SRI RAMACHANDRA
MEDICAL COLLEGE AND RESEARCH INSTITUTE
(Deemed to be University)
Porur, Chennai - 600 116

FACULTY OF ALLIED HEALTH SCIENCES

REGULATIONS AND SYLLABUS FOR

M.Sc. (SPEECH-LANGUAGE PATHOLOGY) PROGRAM

(Under Credit Based Semester System)

Approved by Academic Council in its 26th meeting held on 23.06.2018

Master of Science (Speech-Language Pathology)

Introduction

The **Master of Science (Speech-Language Pathology)** is a two-year postgraduate program in Speech-Language Pathology. This post graduate program covers relevant theory, clinical and research project courses in the area of Speech Language Pathology. The aim of the theory courses is to provide thorough knowledge in different subject areas through formal lectures and / or seminars. The clinical courses aim to develop skills necessary for professional practice in the area of speech-language pathology. The courses related to research project provide graded training to conduct research in a particular area culminating in the preparation of the dissertation. This program will impart advanced theoretical knowledge and skills related to professional practice in the area of speech-language pathology than previously studied at the undergraduate level.

The objectives of the M.Sc.(Speech-Language Pathology) program are to equip the students with knowledge and skills to

- function as teachers and researchers in institutions of higher learning,
- diagnose and manage disorders of speech, language, and swallowing across life span,
- counsel and guide persons with disorders of speech, language and swallowing as well as their family members,
- implement rehabilitation programs for persons with speech, language and swallowing disorders,
- function as the disability certification authority in the field,
- liaise with professionals in allied fields and other stake holders,
- implement prevention and public education programs,
- undertake advocacy measures on behalf of and for persons with speech, language and swallowing disorders,
- advise government and other institutions on legal and policy issues related to persons with communication disorders, and
- establish and administer institutions of higher learning.

SUMMARY SCHEME FOR SEMESTER BASED CREDIT SYSTEM

Category of Courses

Master of Science (Speech-Language Pathology)

SEMESTER	Core Theory (CT) (14)	Allied Theory (AT) (2)	Clinical Rotations (CR) (4)	Research Projects (RP) (4)	Total Credits
I	CT-1	AT-1	CR-1	RP-1	
	CT-2	AT2			
	CT-3				
	12	8	5	2	27
II	CT-4		CR-2	RP-2	
	CT-5				
	CT-6				
	CT-7				
	CT-8				
	20		5	2	27
III	CT-9		CR-3	RP-3	
	CT-10				
	CT-11				
	CT-12				
	16		5	4	25
IV	CT-13		CR-4	RP-4	
	CT-14				
	8		5	8	21
Total	**56**	**8**	**20**	**16**	**100**

REGULATIONS FOR MASTER OF SCIENCE (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 Medical College & Research Institute (Deemed to be University), Porur, Chennai-600 116, the Academic Council of the Deemed University hereby makes the following Regulations:

SHORT TITLE AND COMMENCEMENT
These regulations may be called as "THE REGULATIONS FOR MASTER OF SCIENCE (SPEECH-LANGUAGE PATHOLOGY) DEGREE PROGRAM OF SRI RAMACHANDRA MEDICAL COLLEGE AND RESEARCH INSTITUTE (DEEMED TO BE UNIVERSITY), PORUR, CHENNAI- 600116".

These regulations shall be deemed to have come into force from the academic year 2018-19. These regulations are subject to such modifications as may be approved by the Academic Council from time to time.

1. NOMENCLATURE
As per Rehabilitation Council of India (RCI), the nomenclature of the program shall be **Master of Science (Speech-Language Pathology) -** Abbreviated as **M.Sc. (SLP)** Degree Program.

2. ELIGIBILITY FOR ADMISSION
Candidates with a B. ASLP or B. Sc (Speech & Hearing) degree of any University recognized by the RCI or any other degree considered as equivalent thereto with an average of not less than 55% of marks are eligible for admission to M.Sc. (Speech-Language Pathology). "Average" refers to average of the aggregate marks obtained in all the years/semesters of the qualifying examination.

3. AGE LIMIT FOR ADMISSION
Applicants shall not be older than 30 years on the 1st July of the year of admission.

4. 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.

5. ELIGIBILITY CERTIFICATE
Candidates who have passed B. ASLP or B.Sc (Speech & Hearing) from any university other than Sri Ramachandra Medical College and Research Institute (Deemed to be University) shall obtain eligibility certificate from this Deemed University at the time of admission and remit recognition fee as prescribed.

6. 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.

7. DURATION OF THE PROGRAM

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

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:

Odd semesters – 1 & 3   July – December
Even semesters – 2 & 4   January – June

8. COMMENCEMENT OF THE PROGRAM
The program shall commence ordinarily from 1st July of the academic year.

9. COMMENCEMENT OF THE EXAMINATIONS
There shall be two sessions of University examinations in an academic year, viz., June (end of even semesters) and December (End of odd semesters).

10. MEDIUM OF INSTRUCTION
English shall be the medium of instruction and examinations.

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

11.1. Program / Course Credit Structure
As per the philosophy of Credit Based Semester System, certain quantum of academic work viz. theory classes, clinics, seminars, assignments, etc are measured in terms of credits. On satisfactory completion of the courses, a candidate earns the credits. The amount of credit associated with a course is dependent upon the number of hours of instruction per week in that course. 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/per activity.

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, Dissertation/Research Project and Clinical. Theory programs consist of lecture (L) and /or tutorial (T) hours; Clinical Rotation (CR) program consist 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 tutorial and dissertation hours, multiplying by 1/3rd for clinicals. 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.

The credit weightage is computed as shown below:
Lecture: 1 credit = 1 hour/week; 15 hours/Semester
Clinical: 1 credit = 3 hours/week; 45 hours/Semester
Research Project: 1 credit = 2 hours/week; 30 hours/Semester

Table 1 Credit value per course and structure of the syllabus/course/plan

For PG Programs each course will be provided a structured syllabus in the following style:

Category	Credits	Syllabus units
Core Theory (CT) /Allied Theory (AT)	4	5
Clinical Rotation (CR)	5	240 hours
Core Projects: Research Projects (RP)	8	240 hours
Dissertation (RP)	8	240 hours

The minimum credit allocation for a course is as per the curriculum designed by the department.

The program will be conducted on a credit based semester pattern as described below:

Minimum credit requirements
The minimum credit points required for the award of **M.Sc. (SLP). Degree is 100.** These credits are divided into theory courses, clinics, seminars, assignments, dissertation with the supervisor, and journal club over the duration of four semesters. The credits are distributed semester-wise as shown in Table 2. Courses generally progress in sequence, building competencies and their positioning indicates certain academic maturity on the part of the learners. Learners are expected to follow the semester-wise schedule of courses given in the syllabus.

12. GRADING SYSTEM
The University would be following the absolute grading system, where the marks are compounded to grades based on pre-determined class intervals.

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:

Table 2: 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 (PASS)	6	Average
Less than 50	RA (Reappear)	0	Reappear
Absent	AB	0	AB
Not Completed	NC	0	detained
RC-Repeat the course	RC	0	Long absent

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.

 i. A student obtaining Grade RA shall be considered failed and will be required to reappear in the examination.
 ii. Candidate with NC grading indicates absent for examinations or detained in a course (s); while RC indicates that student is not fulfilling the minimum criteria for academic progress and attendance [i.e., lack of attendance- < 50% and internal assessments (CIA)]. Registrations of such students for those courses shall be treated as cancelled. If the course is a core course, the candidate should register for and repeat the course when it is offered the next time.

Table 3: Example: <u>Grades and Grade Points</u>

Category	Course Title	Credits (C)	Grade Letter	Grade Point	Credit Point (Credit x Grade)
CT	Neurogenic Speech Disorders	3	A	9	3x 9=27
CT	Dysphagia	3	O	10	3x 10=30
CT	Aphasia	3	B	8	3x 8=24
CT	Cognitive Communication Disorders	3	C	7	3x7=21
RP	Dissertation*	5	D	6	5x6=30
CR	Clinicals in Speech Language Pathology (Internals)*	5	A	9	5x9=45
	Total	**22**			**177**

Thus, SGPA = 177/22 = **8.04**

The Semester grade point average (SGPA)
The performance of a student in a semester is indicated by a number called 'Semester Grade Point Average' (SGPA). The SGPA is the weighted average of the grade points obtained in all the courses by the student during the semester. For example, if a student takes five courses (Theory/Practical) in a semester with credits C1, C2, C3, C4 and C5 and the student's grade points in these programs are G1, G2, G3, G4 and G5, respectively.

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 C_i is the number of credits of the ith course and Gi in 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.

Table 4: 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	Credit: 24	Credit: 25	Credit: 25
SGPA: 7.42	SGPA: 6.8	SGPA: 6.6	SGPA: 6.0
Illustration for CGPA			
CGPA = $\dfrac{26 \times 7.42 + 24 \times 6.8 + 25 \times 6.6 + 25 \times 6.0}{100}$ = **6.71**			

13. **EXAMINATIONS AND ASSESSMENT:**

   i.   For all category of core theory courses offered, the assessment will comprise of Internal Assessments (IA) and the End Semester University examination (ES). For each core theory course the IA evaluation weighted at 20% and the ES weighted at 80%.
   ii. Continuous internal assessment weighted at 100% shall be conducted internally by the subject experts at the college level for those courses (Only theory & Dissertation) that have no end semester exam component.
   iii. A candidate failed in any course in the University examination will be provided an opportunity to improve his/her internal marks (theory only) which will be called "Improvement I.A. Examinations".
   iv. If a failed candidate does not appear for such "Improvement I.A. Examinations" for internal marks in the failed course(s), the internal marks (in theory) already secured by him/her shall be carried over for his/her subsequent appearance(s) in the University examinations.
   v.   IA Marks shall be submitted to the University for each Course separately by the Head of the department/ program co-ordinator 15 days prior to the commencement of the University examinations, through the Principal.

13.1. Internal assessment

   a) Evaluation for a course shall be done on a continuous basis. The uniform procedures to be adopted under the Credit based semester system (CBSS) are to conduct at least two internal assessments followed by University examination for each course.
   b) A regular record of attendance in theory, clinical, seminar, assignment, journal club, discussion with the supervisor, research work presentation and dissertation, etc shall be maintained by the department / teaching staff of respective courses.

13.2. Eligibility in Internal Examination for end –semester (IA for all theory, clinical courses, and other courses)
   a) For theory, clinical and research courses, a candidate should obtain a minimum of 50% marks in IA to be eligible to appear for University examination of each course in a semester. IA marks shall be awarded on the basis of the candidates work throughout the particular semester.
   b) Improvement of Internal Assessment: A student shall have the opportunity to improve his/her performance only once in the sessional exam component of the internal assessment. The re-conduct of the sessional exam shall be completed before the commencement of next end semester theory examinations.

13.3. 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 a satisfactory conduct from the Head of the Institution.
   b) Every candidate is required to put in a minimum of 80% of attendance in theory and 90% in clinical course (s) in the semester concerned to become eligible to appear for admission to the University examination.
   c) A candidate lacking the prescribed attendance in any course(s) shall not be allowed to appear for University examination in that course only.

13.4. Assessments in End Semester Examinations:
   a) The process of assessment in examinations for all the theory and clinical courses offered in Semesters I to IV, dissertation examinations at the end of Semester IV shall be undertaken by internal and external who will be appointed by the Controller of Examinations based on the panel of examiners provided by the respective department heads / BoS.

   b) Clinical examinations (for PSL18CR101 and PSLP18CR301 shall be conducted by two University appointed faculty of the department at the end of 1st and 3rd semesters.

c) Clinical examinations for PSL18CR201 and PSL18CR401 will be conducted by One external examiner and One internal examiner appointed by the University at the end of the 2nd and 4th semester, respectively. Clinical examination shall be with patients, equipment, simulators and/or patient records. The examiners shall also evaluate records of clinical work of the students.

13.5. Pattern of Question Paper - End Semester Examination

Theory	Duration: 3 hours
Essays (Answer 4 out of 5) (4 x 15)	60 marks
Short notes (Answer 4 out of 5) (4 x 5)	20 marks
Total	**80 marks**

14. DISSERTATION

Continuous and Summative assessments for DISSERTATION

a) All candidates registered to undergo the M.Sc. (SLP) degree program shall have to submit a dissertation at the end of 4th semester (15 days prior to commencement of end semester theory exams).
b) Each candidate will be assigned a recognized guide in the first semester.
c) Candidate shall obtain approval for their dissertation proposal through ethical committee (students) of the university (by the end of second semester).
d) The topic assigned to the candidate will be intimated to the controller of examination of this University by the end of second semester.
e) The dissertation work will be individual research and will consist of data collection carried out during third and fourth semester.
f) The dissertation work shall be in a bound volume not exceeding 75 pages (one and half line spacing and on one side of A4 size paper) excluding references.
g) Three bound copies and one soft copy of the dissertation work shall be submitted fifteen days prior to the commencement of the University examination and forwarded to the Controller of Examination of the University.
h) The concerned guide may evaluate the performance of the candidate for the **internal marks** as per the guidelines given below. This evaluation would reflect the quality of work put into the dissertation by the student.

Table 5: Guideline for awarding IA – Dissertation

Semester	Activity to be completed	Hours/ Semester	Credits	Max. Marks (Internal)
I	Research Seminar -1: Submit a summary of literature related to broad area of research	60	2	100
II	Research Seminar- 2: Present research proposal in the department, and obtain clearance from IEC	60	2	100
III	Research Practicum: Demonstrate progress in dissertation as written report	120	4	100
IV	Dissertation: Submit dissertation and present at the department	240	8	20

i) The internal marks awarded based on the above format has to be submitted to the CoE through the Head of Department 15 days before the commencement of end semester exams.

j) One external and one internal examiner appointed by the University shall evaluate the dissertation as per the guideline given below.

Table 6 Guidelines for Allotment of Marks for University Examination

Introduction, Review of literature	10 marks
Need for the study and Objectives	10 marks
Method	20 marks
Results and discussion	30 marks
Summary and Conclusion	10 marks
Total	80 marks

15. CRITERIA FOR PASSING

15.1. Marks qualifying for a Pass for M.Sc (SLP) Program

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

a) Grade D (50% of marks) in the University End Semester Examination Theory, Clinical, and Dissertation (ESE)

b) Grade D (50%) aggregate in each course which includes both Continuous Internal Assessment and End Semester Examinations.

15.2. Reappearance for arrear subjects:

a) In case a student fails to secure the minimum 50% in any theory or clinical course (s), then he/she shall reappear for the next end semester examination of that course only.

b) However, his/her marks of the Internal Assessment shall be carried over and he/she will be entitled for grade obtained by him/her on passing, subject to provisions under 13 (iii & iv).

15.3. Carry-over of courses

A student will be eligible to carry forward all the failed courses (including Grade AB) of I and II semesters till the III semester examinations but he/she will not be eligible to appear for the University examinations of IV semester until all the courses of I, II and III semesters are successfully completed. However, the student may be permitted to attend and complete the course requirements **ONLY,** for courses in the IV semester.

On successful completion of all courses until third semester such candidates are eligible to appear for the end semester examinations of the IV semester.

A student shall be eligible to get his/her CGPA upon successful completion of the courses of I to IV semesters as per the norms of this University.

16. END SEMESTER SUPPLEMENTARY EXAMINATIONS

End semester supplementary examinations shall be conducted as per the schedule given in table below. The exact dates of examinations shall be notified from time to time.

17. RETOTALING OF ANSWER PAPERS

The candidates can apply for retotaling by paying prescribed fee.

18. CLASSIFICATION OF SUCCESSFUL CANDIDATES

The class shall be awarded based on CGPA as follows:

Table 9: Classification of successful candidates

≥ 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 MSc (SLP) 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 course to the corresponding letter grade as mentioned in Table 3, 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 the prescribed credits.

19. AWARD OF RANKS

Ranks and medals shall be awarded based on final CGPA for candidates who pass in the first attempt and the candidates should have completed the MSc (SLP) program in minimum prescribed number of years, (two years) for the award of ranks. However, candidates who fail in one or more courses during the M.Sc. (SLP) program shall not be eligible for award of ranks.

20. AWARD OF DEGREE

The University will award the degree after a candidate successfully completes the required University examinations (all semesters).

21. RE-ADMISSION AFTER BREAK OF STUDY

A candidate having a break of study shall be re-admitted after satisfactory fulfillment of the regulations of the University at the commencement of an academic year only and shall undergo the full duration of the Program. No exemption for the period of study already undergone or for the examination already passed shall be granted. The candidate will be required to appear for all the examinations as prescribed in the regulations and syllabus in vogue at the time of readmission.

A candidate having a break of study of four years and above from the date of admission and more than two spells of break will not be considered for re-admission. The four years' period of break of study shall be calculated from the date of first admission of the candidate to the course inclusive of all the subsequent spells of break of studies.

If a candidate has a break of study of more than 2 months during the semester, he/ she has to apply for continuation to the semester which has to be redone when it is being offered with specific recommendations by HOD.

22. DISCHARGE FROM THE PROGRAM

If a student admitted to a Program of study in this Deemed University is for any reason not able to complete the Program or qualify for the degree by passing the examinations prescribed within a period comprising twice the duration prescribed in the Regulations for the concerned Program, he/she will be discharged from the said Program, his/her name will be taken off the rolls of the Deemed University and he/she will not be permitted to attend classes or appear for any examination conducted by the Deemed University thereafter.

SCHEME OF CURRICULUM AND EVALUATION OF THE PROGRAM

				Hours / Week				Hours/ semester (Credits x 15 weeks)						University Exam		Grand Total
Course Number	Course code	Category	Course Title	Lecture (L)	Tutorial(T)/ Clinical Training (CT)	Research Project (RP)	Credits (C)	Lecture	Tutorial(T)/ Clinical Training(CT)	Research Project (RP)	Total hours	(%) Attendance	Internal assessment (IA) – Theory / Practical (a)	Theory (b)	Viva-voce (c)	Theory: a+ b = 100 Practical: a + c = 100
			M.Sc. (Speech-Language Pathology), 2018-19 [APSL]													
			SEMESTER- I													
														EST	ESP	
1	PSL18CT101	CT1	Speech Science and Instrumentation	4			4	60			60	80	20	80	-	100
2	PSL18CT102	CT2	Neurobiology of Speech-Language and Cognition	4			4	60			60	80	20	80	-	100
3	PSL18CT103	CT3	Augmentative and Alternative Communication	4			4	60			60	80	20	80	-	100
4	PSL18AT104	AT1	Clinical Linguistics & Multilingual Issues	4			4	60			60	80	20	80	-	100
5	PSL18AT105	AT2	Research Methods, Epidemiology and Statistics	4			4	60			60	80	20	80	-	100
6	PSL18CR106	CR1	Clinicals in Speech-Language Pathology – 1		5		5	-	225	-	225	90	50		50	100
7	PSL18RP107	RP1	Research Seminar -1			2	2			60	60	80	100			100
	Year 1 – Semester-I		Total	20	5	2	27	300	225	60	585		250	400	50	700

			M.Sc. (Speech-Language Pathology), 2018-19 [APSL]												
			SEMESTER- II												
				Hours / Week				Hours/ semester (Credits x 15 weeks)						University Exam	Grand Total
Course Number	**Course code**	**Category**	**Course Title**	**Lecture (L)**	**Tutorial(T)/ Clinical Training(CT)**	**Research Project (RP)**	**Credits(C)**	**Lecture**	**Tutorial(T)/ Clinical Training(CT)**	**Research Project (RP)**	**Total hours**	**(%) Attendance**	**Internal assessment (IA) – Theory/ Practical (a)**	**Theory (b)** / **Viva-voce(c)**	**Theory: a+b = 100 Practical: a + c = 100**
														EST / ESP	
8	PSL18CT201	CT4	Advances in Speech Sound Disorders	4			4	60			60	80	20	80 / -	100
9	PSL18CT202	CT5	Voice Science and Disorders	4			4	60			60	80	20	80 / -	100
10	PSL18CT203	CT6	Disorders of Fluency	4			4	60			60	80	20	80 / -	100
11	PSL18CT204	CT7	Language Disorders in Children	4			4	60			60	80	20	80 / -	100
12	PSL18CT205	CT8	Language and Literacy Disorders	4			4	60			60	80	20	80 / -	100
13	PSL18CR206	CR2	Clinicals in Speech-Language Pathology - 2		5		5	-	225	-	225	90	50	/ 50	100
14	PSL18RP207	RP2	Research Seminar -2			2	2			60	60	80	100		100
	Year 1 – Semester-II	Total		**20**	**5**	**2**	**27**	**300**	**225**	**60**	**585**		**250**	**400** / **50**	**700**

Dept. of SLHS, SRMC & RI (DU)

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SEMESTER- III

Course Number	Course code	Category	Course Title	Hours / 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)**	**Research Project (RP)**	**Credits (C)**	**Lecture**	**Tutorial(T)/ Clinical Training (CT)**	**Research Project (RP)**	**Total hours**			**Theory (b)**	**Viva-voce(c)**	Theory: a+b = 100 Practical: a + c = 100
														EST	ESP	
15	PSL18CT301	CT9	Neurogenic Speech Disorders	4			4	60			60	80	20	80	-	100
16	PSL18CT302	CT10	Dysphagia	4			4	60			60	80	20	80	-	100
17	PSL18CT303	CT11	Aphasia	4			4	60			60	80	20	80	-	100
18	PSL18CT304	CT12	Cognitive Communication Disorders	4			4	60			60	80	20	80	-	100
19	PSL18CR305	CR3	Clinicals in Speech-Language Pathology - 3		5		5	-	225	-	225	90	50		50	100
20	PSL18RP306	RP3	Research Practicum			4	4			120	120	80	100			100
	Year 2 – Semester-III		**Total**	**16**	**5**	**4**	**25**	**240**	**225**	**120**	**585**		**230**	**320**	**50**	**600**

Course Number	Course code	Category	Course Title	Hours / 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)	Research Project (RP)	Credits(C)	Lecture	Tutorial(T)/ Clinical Training(CT)	Research Project (RP)	Total hours			Theory (b)	Viva-voce(c)	Theory: a+b = 100 Practical: a + c = 100
			M.Sc. (Speech-Language Pathology), 2018-19 [APSL]													
			SEMESTER- IV													
														EST	ESP	
21	PSL18CT401	CT13	Practices in Speech-Language Pathology	4			4	60			60	80	20	80	-	100
22	PSL18CT402	CT4	Seminars in Practices related to Medical Speech-Language Pathology	4			4	60			60	80	100	-	-	100
23	PSL18CR403	CR4	Clinicals in Speech-Language Pathology-4		5		5	-	225	-	225	90	50		50	100
24	PSL18RP404	RP4	Dissertation			8	8			240	240	80	20		80	100
	Year 2 – Semester-IV	Total		8	5	8	21	120	225	240	585		190	80	130	400

M.Sc. (SLP) Regulations and Syllabus – 2018 - Passed in 26th Academic council meeting on 23.06.2018

M.Sc (Speech-Language Pathology)
Course content
Semester I

Course Title: Speech Science and Instrumentation   Marks – 100

Course Number	Course Code	Course category	Course Title	Lecture (L)	Clinical Training (CT)	Research Project (RP)/ Dissertation	Total Credits	Total Hours/Marks
1	PSL18CT101	Core Theory CT1	**Speech Science and Instrumentation**	4	-	-	**4**	60/ 100

Learning objectives	Learning outcomes
The objectives of the course are to provide knowledge on: a) theoretical constructs of speech production to analyze speech at different levels b) acoustic and aerodynamic aspects of speech. c) instruments and methods related to measuring speech physiology. d) applications of speech sciences	At the end of the course, the student will be able to: a) discuss about speech science as a distinct field focusing on physiology aspects of speech production and different levels of observation of speech b) analyze acoustic and aerodynamic aspects of speech production c) discuss different techniques for physiological measurements of speech c) discuss clinical and non-clinical application of speech science

Unit	Syllabus
UNIT I:	**Speech Science and speech physiology** a) Speech Science- Introduction and scope b) Physiological aspects of speech production – subsystems involved i.e. respiration, laryngeal & articulatory subsystem and different levels of observation of speech production c) Critical evaluation of acoustic theory of speech production: source and filter characteristics; output speech and its characteristics d) Effects of contextual, co-articulatory and speaker related factors
UNIT II:	**Acoustic and aerodynamic characteristics of speech sounds** a) Speech breathing and aerodynamics of speech: mechanics of airflow – laminar, orifice and turbulent flow: maintenance of airway pressure for speech b) Upper and lower airway dynamics: lower - anatomy, laryngeal and lung activity in speech: conversational speech and loud speech; glottal activity in the production of speech sounds and whisper; upper - constrictors in upper airway; aerodynamics of speech sounds c) Aspects of speech acoustics; aspects of prosody and their realization

	d) Acoustic characteristics of vowels and consonants and prosody
	e) Characteristics and production of vocal music in contrast with speech production
UNIT III:	**Technology and instrumentation – respiratory and acoustic analysis**
	a) Measures of respiratory analysis and instrumentation: intraoral and sub glottal pressure; Instrumentation
	b) Acoustic analysis of speech - techniques of digital signal processing (linear predictive coding, fast fourier transform, short-time speech analysis - energy, zero-crossing rate, autocorrelation function; Long Term Average Spectrum, Inverse filtering)
	c) Basic principles of cepstral analysis, filtering low-time filtering for formant estimation, high-time filtering for pitch estimation, complex cepstrum
	d) Spectrogram: Identification of sounds and their acoustic features through spectrogram
	e) Software for acquisition and acoustic analysis – freeware and patented software
UNIT IV:	**Technology and instrumentation – Other physiological measurements**: Techniques and instrumentation (working principles, interpretation and implications) including
	a) electromyography,
	b) stroboscope, high speed kymography, electroglottography,
	c) electromagnetic articulography,
	d) ultrasound
	e) neuroimaging - MRI, fMRI, NIRS, CT, PET, SPECT, TMS and MEG
UNIT V:	**Applications of speech science**
	a) Clinical application of speech science: applications in speech disorders - speech of persons with hearing impairment, voice disorders, stuttering, dysarthria, cleft lip and palate
	b) Forensic applications: semiautomatic and automatic methods
	c) Infant cry analysis- characteristics of normal and abnormal cries, models, infant cry as a tool for early identification of high-risk babies
	d) Speech synthesis and its applications: articulatory, parametric synthesis and analysis by synthesis
	e) Speech recognition, speaker recognition, speech coding, and speech enhancement.

Recommended Reading

- Hixon, T. J., Weismer, G., & Hoit, J. D. (2014). *Preclinical speech sciences: Anatomy physiology acoustics perception*. San Diego: Plural Publishing.
- Behrman, A. (2017). *Speech and voice science*. (2nd Ed). San Diego, Plural publishing.
- Speaks, C. E. (2018). *Introduction to sound: Acoustics for the hearing and speech sciences*. (4th Edition). San Diego, Plural Publishing.
- Holmes, W. (2001). *Speech synthesis and recognition*. CRC press.
- Maassen, B., & Van Lieshout, P. (Eds.). (2010). *Speech motor control: New developments in basic and applied research*. Oxford University Press.
- Borden, G. J., & Harris, K. S. (2009). *Speech science primer*. (5th Ed). Philadelphia: Lippincott, William & Wilkins.
- CIIL Publications on the production of sounds in different languages of India
- Boulston, F. R. & Dvorak, J.D (2015). Matlab Primer for Speech Language Pathology and Audiology. San Diego: Plural Publishing Inc
- Ferrand, C. T. (2007). *Speech Science – An integrated approach to theory and practice*. (2nd Ed). Boston: Allyn & Bacon.
- Hollien, H. (2002). *Forensic voice identification*. NY, Academic Press Inc.
- Kent, R. D., & Read, C. (2002). *The acoustic analysis of speech*. New York, Delmar Learning.

- Ladefogd, P. (2001). *An introduction to the sounds of languages; vowels and consonants*. Oxford Black Well.

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Course Title: Neurobiology of Speech-Language and Cognition   Marks – 100

Course Number	Course Code	Course category	Course Title	Lecture (L)	Clinical Training (CT)	Research Project (RP)/ Dissertation	**Total Credits**	**Total Hours/Marks**
2	PSL18CT102	Core Theory CT2	**Neurobiology of Speech-Language and Cognition**	4	-	-	**4**	60/ 100

Learning objectives	**Learning outcomes**
The objectives of the course are to provide knowledge on: a) anatomy and physiology of nervous system related to speech and language b) different methods to assess the neurological status of speech language mechanisms c) neural basis related to speech-language perception and production from recent research d) different cognitive domains and their neural basis from recent research e) neurophysiological and functional changes during aging; and its influence on speech, language and cognition	At the end of the course, the student will be able to: a) discuss the anatomy and physiology of nervous system and role of neurotransmitters in relation to speech-language and its disorders, b) analyze and interpret different neuro-diagnostic findings, c) discuss the neural basis of speech-language and cognition d) apply information on neurophysiological and functional changes with aging in relation to speech, language and cognition

Unit	Syllabus
UNIT I:	**Anatomy and physiology of the nervous system related to speech-language** a) Review of central nervous system and peripheral nervous system, cortical and subcortical pathways b) Blood supply to CNS c) Neurotransmitters – types and classification, major location, functions and synthesis / chemical composition; signal propagation in the nervous system d) Neurotransmitters in neuropathological conditions influencing speech, language and related disorders e) Functional organization of brain – lateralization of functions f) Concepts related to neuroplasticity for speech-language and swallowing

UNIT II:	**Methods of understanding the neurological status of speech-language mechanisms**
	a) Clinical examination of neurological status - history, physical examination, reflexes
	b) Neuro-diagnostic procedures for routine clinical examination – cranial nerve examination, sensory & motor examination, examination of mental functions
	c) Neuro-imaging procedures: X-Ray, CT scan, MRI, fMRI, TcMS, PET, SPECT, and others - advantages and disadvantages
	d) Neuro-physiological procedures - Evoked potentials (visual, auditory and somato-sensory), eye-tracking. eletromyography (EMG), magnetoencephalography (MEG) - Advantages and disadvantages
	e) Neuro-behavioral procedures - neurolinguistic investigation, priming and its types, reaction time measures and other related procedures
UNIT III:	**Neural basis of speech-language processing and production**
	a) Neural networks for speech perception, semantic processing and sentence comprehension
	b) Neural basis of speech production (sound, syllable, word and sentences)
	f) Representation of languages in the brain – Monolingual, bilingual and multilingual
	g) Evidence from research studies - behavioral, neuroimaging and evoked potentials studies in neurotypical persons and persons with neurological disorders
UNIT IV:	**Cognitive processes and their neural basis**
	a) Attention, memory and executive functions – types and components
	b) Relationship of cognitive processes to speech-language processes; implication of information processing models of cognitive linguistic processes (hierarchical, process, interactive, computational, neural network) to development of speech and language
	c) Neural basis for different cognitive processes and its relation to language processes
	d) Neural network for reading, writing and spelling
UNIT V:	**Neuroscience of aging and its effect on speech-language**
	a) Aging - definition, types- (senescence and senility, primary and secondary aging, biological and psychological aging), phenomenon of aging (neurological, cognitive and behavioral correlates, structural changes with age, brain weight, ventricular size, microscopic changes and atrophy).
	b) Theories of aging - cellular, genetic, cumulative, random cell damage, programmed cell death, high level control of aging, cellular theories, geriatric theories and other theories
	c) Neurophysiological / functional changes with age: accuracy, speed, range, endurance, coordination, stability and strength; neurobehavioral correlates of aging - lateralization of functions across life span, cerebral asymmetry, electrophysiological and behavioral evidences
	d) Effects of aging on speech and language across life span: in typical and pathological conditions.
	e) Effect of aging on cognition and speech perception

Recommended Reading

- Duffy, J. R. (2013). *Motor speech disorders: Substrates, differential diagnosis and management*. (3rd Ed). Missouri: Mosby Publishers.
- Barkhof, F., Fox, N. C., BastosLeite, A. J., & Scheltens, P. (2011). *Neuroimaging in Dementia*. Springer-Verlag.
- Ingham, R. J. (2007). *Neuroimaging in communication sciences and disorders*. San Diego: Plural Publishing.
- Webster, D. B. (1999). *Neuroscience of communication*. San Diego: Singular.

- Lundy-Ekman, L. (2013). *Neuroscience-e-book: Fundamentals for rehabilitation.* Elsevier Health Sciences.
- Kemmerer, D. (2015). *Cognitive neuroscience of language.* New York: Psychology Press.
- Handy, T. C. (2005). *Event-related potentials: A methods handbook.* London: MIT press.
- Zigmond, M. J., Rowland, L. P. & Coyle J. T. (2015). *Neurobiology of brain disorders: Biological basis of neurological and psychiatric disorders.* New York: Academic Press.
- Bhatnagar, S. C. (2008). *Neuroscience for the study of communicative disorders.* (3rd Ed). New York: Wolters Kluwer Publisher.
- Arslan, O. E. (2015). Neuroanatomical basis of clinical neurology. 2nd Edition, New York, CRC Press.
- Benarroch, E. E., Daube, R. J., Flemming, D. K. & Westmoreland, F. B. (2008*). Mayo clinic medical neurosciences.* (5th Ed). USA: Mayo Clinic Scientific Press.

Course Title: **Augmentative and Alternative Communication**   Marks - 100

Course Number	Course Code	Course category	Course Title	Lecture (L)	Clinical Training (CT)	Research Project (RP)/ Dissertation	Total Credits	Total Hours/Marks
3	PSL18CT103	Core Theory CT3	**Augmentative and Alternative Communication**	4	-	-	**4**	60/ 100

Learning Objectives	Learning outcomes
The objectives of the course are to provide knowledge on: a) different components of augmentative and alternative communication (AAC) and their subtypes b) the procedures to assess candidacy for AAC c) the process of implementing AAC for individuals with complex communication needs d) contemporary topics in clinical and research aspects of AAC globally and in India	At the end of the course, the student will be able to: a) identify and discuss various components of AAC b) discuss the assessment procedures determining candidacy for AAC among individuals with complex communication needs and select appropriate AAC strategies c) discuss the treatment plan for implementation of AAC for individuals with complex communication needs d) discuss the current status in practice of AAC in India and identify issues for research

Unit	Syllabus
UNIT I:	**Types, classification and description of AAC** a) Definition, history, need and classification of AAC b) Team approach in AAC -Team members and their roles c) AAC components – symbols, aids, strategies and techniques d) Technology in AAC: communication boards; non-tech, low-tech, high-tech aids and mobile computing; Interfaces to access AAC
UNIT II:	Assessment for AAC a) Assessment for AAC candidacy: Models for assessment b) Formal and informal assessment: Standard tests and scales c) Considerations in other domains - physical/ motor and seating requirements, cognition, vision and hearing, speech perception
UNIT III:	**AAC intervention: Principles and procedures** a) General principles and strategies – Aided and unaided AAC b) Selection of vocabulary and symbol representation of the vocabulary: - types of vocabulary, factors affecting choice of vocabulary c) Strategies for selection of symbols in AAC: types of strategies (direct selection, scanning, encoding, word prediction) and factors affecting decision making d) Selection and decision making with reference to low and high-tech aids and devices e) Counselling and guidance regarding the use and application of AAC for parents and caregivers

UNIT IV:	**AAC for different populations**
	a) Implementing AAC for children with complex communication needs (intellectually challenged, cerebral palsy, children with language disorders and children with dual and multiple disabilities) - Language intervention and AAC - Literacy and AAC - Speech and AAC
	b) Implementing AAC for adults with acquired communication disorders: - Temporary conditions: laryngectomy, voice disorders - Neurological conditions: Degenerative and non-degenerative conditions, Aphasia, traumatic brain injury, dementia and other acquired cognitive communication disorders - Structural disorders and other disorders affecting speech intelligibility
	c) Measuring outcomes in individuals using AAC
	d) Evidence-base for implementing AAC
UNIT V:	**Contemporary topics in AAC**
	e) Adaptation of AAC in different set ups: home, schools, work place, and other social situations
	f) AAC and community; Role of ISAAC (International Society for Augmentative and Alternative Communication) and other organizations
	g) Current updates on use of technology: Hardware and software (applications)
	h) Current status of AAC in India and scope for research

Recommended Reading

- Beukelman, D., & Mirenda, P. (2012). *Augmentative and alternative communication: Supporting children and adults with complex communication needs.* (4th Ed). Baltimore: MD. Paul Brookes Publishing.
- Mani, M.N.G., Gopalkrishnan, V., & Amaresh, G. (2001). *Indian sign language dictionary.* Germany: CBM International.
- Vasishta, M., Woodward, J., & Desantu, S. (1980). *An Introduction to Indian sign language.* New Delhi: All India Federation of the Deaf.
- Deshmukh, D. (1996). *Sign language and bilingualism in deaf education.*
- Hurtig, R.R., & Downey, D. (2015). *Augmentative and alternative communication in acute and critical care settings.* San Diego: Plural Publishing
- McCarthy, J.w., & Dietz, A. (Eds.) (2015). *Augmentative and alternative communication: An interactive clinical casebook.* San Diego: Plural Publishing.
- Loncke, F. (2014). *Augmentative and alternative communication: Models and applications for educators, speech-language pathologists, psychologists, caregivers, and users.* San Diego: Plural Publishing.
- Alant, E. (2016). *Augmentative and alternative communication engagement and participation.* San Diego: Plural Publishing
- Bryant, D. P., & Bryant, B. R. (2011). *Assistive technology for people with disabilities.* USA: Pearson Higher Ed.
- Light, J. C., Beukelman, D. R., & Reichle, J. (2003). *Communicative competence for individuals who use AAC – From research to effective practice.* Baltimore: H.Brookes Publishing Co.
- Lloyd, L., Fuller, D., & Arvidson, H. (1997). *Augmentative and alternative communication: Handbook of principles and practices.* Boston, MA: Allyn & Bacon.
- McNaughton, D. & Beukelman, D.R. (2010). *Transition strategies for adolescents & young adults who use AAC.* Baltimore: MD Paul H. Brookes Publishing Co.
- Reichle, J., Beukelman, D.R., & Light, J.C. (2002) *Exemplary practices for beginning communicators: implications for AAC.* Baltimore: MD Paul H. Brookes Publishing
- Soto, G., & Zangari, C. (2009). *Practically speaking language literacy & academic development for students with AAC needs.* Baltimore: MD Paul Brookes Publishing.

Course Title: Clinical Linguistics and Multilingual Issues   Marks – 100

Course Number	Course Code	Course category	Course Title	Lecture (L)	Clinical Training (CT)	Research Project (RP)/ Dissertation	Total Credits	Total Hours/Marks
4	PSL18AT104	Core Theory AT1	**Clinical Linguistics and Multilingual Issues**	4	-	-	**4**	60/ 100

Learning Objectives	Learning outcomes
The objectives of the course are to provide knowledge on: a) aspects of clinical linguistics relevant to speech-language pathology, b) acquisition process and related disorders pertaining to various components of language, c) general concepts, theoretical background and issues related to socio-linguistics, d) nature of multilingualism and multicultural issues in India	At the end of the course, the student will be able to: a) discuss the relationship of clinical linguistics to the field of speech-language pathology b) discuss the acquisition process and related disorders pertaining to various components of language, b) discuss general concepts, and issues related to socio-linguistics affecting speech-language and communication, c) discuss the multilingual and multicultural issues in rehabilitation with reference to India

Unit	Syllabus
UNIT I:	**Introduction to clinical linguistics; Phonological acquisition and related disorders** a) Introduction to clinical linguistics and scope of linguistics in clinical field. b) Principles of general linguistics and their clinical relevance. c) Phonological acquisition d) Phonological disability
UNIT II:	**Grammatical and semantic acquisition and related disabilities** a) Grammatical acquisition b) Grammatical disorders c) Semantic acquisition d) Semantic disorders
UNIT III:	**Pragmatics and sociolinguistic concepts** a) Pragmatics – Theoretical background: Discourse, Deixis, Maxims and Truth relations b) Pragmatic development c) Pragmatic disorders with respect to some clinical disorders d) Sociolinguistic concepts relevant to speech-language pathologists (language and dialects issues, various types and dialects, diglossia, stylistic variation of language-registers, Language contact -Creoles, Pidgins, language maintenance, language shift and language death e) Language deficiency

UNIT IV:	Psycholinguistics and language acquisition
	a) Issues involved in language acquisition
	b) Models of second language acquisition
	c) Language acquisition in bi- and multi-lingual environments – concepts related to proficiency, dominance etc; issues and implications for assessment and intervention
	d) Linguistic and psycho-neuro linguistic models of language pathology
UNIT V:	Multilingual and multicultural issues in communication
	a) India as a multilingual nation– A brief introduction to the major language families of India
	b) Relation between language and culture; language and thought relationship in view of Sapir-Whorf hypothesis: linguistic determinism and linguistic relativity
	c) Cultural issues - cultural issues in verbal and non-verbal communication
	d) Multicultural and multilingual issues in rehabilitation with special reference to India

Recommended Reading

- Radford, A., Atkinson, M., Britain, D., Clahsen, H., & Spencer A. (2009). *Linguistics: An introduction.* (2nd Ed). Cambridge: Cambridge University Press.
- Aitchison, J. (2010). *Aitchison's Linguistics: A practical introduction to contemporary linguistics.* John Murray Learning.
- Lyons, J. (1995). Linguistics semantics. Cambridge, Cambridge University Press
- Maassen, B., & Groenen, P. (1999). *Pathologies of speech and language: Advances in clinical phonetics and linguistics.* John Wiley & Sons.
- Singh, S. (2005). *Phonetics: Principles and Practices.* (3rd Ed). San Diego: Plural Publishing.
- Wei, L. (2014). *Applied linguistics.* UK: Wiley Blackwell.
- Bonvillian, N. (2011). *Language, culture and communication.* New Jersey: Pearson Education.
- Ball, M., J., Perkins, M., R., Müller, N. & Howard, S. (2008). *The handbook of clinical linguistics. (*Eds). Oxford: Blackwell Publishing.
- Allan, B. (2014). *The guidebook to sociolinguistics.* UK: Wiley Blackwell.
- Bishop, D. V. M., & Leonard, L. B. (2007). *Speech and language impairments in children.* USA: Psychology
- Pressacy, D. P. (2007). *The Cambridge handbook of phonology.* Cambridge: Cambridge University press.

Course title: Research Methods, Statistics & Epidemiology   **Marks**:100

Course Number	Course Code	Course category	Course Title	Lecture (L)	Clinical Training (CT)	Research Project (RP)/ Dissertation	Total Credits	Total Hours/Marks
5	PSL18AT105	Core Theory AT2	**Research Methods, Statistics & Epidemiology**	4	-	-	**4**	60/ 100

Learning Objectives	Learning outcomes
The objectives of the course are to provide knowledge on: a) clinical research designs and statistical methods b) ethical considerations in conduct of research with human participants c) epidemiological issues and its relevance in speech-language research d) methods used in evidence-based practice in speech and language pathology	At the end of the course, the student will be able to: a) evaluate research material/publications in terms of types of research designs and statistical methods used. b) discuss epidemiological concepts in relation to speech-language, hearing disorders c) appraise evidence-based practice in different fields of speech-language and hearing disorders d) develop a research proposal for research project

Unit	Syllabus
UNIT I:	**Research designs, documentation and research ethics** a) Types of research- post facto research, normative research, standard group comparison, b) Experimental research, clinical and applied research, sample surveys, evaluation research c) Methods of observation and measurement, strategies and designs in research d) Experimental designs - single subject designs and group designs e) Documentation and research writing f) Ethical considerations in research with human participants – ICMR guidelines
UNIT II:	**Epidemiology** a) Definition, basic concepts – scope and function of epidemiology b) Study designs in epidemiology: Cohort studies, case-control studies, cross-sectional studies, clinical trials c) Measures in epidemiology – Ratios, proportions, rates, relative risk, odds ratio d) Identify biases and their consequences in published literature. e) Describe criteria for characterizing the causality of associations. f) Application of epidemiology in evaluation and screening procedures employed in Speech-language Pathology g) Application and impact of epidemiology on national and local policy; influence of epidemiology on ethical and professional issues

UNIT III:	**Statistical measures and their features**
	a) Review of data description and exploratory data analysis (Numerical summaries and graphical summaries)
	b) Statistical Inference – Estimation of Confidence Intervals
	c) Statistical Inference – Basic concepts related to hypothesis testing –null hypothesis, alternative hypothesis, significance level, statistically significant, critical value, acceptance / rejection region, p-value, power, types of errors: Type I (α), Type II (β), one-sided (one-tailed) test, Two-sided (two-tailed) test
	d) Parametric tests of hypothesis testing: testing the significance between two means (Independent samples t-test, Paired sample t-test)
	e) Non-parametric tests of hypothesis testing: Need for transformations and non-parametric tests; independent samples (Median test, Mann-Whitney U test, Kruskal-Wallis test) and for related samples (Sign test, Wilcoxon's signed-rank test, Friedman's test)
	f) Analysis of qualitative data - Contingency tables; Chi-square test for independence of attributes; Measures of Association - contingency coefficient and Cramer's; Measures of agreement - Kappa coefficient
UNIT IV:	**Regression, univariate and multivariate analysis**
	a) Correlation; simple and multiple linear regression; logistic regression; path analysis
	b) Analysis of Variance (ANOVA)- Basic models, assumptions, one way and two-way ANOVA; Consequence of failure of assumptions underlying ANOVA; Tests for additivity, homogeneity, transformation; Post – hoc tests; Analysis of Covariance (ANOCOVA); Repeated measure ANOVA
	c) Multivariate data analysis (concept only) - Need for multivariate data analysis; Introduction to various methods including Principal component analysis, Cluster analysis, Discriminant analysis, MANOVA
	d) Evaluation of application of statistics to different research designs used in different publications
	e) Critical analysis of research articles in the field: Analysis of research designs in different areas of Speech-language Pathology
UNIT V:	**Evidence based practice**
	a) Introduction to Evidence Based Practice (EBP) and Steps to EBP from formulating foreground question, finding best current evidence, critical appraisal of best current evidence, summarizing evidence, integrating evidence and tracking progress.
	b) Concepts related to practical significance (effect size) vs. statistical significance, precision of measurement (confidence intervals)
	c) Levels of evidence for experimental and non-experimental designs; treatment efficacy- randomized control study, quasi experimental study, correlation and case study, single subject designs, expert committee report, consensus conference
	d) Measures of diagnostic accuracy – positive and negative likelihood ratios; positive predictive value, negative predictive value, diagnostic odds ratio
	e) Concepts related to randomized control trials: Comparative groups- allocation concealment / random allocation; importance of participation and follow up in understanding, evaluating and applying randomized controlled trial results
	f) Methods of carrying out therapy trials; execution, indexing and reporting of therapy trials – efficacy studies; Conventions to study outcomes - i) Absolute risk reduction, ii) Absolute benefit increase, iii) Absolute risk increase, and iv) Absolute benefit reduction
	g) Systematic review and meta-analysis: importance of research publications in terms of systematic review, meta-analysis, clinical practice guidelines, health technology assessments.
	h) Challenges in implementation of EBP in Speech-language Pathology in India and future directions

Recommended Reading

- Hegde, M. (2017). *A coursebook on scientific and professional writing for speech-language pathology (*5th Ed). San Diego: Plural Publishing
- Irwin, D. L., Pannbacker, M., & Lass, N. J. (2013). *Clinical research methods in speech-language pathology and audiology*. (2nd Ed). San Diego: Plural Publishing
- Silverman, F. H. (1998). *Research design and evaluation in speech-language pathology and audiology*. Allyn & Bacon.
- Goyal, R. C. (2010). *Research methodology for health professionals*. Jaypee brothers' publishers.
- Kothari, C. R., & Garg, G. (2004). *Research methodology: Methods and techniques*. (3rd Ed). New Age International.
- Gurumani, N. (2011). *Research methodology: for biological sciences*. Mjp Publishers.
- National Ethical Guidelines for Biomedical and Health Research Involving Human Participants (2017) by Indian Council of Medical Research, New Delhi
- National Ethical Guidelines for Bio-Medical Research Involving Children by Indian Council of Medical Research, New Delhi
- Orlikoff, R.F., Schiavetti, N., & Metz, D. E. (2014). *Evaluating research in communication disorders.* USA: Pearson Education.
- Meline, T., (2009). *A research primer for communication sciences and disorders.* USA: Pearson Education.
- Miles, J., & Gilbert, P. (Eds.). (2005). *A handbook of research methods for clinical and health psychology*. Oxford University Press on Demand.
- Maxwell, D. L., & Satake, E. (2006). *Research and statistical methods in communication sciences and disorders.* San Diego: Singular Publishing.
- Carter, R., &Lubinsky, J. (2016). *Rehabilitation research: Principles and applications.* Elsevier.
- Reinard, J. C. (2006). *Communication research statistics.* SAGE Publications
- Pring, T. (2005). *Research methods in communication disorders.* Wiley
- Doehring, D. G. (2002). Research strategies in human communication disorders. Pro-Ed.
- Johnson, C. E., & Danhauer, J. L. (2002). *Handbook of outcomes measurement in audiology.* San Diego: Singular Publishing.

Course Title: Clinicals in Speech-Language Pathology -1   Marks: 100

Course Number	Course Code	Course category	Course Title	Lecture (L)	Clinical Training (CT)	Research Project (RP)/ Dissertation	Total Credits	Total Hours/Marks
6	PSL18CR106	Clinical Rotation CR1	**Clinicals in Speech-Language Pathology - 1**	-	5		**5**	225/100

Note: Clinical practicum for CR-1 will be based on the sub-specialty clinics attended the students. The practicum is listed at the end of the syllabus.

Course Title: Research Seminar -1   **Marks**:100

Course Number	Course Code	Course category	Course Title	Lecture (L)	Clinical Training (CT)	Research Project	Total Credits	Total Hours/Marks
7	PSL18RP107	Research Project RP1	**Research Seminar -1**	-	-	**2**	**2**	60/ 100

Learning objectives	Learning outcomes
The objectives of the course in conjunction with the course on research methods, epidemiology and statistics are to: a) learn to perform a literature research in a broad area of research b) learn to critically evaluate a research article c) appraise on issues related to ethics in research on human participants d) learn about functioning of institutional ethics committee and review process of proposals.	At the end of the course the student will be able a) to identify a research question within a broad research theme b) submit a summary of literature related to broad area of research

COURSE PLAN:

1. Identify a Research Theme

2. Identify an Advisor and get approval

3. Perform a review of literature in the area of the research theme and write an annotated bibliography

4. Formulate hypotheses or research question

5. Complete online learning related to ethics in research on human subjects covering topics included but not restricted to:
   - History and ethics of human subject research
   - Social and behavioral research
   - Basic Institutional Review Board (IRB) Regulations and Review process
   - Informed consent
   - Populations in research requiring additional considerations and/or protection
   - Vulnerable subjects – Research involving children
   - Conflict of Interest in research involving human subjects
   - Records–based research

The above course plan will be transacted by students individually with their research advisors. The internal assessment for the course will be based on brief review of literature/annotated bibliography submitted by the student.

Course content

Semester II

Course Title: Advances in Speech Sound Disorders   Marks – 100

Course Number	Course Code	Course category	Course Title	Lecture (L)	Clinical Training (CT)	Research Project (RP)/ Dissertation	Total Credits	Total Hours/Marks
8	PSL18CT201	Core Theory CT4	**Advances in Speech Sound Disorders**	4	-	-	4	60/ 100

Learning Objectives	Learning outcomes
The objectives of the course are to provide knowledge on: a) current theoretical concepts on development of phonology and classification of speech sound disorders b) recent comprehensive assessment of phonological normal aspects of phonology in assessment and management of phonological disorders. c) learn about the process in diagnosing and planning intervention in individuals with congenital orofacial anomalies	At the end of the course, the student will be able to: a) Analyze recent theories and concepts related to phonological development and its disorders, b) discuss comprehensive evidence-based assessment for children with speech sound disorders c) develop an evidence-based intervention plan for children with speech sound disorders, c) provide comprehensive care including speech therapy for persons with CLP as a member of the cleft palate team.

Unit	Syllabus
UNIT I:	**Speech sound development and disorders** a) Current concepts in taxonomy of speech sound disorders in children b) Recent concepts in theories of phonological development: Generative phonology, non-linear phonology, optimality theory c) Application of phonological theories in evaluation and management of phonological disorders d) Co-articulation – Types (anticipatory, carryover); Models of co-articulation - feature based, syllabic, allophonic, target, physiological and degree of articulatory constriction models); Physiological / Acoustical / Perceptual studies in co-articulation
UNIT II:	**Assessment of speech sound disorders** a) Comprehensive phonological assessment procedures – Formal and informal; Independent and relational analyses; dynamic assessment b) Assessment of phonological awareness and phonological processing in children with speech sound disorders c) Critical appraisal of test material in Indian context - Specific issues in phonological assessment in multilingual environments d) Determining need for intervention and intervention decisions

UNIT III:	**Management of children with speech sound disorders**
	a) Evidence based approaches to intervention – motor-based approaches, linguistic based approaches; use of non-speech oro-motor activities; review of research evidence for intervention approaches
	b) Motor learning principles – applications to intervention of speech sound disorders
	c) Considerations in intervention: selection of target; methods to measure clinical change and determining progress in therapy and generalization; intensity of intervention
	d) Specific considerations in phonological intervention within multilingual contexts.
	e) Use of software applications (mobile apps) in intervention; Use of tele-health for intervention of speech sound disorders
UNIT IV:	**Cleft lip and palate**
	a) Phonological development in children with CLP
	b) Velopharyngeal closure- normal physiology, parameters affecting velopharyngeal closure and nature of velopharyngeal dysfunction in individuals with CLP
	c) Perceptual assessment protocols for speech characteristics in children with repaired CLP
	d) Instrumental assessment of velopharyngeal closure- Imaging techniques, acoustic measurements, aerodynamic measurements
UNIT V:	**Management of individuals with CLP**
	a) Surgical and prosthodontic management in CLP.
	b) Early intervention for children with CLP – Methods and studies related to efficacy of treatment for speech and language
	c) Current evidence-based approaches for corrections of errors in articulation in individuals with CLP
	d) Current evidence-based approaches for management of resonance in individuals with velopharyngeal dysfunction

Recommended Reading

- Vasanta, D. (2014). *Clinical applications of phonetics and phonology*. ISHA Monograph.Vol 14, No. 1. Indian Speech & Hearing Association.
- Bowen, C. (2014). *Children's speech sound disorders*. John Wiley & Sons.
- Dodd, B. (2013). *Differential diagnosis and treatment of children with speech disorder* (2nd Ed). NJ: Wiley.
- Peterson-Falzone, S. J., Hardin-Jones, M. A., & Karnell, M. P. (2001). *Cleft palate speech* (4th Edition). St. Louis: Mosby.
- Shprintzen, R. J., & Bardach, J. (1995). *Cleft palate speech management: A multidisciplinary approach*. St. Louis: Mosby.
- Rvachew, S., & Brosseau-Lapré, F. (2012). *Developmental phonological disorders: Foundations of clinical practice*. San Diego: Plural Publishing.
- Paul, R., & Flipsen Jr, P. (2009). *Speech sound disorders in children: In honor of Lawrence D. Shriberg*. San Diego: Plural Publishing.
- Velleman, S. (2016). *Speech sound disorders*. LWW publishers.
- Williams, A., McLeod, S., & McCauley, R. (2010). *Interventions for speech sound disorders in children.* Baltimore: Brookes.
- Bernthal, J.E., Bankson, N.W., & Flipsen, P. (2013). *Articulation and phonological disorders* (7th Ed.). Boston, MA: Pearson.

Course Title: Voice: Science and Disorders   Marks – 100

Course Number	Course Code	Course category	Course Title	Lecture (L)	Clinical Training (CT)	Research Project (RP)/ Dissertation	Total Credits	Total Hours/Marks
9	PSL18CT202	Core Theory CT5	**Voice Science and Disorders**	4	-	-	**4**	60/100

Learning Objectives	Learning outcomes
The objectives of the course are to provide knowledge on: a) the biomechanics of voice production and role of systems involved in voice production b) the principles and methods in the assessment and management of voice disorders c) the voice needs of professional voice users and issues related to assessment of management of voice concerns among them, d) different service delivery models and procedures to run a voice clinic	At the end of the course, the student will be able to: a) discuss the bio-mechanics of voice production in normal individuals and in those with voice disorders, b) explain and assess the roles of breathing mechanism, vocal fold vibration, vocal tract resonance and enunciation in voice production, c) delineate the roles and responsibilities of an SLP in a trans-disciplinary (medical) team to assess and treat voice disorders in children, adults, geriatrics and specific population including professional voice users, and d) appraise different service delivery models and procedures to run a voice clinic

Unit	Syllabus
UNIT I:	**Voice science** a) Vocology – scope and objectives b) Breathing and voicing: lungs and airways, breathing mechanism as an interactive sound generating system: breathing oscillator & valving oscillator, combining the breathing and valving oscillators with voicing c) Vocal folds and voice: Biology of vocal fold tissue and lamina propria, muscular properties and vocal behaviours, biomechanics and voice control/modulation, voice fatigue, vocal injury and recovery, wound healing d) Resonance and voice: concepts of acoustic impedance, reactance, inertance, and compliance, acoustic impedance of the vocal tract, the effect of vocal tract reactance on self-sustained vocal fold oscillation, idealized vocal tract shapes and voice quality, modulating phonation with articulation and prosody
UNIT II:	**Voice assessment and voice disorders** a) Vocometry: assessing vocal ability: principles, methods and procedures: General assessment principles, evaluation procedures, tools of measurement, purpose of measurement, measurement scales, auditory perceptual evaluation- speech

	breathing, voice quality, resonance, and overview of instrumentation for voice assessment: visualization techniques, acoustic analysis, aerodynamic analysis, glottography, nasometry and electromyography
	b) Voice disorders: issues in definition, incidence and prevalence, occupational risks and voice disorders
	c) Classification of voice pathologies, characteristics and pathophysiology: Structural, neuropathologic, idiopathic, functional/behavioral - pathologies related to mechanical stress, tissue elasticity, fluid transport, airway environment and abnormal muscle activation
	d) Voice disorders in specific populations: pediatric voice disorders, aging voice, professional voice, vocal cord dysfunction/paradoxical vocal fold motion, transgender and trans-sexual voice
UNIT III:	**Voice habilitation**
	a) Voice management team, roles and functions
	b) Pharmacological and surgical effects on voice: Current trend in medical and surgical management: Medications for bacterial and other infections, allergies, edema, pain, asthma, cough, gastric and laryngopharyngeal reflux, stage fright, spasmodic dysphonia, mood conditions, sleep disturbance, hormone imbalances, etc. Voice surgeries – pre-operative and post-operative care and precautions
	c) Voice habilitation: Current views and approaches; EBP for voice and its disorders; Voice therapy methods for children and adults.
	d) Voice exercise principles and procedures: Physiological voice therapy methods Vs. Behavioral voice therapy methods, role of vocal hygiene and voice rest, basics of exercise physiology, general principles, types of exercises, exercise prescription and progress, vocal exercise techniques – vocal function exercises, resonant voice exercise, confidential voice therapy, and other voice exercises including psychological approaches, relapse and restoration
	e) Habilitation of persons with laryngectomy: Speech, surgical, radiological and medical considerations in laryngectomy, voice restoration in laryngectomees, counseling and quality of life
UNIT IV:	**Voice needs and problems in professional voice users**
	a) Vocal professionals and voice disorders: classification, pathologies affecting voice – frequency, personal and social impacts, occupational hazards and issues, nature of voice problems: repetitive strain injuries, acute injuries and chronic problems – presentation, assessment and treatment
	b) Laryngeal rest, modified voice rest/conservative voice use, vocal hygiene; laryngeal rest versus exercise: effects on wound healing, general wound healing processes
	c) Voice habilitation for singers and other elite vocal users: Demands on voice, nature of vocal training and use, voice fatigue and assessment, basic principles of motor learning, awareness training, and vocal exercises, concept of professional voice care team – role of medical and non-medical team players
	d) Voice habilitation for teachers: voice problems in teachers: nature and manifestation, use of voice in classroom and factors influencing, vocal loading and assessment, vocal fatigue, techniques to improve the speaking voice and delivery, voice projection techniques, vocal education and counseling
UNIT V:	**Service delivery and other professional issues**
	a) Scope of practice in the area of voice – training in endoscopy, documentation, telepractice – trends across globe and in India (practice guidelines, technical reports, position statements, knowledge and skills document relevant to voice as per RCI, ASHA, European Laryngologiocal Society, and other relevant professional/statutory body). Issues in adopting and implementing the same in India.
	b) Patient compliance and concordance to voice management: Relevance of voice problems/voice problems as a public health concern, measuring severity of voice condition, measurement of compliance to management options, treatment variables and effects, patient-clinician interactions, socio cultural and economic considerations

	c) Voice clinics: SLP led clinics Vs. SLP in a medical team, space and other infrastructural requirements, specialty clinics considering needs of specific population such as singers, transgenders, transsexuals, non-native speakers, broadcasters, etc d) Research and ethics in clinical practice: overview of basic and applied research in voice, ethics in clinical research, informed consent, clinical trials, methods to popularize services- roles of associations, conferences, working groups, awareness movements/drives like world voice day, camps, public awareness programs, role of media, prevention of voice problems.

Recommended Reading

- Stemple, J. C., Glaze, L. E., & Gerdeman, B. K. (2014). *Clinical voice pathology: Theory & management* (5th Ed.). San Diego: Plural Publishers.
- Johnson, A. F., & Jacobson, B. H. (2017). *Medical speech-language pathology: A practitioner's guide.* (3rd Ed). Thieme.
- American Speech-Language- Hearing Association. (2004a). Vocal tract visualization and imaging: Position statement. Available from www.asha.org/policy.
- American Speech-Language- Hearing Association. (2004b). Vocal tract visualization and imaging: Technical report. Available from www.asha.org/policy.
- Scope of practice document – SLPA (2015) – Rehabilitation Council of India
- Behrman, A. (2013). *Speech & voice science.* (2nd Ed.). San Diego: Plural publishing.
- Hixon, T. J., Weismer, G., & Hoit, J. D. (2014). *Preclinical speech science: Anatomy, physiology, acoustics, perception* (2nd Ed.). San Diego: Plural publishers.
- Titze, I. R., & Verdolini A, K. (2012). *Vocology: The science and practice of voice habilitation.* Salt Lake City: National Center for Voice and Speech.
- Sapienza, C.M., & Ruddy, B. H. (2013). Voice Disorders. (2nd Ed.). San Diego: Plural publishers.
- Sataloff, R. T. (2006). *Vocal health & pedagogy: Advanced assessment and treatment.* Vol. II. (2nd Ed.). San Diego: Plural Publishing.
- Sataloff, R. T. (2006). *Vocal health & pedagogy: Science and assessment.* Vol. I. (2nd Ed.). San Diego: Plural Publishing.
- Sataloff, R. T. (2005). *Voice science.* San Diego: Plural publishers.

Course Title: Disorders of Fluency   Marks – 100

Course Number	Course Code	Course category	Course Title	Lecture (L)	Clinical Training (CT)	Research Project (RP)/ Dissertation	Total Credits	Total Hours/Marks
10	PSL18CT203	Core Theory CT6	**Disorders of Fluency**	4	-	-	**4**	60/100

Learning Objectives	Learning outcomes
The objectives of the course are to provide knowledge on: a) recent updates related to development of fluency and theoretical concepts related to stuttering b) etiologies and characteristics of different types of fluency disorders c) recent updates in comprehensive assessment of fluency disorders leading to differential diagnosis d) approaches to management of fluency disorders with appraisal of research evidence on the same.	At the end of the course, the student will be able to: a) analyze the current theoretical concepts on nature of stuttering and other fluency disorders b) discuss the assessment and differential diagnosis of children and adults with fluency disorders, c) develop an evidenced -base management plan for children and adults with fluency disorders d) counsel the clinical clientele, their family members and community members for effective management

Unit	Syllabus
UNIT I:	**Overview of fluency and theoretical concepts related to stuttering** a) Dimensions of fluency disorders- recent advances b) Development of fluent speech: Factors affecting fluency of speech c) Theories of stuttering - linguistic, articulatory, audiological, laryngeal and genetic predisposition d) Neuro anatomical, neuro-physiological bases of fluency disorders e) Cortical activation patterns in stuttering - a neuromotor problem f) Stuttering as a timing disorder; feedback and feed-forward models of stuttering.
UNIT II:	**Different types of fluency disorders** a) Normal non-fluency and developmental stuttering b) Cluttering- characteristics and etiologies c) Neurogenic stuttering – characteristics and etiologies d) Psychogenic and other types of fluency disorders e) Stuttering as a co-morbid condition in children and adults

UNIT III:	**Assessment of fluency disorders in children and adults**
	a) Objective tools for assessment of fluency and its disorders
	b) Subjective and perceptual assessment of fluency disorders; self-rating and quality of life assessment.
	c) Electrophysiology in the evaluation of fluency disorders
	d) Functional radiological studies of stuttering
	e) Cognitive dimension of stuttering
	f) Differential diagnosis
UNIT IV:	**Management of fluency disorders in children and adults**
	a) General principles of therapy; skill training
	b) Current evidenced based- approaches to management of different fluency disorders
	c) Group therapy
	d) Input from allied professionals in the management of fluency disorders
	e) Behavioral and work-place management
	f) Counseling - including parents and teachers
UNIT V:	**Recovery and related issues on intervention**
	a) Relapse and spontaneous recovery pattern in fluency disorders
	b) Efficacy and outcome measures of fluency therapy
	c) Tele-practice for delivery of intervention; use of technology in assessment and management
	d) Self-help and advocacy groups
	e) Bilingualism / multilingualism relating to stuttering and cultural sensitivity
	f) Ethics in research and management of stuttering

Recommended Reading

- Logan, K.J. (2014). *Fluency disorders.* San Diego: Plural Publishing.
- Guitar, B. (2013). *Stuttering: An integrated approach to its nature and treatment.* (3rd Ed). Lippincott: Williams & Wilkins.
- Logan, R. (1999). *The three dimensions of stuttering: Neurology, behaviour and emotion.* (2nd Ed). Wiley-Blackwell
- Shames, G.H., & Rubin, H. (1986). *Stuttering: Then and now.* Merril Publishing
- Maassen, B., & Van Lieshout, P. (Eds.). (2010). *Speech motor control: New developments in basic and applied research.* Oxford University Press.
- Bloodstein, O., & Ratner, N. B. (2008). *A handbook on stuttering* (6th Ed). Clifton Park, NY: Thomson Demer Learning.
- Conture, E., Curlee, R., & Rrichard, F. (2007). *Stuttering and related disorders of fluency.* (3rd Ed). N Y: Thieme Publishers.
- Manning, W. H. (2010). *Clinical decision making in fluency disorders.* (3rd Ed). NY: Delmer Language Learning
- Myers, (1992): *Cluttering.* Kibworth: Far Communication.
- Onslow, M., & Packman, A. (1999). *The handbook of early stuttering intervention.* USA: Singular Publishing.
- Peters, H.F.M. and others (Ed.) :(1991). *Speech motor control and stuttering.* Amsterdam: Excerpta medicals.
- Rustin, L. and others (1996). *Assessment and therapy for young dysfluent children.* London: Whurr Publishers.
- Webster, R. L. (2014). *From stuttering to fluent speech, 6300 cases later: Unlocking muscle mischief create space.* South Carolina: Independent Publishing Platform.

Course Title: Language Disorders in Children   Marks – 100

Course Number	Course Code	Course category	Course Title	Lecture (L)	Clinical Training (CT)	Research Project (RP)/ Dissertation	Total Credits	Total Hours/Marks
11	PSL18CT204	Core Theory CT7	**Language Disorders in Children**	4	-	-	**4**	60/ 100

Learning Objectives	Learning outcomes
The objectives of the course are to provide knowledge on: a) current concepts related to language disorders and their etiologies among children during birth-preschool years. b) recent methods in assessment and differential diagnosis of child language disorders c) different intervention approaches for children with language disorders and critical appraisal of research evidence for intervention approaches.	At the end of the course, the student will be able to: a) discuss recent concepts related to classification, characteristics and etiology of child language disorders in young children. b) conduct evidence-based assessments (formal and informal) and differentially diagnose various language disorders in children c) apply evidence-based strategies and approaches to management of language disorders in children

Unit	Syllabus
UNIT I:	**Language Acquisition, classification and assessment of language Disorders** a) Theories of language acquisition - biological maturation, linguistic, cognitive, information processing and social theory; critically evaluate implications of theories for assessment and intervention b) Classification of language disorders: Primary language impairment, language impairment secondary to cognitive/ sensory and/ other related disorders c) Recent trends in the assessment of children with language disorders – static and dynamic assessment; methods of observation and interpreting informal assessment, critical evaluation of procedures d) Age specific assessment protocols and content: pre-linguistic period, emerging language, developing language e) Global and Indian scenario with reference to assessment of bi/multilingualism, linguistically and culturally diverse children
UNIT II:	**Primary language impairment and other language disorders in children** a) Primary language impairment: Different terminologies (Specific language impairment/Mixed receptive and expressive language disorder/Language impairment etc.); Incidence and prevalence; etiologies; defining characteristics b) Intellectual disability- incidence, prevalence; relationship between cognition and language c) Language impairment resulting from other conditions: Genetic and chromosomal abnormalities (syndromes related to language disorders); prematurity and low-birth-weight; prenatal exposure to alcohol and others; sensory impairments (visual and hearing impairment); neglected, abused children, etc.

	d) Acquired language disorders: causes; incidence and prevalence of acquired language disorders; defining characteristics- cognitive-communication deficits e) Intervention approaches- Focused stimulation, enhanced milieu teaching, prelinguistic milieu teaching, conversational recast training, sentence combining, and other specific interventions for language impairment – research evidence for different approaches.
UNIT III:	**Autism Spectrum Disorders (ASD)** a) Defining characteristics as per different classification system (ICD10; DSM V), incidence and prevalence of ASD, warning signs, etiology b) Symbolic abilities; social aspects of communication, theory of mind c) Language outcome among children with ASD d) Co-morbid conditions e) Assessment and diagnosis of ASD - norm-referenced and criterion referenced tools; specific checklists and informal assessment tools used in India (ISAA, INCELN tool etc.) f) Prognosis and intervention – applied behavioral analysis, peer mediated interactions, floor time/developmental individual difference relationship-based model, social-communication, emotional regulations abilities and transactional supports, responsive teaching, relationship development intervention, Hanen approach, Treatment And Education of Autistic and Related Communication Handicapped Children, Picture exchange communication system, Com-DEALL, SCERTS approach, and diet management; review of evidence-base for different interventions
UNIT IV:	**Attention Deficit Hyperactivity Disorder** a) Defining characteristics as per different classification system (ICD10; DSM V), incidence and prevalence of ADHD, warning signs, etiology, b) Relationship of attention and executive functions to language acquisition and use c) Language outcomes among children with ASD d) Co morbid conditions and adolescents with ADHD e) Assessment and diagnosis of ADHD - norm-referenced and criterion referenced tools; specific checklists and informal assessment tools used in India f) Treatment of ADHD- areas of treatment – communication deficits, academic issues, memory deficits, behavioral, medical and social issues
UNIT V:	**General consideration in the assessment and management** a) Critical review of developmental scales, norm- and criterion-referenced tools for language development for Indian population; comparison with Western test materials b) Response-to-Intervention in child language disorders c) Team approach to assessment and management d) Presence of co morbid features like swallowing / apraxia etc. and their assessment e) Parent empowerment/ parent implemented intervention for language delay/disorders f) Use of AAC in the management of child language disorders

Recommended Reading

- Kaderavek, J. N. (2015). *Language disorders in children: Fundamental concepts of assessment and intervention.* (2nd Ed). USA: Pearson Education Inc.
- Paul, R. & Norbury, C. (2012). *Language disorders from infancy through adolescence: Listening, speaking, reading, writing, and communicating.* (4th Ed.). St. Louis, MO: Elsevier.
- Owens, J. R., Metz, D.E., & Farinella, K.A. (2011). *Introduction to communication disorders - A lifespan evidence-based perspective.* Upper Saddle River; NJ: Pearson Education Inc.
- Nelson, N. W. (1998). *Childhood language disorders in context: Infancy through adolescence.* (2nd Ed). USA: Allyn & Bacon Inc.

- Dwight, D.M., (2014). *Here's how to do therapy: Hands-on core skills in speech-language pathology.* San Diego: Plural Publishing
- Hegde, M. N., & Davis, D. (2009). *Clinical methods and practicum in speech-language pathology.* Nelson Education
- Bhatia, T. K. & Ritchie, W. C. (2014). *Handbook of bilingualism and multilingualism.* (2nd Ed). East Sussex: Wiley Blackwell.
- Gregg, N. (2009). *Adolescence & adults with learning disabilities and ADHD - Assessment and accommodation.* New York: Guilford Publications, Inc.
- Vinson, P.B (2012). *Language disorders across life span.* Delmar: Cengage learning.

Course Title: Language and Literacy Disorders   Marks - 100

Course Number	Course Code	Course category	Course Title	Lecture (L)	Clinical Training (CT)	Research Project (RP)/ Dissertation	Total Credits	Total Hours/Marks
12	PSL18CT205	Core Theory CT8	**Language and Literacy Disorders**	4	-	-	**4**	60/100

Learning Objectives	Learning outcomes
The objectives of the course are to provide knowledge on: a) general concepts related to reading and writing and their relation to oral language skills. b) the characteristics of disorders related to language and literacy in school-age children. c) methods of screening and specific diagnostic assessment methods for assessment language and literacy in preschool and school-age. d) intervention strategies for language and literacy disorders in school-age children.	At the end of the course, the student will be able to: a) discuss relationship between oral language and development of reading and writing b) identify characteristics of language and literacy disorders in school-age children c) discuss methods of screening and specific diagnostic assessments for language and literacy skills in preschool and school-age children. d) plan evidence-based intervention strategies for literacy in preschool and school years and language in school years

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

UNIT II:	**Disorders related to language and literacy**
	a) Definition and differences among underachievement in school, learning disability, reading disability, dyslexia, dysgraphia, dyscalculia, language learning disability, language impairment/ specific language impairment; DSM V and ICD 10 classifications; challenges in use of classifications.
	b) Language characteristics of students with reading/language/learning disabilities
	c) Issues related to co-morbidity and overlap among phonological disorders, primary language impairment/specific language impairment, reading disability and auditory processing disorders
	d) Genetics of literacy disorders (family risk, molecular genetics etc.).
UNIT III:	**Assessment**
	a) Screening of children for language disorders in schools; formal tests to assess language (English and other languages) in children in school (5-18 years)
	b) Other forms of assessments to identify children with language/learning disabilities in school - Criterion referenced assessments, language sampling, portfolio, dynamic assessment, curriculum-based assessment etc.
	c) Specific assessment tools for learning disability in India (e.g., NIMHANS battery, Dyslexia Assessment for Languages in India and other published tests)
	d) Informal assessment of different domains – Tasks and stimuli in specific languages for phonological awareness, orthographic skills, phonological processing, oral language skills etc.
	e) Brief overview of assessment of associated areas (auditory processing, visual processing, memory etc.)
UNIT IV:	**Evidence based intervention for language and literacy**
	a) Approaches to promote emergent literacy, decoding and early reading skills
	b) Interventions to promote language-for-learning in school
	c) Approaches to promote development of reading comprehension
	d) Intervention to promote spelling and written language output
	e) Research on cross-linguistics issues in intervention; intervention for children with Bilingual / multilingual background and reading intervention
UNIT V:	**Issues related to Service Delivery and Related Laws/Policies**
	a) Modes of service delivery for school-aged children (clinical, consultative, collaborative, language-based classroom, peer-mediated)
	b) Team members working children with literacy disorders; Response to Intervention– tiers and their role in instruction for poor readers; role of SLP in Response to Intervention
	c) Acts, regulations and policies relevant to education and children with special needs in India (e.g., Right to Education Act, Sarva Siksha Abhiyan, regulations related to language exemption in examination, National Open School system).
	d) Dyslexia associations/groups in India

Recommended Reading

- Paul, R. & Norbury, C. (2012). *Language disorders from infancy through adolescence: Listening, speaking, reading, writing, and communicating* (4th Ed.). St. Louis, MO: Elsevier.
- Justice, L. M. (2006). *Clinical approaches to emergent literacy intervention*. San Diego: Plural Publishing.
- Burrows, C., Marinac, J. V., & Pitty, K. (2009). *Phonological awareness training for high schools* (PATHS). San Diego: Plural Publishing.
- Nag, S., & Snowling, M. J. (2012). *School underachievement and specific learning difficulties. IACAPAP e-Textbook of Child and Adolescent Mental Health. Geneva: International Association for Children and Adolescent Psychiatry and Allied Professions.*
- Cabell, S. Q., Juctice, L. M., Kadeverek, J., Pence, K. L., & Breit-Smith, A. (2008*). Emergent literacy lessons for success.* San Diego: Plural Publishing.

- Pence, K. L. (2007). *Assessment in emergent literacy*. San Diego: Plural Publishing.
- van Kleeck, A. (2007). *Sharing books and stories to promote language and literacy. San* Diego: Plural Publishing.
- Goldsworthy, C. L., & Lambert, K. (2010). *Linking the strands of language and literacy: A resource manual*. San Diego: Plural Publishing.
- Kamara, C. A. (2015). *Neurolinguistic approach to reading: A guide for speech-language pathologists treating dyslexia*. San Diego**:** Plural Publishing.

- Hulme, C., & Snowling, M. J. (2009). *Developmental disorders of language learning and cognition*. John Wiley & Sons.
- Carroll, J. M., Bowyer-Crane, C., Duff, F. J., Hulme, C., & Snowling, M. J. (2011). *Developing language and literacy: Effective intervention in the early years*. John Wiley & Sons.
- C. A. Stone, E. R. Silliman, B. J. Ehren, & G. P. Wallach (Eds.), (2016). *Handbook of language and literacy: Development and disorders* (2nd ed.), pp. 339-357. New York, NY: Guilford Press.
- Clarke, P. J., Truelove, E., Hulme, C., & Snowling, M. J. (2013). *Developing reading comprehension*. John Wiley & Sons.
- Turnbull, K. L. P., & Justice, L. M. (2011). *Language development from theory to practice*. USA: Pearson Higher Ed.
- Cabell, S. Q., Justice, L. M., Kaderavek, J., Pence, K. L., & Breit-Smith, A. (2008). *Emergent literacy: Lessons for success*. San Diego: Plural Publishing.

Course Title: Clinicals in Speech-Language Pathology -2   Marks: 100

Course Number	Course Code	Course category	Course Title	Lecture (L)	Clinical Training (CT)	Research Project (RP)/ Dissertation	Total Credits	Total Hours/Marks
13	PSL18CR206	Clinical Rotation CR2	**Clinicals in Speech-Language Pathology -2**	-	5		**5**	225/ 100

Note: Clinical practicum for CR-2 will be based on the sub-specialty clinics attended the students. The practicum is listed at the end of the syllabus.

Course Title: Research Seminar - 2   Marks:100

Course Number	Course Code	Course category	Course Title	Lecture (L)	Clinical Training (CT)	Research Project (RP)/ Dissertation	Total Credits	Total Hours/Marks
14	PSL18RP207	Research Project RP2	**Research Seminar - 2**	-	-	**2**	**2**	60/ 100

Learning objectives	Learning outcomes
The objectives of the course in conjunction with the course on research methods, epidemiology and statistics are to: a) become familiar with components of a research proposal b) understand details of scientific writing	At the end of the course the student will be able a) write a research proposal in the prescribed format b) submit research proposal to the IEC for approval

Course Plan

1. Develop a hypothesis or a research question in an identified area of research

2. Write a research proposal and submit to your advisor

3. Make a presentation of the research proposal in the department

4. Submit the research proposal with necessary documentation to the Institutional Ethics Committee for approval; obtain approval from the IEC.

The above course plan will be transacted by students individually with their research advisors. The internal assessment for the course will be conducted by the advisor based on the written research proposal, presentation of the research proposal and submission to the IEC.

Semester III
Content

Course Title: Neurogenic Speech Disorders   Marks – 100

Course Number	Course Code	Course category	Course Title	Lecture (L)	Clinical Training (CT)	Research Project (RP)/ Dissertation	Total Credits	Total Hours/Marks
15	PSL18CT301	Core Theory CT9	**Neurogenic Speech Disorders**	4	-	-	**4**	60/100

Learning Objectives	Learning outcomes
The objectives of the course are to provide knowledge on: a) the neuroanatomical and physiological correlates of speech motor control. b) assessment procedures for different aspects of speech in children and adults with motor speech disorders. c) therapy principles and approaches to intervention of speech among children and adults with motor speech disorders including appraisal of research evidence for the different approaches	At the end of the course, the student will be able to: a) apply models of speech motor control and explain neurogenic speech disorders in children and adults b) discuss assessments of different components of speech leading to differential diagnosis of motor speech disorders in children and adults c) develop an evidence-based intervention plan for children and adults with motor speech disorders.

Unit	Syllabus
UNIT I:	**Neuroanatomical and physiological substrates and models of speech motor control** a) Review of neuroanatomical substrates of speech motor control- motor and sensory cortex, subcortical, cerebellar and brain stem structures and their pathways; cranial nerves and peripheral nervous system, types of mechanoreceptors and their topography in speech b) Early models of speech motor control: Closed Loop, Open Loop, Associative Chain and Serial Order Model, Schema Theory, Task Dynamic Model, Mackay's Model, Gracco's Model; Recent models of speech motor control: DIVA Model c) Other speech motor control models related to development of speech motor control in children d) Application of models of speech motor control to motor speech disorders in children and adults. e) Age related changes in speech motor control

UNIT II:	**Assessment and management of dysarthria in adults**
	a) Perceptual methods: Rating scales and tests for speech parameters, prosody, speech intelligibility, comprehensibility and naturalness.
	b) Recent advances in use of aerodynamic and acoustic analysis of speech among persons with dysarthria
	c) Other physiological analyses of speech subsystems in persons with dysarthria
	d) Behavioural approaches for treatment of speech subsystems affected in persons with dysarthria
	e) Evidence based practice guidelines for management of dysarthria in adults
UNIT III:	**Assessment and management of dysarthria in children**
	a) Behavioral approaches to correct posture, tone, and strength and sensori-motor treatment techniques
	b) Specific behavioral approaches in developmental dysarthria: McDonald's Approach and Hardy's Approach
	c) Application of facilitatory approaches (neurodevelopmental approach and methods for reflex inhibition) in the management of developmental dysarthria's– evidence base for facilitatory approaches
UNIT IV:	**Assessment and management of apraxia of speech (AOS) in adults**
	a) Assessment for suspected apraxia of speech, apraxia of speech and non-speech apraxia: Perceptual assessment protocols; physiological assessment of speech in adults with AOS
	b) Intervention methods for non-verbal apraxia's
	c) Intervention for AOS in adults: specific, programmed and nonspecific approaches – Evidence based practice
	d) Motor learning principles – applications in intervention of AOS
UNIT V:	**Assessment and management of childhood apraxia of speech (CAS)**
	a) Current status of nature of CAS as primary disorder and CAS as co-morbid condition in other neurodevelopmental disorders
	b) Assessment protocols for CAS and differential diagnosis from other speech sound disorders
	c) Current evidenced based intervention approaches for CAS
	d) Motor learning principles – applications in intervention of CAS

Recommended Reading

- Duffy, J. R. (2013). *Motor Speech Disorders: Substrates, differential diagnosis, and management. (*3rd Ed.). Michigan: Mosby.
- Maassen, B., Kent, R., Peters, H., Lieshout, P.V., & Hulstijn, W. (Eds.) (2009). *Speech motor control in normal and disordered speech.* NY: Oxford University Press.
- Maassen, B., & Lieshout, P. V. (Eds.) (2010). *Speech motor control: New developments in basic and applied research.* NY: Oxford University Press.
- Weismer, G. (2007). *Motor speech disorders: Essays for Ray Kent.* San Diego: Plural Publishing.
- Netsell, R. (1991). *A neurobiologic view of speech production and the dysarthrias.* SanDiego: Singular Publishing.
- LaPointe , L. L., & Murdoch, B.E. (2013). *Movement disorders in neurologic disease: Effects on communication and swallowing.* San Diego: Plural Publishing.
- Lowit, A., & Kent, R. D. (2010). *Assessment of motor speech disorders.* San Diego: Plural Publishing.
- Fish, M. (2015). *Here's how to treat childhood apraxia of speech.* (2nd Edition). San Diego: Plural Publishing.
- 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.
- Burda, A. N. (2011). *Communication and swallowing changes in healthy aging adults.* Chapter 7 & 8. MA: Jones & Barlett Learning.

- Murdoch, B. E. (2010). *Acquired speech and language disorders: A neuroanatomical and functional neurological approach* (2nd Ed.). New Delhi, India: John Wiley.
- Guenther F. H., & Perkell, J. S. (2004). *A neural model of speech production and its application to studies of the role of auditory feedback in speech*. UK: Oxford University Press.
- McNeil, M. R. (2008). *Clinical management of sensorimotor speech disorders* (2nd Ed.). New York, NY, Thieme.
- Perkell, J. S., & Nelson, W.L. Sensorimotor Control of Speech Production: Models and Data. Cambridge, Massachusetts Institute of Technology.
- Caruso. A. C., & Strand, E. A. (1999). *Clinical management of motor speech disorders in children.* New York. Thieme.
- Crary. M. A. (1993). *Developmental motor speech disorders.* San Diego: Singular Publishing.
- Dodd, B. (2005). *Differential diagnosis and treatment of children with speech disorders.* London: Whurr Publishers.
- Halpern, H., & Goldfarb, R. (2013). *Language and motor speech disorders in adults* (3rd Ed.). Chapters 8 and 9. MA: Jones & Barlett Learning.
- Love. R. J. (2000). *Childhood motor speech disability.* (2nd Ed.). USA, Allyn & Bacon.
- Manasco, M. H. (2014). *Introduction to neurogenic communication disorders.* MA: Jones & Barlett Learning.

Course Title: Dysphagia   Marks – 100

Course Number	Course Code	Course category	Course Title	Lecture (L)	Clinical Training (CT)	Research Project (RP)/ Dissertation	Total Credits	Total Hours/Marks
16	PSL18CT302	Core Theory CT10	**Dysphagia**	4	-	-	**4**	60/ 100

Learning objectives	Learning outcomes
The objectives of the course are to provide knowledge on: a) the neuroanatomical and neurophysiological bases of normal and abnormal swallowing in children and adults, b) the methods of assessment of swallowing disorders across the lifespan as a member of a trans-disciplinary team c) intervention approaches for feeding and swallowing disorders across the lifespan and appraisal of research evidence for the different approaches. d) different service delivery models for intervention and ethical, cultural and professional considerations in assessment and management of dysphagia.	At the end of the course, the student will be able to a) discuss the neuroanatomical and neurophysiological bases of normal and abnormal swallowing b) delineate the roles and responsibilities of an SLP in a trans-disciplinary team to assess and treat swallowing disorders in infants, children, adults and geriatrics in multiple work settings. c) discuss evidence-based assessment for swallowing across the lifespan. d) develop management plan for swallowing disorders in the context of different service delivery models

Unit	Syllabus
UNIT I:	**Neuroanatomical and neurophysiological bases of swallowing** a) Structures involved in three phases of swallow and peripheral nervous system control of mastication and swallowing (anatomy & physiology of three phases & cranial nerve innervation) b) Central nervous system control for mastication and swallowing c) Etiologies for dysphagia in adults (structural anomalies, neurological conditions, mechanical & motility) d) Age-related changes in eating & swallowing. e) Role of cognition in swallowing disorders (post TBI and hemorrhagic stroke)
UNIT II:	**Assessment of swallowing and its disorders** a) Clinical assessment of swallowing: Clinical bedside evaluation, various published protocols for clinical examination, cervical auscultation for clinical examination b) Visual examination of swallowing and its disorders: modified barium swallow /videofluroscopic study of swallow, flexible endoscopic examination of swallowing – team for conducting assessment, procedure and interpretation c) Other instrumental evaluation (e.g., X Ray, Scintigraphy, Manometry, Transnasal esophagoscopy, acoustic analysis of swallowing) d) Self-report questionnaires and quality of life assessment for dysphagia e) Differential diagnosis - oral vs. pharyngeal dysphagia, prognostic variables and recommendations for oral/non-oral options for nutritional intake/ management.

UNIT III:	**Management of dysphagia in adults**
	a) Behavioral management - Compensatory and facilitatory strategies in detail
	b) Other behavioral management strategies (e.g., neuromuscular electrical stimulation)
	c) Pharmacological and surgical management of dysphagia
	d) Specific management strategies for mechanical causes of dysphagia (tracheostomy, glossectomy, mandibulectomy, oral/ pharyngeal cancer, trismus etc.)
	e) Evidence Based Practice (EBP) - levels of evidence, strengths and weaknesses, evidence base for various management approaches, evaluation of patient progress and treatment efficacy - when to continue treatment, when to terminate and when referrals are appropriate)
UNIT IV:	**Pediatric dysphagia**
	a) Anatomical differences in neonatal and pediatric upper aero digestive tract with reference to adults, Oral-motor and swallow development of infants and children
	b) Clinical manifestations of feeding and swallowing difficulties in children
	c) Motor and sensory issues in feeding/ swallowing among developmental conditions- Sensory based feeding disorders and special populations
	d) Specific considerations for clinical and instrumental evaluation of swallowing in children
	e) Direct and indirect strategies to facilitate safe swallow in children (including motor and sensory issues)
	f) SLP in Neonatal Intensive Care Unit: Etiology of feeding delay/disorders in neonates; assessment of primitive reflexes, suck-swallow coordination among neonates, management of feeding delay/disorders in neonates
UNIT V:	**Service delivery and other issues related to management**
	a) Scope of practice in the area of dysphagia: training in endoscopy, documentation, tele-practice
	b) Trends across the world and in India: Review of practice guidelines, technical reports, position statements, knowledge & skills document relevant to dysphagia in India and other countries - issues in adopting and implementing the same in India.
	c) Dysphagia clinics: SLP led clinics vs. SLP in a medical team, space and other infrastructural requirements within hospital setup, private clinics, schools and other centers.
	d) Esophageal dysphagia – etiologies, symptoms, differential diagnosis and role of SLP in management.
	e) Ethical and cultural considerations in dysphagia management

Recommended Reading

- Arvedson, J. C., & Brodsky, L. (2002). *Pediatric swallowing and feeding: Assessment and management*. (2nd Edition). Canada: Cengage Learning.
- Logemann, J.A. (1998). *Evaluation and treatment of swallowing disorders*. (2nd Edition). Austin: Pro-Ed.
- Murry, T., Carrau, R. L., & Chan, K. (2016). *Clinical management of swallowing disorder.* San Diego: Plural Publishing
- Huckabee, M. L., & Pelletier, C. A. (1999). *Management of adult neurogenic dysphagia*. San Diego**:** Singular Publishing.
- LaPointe, L. L., & Murdoch, B.E. (2013). *Movement disorders in neurologic disease: Effects on communication and swallowing*. San Diego: Plural Publishing.
- Carrau, R. L., Murry, T., & Howell, R. J. (Eds.). (2016). *Comprehensive management of swallowing disorders*. San Diego: Plural Publishing.
- o Aviv, J. E., & Murry, T. (2005). FEESST: Flexible endoscopic evaluation of swallowing using sensory testing. San Diego: Plural Publishing Inc.
- Newman, R. D., & Nightingale, J. M. (Eds.). (2012). *Videofluoroscopy: A multidisciplinary team approach*. San Diego: Plural Publishing Inc.
- Groher, M. E., & Crary, M. A. (2015). *Dysphagia: Clinical management in adults and children.* Elsevier Health Sciences.

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- Fraker, C., & Walbert, L. (2003). Evaluation and treatment of pediatric feeding disorders: From NICU to childhood. *Speech Dynamics.*
- Cichero, J. A., & Murdoch, B. E. (Eds.). (2006). *Dysphagia: foundation, theory and practice.* John Wiley & Sons.

Course Title: Aphasia   Marks – 100

Course Number	Course Code	Course category	Course Title	Lecture (L)	Clinical Training (CT)	Research Project (RP)/ Dissertation	Total Credits	Total Hours/Marks
17	PSL18CT303	Core Theory CT11	**Aphasia**	4	-	-	**4**	60/ 100

Learning Objectives	Learning outcomes
The objectives of the course are to provide knowledge on: a) the neuroanatomical, pathophysiological and linguistic aspects of aphasia b) assessment protocol for profiling linguistic and non-linguistic skills in aphasia (monolinguals, bilinguals, illiterates, sign language users) c) theories and factors influencing spontaneous recovery of aphasia d) associated reading and writing disorders in individuals with aphasia e) various general and specific intervention strategies for aphasia	At the end of the course, the student will be able to: a) demonstrate knowledge on the neuroanatomical, pathophysiological and linguistic aspects of aphasia b) discuss assessment protocol for profiling linguistic and non-linguistic skills in aphasia (monolinguals, bilinguals, illiterates, sign language users) c) critically evaluate theories and factors influencing spontaneous recovery of aphasia d) appreciate associated reading and writing disorders in individuals with aphasia e) select and use various general and specific intervention strategies for aphasia

Unit	Syllabus
UNIT I:	**Aphasia: Neuroanatomy, Pathophysiology and features** a) Neuroanatomical and pathophysiological basis of major types of aphasias based on connectionist and process models, b) Cerebral dominance and hemispheric lateralization for language c) History, Definition, Etiology and Classification of aphasic syndromes d) Linguistic aspects of aphasia: Phonological, Lexical, Syntactic, Semantic and Pragmatic models and deficits d) Associated problems in aphasia: Motor, sensory, psychological and cognition

UNIT II:	Assessment in aphasia
	a) Formal and informal cognitive-linguistic assessment tools: Purpose, test constructs, rationale, scoring, procedures and interpretation both Indian and other languages; Do's and don'ts in assessment procedures
	b) Methods for studying language and the brain- neuroimaging and cortical potentials (electroencephalography, magnetoencephalography, positron emission tomography, functional magnetic resonance imaging, N400 and T-complex) – Evidence from persons with aphasia.
	d) Differential diagnosis of different types of aphasia
UNIT III:	Spontaneous recovery in aphasia
	a) Theories of spontaneous recovery
	b) Prognostic factors affecting spontaneous recovery
	c) Recovery pattern in monolingual, bi/multilingual aphasia
UNIT IV:	Disorders of reading and writing in aphasia and aphasia in varied population
	a) Introduction to acquired disorders of reading: dual route models; extended connectionist models
	b) Acquired alexia; assessment and intervention of acquired reading disorders
	c) Written language and its impairments: classification of written language disorders
	d) Neuroanatomical substrates of writing
	e) Assessment of writing disorders and intervention approaches to writing disorders
	f) Aphasia in bilinguals/multilingual population- definition and features
	g) Aphasia in illiterates, left handers and sign language users- definition and features
UNIT V:	Management of persons with aphasia
	a) Introduction to language intervention strategies in adult aphasia (Principles, different service delivery models, Factors affecting treatment outcome)
	b) Reteaching and Re-access
	c) Linguistic approaches - General and Specific,
	d) Family and Group intervention
	e) Computer applications in the treatment of aphasia, tele-rehabilitation
	f) Medical aspects of rehabilitation

Recommended Reading

- Chapey, R. (2008). *Language intervention strategies in aphasia and related neurogenic communication disorders*. Philadelphia: Lippincott Williams & Wilkins.
- Papathanasiou, I. Coppens, P., & Potagas, C. (2013.). *Aphasia and related neurogenic communication disorders.* Burlington: Jones & Bartlett.
- Martin, N., Thompson, C. K., & Worrall, L. (2007). *Aphasia rehabilitation: The impairment and its consequences*. San Diego: Plural Publishing.
- Holland, A. L., & Forbes, M. M. (2013). *Aphasia treatment: World perspectives*. Springer.
- Hegde, M. N. (2006). *A coursebook on aphasia and other neurogenic language disorders*. Thomson Delmar Learning.
- Goswami, S. P., & George, A. (2006). ISHA monograph. Adult Aphasia: Language Intervention. A publication of Indian Speech and Hearing Association.
- Ardila, A. (2010). A Proposed Reinterpretation and Reclassification of Aphasic Syndromes. *Aphasiology*, 24 (3), 363–394.
- Davis, G.A. (2007). *Aphasiology - disorders and clinical practice.* Boston: Pearson & Allyn & Bacon.
- Goswami, S. P., Shanbal, J. C., Samasthitha, S., Navitha U., Chaitra, S., & Ranjini, M. (2011). *Manual for adult aphasia therapy in Kannada (MAAT-K).* The publication of all India institute of speech and hearing, Mysore. ISBN No. 978-93-81-854-17-0

- Goswami, S. P. (2012). Disability Act and Dementias: Sociological issues. Proceeding of the pre-conference continuing Education programme. A publication of the 44th ISHACON, Hyderabad.
- Sarno, T.M. (1998s). *Acquired aphasia.* San Diego: Academic Press.
- Ward, J. (2010). *The student's guide to cognitive neuroscience.* New York: Psychology Press

Course Title: Cognitive-Communication Disorders **M**arks – 100

Course Number	Course Code	Course category	Course Title	Lecture (L)	Clinical Training (CT)	Research Project (RP)/ Dissertation	Total Credits	Total Hours/Marks
18	PSL18CT304	Core Theory CT12	**Cognitive-Communication Disorders**	4	-	-	**4**	60/ 100

Learning Objectives	Learning outcomes
The objectives of the course are to provide knowledge on: a) various conditions such as primary progressive aphasia, dementia, traumatic brain injury, right hemisphere damage in adults leading to cognitive communication disorders b) assessment of linguistic and non-linguistic skills of cognitive communication disorders c) cognitive communication changes related to ageing d) management strategies for cognitive communication disorders	At the end of the course, the student will be able to: a) Discuss various conditions such as primary progressive aphasia, dementia, traumatic brain injury, right hemisphere damage in adults leading to cognitive communication disorders b) Demonstrate skills on assessment of linguistic and non-linguistic skills of cognitive communication disorders c) Appreciate cognitive communication changes related to ageing d) Plan evidence-based intervention strategies for management of cognitive communication disorders

Unit	Syllabus
UNIT I:	**An overview of cognitive communication disorders** Cognition- Description of cognitive processes models, mechanisms, concept, schema and properties of a) Attention b) Memory c) Executive function

UNIT II	**Traumatic Brain Injury (TBI) and Right Hemisphere Damage (RHD)**
	a) Cognitive communication disorders associated with TBI (effects, classification and linguistic and non-linguistic features)
	b) Assessment and principles of cognitive rehabilitation of TBI – Evidence based guidelines
	c) Linguistic and Nonlinguistic deficits in individuals with Right Hemisphere Damage
	d) Assessment and management of various cognitive communication deficits in RHD
UNIT III:	**Dementia and related cognitive disorders**
	a) Dementia (definition and different etiologies)
	b) Classification (cortical, subcortical and mixed)
	c) Linguistic and nonlinguistic features based on stages (Early, Middle and Late)
	d) Evaluation of cognitive-communication skills – formal and informal test batteries; tasks and findings leading to differential diagnosis of the types of dementia
	e) Intervention of cognitive communication disorders in dementias – Intervention strategies for cognition and communication; Evidence based guidelines in management of dementia
UNIT IV:	**Primary Progressive Aphasia and other cognitive communication disorders**
	a) Cognitive communicative aspects in primary progressive aphasia (PPA), evaluation and management of PPA
	b) Cognitive communication deficits in alcohol induced and metabolic language disorders -Assessment and management
	c) Differential diagnosis of cognitive communication disorders in adults
	d) Ethno-Cultural consideration in assessment and management of cognitive communication disorder
UNIT V:	**Cognitive communication disorder and ageing**
	a) Theories of aging
	b) Neuroanatomical changes associated with ageing
	c) Neurophysiological changes in Language and Cognition in elderly
	d) Psychological, Physical, quality of life changes associated with ageing

Recommended Reading

- Chapey, R. (2008). *Language intervention strategies in aphasia and related neurogenic communication disorders*. Philadelphia: Lippincott Williams & Wilkins.
- LaPointe, L. L. (2011). *Aphasia and related neurogenic language disorders (4th edition)*. Thieme Medical Publishers.
- Mendez, M. F., & Cummings, J. L. (2003). *Dementia: A clinical approach*. Butterworth-Heinemann.
- Kimbarow, M. L. (2014). Cognitive communication disorders (2nd Edition). San Diego: Plural Publishing.
- Murray, L. L., & Clark, H. M. (2015). *Neurogenic disorders of language and cognition: Evidence-based clinical practice*. Pro-Ed, An international publisher.
- Manasco, H. (2017). *Introduction to neurogenic communication disorders*. MA: Jones & Bartlett Publishers.
- Chop, C. W., & Robnett, H. R. (2015). *Gerontology for health care professional.* MA: Jones and Bartlett Learning Burlington.
- Gazzaniga, S., Ivry, M. S., Mangun, R. B., & George, R. (2014)*. Cognitive neuroscience: The biology of the mind.* New York: W. W. Norton & Company Inc.
- Laura, L. M., & Heather, M. C. (2006). *Neurogenic disorders of language: Theory driven clinical practice.* New York: Thomson Delmar Learning.
- Sarno, T.M. (1998). *Acquired aphasia.* San Diego, Academic Press.

- Papathanasiou, Coppens, P., & Potagas, C. (2013), *Aphasia and related neurogenic communication disorders.* Burlington: Jones & Bartlett.
- Morris, J. C. (1994). *Handbook of dementic illlnesses.* NY, Marcel Dekker Inc.
- Murray, L.L. & Clark, M.H. (2015). *Neuro-genic disorders of language and cognition.* Austin, Texas: Pro-Ed Inc.

Course Title: Clinicals in Speech-Language Pathology - 3   Marks: 100

Course Number	Course Code	Course category	Course Title	Lecture (L)	Clinical Training (CT)	Research Project (RP)/ Dissertation	Total Credits	Total Hours/Marks
19	PSL18CR305	Clinical Rotation CR-3	**Clinicals in Speech-Language Pathology - 3**	-	5		**5**	225/ 100

Note: Clinical practicum for CR-3 will be based on the sub-specialty clinics attended the students. The practicum is listed at the end of the syllabus.

Course Title: Research Practicum   Marks:100

Course Number	Course Code	Course category	Course Title	Lecture (L)	Clinical Training (CT)	Research Project (RP)/ Dissertation	Total Credits	Total Hours/Marks
20	PSL18RP306	Research Project RP3	**Research Practicum**	-	-	**4**	**4**	120/ 100

Learning Objectives	Learning outcomes
The objectives of the course in conjunction with the course on research methods, epidemiology and statistics are to: a) become familiar with procedures in data collection and organization of data b) learn about components of writing a dissertation	At the end of the course the student will be able: a) demonstrate progress in relevant sections of the research study depending on the individual requirements of the study.

Course Plan

1. Complete the literature search related to the research question
2. Undertake pilot study and interim analysis if required
3. Begin data collection as required by the research study
4. Demonstrate progress in dissertation as written report and submit for evaluation

Semester IV

Content

Course Title: Speech-language Pathology in Practice   Marks - 100

Course Number	Course Code	Course category	Course Title	Lecture (L)	Clinical Training (CT)	Research Project (RP)/ Dissertation	Total Credits	Total Hours/Marks
21	PSL18CT401	Core Theory CT13	**Speech-language Pathology in Practice**	4	-	-	4	60/ 100

Learning Objectives	Learning outcomes
The objectives of the course are to provide knowledge on: a) the role of a speech-language pathologist in different set-ups and learn about other professionals. b) laws, regulations and professional ethics related to practice in speech-language pathology. c) emerging sub-specializations within the field of speech-language pathology d) different service delivery models and tele-practice applications e) entrepreneurship, documentation and monitoring quality of services in speech-language pathology.	At the end of the course, the student will be able to: a) liaise with other professionals in setting-up a speech-language clinic. b) implement acts and legislations relating to persons with speech-language impairment. c) advise Governments and other agencies on the formulation of policies and legislative acts relating to speech-language disability d) audit speech-language practices in existing set-ups.

Unit	Syllabus
UNIT I:	**Scope of practice, laws, regulations and professional ethics** a) Scope of practice in global and Indian scenario b) Professional ethics c) Acts, legislations, policies related to persons with communication impairment d) Role of speech-language pathologists in the formulation of acts, regulations and policies e) Implementation of acts, legislations, policies and welfare measures relating to persons with speech-language impairment f) Advocacy groups, NGOs and rights of citizens g) National and international standards related to speech-language pathology

UNIT II:	**Specialized programs in speech-language pathology**
	a) Need for specialized programs in speech-language pathology (e.g., geriatric population, persons with multiple handicaps. Birth-to-three years etc.)
	b) Other specializations (e.g., medical speech-language pathology, forensic speech science)
	b) Health, wellness, and health care - Health promotion and disease prevention, quality of life and healthcare finances
	c) Disability-friendly environment including public education
	e) Culture and religion sensitive practice in speech-language practice
	e) Multilingual and multicultural sensitivity in therapeutics and management
	f) Prevention and early identification programs including societal participation
UNIT III:	**Service delivery models in speech-language pathology**
	a) Services in different medical / rehabilitation/ research /educational set ups
	b) School based services pertaining to regular and special schools
	c) Community based practice in rural and urban areas
	d) Family empowerment programs
	e) Home based delivery of services
	f) Autonomous practice in speech-language pathology
	g) Apps for screening/assessment and management
UNIT IV:	**Tele-practice in speech-language pathology**
	a) Information and communication technology in speech-language pathology practice
	b) Infrastructure for video-conferencing and tele-practice in Speech-language Pathology
	c) Techniques/principles of remote testing for screening and diagnostic assessment for speech-language, intervention and counseling
	d) Challenges and limitations of tele-practice in Speech-language Pathology in screening, assessment and evaluation, selection of aids and appliances, therapeutics and counseling.
UNIT V:	**Issues in speech-language pathology practice**
	a) Entrepreneurship and planning to set up private practice/clinic for speech-language pathology practice: Clinical ethics
	b) Documentation in speech-language pathology practice: clinical / demographic data, database management and storage
	c) ICF framework for documentation / reports
	d) Quality control and auditing in speech-language pathology practice
	e) Documenting and implementing evidence-based practice in speech-language pathology
	f) Understanding team approach: Work in cohesion with other professionals
	g) Information resources in speech-language pathology including books and journals, both electronic and print - Databases for evidence-based practice: Changed scenario

Recommended Reading

- Lubinski, R., & Hudson, M. W. (2013), *Professional issues in speech-language pathology and audiology*(4th Edition). Delmar Publishing.
- Flasher, L. V., & Fogle, P. (2011). *Counseling skills for speech-language pathologists and audiologists.* (2nd Edition). Delmar Publishing.
- Johnson, A. F., & Jacobson, B. H. (2017). *Medical speech-language pathology: a practitioner's guide.* (3rd Edition). Thieme.
- Battle, D. E. (2012). *Communication disorders in multicultural populations (4th Edition).* Elsevier Health Sciences.
- Houston, K. T. (2013). *Telepractice in speech-language pathology.* San Diego: Plural Publishing.
- Joffe, V., Cruice, M., & Chiat, S. (Eds.). (2008). *Language disorders in children and adults: new issues in research and practice.* John Wiley & Sons.
- Acts relating to disability, particularly hearing, enacted by the Indian Parliament.

- ASHA. 2007. Scope of Practice in Speech-Language Pathology [Scope of Practice]. Available at: http://www.asha.org/policy.
- ASHA. 2009a. Audiology and Speech-Language Pathology Outside the United States. Available at: http://www.aasha.org/members/international/intl_assoc.
- ASHA. 2009b. Tele-practices for SLPs and Audiologists. Available at: http://www.asha.org/practice/telepractice
- Position paper speech and language therapy in adult critical care. Royal college of Speech-language therapists. (2014), London.
- Speech-Language Pathology Medical Review Guidelines (2015). American Speech-Language-Hearing Association.
- College of Audiologists and Speech-Language Pathologists of Ontario. (2004). Use of Tele practiceapproaches in providing services to patients/clients.
- www.disabilityaffairs.gov.in (website of Department of Empowerment with Disabilities)
- www.rehabcouncil.nic.in (website of Rehabilitation Council of India)
- Barone, O. R. (2016). *Counseling and interviewing in speech-language pathology and audiology*. Jones & Bartlett Publishers.
- Irwin, D., & Irwin, D. L. (2007). *Ethics for speech-language pathologists and audiologists: An illustrative casebook*. Clifton, NY: Thomson Delmar Learning.
- Rizzo, S.R., & Trudean, M.D. (1994). *Clinical administration in audiology and speech language pathology*. San Diego: Singular Publishing.
- Ginsberg, S. M., Friberg, J., & Visconti, C. F. (2011). *Scholarship of teaching and learning in speech-language pathology and audiology: Evidence-based education*. San Diego: Plural Publishing.
- Schraeder, T. (2013). *A guide to school services in speech-language pathology.* 2nd Edition

Course Title: Seminars in Practices related to Medical Speech-language Pathology
Marks - 100

Course Number	Course Code	Course category	Course Title	Lecture (L)	Clinical Training (CT)	Research Project (RP)/ Dissertation	Total Credits	Total Hours/Marks
22	PSL18CT402	Core Theory CT14	**Seminars in practices related to Medical Speech-language Pathology**	4	-	**-**	**4**	60/ 100

Learning Objectives	Learning outcomes
The objectives of the course are to provide knowledge on: a) Scope of medical speech language pathology b) basic procedures and requirements for practice in a medical set-up including infection control and basic life support. c) procedures for documentation and quality benchmarks in medical set-up d) collaborative practice and concepts related to inter-professional practice within transdisciplinary team in a hospital set-up.	At the end of the course, the student will be able to: a) identify clientele within a medical set-up for services of an SLP b) demonstrate procedures and requirements for practice including infection control and basic life support c) discuss the procedures and protocols for documentation of patient care in a medical set-up d) discuss concepts for collaborative professional practice in a medical model.

Course Plan
The following areas will be covered through structured courses offered in the hospital/ medical college or lectures/seminars delivered by respective professionals:
- Infection control/management – caution on type of clothing, washing hands and use of disinfectants
- Basic life support
- Documentation of assessment and management
- Electronic Medical Records
- Standard Operating Procedures in hospital
- Quality benchmarks for medical-set ups
- Medico-legal isssues

Topics related to communication disorders and swallowing will be discussed in relation to medical professions through seminars led by different medical professionals jointly with speech language pathologist. The areas covered will include but be restricted to:
- Neonatology
- Pediatrics
- Otolaryngology
- Neurology/Neurosurgery
- Oncology
- Plastic Surgery
- Psychiatry

- General medicine

Course Title: Clinicals in Speech-Language Pathology -4   Marks: 100

Course Number	Course Code	Course category	Course Title	Lecture (L)	Tutorial (T)/Clinical Training (CT)	Research Project/ Dissertation	Total Credits	Total Hours/Marks
23	PSL18CR403	Clinical Rotation CR-4	**Clinicals in Speech-Language Pathology - 4**	-	5		**5**	225/ 50

Note: Clinical practicum for CR-4 will be based on the sub-specialty clinics attended the students. The practicum is listed below:

Clinical Practicum for CR-1, CR- 2, CR- 3 and CR- 4

Know how
a) Perform acoustic analysis of speech including FFT, LPC, cepstrum and inverse filtering; acoustic analysis of vowels, diphthongs, plosives, nasals, fricatives, affricates and other speech sounds using spectrograms on PRAAT
b) Vowel synthesis using parametric and analysis by synthesis; demonstration of articulatory synthesis
c) Observation of stroboscopic evaluation of persons with voice disorders as part of team assessment
d) Observation of endoscopic examination of persons with cleft lip and palate as part of team assessment
e) Differential diagnosis of conditions relevant to speech and hearing as per DSM-V and ICD 10   classifications
f) Observation of neurodevelopmental assessment in infants and young children (birth-to-two years) as part of child development unit.
g) Practice and learn to use finger spelling and signs for functional vocabulary
h) Observation of modified barium swallow examination
i) Observation of flexible endoscopic examination of swallowing as part of team assessment
j) Observe and identify reports of persons with neurogenic communication disorders in tests such as EEG, CT Scan, MRI etc.
k) Reversible and irreversible conditions that cause neurogenic communication disorders.
l) Rights and privileges of persons with communication disorder
m) Analyze the certification procedures for persons with communication disorder
n) Use of mobile apps for assessment and management of different communication disorders in adults and children
o) Become familiar with scope of practice of different medical and rehabilitation professionals in transdisciplinary practice

Demonstrate
a) Measurement of aerodynamic parameters using spirometer and instrumentation for aerodynamic analysis
b) Carry out and interpret the acoustic measures of voice on two recorded samples and correlate with the perceptual analysis

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c) Practice and learn to use the strategies of direct selection, scanning, encoding and word prediction in a communication board/book or aided AAC system in simulated situation

d) Learn to operate non-tech, low-tech and high-tech AAC aids

e) Complete perceptual analyses of speech samples of persons with CLP.

f) Demonstration of therapy techniques for disorders of speech sound, voice, and fluency.

g) Record language samples of typically developing children and children with language disorders, transcribe the samples using International Phonetic Alphabet (IPA) and perform analysis of language in terms of - phonology, morphology, syntax, semantics and pragmatics

h) Perform assessment of typically developing child using assessment protocols for learning disability

i) Demonstrate process of differential diagnosis for persons with adult language and cognitive communication disorders.

j) Use of AAC for adults with communication disorders (e.g., alphabet supplementation board, software applications)

k) Demonstration of therapy techniques for adults with aphasia, cognitive communication disorders, dysarthria and dysphagia

l) Conduct assessment and management for child/adult with communication disorders using tele-practice

m) Prepare a report for persons with communication disorders for medico-legal purposes

Do

a) Complete evaluation, write detailed evaluation report, counsel persons with communication disorder and their families as required for the following:

- Persons with stuttering using standardized tests (SSI, SPI etc.), including assessment of rate of speech, type, percent of dysfluencies, and quality of life measures.
- Persons with voice disorders including perceptual assessment using different scales, acoustic analysis of voice and patient reported outcome measurement.
- Children with speech sound disorders – record and transcribe speech samples (word and connected speech), carry out independent and relational analyses;
- Children with language disorders using appropriate tests/protocols: focus on birth-to-three years, preschool and school ages.
- Persons with communication disorders at bed side
- Persons with aphasia using appropriate screening, diagnostic (WAB/ BDAE etc.) and performance tool
- Persons with adult cognition communication disorders using appropriate screening (ACE/MMSE/CLQT etc.), diagnostic (ABCD/CLAP etc.) and performance tool
- Persons with motor speech disorders including perceptual evaluation of speech subsystems, speech intelligibility assessment, instrumental assessments for respiration or phonology and quality of life assessment
- Children and adults with concerns in swallowing

b) Plan and carry out appropriate intervention program for children and adults with voice and fluency disorders, and children with speech sound disorders.

c) Plan and carry out appropriate intervention program for children with language disorders

d) Plan and carry out early communication stimulation program for children 'at-risk' for developmental delays as part of child development follow-up clinic.

e) Plan and carry out intervention program for a child with language disorder using AAC

f) Plan and carry out intervention program for adults with neurogenic speech disorders, aphasia, cognitive communication disorders and dysphagia

Students will complete the clinical practicum during rotations in specialty clinics during the four semesters. The objectives of the specialty clinics are to provide focused exposure on clinical practice with specific populations of individuals with communication disorders across the

lifespan. Students will be exposed to advanced methodologies in assessment and management in addition to those focused in the undergraduate training program. An additional emphasis will be on interaction with professionals in transdisciplinary management team.

The specialty clinics and their focus areas in the four semesters will include the following:

Sub-specialty clinic	Focus/ Thrust area
Voice and fluency disorders	Clinical practice with children and adults with • voice disorders • fluency disorders Instrumentation Professional voice users
Speech sound disorders	Clinical practice with children and adults with • speech sound disorders- Cleft lip and palate • speech sound disorders- Phonological disorders Community based practice for individuals with cleft lip and palate
Child Language Disorders – 1 Child Language Disorders- 2	Clinical practice with children in • birth-to-three years including early communication stimulation program in NICU and regular follow-up in child development unit • preschool years • school-going years Augmentative and Alternative Communication for children with language disorders
Neuro Communication Disorders - 1 Neuro Communication Disorders - 2	Clinical practice with persons with neuro-communication disorders and swallowing disorders in • acute and sub-acute care settings • out-patient clinic Clinical practice for feeding disorders among neonates in NICU and infants and children in PICU, paediatric wards and Vidya Sudha - Early Intervention Centre Augmentative and alternative communication for persons with neurocommunication disorders in acute care settings and out-patient clinic settings.
Tele-practice in Speech-Language Pathology Communication disorders associated with hearing impairment/ multiple handicap	Clinical practice with children and/or adults with communication disorders Training of caregivers for supporting home-based intervention Clinical practice with children with hearing impairment and/or multiple handicap

A continuous formative assessment will be done based on clinical activities in each rotation for every semester. A university exam will be conducted at the end of each semester.

Course Title: Dissertation   Marks:100

Course Number	Course Code	Course category	Course Title	Lecture (L)	Clinical Training (CT)	Research Project (RP)/ Dissertation	Total Credits	Total Hours/Marks
24	PSL18RP404	Research Project RP4	**Dissertation**	-	-	**8**	**8**	240/ 100

Learning Objectives	Learning outcomes
The objectives of the course in conjunction with the course on research methods, epidemiology and statistics are to: a) learn about data collection, organization and analyses including statistical analyses and interpretation of results. b) learn about components of writing a dissertation including results and discussion and summary/conclusion	At the end of the course the student will be able a) analyze data by applying statistical analyses as required for the research study b) interpret the findings of the study with reference to previous research c) write a dissertation in the prescribed format

Course Plan
1. Complete the data collection,
2. Data analysis and interpretation
3. Complete writing the dissertation in the prescribed format.
4. Make a presentation in the department
5. Prepare manuscript for publication and submit for approval of the publication oversight committee