To evaluate communication skills in individuals with neuro-communication disorders at the bedside

B. Speech Therapy

1. To use appropriate strategies for improving specific skills in individuals with aphasia
2. To consult with inter-disciplinary medical/rehabilitation team and counsel the individual/family regarding management options and prognosis.

Show:

A. Speech Diagnostics

1. Language assessment - minimum of one individual after stroke.
2. Dysphagia assessment - minimum of one child and one adult.
4. Goals and activities for therapy (including AAC) based on assessment/test results for adults with neuro-communication disorders.

B. Speech Therapy

1. Therapy techniques for improving speech intelligibility in adults with MSD
2. Therapy techniques for improving language skills in adults with ALD

Do:

A. Speech Diagnostics

1. Assessment of play and mother-child interaction in children with language disorders
2. Administer a standardized test battery on two normal individuals to assess language and cognition.

B. Speech Therapy

1. Voice therapy - Minimum of one session
2. Fluency therapy - Minimum of one session

3. Apply speech language stimulation/therapy techniques on 5 children with language disorders
4. Therapy for individuals with speech sound disorders/ motor speech disorders – minimum 3 sessions of therapy

Evaluation:

Internal evaluation shall be based on attendance, clinical diary, log book, spot test, OSCE, record, and case work.

University evaluation: Viva-voce

Semester VI

B 6.6 Clinicals in Audiology

Marks – 100

General considerations:

Exposure is primarily aimed to be linked to the theory courses covered in the semester, however, not just limited to these areas.

After completion of clinical postings in auditory diagnostics and auditory rehabilitation, the student will Know (concept), know how (ability to apply), show (demonstrate in a clinical diary/log book), and do (perform on patients/ client contacts) the following:

Know:

1. Components of aural rehabilitation program for adults
2. Need assessment for non-hearing and assistive technology for adults
3. National and international standards related to noise exposure.
4. Recommend appropriate treatment options such as speech reading, AVT, combined approaches etc.

Know-how:

1. To carryout noise survey in Industry and community
2. To carryout mapping of cochlear implant in infants and children using both objective and subjective procedures
3. To trouble shoot cochlear implant
4. Speech in noise assessment for 5 subjects

Show:

1. Noise measurement using SLM in different locations
2. Analysis of objective responses like compound action potential, stapedial reflexes on at least 3 samples
3. Comprehensive hearing conservation program for at least 1 situation
4. How to formulate/ select appropriate auditory training technique based on audiological evaluation

Do:

1. Hearing aid fitting for at least 4 individuals hearing loss
2. Self report questionnaire to 3 adults with hearing loss
3. AVT on at least 1 child with hearing aid /CI
4. Trouble shooting and fine tuning of hearing aids on at least 2 geriatric clients
5. At least one activity for different stages involved in auditory training
6. Noise measurement and attenuation of different types of ear protective devices

Evaluation:

Internal evaluation shall be based on attendance, clinical diary, log book, spot test, OSCE, record, and case work.

University evaluation: Viva-voce

Semester VII and VIII

B 7.1 Clinicals in Speech-language Pathology

Total Marks – 150

General: Clinical internship aims to provide clinical exposure and experience in different set ups. The students would not only carry out greater quantum of work, but also work varied clinical populations and in different contexts. Internship will provide greater opportunity for the students to liaise with professionals from allied fields. The intern is expected to demonstrate competence and independence in carrying out the following, among others:

- Diagnosis and management of speech, language, and swallowing disorders across life span.
- Report evaluation findings, counsel and make appropriate referrals.
- Plan and execute intervention and rehabilitation programs for persons with speech language, communication, and swallowing disorders
- Develop and maintain records related to persons with speech-language, communication, and swallowing disorders
- Engage in community related services such as camps, awareness programs specifically, and community based rehabilitation activities, in general.
- Make appropriate referrals and liaise with professionals from related fields.
- Gain experience in different set ups and be able to establish speech centres in different set-ups
- Demonstrate that the objectives of the B.ASLP program have been achieved.
- Advise on the welfare measures available for their clinical clientele and their families.
- Advise and fit appropriate aids and devices for their clinical population.

Semester VII and VIII

B 7.2 Clinicals in Audiology

Total marks – 150

General: Clinical internship aims to provide clinical exposure and experience in different set ups. The students would not only carry out greater quantum of work, but also work varied clinical populations and in different contexts. Internship will provide greater opportunity for the students to liaise with professionals from allied fields. The intern is expected to demonstrate competence and independence in carrying out the following, among others:

1. Diagnosis and management of hearing disorders across life span.
2. Report evaluation findings, counsel and make appropriate referrals.
3. Plan and execute intervention and rehabilitation programs for persons with hearing disorders
4. Develop and maintain records related to persons with hearing disorders
5. Engage in community related services such as camps, awareness programs specifically, and community based rehabilitation activities, in general.
6. Make appropriate referrals and liaise with professionals from related fields.
7. Gain experience in different set ups and be able to establish hearing centres in different set-ups
8. Demonstrate that the objectives of the B.ASLP program have been achieved.
9. Advise on the welfare measures available for their clinical clientele and their families.
10. Advise and fit appropriate aids and devices for their clinical population.