TEHRAN UNIVERSITY
OF
MEDICAL SCIENCES

School of rehabilitation

Doctor of Philosophy (PhD) Degree, Speech Therapy Program

2023

Section I:

Title: Speech Therapy

Degree: Doctor of philosophy (PhD)

Introduction: Speech and language pathologists/ therapists are responsible for pathology, assessment, and treatment of speech, language, communication, and swallowing disorders (American speech and hearing association, 2019). PhD students of speech therapy can present different services. They have role, as a professional manager, in clinical position and in the clinical education for bachelor and MSc students; lead the local and national projects in the academic and research centers such as examination of prevalence of disorders; assess and treat communication, language, speech, and swallowing disorders for clients with speech sound production disorders, stuttering, and fluency disorders, acquired and developmental language disorders and voice and swallowing disorders; analyze language, speech, communication, and swallowing data using laboratory instruments and equipment in a specialized way; diagnose disorders based on analysis of laboratory data and present a treatment plan; perform the designed treatment plan. Generally, the field of PhD students of speech therapy are the professional responsibility of clinical supervision, guidance of minor and major research projects, assessment and diagnosis of speech, language, communication, and swallowing disorders, plan and presentation of specialized treatment.

Definition: Speech therapy is one of the branches of rehabilitation sciences that in Ph.D degree provides education for diagnosis of communication and swallowing disorders via laboratory devices and instruments. In addition to providing the professional role in the clinical position, PhD graduates can educate lower degree students and guide the basic and applied research projects.

The Aim of the Course:

1) Training of expert and professional staff in the field of education, research, treatment, technology, management, and specialized speech therapy services based on update scientific perspective and approaches in fields of communication, speech, language, and swallowing disorders;

2) Participation in health development policy and rehabilitation services according to the role of communication, language, speech, and swallowing.

Philosophy (values and beliefs): It is expected from speech therapy graduates to be aware of the philosophy of speech therapy to use deep knowledge, critical thinking, and advanced skills for educational, research, and therapeutic activities desirably. They should be aware of the different aspects of the communication, language, speech, and swallowing disorders and their effects on individual and social life compassionately and in a professional style, they should work in the field of science production (evidence-based assessment and treatment) and service delivery to facilitate clients'

maximum participation in family and society. They identify clients' needs in the different individual and social levels and give them appropriate solution for treatment of disorders and improvement of the quality of life to help upgrading mental health of individuals and society; speech therapy is a clinical service that requires patience. Any treatment plan results with consistent practice. Therefore, it is necessary to speech therapy graduates be patient in service delivery, identify and understand all aspects of clients' condition for improvement of clients, and have compassion and philanthropy for a flexible interaction with clients. They should be able to guide and perform scholarly and development projects in order to produce service for society.

In this program, the following values are emphasized:

- Treating clients as equal regardless of gender, race, ethnicity, subculture, social and cultural beliefs and respecting them;
- Believing in the human rights and dignity of speech therapy clients;
- Compliance with professional ethics in all educational, research, and clinical dimensions;
- Emphasis on creativity and entrepreneurship, responsibility, and social commitment;
- Trying to achieve scientific and moral excellence, truthfulness and honesty, politeness, verbal and behavioral respect;
- Having a positive attitude towards human progress and change;
- Having an insight into the research priorities in the country according to the cultural and linguistic characteristics of the different populations.

Perspective (vision): With the presence of PhD graduates in speech therapy, in the next ten years, a high percentage of communication and swallowing disorders of the elderly will be identified and evaluated, and will improve the health of the elderly in the world. Also, routine developmental screening of children leads to diagnosis of children with communication, speech, language, and swallowing disorders, and by applying expertise in various areas of communication impairment, it can pave the way for conducting local research as well as providing assessment and treatment solutions and creating areas for improving community communication. Therefore, it could be helped to prevent and treat communicative disorders with performing screening programs and early diagnosis.

Mission: The main mission of PhD program in speech therapy is providing a valid and scientific way for training of expert and knowledgeable manpower to current scientific issues, potent, responsible and sensitive to individual and society health in the field of communication, language, speech, swallowing and their disorders. PhD students of speech therapy after passing academic courses, with the guidance and counseling of faculty members and skill acquisition in the field of education and research, prepared to present specialized and up to date knowledge in the field of pathology, assessment, and treatment of communication, language, speech, swallowing and their disorders effectively and in an evidence-based manner. Along with skill acquisition in the interdisciplinary fields, PhD students are encouraged to

acquire experience and cooperate in the education and research with faculty members from other fields to guide or perform research projects in the mentioned fields.

Roles of graduates in society: Professional roles of PhD graduates in speech therapy in the fields of education, research, counseling, diagnosis-speech therapy, prevention, laboratory services, production, and management are mentioned below:

In education role:

- PhD graduates of speech therapy can be used as internship instructor for undergraduate, master's and PhD students and as a teacher for theoretical courses of speech therapy;
- Teaching to the family of a person with speech disorders and teaching the society.

In research and technology role:

- PhD graduates of speech therapy can plan and perform research projects independently;
- Participating in master's and other PhD theses;
- Directing technological cores.

In counseling-communicative role:

- Counseling in communication, language, speech, and swallowing fields;
- Counseling in research projects related to communication, language, speech, and swallowing fields.

In diagnosis-speech therapy: PhD graduates in addition to defined roles for bachelor and master's graduates, work based on evidence-based practice approach and analysis of laboratory data more specifically, that also includes the following roles:

- Diagnosis signs and symptoms of communication, speech, language, and swallowing disorders;
- Detecting environmental, physical and family factors effective in aggravation or improvement of disorder that mentioned above;
- Planning and directing of correct speech therapy methods in communication, speech, language; and swallowing disorders.

In prevention role:

- Primary prevention to prevent from communication, speech, language, and swallowing disorders;
- Secondary prevention to prevent from aggravation of communication, speech, language; and swallowing disorders;

- The third level of prevention for assessment and treatment of communication, speech, language; and swallowing disorders.

In laboratory services role:

- Performing independently and analysis of data extracted from laboratory instruments, including:
    - Computerized Language Analysis (Clan) and Systematic Analysis of Language Transcripts (SALT) for linguistic data analysis;
    - Electromyography (EMG) for function analysis of facial and neck muscles;
    - Transcranial Direct Current Stimulation (tDCS) and Event-Related Potential (ERP) and Repetitive Transcranial Magnetic Stimulation (rTMS).

In production role: Designing and production of specialized native tools (software or hardware and any related technologies) in fields of communication, speech, language, and swallowing alone or in cooperation with engineers such as Biomedical Engineering.

In management role:

- Supervision of clinical activity of bachelor and master's graduates of speech therapy;
- Management of speech therapy centers;
- Management of speech and language data analysis laboratory.

General Competencies:

- Communicative-interactive skills;
- Teaching;
- Research and writing scientific papers;
- Critical thinking and problem-solving skills;
- Evidence-based management skills (policy- planning- organizing- monitoring, supervision and control- evaluation);
- Professionalism.

Specific Competencies and Skills (Special Qualifications):

Comparative table of professional duties and specific abilities expected of graduates and their related curriculum codes:

Row	Specialized competencies	Description of professional duties	Related curriculum codes
01	Teaching	• Teaching to a person, family, and society to prevent occurrence and exacerbation of speech, language, communication, and swallowing disorders; • Teaching academic courses to different degrees.	03-04-05-06-07-08-09-10-11-12-13-14-22-23-26-27-28-29-30-31-32-33-34-35
02	Research and technology	• Designing and directing projects related to speech therapy fields based on social needs; • Research about designing and producing new instruments in the specialized fields of speech therapy.	15-16-18-20-24
03	Counseling-communicative	• Effective communication with clients with speech, language, communication, and swallowing disorders and their families and providing advice to them; • Providing necessary advice to a team of experts.	03-04-05-06-07-08-09-10-11-12-13-14-22-23-26-27-28-29-30-31-32-33-34-35
04	Diagnosis-speech therapy	• Diagnosis of signs and symptoms, type and severity, and effective factors in exacerbation or improvement of speech, language, communication, and swallowing disorders with evidence-based approaches; • Identifying patients and their family's need for referring to other specialists; • Using results of basic and supplementary assessment in screening, assessment, diagnosis, and treatment of speech, language, communication, and swallowing disorders with evidence-based approaches;	03-04-05-06-07-08-09-10-11-12-13-14-22-23-26-27-28-29-30-31-32-33-34-35

		• Designing and performing correct speech therapy methods (in developmental language disorders, swallowing disorder, voice disorders, cleft palate speech disorders, speech sound disorders and acquired language disorders) with evidence-based approaches.	
05	Prevention	• Primary prevention to prevent from developmental language disorders, communicative-linguistic impairments resulted from different disorders; • Secondary prevention to prevent from exacerbation of developmental language disorders, communicative-linguistic impairments; • The third level of prevention for assessment and speech therapy of developmental language disorders, communicative-linguistic impairments.	03-04-05-06-07-08-09-10-11-12-13-14-22-23-26-27-28-29-30-31-32-33-34-35

06	Laboratory services	• Do independent and analysis of data from the following laboratory instruments:
		  o Videostroboscopy
		  o Praat software
		  o Nasometry
		  o Palatography
		  o Glottography
		  o Laryngography
		  o Nasolaryngoscopy
		  o Transcranial direct current stimulation (tDCS)
		  o Event-related potential (ERP)
		  o Repetitive transcranial magnetic stimulation (rTMS)
		  o Using software of linguistic samples analysis, such as Child Language Data Exchange System (CHILDES),
			17

		Systematic Analysis of Language Transcripts (SALT), etc.	
07	Productive	• Designing and producing specialized native instruments (software or hardware and any related technologies) in field of communication, speech, language, and swallowing alone or in cooperation with engineers such as Biomedical Engineering.	21-25
08	Management	• Monitoring the activities of bachelor and master's graduates; • Managing speech therapy and rehabilitation centers; • Managing laboratory of speech and language data analysis.	22

Expected procedural skills:

Skill	The minimum number of times a skill is performed to learn			
	Observation	Help to do	Doing independently	All times
Application and interpretation of data from at least 3 of the following equipment: **Surface electromyography (EMG);** **Event-related potential (ERP);** **Transcranial direct current stimulation (tDCS);** **Repetitive transcranial magnetic stimulation (rTMS);** **Fiberoptic endoscopic evaluation of swallowing (FEES);** **Child language data exchange system (CHILDES);** **Systematic analysis of language transcripts (SALT);** **Neurofeedback;** **Eye tracking;** **Nasoendoscopy;** **Articulography;** **Vital stim;** **Computerized speech lab (CSL);** **X observer**	12	9	6	27
Implementation of Anderson's model in supervision and practical implementation of different models of communication skills, critical thinking, clinical reasoning, giving feedback.	5	3	3	11
Data collection with motion capture	5	5	3	13
Signal analysis with biometric and Vicon software	5	5	3	13
Signal reconstruction; **Aliasing;** **Quantization;** **PCM Encoder/Decoder;** **Noise elimination,** **Filtering in audio processing;**	30	30	10	70

Audio signal compression;
 Simple filter design using averaging and convolution;
 Application of the following filter:
    – **Finite impulse response filter (FIR)**
    – **Infinite impulse response filter (IIR),**
 Introduction and implementation of filters for audio processing;
 Basic audio recognition using a simple algorithm				

Practical work with nasolaryngoscopy	5	5	3	13
Providing voice disorder counseling for patients in hospitals or other medical centers	10	5	3	18
Practical implementation of assessment and treatment of patients with stuttering based on neuropsycholinguistics model, phonological model, grammatical and semantic and emotional processing model	10	10	8	28
Practical implementation, scoring and interpretation of assessments of executive function in normal and dementia people	5	5	3	13
Practical implementation, scoring and interpretation of speech and language assessment in dementia	5	5	3	13
Practical implementation of assessments in children with Autism spectrum disorder, such as children's communication checklist, questionnaire and classification systems of communicative function and their interpretation	5	5	3	13
Practical implementation of treatment approaches for improvement of behavior-communication skills in Autism spectrum disorder, including training, social stories, pivotal response, picture exchange communication system (PECS), supporting knowledge in language and literacy	5	5	3	13
Practical and evidence-based implementation of assessment techniques of linguistic skills (linguistic sample analysis) and cognitive skills (with a focus on phonological working memory) in children with developmental language disorder (specific language impairment)	5	5	3	13
Practical and evidence-based implementation of intervention techniques of linguistic skills (narrative language-based	5	5	3	13

intervention) and cognitive skills (with a focus on phonological working memory) in children with developmental language disorder (specific language impairment)				
Practical and evidence-based implementation of assessment and intervention techniques for communication disorders (verbal-nonverbal) in children with brain damage	5	5	3	13
Practical work with fiberoptic endoscopic evaluation of swallowing (FEES) and information registration	5	5	3	13
Practical work with transcranial direct current stimulation (tDCS) in the treatment of patients with swallowing disorder	5	5	3	13
Performing and interpreting of acoustic assessments and/or performing and interpreting of laryngeal nasoendoscopy and oral-pharyngeal swallowing system and/or interpreting of ultrasound and/or interpreting of magnetic resonance imaging (MRI)	5	5	2	12
Practical implementation of speech transcription for two patients with cleft palate speech and resonance disorders	5	5	2	12
Practical implementation of cognitive neuropsychology, stimulative, neurolinguistic approaches for aphasic patient	5	5	3	13
Practical implementation of assessment of speech and language indicators in fields of prelinguistic skill, phonology, morphosyntax, semantic skill (vocabulary, semantic relations), pragmatic skill, prosody and speed of speech	5	5	2	12

The Terms and Conditions of Admission to the Course (specific conditions including exams, interview, CV, Recommendations, etc.)

Interview;

- ❖ Filing online application form;
- ❖ Upload following documents:
  - Academic Grade Point Average (GPA): 3.00/4.00 (or its equivalent);
  - A letter of motivation;
  - A resume or CV;
  - Previous degree(s) in original:
    - o BSc or MSc graduates in Speech Therapy or similar programs (such as

      Communication Disorders; Speech Pathology and Audiology, Speech and

Language Pathology, Language Therapy, Speech Sciences, Cognitive Neuroscience);

- o BSc or MSc graduates in other related fields (such as Linguistics, Psychology, Health, Medicine).

- Evidence of English Proficiency: IELTS with a minimum band score of 5.5 or its equivalent in TOEFL iBT (minimum 69) or TPEFL PBT (minimum 525);
- Two letters of recommendation.

Educational Strategies, Methods and Techniques: This program is based on the following strategies:

- Task based education;
- Student and professor-based education;
- Problem based education;
- Community oriented education;
- Evidence based education;
- Lab based education.

Methods and techniques of education: In this course, the following methods and techniques of education are often used:

- All kinds of intra-departmental, inter-departmental, hospital, inter-disciplinary, inter-university conferences and seminar;
- Discussion in small groups, workshops, journal club and book reading, case presentation;
- Morning report, working and educational rounds, outpatient education, education in the operating room (observation of cleft palate surgery, laryngeal surgery, cochlear implant surgery), practical procedures room or laboratory;
- Simulation technique and distance education according to facilities;
- Participation in education of lower levels students;
- Self-study, self-education;
- Other educational methods and techniques according to educational needs and goals.

Student Assessment:

A. **Evaluation method:** Students are evaluated with the following methods:
- Written
- Oral
- Practical
- OSCE

- Portfolio is including: Log book, results of tests, articles, encouragements and reminders, certificates of works and so on.

Testing frequencies:

- Continues;
- Periodic;
- Final.

Percentage of virtual or non-virtual courses: All of theoretical courses can be held virtually (up to 4/17 sessions) or in person. Internship courses can only be done in person. The theoretical part of the laboratory course is done in person and virtual (up to 4/17 sessions), and the practical part is done in person.

Number and Type of Credits and Tables of the Courses (including compulsory and optional [elective] courses)
The total number of courses: 42 credits

The number of credits in this curriculum is 42 credits as follows:

- Specialized compulsory curriculum (core): 16 credits
- Specialized optional curriculum (non-core): 10 credits
- Thesis: 20 credits
- Total: 46 credits

Table A. Compensatory or deficiency courses of curriculum in PhD of speech therapy

Code	Course Title	Number of Credits				Hours				Prerequisite or Concurrent
		Theoretical	Practical	Intern-ship	Total	Theoretical	Practical	Intern-ship	Total	
01	**Medical Information Systems✱**	0.5	0.5	-	1	9	17	-	26	None
02	**Introduction to Neuropsycholinguistics**	0.5	0.5	-	1	9	17	-	26	None
03	**Clinical Practicum 1**	-	-	1	1	-	-	51	51	None
04	**Clinical Practicum 2**	-	-	1	1	-	-	51	51	None
05	**Clinical Practicum 3**	-	-	1	1	-	-	51	51	None
06	**Swallowing Disorders in Adults**	0.5	0.5	-	1	9	17	-	26	None

07	Developmental Reading and Writing Disorders	1	1	-	2	17	34	-	51	None
08	Autism Spectrum Disorders	0.5	0.5	-	1	9	17	-	26	None
09	Acquired Language Disorders	1.5	1.5	-	3	26	17	-	43	None
10	Developmental Language Disorder (Specific Language Impairment)	0.5	0.5	-	1	9	17	-	26	None
11	Fluency Disorders	1.5	0.5	-	1	26	17	-	43	None
12	Voice Disorders	1	1	-	2	17	34	-	51	None
13	Communication Disorders in Cleft Palate and Craniofacial Anomalies	0.5	0.5	-	1	9	17	-	26	None
14	Motor Speech Disorders in Adults	1.5	0.5	-	2	26	17	-	43	None
Total		19								

Students with BSc or MSc in other related fields (such as Linguistics, Psychology, Health, Medicine) except Speech Therapy or similar programs (such as Communication Disorders; Speech Pathology and Audiology, Speech and Language Pathology, Language Therapy, Speech Sciences, Cognitive Neuroscience) is required to take a maximum of 16 credits of compensatory or deficiency courses (Table A) with the approval of the educational department and the approval of the university's graduate education council. It should be noted that passing at least 2 credits of 3 internship credits in specific fields with the approval of the educational department is necessary.

*It is necessary to pass this course, as a deficiency or compensatory course, for students who ever didn't pass it.

Table B. Specialized compulsory curriculum (core) of educational program for PhD in speech therapy

Code	Course Title	Number of Credits				Hours				Prerequisite or Concurrent
		Theoretical	Practical	Intern-ship	Total	Theoretical	Practical	Intern-ship	Total	
15	Advanced Statistics	1	2	-	3	17	68	-	85	None
16	Advanced Research Method	2	1	-	3	34	34	-	68	15
17	Speech, Language, and Swallowing Laboratory	1	2	-	3	17	68	-	85	None
18	Seminar in Speech and Language Disorders	-	1	-	1	-	34	-	34	15 & 16
19	Ethics in Speech Therapy	1	-	-	1	17	-	-	17	None
20	Philosophy of Science in Speech and Language Pathology	1	-	-	1	17	-	-	17	None
21	Idea Generation, Entrepreneurship, and Principles of Business	1	-	-	1	17	-	-	17	None
22	Clinical Supervision in Speech and Language Pathology	-	-	2	2	-	-	102	102	None
23	Specialized Internship	-	-	1	1	-	-	51	51	None
24	Thesis	20								
	Total	36								

Table C. Specialized optional curriculum (non-core) of educational program for PhD in speech therapy

Code	Course Title	Number of Credits			Hours			Prerequisite
		Theoretical	Practical	Total	Theoretical	Practical	Total	
25	Signal Processing in Speech and Language Pathology	1	1	2	17	34	51	None
26	Cognitive Production and Perception Models of Speech and Language	2	-	2	34	-	34	None
27	Advanced Voice Disorders- Pathology, Assessment, and Treatment	1	1	2	17	34	51	17
28	Advanced studies in Stuttering- Pathology, Assessment, and Treatment	1	1	2	17	34	51	None
29	Cognitive and Communication Disorders	1	1	2	17	34	51	None
30	Cognitive and Language Development in Normal and Language-Impaired Children	1	1	2	17	34	51	None
31	Advanced Methods of Evaluation and Treatment in Swallowing Disorders	1	1	2	17	34	51	None
32	Speech and Resonance Disorders in Cleft Palate	1.5	0.5	2	26	17	43	None
33	Speech Motor Control	2	-	2	34	-	34	None
34	Cognitive Neurorehabilitation in Aphasia	1	1	2	17	34	51	None
35	Evaluation and Analysis Indicators of Speech and Language	1	1	2	17	34	51	None
Total		22						

*Student should pass 6 credits of above credits (Table C) according to their thesis topic, supervisor's approval and approval of university graduate education council.

Titles of course workshops:

Participation in the following workshops is obligatory:

- Methods and principals of teaching (16 hours);
- Method of scientific article writing (8 hours);
- Method of proposal writing (24 hours);
- Ethics in research (8 hours);
- Systematic review and meta-analysis research method (40 hours).

The following workshops are proposed:

- Randomized clinical trials research method (24 hours);
- Application of statistical software for data analysis (32 hours);
- Health economics in the clinical and research practices (8 hours);
- Digital health workshop (16 hours).

All workshops, including compulsory or optional, should have pass before comprehensive examination.

Ethical issues:
The graduates should,

- Observe the Patient's Bill of Rights1 when working with the patients.
- Strictly observe Biosafety and Patient Safety Rules* concerning the patients, personnel and workplace.
- Observe the Rulebook for Dress Code2.
- Strictly observe the Regulations of Working with the Laboratory Animals3.
- Carefully preserve resources and equipment.
- Truly respect faculty members, the staff, classmates and other students and work for creating an intimate and respectful atmosphere.
- Observe social and professional ethical considerations in criticism.

1, 2 and 3 are contained in the Enclosures.

* Biosafety and Patient Safety Rules will be set out by the Educational Departments and will be available to the students.

Title of the course: Medical Information Systems

Code of the course: 01

Prerequisite or concurrent: None

Number of credits: 1 (0.5 theoretical, 0.5 practical)

Type of the course: Theoretical- Practical

The general purpose of the course: Student must be familiar with the search engines and role of its 5 softwares including spider, crawl, indexer, database and ranker. He/she must know and compare difference and capability of these softwares in the multiple motor engines including google, Yahoo, Bing and etc. Also, while learning about several search engines Meta search engine, he/she can learn about methods, search and its influencing factors, advanced search, Boolean operators, errors in the shortness of keywords (Truncation) such as asterisk, the use of parentheses, and the mutual influence of keywords on search results. Student should know about available facilities of internet related softwares Google, Mozilla Firefox, Explorer, Chrome. Another goal of this course is to familiarize students with the library service of the university where they study. The student's knowledge of databases and publishers related to health and medical sciences, important sites in health and medical sciences, especially Cochrane and PubMed, criteria for evaluating articles (such as citations), journals (impact factor) and authors (H-index), and one of the resource management software such as reference manager is required.

Course description:

In this course, the student will be trained with scientific search methods, internet search problems and overcoming them. She/he will be familiar with the concepts of evaluating articles, magazines and searching in some important publishers' sites. In this way, the student will be able to have an organized search of browsers and databases. Finally, the student will be able to create a dedicated library using one of the resource management software to prepare all the resources he needs for writing theses, articles and reports.

Outlines (Theoretical 9 hours – Practical 17 hours):

- Getting to know general search engines, their differences and comparing several search engines with each other in terms of the same search (practical work: doing advanced search alone, Boolean search and, or, not in the PubMed search engine in the class)
- Getting to know role of 5 softwares including spider, crawl, indexer, database and ranker, in each motor engine
- Getting to know Google chrome, Mozila firefox, Internet Explorer and their features (practical work: sort and save favorite on flash disk)
- Getting to know available services in the library of the university where they study including access to inside and outside journals and the comprehensive software
- Getting to know publishers such as Springer, Wiley, EBSCO, Elsevier
- Getting to know information banks and resources such as Biological, ProQuest, Scopus, Science, Web of Science, Abstract and …
- Getting to know databases
- Getting to know the comprehensive bank of medical articles such as Irandoc, Iranmedex, Medlib and …
- Searching methods with medical subject heading (MeSH)
- Getting to know measurement criteria of articles (such as citation), journals measurement (impact factor) and writers' measurement (H-index) in relevant databases
- Getting to know application of DOI
- Getting to know PubMed and the collection of articles from information bank of Medline, Gene bank, online softwares in it
- Getting to know EndNote software and Creating a personal library of resources, practically

Student evaluation method:

- Examination during the academic semester- 25%
- Written exam at the end of the semester- 50%
- Doing homework- 15%
- Presence and active participation in class- 10%

References:

1. www.medlib.ir
2. www.proquest.com
3. www.ncbi.nlm.nih.gov

Course title: Introduction to Neuropsycholinguistics

Code of the course: 02

Prerequisite: None

Number of credits: 1 (0.5 theoretical- 0.5 practical)

Type of the course: Theoretical- Practical

General purpose of the course: Increasing students' theoretical and practical knowledge about association of language and brain with emphasis on general principals of neuropsycholinguistics

Course description:

In this course, students get to know about language location on the brain and how language processing in brain hemispheres in normal and patient people and while get to know about commonly used neuropsychological tests, they learn how to perform them.

Outlines: Theoretical (9 hours):

1. Review on language function and brain hemispheres
    a. Individual differences in language organization in the brain
    b. Hemispheric specialization
    c. Role of right and left hemisphere in language processing
2. Review on higher cortical functions
    a. Memory and learning
    b. Excitement
    c. Attention and alertness
    d. Brain flexibility
3. Bilingualism
    a. Lexical comprehension in bilingual brain
    b. Lexical acquisition in bilingual brain
    c. Language processing in bilingual brain
4. Study methods in neuropsycholinguistics
    a. Evoked-related potential (ERP)
    b. Functional magnetic resonance imaging (fMRI)
    c. Analytical methods for single-subject studies
5. Neuropsychological tests

a. Introduction of tests and the logic of using them (such as Benton's neuropsychological investigation, Boston Process Approach, Frontal-lobe assessment, Luria-Nebraska Battery, CANTAB, Verbal fluency tasks, …)
b. Effective factors on test selection
c. Memory, attention and alertness tests

Outlines: Practical (17 hours):

Evaluation of students in the cognitive field is done in the middle and end of the course, descriptive and four-choice in the field of skill using written report, checklist and practical implementation of tests.

References:

1. Faust, M. The Handbook of the Neuropsychology of Language (Blackwell Handbooks of Behavioral Neuroscience). Wiley-Blackwell.
2. Kolb, B. Fundamentals of Human Neuropsychology. Worth Publishers.

Course title: Clinical Practicum 1

Code of the course: 03

Number of credits: 1 credit

Type of the course: Internship

Prerequisite: None

The general purpose of the course: Evidence-based clinical practice and practicing professionalism, getting to know about clinical training, learning advanced clinical practice in adult swallowing disorders (oral and oral-pharyngeal phases), voice disorders, and developmental dyslexia and dysgraphia

Course description:

In this course, students will train usage of professional ethics in speech therapy and they can provide clinical training to undergraduate students after completing the course. Also, they can assess dysphagia in adults (oral and oral-pharyngeal phases), voice disorders, and developmental dyslexia and dysgraphia based on high quality evidence and they can treat based on the new treatment approaches and report to scientific community.

Outlines: Internship (51 hours):

1. Professional ethics: professional clinical practice, professional standards, professional competency requirement:

Professional ethics principals in adult dysphagia (oral and oral-pharyngeal phases), voice disorders, and developmental dyslexia and dysgraphia

2. Methods of obtaining, evaluating, and applying evidence to clinical practice:

Grading of evidence for clinical practice, how to translate results into evidence for assessment and treatment of adult dysphagia (oral and oral-pharyngeal phases), voice disorders, and developmental dyslexia and dysgraphia

3. Principles of clinical training and supervision:

Getting to know about clinical supervision principals and methods

Education of undergraduate students under the supervision of the main supervisor of the clinic

4. Internship in dysphagia (oral and oral-pharyngeal phases):

Assessment of one case with adult dysphagia (implementation of clinical assessment methods for adult dysphagia including case history, assessment of structure and function of the organs involved in swallowing, clinical swallowing assessment)

Forming treatment baseline, designing and implementing of treatment based on approach (implementing rehabilitative methods for adult dysphagia (oral and oral-pharyngeal phases) including oral motor exercises, swallowing maneuvers and tactile-thermal stimulations)

Baseline re-evaluation, pre-post treatment comparison, preparing a case report and presenting it in the form of a seminar

5. Internship in voice disorders:

Assessment of one case with voice disorders (auditory-perceptual assessment, posture assessment)

Forming treatment baseline, designing and implementing of treatment based on approach (physiologic voice therapy: manual treatment of the larynx based on phonation, functional voice exercises, resonance voice therapy, vocal warm up methods, the accent method of voice therapy)

Baseline re-evaluation, pre-post treatment comparison and preparing a case report and presenting it in the form of a seminar

6. Internship in developmental dyslexia and dysgraphia:

Assessment of one case with developmental dyslexia and dysgraphia, using of cognitive neuroscience model, psycholinguistic and neurolinguistic approach for explaining the defects of children with developmental dyslexia and dysgraphia

Usage of team approaches in assessment and treatment of children with developmental dyslexia and dysgraphia

Assessment of general and specific areas such as intelligence, motor skills and language and reading

Forming treatment baseline, designing and implementing of treatment based on approach (implementing treatment methods in fields of cognition, language, reading, and writing)

Baseline re-evaluation, pre-post treatment comparison and preparing a case report and presenting it in the form of a seminar

Student evaluation method:

Evaluation of students in cognitive field is done in the middle and end of the course in descriptive and four-choice form, and in skill fields using written report, checklist and practical implementation of methods

References:

1. McAllister, L. Issues and innovation in clinical education. Advances in Speech Language Pathology, 7(3), 138-148.

2. Body, R. Ethics in speech and language therapy. John Wiley & Sons.

3. Reilly, S., Douglas, J., & Oates, J. Evidence-based practice and speech pathology: future directions. Murry T. Carrau RL. Clinical management of swallowing disorders. Plural publishing.

4. Corbin-Lewis K, Liss, JM Sciortino KL. Clinical anatomy & Physiology of swallow mechanism. Thomson Delmar.

5. Murry, T., Carrau, R.L., & Chan, K. Clinical management of swallowing disorders. Plural Publishing.

6. Rosenbek, J.C., & Jones, H.N. Dysphagia in movement disorders. Plural Publishing.

7. Stemple, J.C., Roy, N., & Klaben, B.K. Clinical voice pathology: Theory and management. Plural Publishing.

8. Seikel, J.A., Drumright, D.G., & King, D.W. Anatomy & physiology for speech, language, and hearing. Nelson Education.

9. Casper, J.K., & Leonard, R. Understanding voice problems: A physiological perspective for diagnosis and treatment. Lippincott Williams & Wilkins.

10. Snowling, M.J., & Stackhouse, J. (Eds.). Dyslexia, speech and language: a practitioner's handbook. John Wiley & Sons.

11. Paul, R., & Norbury, C.F. Language disorders from infancy through adolescence. St. Louis (MO: Elsevier Health Sciences.

12. Christo, C., Davis, J.M., & Brock, S.E. Identifying, assessing, and treating dyslexia at school. Springer Science & Business Media.

13. Wallach GP. Language and school-age children with learning disabilities. A. Reed (Eds.). An introduction to children with language disorders. Pearson/Allyn and Bacon.

14. Kamara, C.A. Neurolinguistic Approach to Reading: A Guide for Speech-language Pathologists Treating Dyslexia. Plural Publishing.

Course title: Clinical Practicum 2

Code of the course: 04

Number of credits: 1

Type of the course: Internship

Prerequisite: None

The general purpose of the course: Using professional ethics in the clinical practice, evidence-based clinical exercises and professionalism training, getting to know clinical teaching method, learning about advanced clinical practice in developmental language disorder (specific language impairment), acquired language disorders, and motor speech disorders in adulthood

Course description:

In this course, students will train usage of professional ethics in speech therapy and they can provide clinical training to undergraduate students after completing the course. Also, they can assess developmental language disorder (specific language impairment), acquired language disorders, and motor speech disorders in adulthood based on high quality evidence and they can treat based on the new treatment approaches and report to scientific community.

Outlines: Internship (51 hours):

1. Professional ethics: professional clinical practice, professional standards, professional competency requirement
2. Professional ethics principals in developmental language disorder (specific language impairment) and acquired language disorders, and motor speech disorders in adulthood
3. Methods of obtaining, evaluating, and applying evidence to clinical practice
4. Grading of evidence for clinical practice, how to translate results into clinical practice, application of evidence for assessment and treatment of developmental language disorder (specific language impairment), acquired language disorders, and motor speech disorders in adulthood
5. Principles of clinical training and supervision:
7. Getting to know about clinical supervision principals and methods
8. Education of undergraduate students under the supervision of the main supervisor of the clinic
6. Internship in developmental language disorder (specific language impairment):
9. Diagnosis and assessment of one child with developmental language disorder (specific language impairment)

10. Determination of communicative and linguistic baseline in the field of morphosyntax, semantic, pragmatic and phonological skills assessment

11. Assessment of fields related to language disorder using language sampling methods, native tests, and observations appropriate to the age of the client

12. Analysis of results of assessment for designing an appropriate treatment plan. Selection and implementation of treatment method appropriate to the child's disorder in the areas of grammar and semantic and other possible areas among the therapeutic methods

13. Baseline re-evaluation, pre-post treatment comparison, determining discharge criteria for clients, preparing a case report and presenting it in the form of a seminar

7. Internship in acquired language disorders:

14. Assessment of one case with aphasia

15. Forming a baseline, designing and implementing treatment based on specific approach (model-based assessment and treatment of aphasia defects including auditory-verbal comprehension defects, anomia, dyslexia, dysgraphia)

16. Baseline re-evaluation, pre-post treatment comparison

17. Preparing a case report and presenting it in the form of a seminar

8. Internship in motor speech disorders in adulthood:

18. Assessment of one case with adult motor speech disorders (implementation of clinical assessment methods for adult dysarthria including case history, assessment of structure and function of the organs involved in speech, perceptual assessment and differential diagnosis of perceptual features of types of dysarthria and apraxia of speech)

19. Forming a baseline, designing and implementing of treatment based on specific approach (implementation of rehabilitative methods related to types of dysarthria and apraxia of speech)

20. Baseline re-evaluation, pre-post treatment comparison

21. Preparing a case report and presenting it in the form of a seminar

Student evaluation method:

Evaluation of students in cognitive field is done in the middle and end of the course in descriptive and four-choice form, and in skill fields using written report, checklist and practical implementation of methods

References:

1. McAllister, L. Issues and innovations in clinical education. Advances in Speech Language Pathology, 7(3), 138-148.

2. Body, R. Ethics in speech and language therapy, John Wiley & Sons.

3. Reilly, S., Douglas, J., & Oates, J. Evidence-based practice and speech pathology: future directions. Murry T, Carrau RL. Clinical management of swallowing disorders. Plural publishing.

4. Thal, D.J., Marchman, V.A., & Tomblin, J.B. Late-talking toddlers: Characterization and prediction of continued delay.

5. Stavrakaki, S. (Ed.). Specific Language Impairment: Current Trends in Research (Vol.58). John Benjamins Publishing Company.

6. Leonard, L.B. Children with specific language impairment. MIT press.

7. Reed VA. Toddlers and preschoolers with specific language impairment. Reed (Ed.). An introduction to children with language disorders, (5th ed.). NewYork: Pearson.

8. Hoff, E. (Ed.). Research methods in child language: A practical guide (Vol.9). John Wiley & Sons.

9. Coppens, P. Aphasia and related neurogenic communication disorders. Jones & Bartlett Publishers.

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

11. Chapey, R. Language intervention strategies in aphasia and related neurogenic communication disorders. Lippincott Williams & Wilkins.

12. Duffy, J.R., Strand, E.A., & Josephs, K.A. Motor speech disorders associated with primary progressive aphasia. Aphasiology, 28(8-9), 1004-1017.

13. Freed, D. Motor speech disorders: diagnosis & treatment. Nelson Education.

14. Perrier P. About speech motor control complexity. In Harrington, J. and Tabain, M. (Eds.): Towards a better understanding of speech production processes. New York: Psychology Press.

Course title: Clinical Practicum 3

Code of the course: 05

Number of credits: 1

Type of the course: Internship

Prerequisite: None

The general purpose of the course: Using professional ethics in the clinical practice, evidence-based clinical exercises and professionalism training, getting to know clinical teaching method, learning about advanced clinical practice in autism spectrum disorder, fluency disorders, and communicative disorders in cleft palate and craniofacial anomalies

Course description:

In this course, students will train usage of professional ethics in speech therapy and they can provide clinical training to undergraduate students after completing the course. Also, they can assess autism spectrum disorder, fluency disorders, and communicative disorders in cleft palate and craniofacial anomalies based on high quality evidence and they can treat based on the new treatment approaches and report to scientific community.

Outlines: Internship (51 hours):

1. Professional ethics: professional clinical practice, professional standards, professional competency requirement
2. Professional ethics principals in the communicative-linguistic impairments in autism spectrum disorder, fluency disorder and communicative disorders in cleft palate and craniofacial anomalies
3. Methods of obtaining, evaluating, and applying evidence to clinical practice
22. Grading of evidence for clinical practice, how to translate results into clinical practice, application of evidence for assessment and treatment of communicative-linguistic impairments in autism spectrum disorder, fluency disorders and communicative disorders in cleft palate and craniofacial anomalies
4. Principles of clinical training and supervision:
23. Getting to know about clinical supervision principals and methods
24. Education of undergraduate students under the supervision of the main supervisor of the clinic
5. Internship in autism spectrum disorder:

25. Assessment and diagnosis of one case with communicative-linguistic impairments in autism spectrum disorder (using screening tools and diagnosis of communicative-linguistic impairments in autism spectrum disorder such as M-CHAT, GARS, CARS)

26. Assessment of communication and language in children with communicative-linguistic impairments in autism spectrum disorder including prelinguistic assessment, linguistic and social skills assessment, forming a baseline, designing and implementing treatment based on specific approach (behavioral implementation to increase learning and communicative and social skills such as PECS or augmentative-alternative communication, specific implementation of language to increase language proficiency according to language development patterns)

27. Baseline re-evaluation, pre-post treatment comparison

28. Preparing a case report and presenting it in the form of a seminar

6. Internship in fluency disorders:

29. Assessment of one case with fluency disorders (types of quantitative and qualitative assessment methods for children and adults with fluency disorders)

30. Forming a baseline, designing and implementing treatment based on specific approach (speech restructuring approaches such as Camperdown Program, Video self-modeling and Comprehensive Stuttering Program (CSP))

31. Baseline re-evaluation, pre-post treatment comparison

32. Preparing a case report and presenting it in the form of a seminar

7. Internship in communicative disorders in cleft palate and craniofacial anomalies:

33. Assessment of one case with communicative disorders in cleft palate and craniofacial anomalies (standard perceptual assessment such as CAPS, differential diagnosis of speech disorders related to cleft palate and transcription and registration of errors, assessment of velopharyngeal mechanism using nasometer, interpretation of instrumental assessment results and connecting their results to results of perceptual assessments)

34. Forming a baseline, designing and implementing treatment based on specific approach (implementing treatment techniques of articulation disorders related to cleft palate, treatment methods of hypernasality in borderline velopharyngeal dysfunction, elimination of nutritional problems and prosthetic treatments and types of secondary surgery in VPI, application of ICF model in cleft palate and its concomitant disorders)

35. Baseline re-evaluation, pre-post treatment comparison

36. Preparing a case report and presenting it in the form of a seminar

Student evaluation method:

Evaluation of students in cognitive field is done in the middle and end of the course in descriptive and four-choice form, and in skill fields using written report, checklist and practical implementation of methods

References:

1. McAllister, L. Issues and innovations in clinical education. Advances in Speech Language Pathology, 7(3), 138-148.
2. Body, R. Ethics in speech and language therapy, John Wiley & Sons.
3. Reilly, S., Douglas, J., & Oates, J. Evidence-based practice and speech pathology: future directions. Murry T, Carrau RL. Clinical management of swallowing disorders. Plural publishing.
4. Volkmar, F.R., Paul, R., Klin, A., & Cohen, D. Handbook of Autism and Pervasive Developmental Disorders. Volume 1: Diagnosis, Development, Neurobiology, and Behavior (3de druk). Tijdschrift voor Psychiatrie, 49 (12), 920-920.
5. Longerbeam M, Sigafoo J. Language and children with autism spectrum disorder. Reed (Ed.). An introduction to children with language disorders. New York: Pearson.
6. Tarbox, J., Dixon, D., Sturmey, P., & Matson, J.L. Handbook of early intervention for autism spectrum disorders. Springer New York.
7. Guitar, B. Stuttering: An integrated approach to its nature and treatment. Lippincott Williams & Wilkins.
8. Viswanath, N. Treatment of Stuttering: Established and Emerging Interventions, B. Guitar, R. McCauley (Eds.), Lippincott, Williams & Wilkins, Baltimore, MD, 448 pp., Hardback.
9. Reardon-Reeves, N., & Yaruss, J.S. School-age stuttering therapy: A practical guide. Stuttering Therapy Resources, Incorporated.
10. Packman, A., Onslow, M., Webber, M., Harrison, E., Arnott, S., Bridgman, K., & Lloyd, W. The Lidcombe Program treatment guide. Lidcombe Program Trainers Consortium. Retrieved from http://sydney.edu.au/health-sciences/asrc/docs/lp_treatment_guide_pdf.
11. O'Brian S, Carey B, Lowe R, Onslow M, Packman A, Cream A. Camperdown program treatment guide. Australian Stuttering Research Centre, University of Sydney. Retrieved at https://www.uts.edu.au/sites/default/files/10/Camperdown%20Program%20Treatment%20Guide%20
12. Ward, D., & Scott, K.S. 9(Eds.). Cluttering: A handbook of research, intervention and education. Psychology Press.
13. Pertijs, M.A.J., Oonk, L.C., Beer de JJ, B.E., & Bast, E.J. Clinical guideline stuttering in children, adolescents and adults. Woerden: NVLF.
14. Howard, S., & Lohmander, A. (Eds.). Cleft palate speech: assessment and intervention. John Wiley & Sons.

15. Kummer, A.W. Cleft palate & craniofacial anomalies: Effects on speech and resonance. Nelson Education.

16. Peterson-Falzone, S.J., Trost-Cardamone, J., Karnell, M.P., & Hardin-Jones, M.A. The Clinician's Guide to Treating Cleft Palate Speech-E-Book. Elsevier Health Sciences.

17. Peterson-Falzone, S.J., Hardin-Jones, M.A., Karnell, M.P., & McWilliams, B.J. Cleft palate speech (pp. 266-291). St. Louis: Mosby.

Course title: Swallowing Disorders in Adults

Code of the course: 06

Prerequisite: None

Number of credits: 1 (0.5 theoretical, 0.5 practical)

Type of the course: Theoretical-Practical

The general purpose of the course: Getting to know about normal swallowing (oral and oral-pharyngeal phases), swallowing disorder (oral and oral-pharyngeal phases) and methods of assessment and treatment of adult dysphagia (oral and oral-pharyngeal phases)

Course description:

In this course, students will know about normal mechanism of swallowing in adults (oral and oral-pharyngeal phases), swallowing disorder characteristics (oral and oral-pharyngeal phases) and its causes in adults and they learn methods of assessment and treatment of adult dysphagia (oral and oral-pharyngeal phases).

Outlines: Theoretical (9 hours):

1. Anatomy and physiology of normal swallowing (oral and oral-pharyngeal phases) in adults
2. Definition, classification, terminology of the frequent words and prevalence of adult dysphagia (oral and oral-pharyngeal phases)
3. Pathophysiology and dysphagia signs (oral and oral-pharyngeal phases) in neurologic disorders (stroke, traumatic brain injury, Parkinson, Alzheimer, multiple sclerosis and amyotrophic lateral sclerosis)
4. Pathophysiology and dysphagia signs (oral and oral-pharyngeal phases) in head and neck cancers
5. Pathophysiology and dysphagia signs (oral and oral-pharyngeal phases) post-surgery (intubation)
6. Getting to know about dysphagia (oral and oral-pharyngeal phases) in oral-pharyngeal and esophageal phases
7. Methods of clinical assessment of dysphagia (oral and oral-pharyngeal phases) in adults including case history, assessment of structure and function of swallowing organs (oral and oral-pharyngeal phases) and getting to know about common tests in dysphagia assessment (oral and oral-pharyngeal phases)

8. Methods of instrumental assessment (fiberoptic endoscopic evaluation of swallowing (FEES), videofluoroscopy swallowing study (VFSS), manometry, sonography and radiography)

9. Dysphagia treatment principals and approaches (oral and oral-pharyngeal phases) in adults (dysphagia treatment team (oral and oral-pharyngeal phases), compensatory, rehabilitative and mixed approaches)

10. Compensatory methods of dysphagia treatment (oral and oral-pharyngeal phases) in adults (posture correction, modification of food concentration, modification of feeding and use of prostheses)

11. Methods of dysphagia rehabilitation (oral and oral-pharyngeal phases) in adults (oral motor exercises, swallowing maneuver (oral and oral-pharyngeal phases) and tactile-thermal stimulation)

12. Getting to know about novel methods for dysphagia (oral and oral-pharyngeal phases) in adults (for example neuromuscular electrical stimulation (NMES))

13. Getting to know about medical treatment of dysphagia (oral and oral-pharyngeal phases) in adults (pharmaceutical, surgical and non-oral nutrition methods)

14. Role of speech and language pathologist in assessment and treatment of dysphagia (oral and oral-pharyngeal phases) in intensive care unit (ICU)

15. Getting to know about coding of swallowing disorders according to ICF

Outlines: Practical (17 hours):

1. Screening of adult dysphagia (oral and oral-pharyngeal phases)

2. Implementing of clinical assessment methods for adult dysphagia (oral and oral-pharyngeal phases) including case history, assessment of structure and function of swallowing organs (oral and oral-pharyngeal phases), clinical assessment of swallowing (oral and oral-pharyngeal phases)

3. Implementing treatment methods of adult dysphagia (oral and oral-pharyngeal phases)

4. One case with coding of adult dysphagia according to ICF

Student evaluation method:

Evaluation of students in cognitive field is done in the middle and end of the course in descriptive and four-choice form, and in skill fields using written report, checklist and practical implementation of methods.

References:

1. Murry, T. Clinical Management of Swallowing Disorders (4th ed.). Plural Publishing, Inc.
2. Corbin-Lewis, K., & Liss, J.M. Clinical Anatomy & Physiology of the Swallow Mechanism. Cengage Learning.
3. Carrau, R.L., Howell, R.J., & Murry, T. Comprehensive Management of Swallowing Disorders. Van Haren Publishing.
4. Rosenbek, J.C. Dysphagia in Movement Disorders (Clinical Dysphagia). Plural Publishing, Inc.

Course title: Developmental Reading and Writing Disorders

Code of the course: 07

Prerequisite: None

Number of credits: 2 (1 theoretical, 1 practical)

Type of the course: Theoretical-Practical

The general purpose of the course: In this course, students will know about the theoretical basics of developmental dyslexia and dysgraphia and they learn specifically about neurolinguistic theories. They learn about methods of general and specific assessments of reading and writing and methods of reading and writing function improvement with emphasis to elimination of linguistic deficits.

Course description:

In this course, students will know about evolutionary process of developmental dyslexia and dysgraphia theories. They will know specifically about linguistic defects theories. They will learn about assessment and treatment approaches of developmental dyslexia and dysgraphia according to theories.

Outlines: Theoretical (17 hours):

1. Getting to know about types of developmental dyslexia and dysgraphia and their characteristics
2. Getting to know about difference in classification of developmental and acquired dyslexia and dysgraphia
3. Getting to know about etiology of developmental dyslexia and dysgraphia including:
    a) Visual Processing Approaches
    b) Temporal Processing
    c) Phonological Core Deficit
    d) Dual Subtype Approaches (linguistic deficits and perceptual deficits)
    e) Multiple Subtype Approaches (phonological processing, rapid automatized naming, and orthographic processing)
    f) Neurolinguistic approach
4. Getting to know about neurocognitive model for explanation of deficits in children with developmental dyslexia and dysgraphia
5. Getting to know about psycholinguistic approach for explanation of deficits in children with developmental dyslexia and dysgraphia
6. Introducing of team approach in assessment and treatment of children with developmental dyslexia and dysgraphia and determining of role of speech and language pathologist in team

7. Getting to know about assessment of general area of children with developmental dyslexia and dysgraphia (for example intelligence, motor skills and …)

8. Getting to know about assessment of specific area of cognition, language, reading, and writing in children with developmental dyslexia and dysgraphia

9. Getting to know about treatment approaches in fields of cognition, language, reading, and writing in children with developmental dyslexia and dysgraphia

10. Developmental reading and spelling disorders in children with specific language impairment

11. Getting to know about coding of developmental dyslexia and dysgraphia according to ICF

Outlines: Practical (34 hours):

1. Implementation and interpretation of assessment in specific areas of cognition, language, reading, and writing in children with developmental dyslexia and dysgraphia

2. Implementation and interpretation of treatment approaches in fields of cognition, language, reading, and writing in children with developmental dyslexia and dysgraphia

3. One case with coding of developmental dyslexia and dysgraphia according to ICF

Student evaluation method:

Evaluation of students in cognitive field is done in the middle and end of the course in descriptive and four-choice form, and in skill fields using written report, checklist and practical implementation of methods.

References:

1. Snowling M, Stackhouse J. Dyslexia, speech and language: A practitioner's handbook, Whurr.
2. Paul R. Language disorders from infancy through adolescence. Elsevier.
3. Christo C, Davis J, Brock SE. Identifying, assessing and treating dyslexia at school. Springer.
4. Wallach GP. Language and school-age children with learning disabilities, chapter 4, in Vicki A. Reed (Eds.). An introduction to children with language disorders, NewYork: Pearson.
5. Kamara CA. Neurolinguistic approach to reading: A guide for speech-language pathologists treating dyslexia. Plural Publishing.

Course title: Autism Spectrum Disorders

Code of the course: 08

Prerequisite: None

Number of credits: 1 (0.5 theoretical- 0.5 practical)

Type of the course: Theoretical-Practical

The general purpose of the course: Getting to know about nature, causes and principals of specific assessment and treatment of communicative-linguistic impairments in autism spectrum disorder

Course description:

Students learn about definition, pathology explanation, and specific assessment and intervention principals in children with communicative-linguistic impairments in autism spectrum disorder.

Outlines: Theoretical (9 hours):

1. Diagnostic criteria for a child with communicative-linguistic impairments in autism spectrum disorder according to DSM-V and epidemiology

2. Progress of communicative-linguistic impairments in autism spectrum disorder in infancy, childhood, school-age and adulthood

3. Etiology of communicative-linguistic impairments in autism spectrum disorder including findings of genetic, neuropsychologic, neurobiologic, …

4. Specific symptomatology of neuropsychological, behavioral, emotional, cognitive, sensory-motor, and socio-communicative and linguistic characteristics in communicative-linguistic impairments in autism spectrum disorder

5. Differential diagnosis of communicative-linguistic impairments in autism spectrum disorder with disorders such as social communication disorder, childhood schizophrenia, ADHD, developmental language disorder (specific language impairment) and …

6. Screening tools and diagnosis of communicative-linguistic impairments in autism spectrum disorder such as M-CHAT, GARS, CARS, …

7. Assessment of communication and language in children with communicative-linguistic impairments in autism spectrum disorder (prelinguistic assessment, linguistic and social skills assessment)

8. Getting to know about non-specific interventions such as pharmaceutical treatment, psychotherapy, occupational therapy, …

9. Speech therapy interventions for communicative-linguistic impairments in autism spectrum disorder such as behavioral interventions for improvement of learning, communicative and social skills such as PECS or augmentative and alternative communication and improvement of linguistic skills according to patterns of language development

10. Getting to know about coding of communicative-linguistic impairments in autism spectrum disorder according to ICF

Outlines: Practical (17 hours):

1. Practical implementation and interpretation of assessments in fields related to language such as play and … in the minimum two samples of client or malinger

2. Determining the level of communication and language skills in the minimum two samples of client or malinger

3. Practical implementation of treatment approaches such as PECS for the minimum two samples of client or malinger

4. One sample for coding of communicative-linguistic impairments in autism spectrum disorder according to ICF

Student evaluation method:

Evaluation of students in cognitive field is done in the middle and end of the course in descriptive and four-choice form, and in skill fields using written report, checklist and practical implementation of methods.

References:
1. Volkmar FR, Paul R, Klin A, Cohen DJ (Eds.). Handbook of autism and pervasive developmental disorders, diagnosis, development, neurobiology, and behavior (Vol. 1 & 2). John Wiley & Sons.

2. Longerbeam M, Sigafoo J. Language and children with autism spectrum disorder, chapter 7, in Vicki A. Reed (Ed.). An introduction to children with language disorders, NewYork: Pearson.

3. Tarbox J, Dixon DR, Sturmey P, Matson JL (Eds.). Handbook of early intervention for autism spectrum disorders: Research, policy, and practice. NewYork: Springer.

Course title: Acquired Language Disorders

Code of the course: 09

Prerequisite: None

Number of credits: 2 (1.5 theoretical- 0.5 practical)

Type of the course: Theoretical-Practical

The general purpose of the course: Increasing the knowledge and skill acquisition of students in assessment and treatment of types of acquired language disorders

Course description:

In this course, students will know about types of acquired language disorders caused by illness and different neurological conditions such as aphasia, dementia, right hemisphere damage and brain damage and they will assess and treat using defined framework such as ICF and cognitive neuropsychology and with considering the quality-of-life approach as important.

Outlines: Theoretical (26 hours):

1. Definition and classification of acquired language disorders
2. Reviewing on types of aphasia and improvement mechanisms of brain damage
3. Reviewing on aphasia assessment approaches (ICF model, application of EBP and quality of life)
   a. Psychometrics of aphasia tests
4. Aphasia treatment approaches
   a. Description of treatment process
   b. Application of ICF model in aphasia treatment
   c. The starting and ending point of treatment
   d. Discrimination among different treatment approaches
5. Model-based assessment and treatment of aphasia
6. Assessment and treatment approaches of sentence processing disorders in aphasia
7. Assessment and treatment of multilingual aphasia
   a. Different improvement patterns in multilingual aphasia
   b. Approaches and effective factors on multilingual aphasia treatment
8. Assessment and treatment approaches of discourse disorders
   a. Definition of discourse prospect, conversation analysis, and narrative prospect
   b. Approaches of discourse disorders assessment

c. Approaches of discourse disorders treatment

9. Pathophysiology, assessment and treatment of communicative deficits in right hemisphere damage (RHD)
   a. Linguistic and non-linguistic deficits in RHD
      i. Cognitive resources hypothesis in communicative disorder of right hemisphere
      ii. Suppression deficit hypothesis
   b. Types of treatment for communicative deficits in RHD
      i. Medical models, ICF, and cognitive rehabilitation in assessment and treatment of right hemisphere disorders
      ii. Directing treatment via patient
      iii. Treatment of cognitive resources deficits

10. Pathophysiology, assessment and treatment of TBI
    b. Epidemiology of TBI
    c. Assessment of communicative, cognitive, behavioral and executive function in TBI
    d. Improvement process of TBI
    e. Rehabilitation goals of TBI
    f. Assessment and treatment principals of TBI
    g. Treatment approaches of TBI

11. Pathophysiology, assessment and treatment of dementia
    a. Knowing the diseases that lead to dementia
    b. Types of dementia syndromes
    c. Linguistic and cognitive deficits in dementia with emphasis to Alzheimer
    d. The role of speech language pathologist for patients with dementia
    e. Appropriate treatment methods for patients with dementia

12. Paraclinical assessments in neurologic disorders (concepts, principles, application, instrumental characteristics and interpretation of findings in types of instruments and neuroimaging methods including CT-Scan, MRI in typical and acquired language disorders samples)

13. Getting to know about coding of acquired language disorders according to ICF framework

Outlines: Practical (17 hours):

1. Observation of neuroimaging findings including MRI and CT-Scan in the normal population and individuals with acquired language disorders

2. Assessing and designing a treatment plan according to ICF model (using the movie is shown, case description or role playing)

3. Assessing and designing a treatment plan according to cognitive neuropsychology (using the movie is shown, case description or role playing)

4. Quality of life assessment using questionnaire
5. Assessment of treatment plan efficacy using quality of life questionnaire
6. Implementation of treatment methods related to brain damage due to TBI and dementia
7. Implementation of assessment and treatment approaches of discourse disorders

Student evaluation method:

Evaluation of students in cognitive field is done in the middle and end of the course in descriptive and four-choice form, and in skill fields using written report, checklist and practical implementation of methods.

References:

1. Papathanasiou I, Coppens P. Aphasia and related neurogenic communication disorders. Jones & Bartlett Publishers.
2. Whitworth A, Webster J, Howard DA. Cognitive neuropsychological approach to assessment and intervention in aphasia: A clinician's guide. NewYork: Psychology Press.
3. Chapey R. Language intervention strategies in aphasia and related neurogenic communication disorders. Philadelphia: Lippincott, Williams.

Course title: Developmental Language Disorder (Specific Language Impairment)

Code of the course: 10

Prerequisite: None

Number of credits: 1 (0.5 theoretical- 0.5 practical)

Type of the course: Theoretical-Practical

The general purpose of the course: Getting to know about nature, causes and principals of specific assessment and treatment of developmental language disorder (specific language impairment)

Course description:

Students learn about definition, pathology explanation, and specific assessment and intervention principals in children with developmental language disorder (specific language impairment).

Outlines: Theoretical (9 hours):

1. Definition and terminology of developmental language disorder (specific language impairment)

2. Diagnostic criteria for a child with developmental language disorder (specific language impairment) and epidemiology

3. Etiology of developmental language disorder (specific language impairment) including findings of genetic, neurobiological, …

4. Specific symptomatology of cognitive, linguistic, communicative-social and academic in developmental language disorder (specific language impairment)

5. Differential diagnosis of developmental language disorder (specific language impairment) with disorders such as communicative-linguistic impairments in autism spectrum disorder, social communication disorder, childhood schizophrenia, ADHD

6. Screening, diagnosis and assessment of communication and language in children with developmental language disorder (specific language impairment)

7. Speech therapy interventions for developmental language disorder (specific language impairment) and increasing linguistic competencies such as grammar and semantic-center interventions, dosage of treatment, according to language development patterns

8. Getting to know about coding of developmental language disorder according to ICF framework

Outlines: Practical (17 hours):

1. Assessing and determining the level of communication and language skills in the minimum two samples of client or malinger
2. Practical implementation of speech therapy interventions for the minimum two samples of client or malinger
3. One sample for coding of developmental language disorder according to ICF

Student evaluation method:

Evaluation of students in cognitive field is done in the middle and end of the course in descriptive and four-choice form, and in skill fields using written report, checklist and practical implementation of methods.

References:

1. Rescorla L, Dale PS (Eds.). Late talkers: Language development, interventions, and outcomes. Paul H. Brookes Publishing Company.
2. Stavrakaki S (Ed.). Specific language impairment: current trends in research (Vol. 58). John Benjamins Publishing Company.
3. Leonard LB. Children with specific language impairment. MIT.
4. Reed VA. Toddlers and preschoolers with specific language impairment, Chapter 3, in Vicki A. Reed (Ed). An introduction to children with language disorders. NewYork: Pearson.
5. Hoff E. Research methods in child language: A practical guide. West Sussex: Blackwell Publishing Ltd.

Course title: Fluency Disorders

Code of the course: 11

Prerequisite: None

Number of credits: 2 (1.5 theoretical- 0.5 practical)

Type of the course: Theoretical-Practical

The general purpose of the course: Increasing the knowledge and skill acquisition of students in assessment and treatment of children and adults with fluency disorders according to new perspectives in pathology, assessment and evidence-based practice approaches

Course description:

In this course, it is expected from students to know about differential diagnosis of fluency disorders and to criticize theories and models of stuttering etiology. They have to evaluate stuttering and other fluency disorders and its effect on quality of life qualitatively and quantitatively. They have to criticize and implement evidence-based interventions for stuttering treatment in adults. They have to use ICF framework in assessment and treatment of fluency disorders for quality-of-life improvement in adults with stuttering.

Outlines: Theoretical (26 hours):

1. Differential diagnosis of types of fluency disorders including developmental and acquired dysfluencies
2. Knowing about epidemiologic indicators of types of fluency disorders
3. Getting to know about models and theories of stuttering etiology including linguistic, neurologic, motor, three factors, demand and capacity, and multifactorial theories
4. Getting to know about types of qualitive and quantitative assessment methods of fluency disorders in adults
5. Getting to know about Lidcombe program and interventions based on demand and capacity approach
6. Getting to know about the comprehensive approach to treatment of adults' stuttering
7. Getting to know about speech restructuring approaches such as Camperdown Program, Video self-modeling (VSM), Comprehensive Stuttering Program (CSP) for treatment of adolescence and adults

8. Getting to know about evidence-based assessments and treatments about emotional-psychological-social and attitude problems concomitant to stuttering including cognitive-behavioral therapy in adults with stuttering

9. Getting to know about different methods of stuttering treatment including group therapy and tele practice

10. Assessment and treatment of acquired stuttering

11. Assessment and treatment of cluttering

12. Getting to know about coding of fluency disorders according to ICF framework

Outlines: Practical (17 hours):

1. Clinical observation, registration and interpretation of symptoms of dysfluency and behaviors related to stuttering in adults using qualitative and quantitative tools

2. Determination of prognosis, short-term and long-term goals for treatment of adult stuttering

3. Implementing the qualitative and quantitative assessment for adults with fluency disorders

4. Designing and implementing of treatment plan according to findings of assessment and case report presentation

5. Coding of one case with fluency disorder according to ICF

Student evaluation method: Evaluation of students in cognitive field is done in the middle and end of the course in descriptive and four-choice form, and in skill fields using written report, checklist and practical implementation of methods.

References:

1. Guitar B. Stuttering: An integrated approach to its nature and treatment. Lippincott Williams & Wilkins.

2. Guitar B, McCauley RJ. Treatment of stuttering: Established and emerging interventions. Wolters Kluwer.

3. Reardon-Reeves N, Yaruss JS. School-age stuttering therapy: A practical guide.

4. Packman A, Onslow M, Webber M, Harrison E, Arnott S, …, Lloyd W. Lidcombe program trainers' consortium. Retrieved at: lidcombe program treatment guide. http://lidcombeprogram.org/wp-content/uploads/Lidcombe-Program-Treatment

5. O'Brian S, Carey B, Lowe R, Onslow M, Packman A, Cream A. Camperdown program treatment guide. Australian Stuttering Research Centre, University of Sydney. Retrived at:

https://www.uts.edu.au/sites/default/files/10/Camperdown%20Program%20Treatment%20Guide%20June%20

6. Ward D, Scott KS (Eds.). Cluttering: A handbook of research, intervention and education. Psychology Press.

7. Pertijs MAJ, Oonk LC, Beer de JJA, Bunschoten EM, Bast EJEG, …, Veenendaal van H. Clinical guidline 'stuttering in children, adolescents and adults'. NVLF, Woerden.

Course title: Voice Disorders

Code of the course: 12

Prerequisite: None

Number of credits: 2 (1 theoretical- 1 practical)

Type of the course: Theoretical-Practical

The general purpose of the course: Getting to know about pathology, assessment, diagnosis and treatment of voice disorders with emphasis to physiologic approach and increasing his/her skill in this field

Course description:

In this course, students will know about functional anatomy and pathophysiology of muscle tension dysphonia, as well as supplementary voice assessments. Also, they will learn about treatments of voice disorders with emphasis to physiologic approach and they will know and do coding method of voice disorders according to ICF framework.

Outlines: Theoretical (17 hours):

1. Functional anatomy (touching) of laryngeal and neck muscles
2. Physiology of vocalization (mechanisms of frequency, loudness, and quality of voice changing)
3. Pathophysiology of primary and secondary muscle tension dysphonia
4. Perceptual-auditory assessment, posture assessment
5. Physiologic voice therapy: manual therapy of larynx with emphasis to vocalization, functional voice exercises, resonant voice therapy, methods of vocal warm up, the accent method of voice therapy
6. Introducing surgical treatments of larynx
7. Speech rehabilitation pre- and post-surgeries of laryngeal cancer
8. Getting to know about coding of voice disorders according to ICF framework

Outlines: Practical (34 hours):

1. Observation and practical implementation of `functional anatomy (touching) of laryngeal and neck muscles
2. Practical implementation of perceptual-auditory assessment of voice using formal scales, observation and practical implementation of posture assessment

3. Observation and practical implementation of laryngeal manual therapy with emphasis to vocalization

4. Observation and practical implementation of functional voice exercises

5. Observation and practical implementation of resonant voice therapy

6. Observation and practical implementation of methods of vocal warm up

7. Observation and practical implementation of the accent method of voice therapy

8. Observation of video about vocal surgery treatments

9. Observation and practical implementation of speech rehabilitation pre- and post-surgeries of laryngeal cancer

10. Coding of one case with voice disorder according to ICF

Student evaluation method:

Evaluation of students in cognitive field is done in the middle and end of the course in descriptive and four-choice form, and in skill fields using written report, checklist and practical implementation of methods.

References:

1. Stemple JC, Roy N, Klaben BK. Clinical voice pathology: Theory and management: Plural Publishing.

2. Seikel JA, Drumright DG, King DW. Anatomy & physiology for speech, language, and hearing: Nelson Education.

3. Colton RH, Casper JK, Leonard R. Understanding voice problems. Philadelphia: Techbooks.

Course title: Communication Disorders in Cleft Palate and Craniofacial Anomalies

Code of the course: 13

Prerequisite: None

Number of credits: 1 (0.5 theoretical- 0.5 practical)

Type of the course: Theoretical-Practical

The general purpose of the course: In this course, students get to know about advanced topics of communicative disorders related to congenital and acquired craniofacial anomalies with emphasis to cleft of the lip and palate and how to assess and treat them.

Course description:

In this course, it is expected from students to know about structure and function of velopharyngeal sphincter, effect of velopharyngeal dysfunction and oral, facial and pharyngeal anomalies on speech and language development, They have to do types of perceptual and instrumental assessments and their interpretation, differential diagnosis and registration of speech errors related to cleft palate, designing an appropriate treatment plan and they have to know and do coding method of cleft palate according to ICF framework.

Outlines: Theoretical (9 hours):

1. Reviewing on anatomy and physiology of orofacial structures, velopharyngeal function in speech and non-speech activities, causes and signs of velopharyngeal dysfunction, articulation errors related to cleft palate
2. Effect of oral, facial and pharyngeal anomalies on speech and resonance
3. Primary phonological development in children with cleft palate
4. Standard perceptual assessments (such as CAPS), differential diagnosis of speech disorders related to cleft palate and transcription and registration of errors
5. Reviewing on instrumental assessments including nasometry, nasoendoscopy, videofluoroscopy and aerodynamic
6. Assessment of velopharyngeal system using nasometry
7. Interpretation of findings of instrumental assessments and association of their findings with perceptual assessments
8. Treatment techniques for articulation disorders related to cleft palate

9. Treatment methods of hypernasality in borderline velopharyngeal dysfunction
10. Role of speech and language pathologist in the elimination of nutrition problems and prosthetic treatments and types of secondary surgeries in VPI
11. Getting to know about coding of cleft palate and its concurrent disorders in ICF framework

Outlines: Practical (17 hours):

1. Doing perceptual assessments (such as doing standard form of CAPS) for minimum 2 patients, associating their results with findings of direct and indirect instrumental assessments and doing differential diagnosis according to video observation
2. Designing a treatment plan for minimum 2 real patients (interventions for hypernasality and articulation)
3. Observation of treatment plans implementation for hypernasality and articulation and providing reports

Student evaluation method:

Evaluation of students in cognitive field is done in the middle and end of the course in descriptive and four-choice form, and in skill fields using written report, checklist and practical implementation of methods.

References:

1. Howard S, Lohmander A. Cleft palate speech: Assessment and intervention. Wiley-Blackwell.
2. Kummer AW. Cleft palate and craniofacial anomalies. Thomson.
3. Peterson-Falzone SJ, Trost-Cardamone J, Karnell MP, Hardin-Jones MA. The clinician's guide to treating cleft palate speech. Mosby.
4. Peterson-Falzone SJ, Hardin-Jones MA, Karnell MP. Cleft palate speech. Mosby.

Course title: Motor Speech Disorders in Adults

Code of the course: 14

Prerequisite: None

Number of credits: 2 (1.5 theoretical- 0.5 practical)

Type of the course: Theoretical-Practical

The general purpose of the course: Getting to know about normal and abnormal aspects of components and functions of motor speech system and acquiring ability for assessment and treatment of motor speech disorders in adults

Course description:

In this course, students get to know about motor speech disorders in adulthood and neurological bases and path of motor speech control. Also, they learn about pathology, types, signs, assessment and treatment of motor speech disorders in adults.

Outlines: Theoretical (26 hours):

1. Getting to know about what movement is and its different theories of motor control
2. Getting to know about speech motor control models
3. Getting to know about difference between non-speech and speech organs motor control
4. Getting to know about difference between non-speech and speech motor control
5. Getting to know about assessment methods of motor speech disorders
6. Assessment of speech production mechanism in motor speech disorders
7. Getting to know about Flaccid dysarthria and its treatment methods for defects of respiration, resonance, vocalization, articulation and prosody
8. Getting to know about Spastic dysarthria and its treatment methods for defects of respiration, resonance, vocalization, articulation and prosody
9. Getting to know about Ataxic dysarthria and its treatment methods for defects of respiration, resonance, vocalization, articulation and prosody
10. Getting to know about Hypokinetic dysarthria and its treatment methods for defects of respiration, resonance, vocalization, articulation and prosody
11. Getting to know about Hyperkinetic dysarthria and its treatment methods for defects of respiration, resonance, vocalization, articulation and prosody
12. Getting to know about Mixed dysarthria and its treatment methods for defects of respiration, resonance, vocalization, articulation and prosody

13. Getting to know about apraxia of speech and its treatment methods
14. Getting to know about coding of motor speech disorders according to ICF

Outlines: Practical (17 hours):

1. Assessment and doing treatment methods for defects of respiration, resonance, vocalization, articulation and prosody of speech in Flaccid dysarthria

2. Assessment and doing treatment methods for defects of respiration, resonance, vocalization, articulation and prosody of speech in Spastic dysarthria

3. Assessment and doing treatment methods for defects of respiration, resonance, vocalization, articulation and prosody of speech in Ataxic dysarthria

4. Assessment and doing treatment methods for defects of respiration, resonance, vocalization, articulation and prosody of speech in Hypokinetic dysarthria

5. Assessment and doing treatment methods for defects of respiration, resonance, vocalization, articulation and prosody of speech in Hyperkinetic dysarthria

6. Assessment and doing treatment methods for defects of respiration, resonance, vocalization, articulation and prosody of speech in Mixed dysarthria

7. Assessment and doing treatment methods for apraxia of speech

8. Coding of one case with motor speech disorder according to ICF

Student evaluation method:

Evaluation of students in cognitive field is done in the middle and end of the course in descriptive and four-choice form, and in skill fields using written report, checklist and practical implementation of methods.

References:
1. Duffy, J.R., Strand, E.A., & Josephs, K.A. Motor speech disorder associated with primary progressive aphasia. Aphasiology, 28 (8-9), 1004-1017.
2. Freed, D. Motor speech disorders: diagnosis & treatment. Nelson Education.
3. Perrier P. About speech motor control complexity. In Harrington, J. and Tabain, M. (Eds.): Towards a better understanding of speech production processes. New York: Psychology Press.

Course title: Advanced Statistics

Code of the course: 15

Prerequisite: None

Number of credits: 3 (1 theoretical- 2 practical)

Type of the course: Theoretical-Practical

The general purpose of the course: Getting to know about advanced topics in statistics and their application in health system research

Course description:

In this course, students get to know about types of statistical methods for data analysis and interpretation. Also, they learn how to work with statistical soft wares and doing statistical analyses.

Outlines: Theoretical (17 hours):

1. Review on distributions: continuous distribution (normal distribution) and discrete distribution, types of variables, types of descriptive statistics (mean, standard deviation, variance, median, quartile, mode)
2. Review on definition of p-value and Confidence Interval
3. Introducing the difference between statistical results and clinical findings
4. Introducing the central limit theorem in T-tests
5. Introducing methods for determining sample size
6. Introducing the effect size index
7. Introducing statistical tests
   7.1. Kolmogorov-Smirnov test
   7.2. T-tests
      - One sample T-test
      - Independent T-test
      - Paired T-test
   7.3. Analysis of variance (ANOVA)
      - One-way ANOVA
      - Two-way ANOVA
      - Repeated measure ANOVA (one-way)
      - Repeated measure ANOVA (two-way)

- Post hoc tests of ANOVA

7.4. Multivariate analysis of variance (MANOVA)

7.5. Multivariate analysis of covariance (MANCOVA)

7.6. Nonparametric tests

- One sample sign test

- One sample Wilcoxon

- Friedman test

- Kruskal-Wallis test

- Mann-Whitney test

- Spearman Rank Correlation

7.7. Correlation tests (Pearson and Spearman)

- Regression

- Linear

- Multiple

- Logistic

8. Introducing statistical analysis soft wares such as SPSS, STATA, and R

9. Introducing sample size determination soft wares such as G power

Outlines: Practical (68 hours):

37. Practical implementation of Kolmogorov-Smirnov test with training data and interpretation of results by student

38. Practical implementation of T-tests

- Practical implementation of one sample T-test with training data and interpretation of results by student

- Practical implementation of independent T-test with training data and interpretation of results by student

- Practical implementation of paired T-test with training data and interpretation of results by student

39. Analysis of variance (ANOVA)

- Practical implementation of one-way ANOVA with training data and interpretation of results by students

- Practical implementation of two-way ANOVA with training data and interpretation of results by students

- Practical implementation of repeated measure ANOVA (one-way) with training data and interpretation of results by students

- Practical implementation of repeated measure ANOVA (two-way) with training data and interpretation of results by students
- Practical implementation of post hoc tests of ANOVA with training data and interpretation of results by students

40. Practical implementation of multivariate analysis of variance (MANOVA) test with training data and interpretation of results by student

41. Practical implementation of multivariate analysis of covariance (MANCOVA) test with training data and interpretation of results by student

42. Nonparametric tests
- Practical implementation of one sample sign test with training data and interpretation of results by students
- Practical implementation of one sample Wilcoxon with training data and interpretation of results by students
- Practical implementation of Friedman test with training data and interpretation of results by students
- Practical implementation of Kruskal-Wallis test with training data and interpretation of results by students
- Practical implementation of Mann-Whitney test with training data and interpretation of results by students
- Practical implementation of Spearman Rank Correlation with training data and interpretation of results by students

43. Practical implementation of correlation tests (Pearson and Spearman) with training data and interpretation of results by students

44. Regression
- Practical implementation of Linear analysis with training data and interpretation of results by students
- Practical implementation of Multiple analysis with training data and interpretation of results by students
- Practical implementation of Logistic analysis with training data and interpretation of results by students

45. Selection of one of introduced statistical analysis soft wares (SPSS, STATA, or R) and familiarity with how to work with it including entering data, selecting an appropriate statistical test, data analysis and interpretation of outputs, drawing a graph and …

46. Selection of one of soft wares for determination of sample size such as G power and familiarity with how to work with it

Student evaluation method:

Evaluation of students in cognitive field is done in the middle and end of the course in descriptive and four-choice form, and in skill fields using written report, checklist and practical implementation of methods.

References:

1. Netter, J., Wasserman, W., Whitmore, G.A. Applied Statistics (Last edition).
2. Rosner, B. Fundamentals of Biostatics (Last edition).
3. Daniel, W.W. Biostatistics: A Foundation for Analysis in the Health Sciences (Last edition).

Course title: Advanced Research Method

Course code: 16

Prerequisite: Advanced concepts of statistics and their practical application in statistical analysis software

Course credit: 3 credits (2 theoretical - 1 practical)

Course credit type: Theoretical-practical

The general purpose of the course: Familiarization with various research methods in the health system

Course description:

In this course, students are fully acquainted with how to achieve the research topic, types of research methods, research tools and ethics in research in the health system, and a research proposal in the field of speech and language pathology is based on the principles of writing, they prepare and present.

Theoretical outlines: 34 hours

1. An overview of research problem recognition and theory in research, research propositions (Goal, Hypothesis and Research question), The difference between construct, concept, variable
2. Introducing all kinds of research sources and finding them
3. Introducing the principles of ethics in research
4. Introduction of research validity types (Internal and external validity)
5. Introducing sample selection and allocation methods
6. Introduction of methodological research (Validity designs, Reliability designs and responsiveness designs in the preparation of instruments)
7. Introducing various research data collection methods (Test, Questionnaire, Interview, Observation and Content analysis)
8. Introduction of various research projects
9. Non-experimental research (Descriptive, Causal-comparative, Correlational)
10. Experimental researches: single group design (Case, Single group pre and post-test, time series), control group design with random assignment and factorials designs, quasi-experimental design and single subject
11. Qualitative research (introduction of qualitative research types and data collection methods)
12. Epidemiology (definition of proportion, share and rate, screening and diagnosis, non-experimental epidemiology plans)
13. Outcomes research
14. Survey research

Practical outlines: 34 hours

1. Evaluation of at least 5 published articles with different research designs such as clinical trial, case-control using Critical Appraisal Checklists

2. Criticism and evaluation of at least 5 existing written research proposals with various research plans

3. Writing a research proposal as an exercise with the following steps: choosing a topic, choosing keywords and databases to find the background of the research, choosing a research plan, choosing a method for measuring research variables, choosing a method for collecting research data, choosing a sampling method.

4. In each stage of writing the proposal, the student must share the logic of choosing the above stages in the classroom so that it can be reviewed.

Student evaluation method:

Evaluation of students in the cognitive field in the middle and at the end of the course is done descriptively and with four options and in the skill area, using written reports, checklists and practical implementation of methods.

References:

1- Carter R E., Lubinsky J., Domholdt E. Rehabilitation research: principles and applications. Elsevier.

Course title: Speech, Language, and Swallowing Laboratory

Course code: 17

Prerequisite: None

Course credit: 3 credits (1 theoretical - 2 practical)

Course credit type: Theoretical-Practical

The general purpose of the course: To acquire knowledge and skills in using laboratory and paraclinical equipment in evaluating, diagnosing and measuring the outcome in speech therapy.

Course Description: In this course, students will get to know the tools and softwires such as of EMG, ERP, tDCS, rTMS, FEES, CHILDES, SALT, Neurofeedback, Eye Tracking, Articulography, Nasoendoscopy, Vital stim, Computerized speech lab (CSL) and X Observer. They become familiar with the structure and applications of these equipment in the process of evaluation, diagnosis and outcome measurement in speech therapy, and learn how to implement and interpret the results of them in at least 3 devices.

Theoretical outlines (17 hours):
1. Familiarity with the concepts, principles, application and characteristics of **EMG** in laryngeal muscles and interpreting the results and methods of its implementation.
2. Familiarity with the concepts, principles and application, and characteristics of **tDCS** and interpretation of the results and methods of its implementation.
3. Familiarity with the concepts, principles and application, and characteristics of **ERP** and interpretation of the results and methods of its implementation.
4. Familiarity with the concepts, principles and application, and characteristics of **rTMS** and interpretation of the results and methods of its implementation.
5. Carrying out **swallowing assessment** (oral and oral-pharyngeal phases), using Evaluation of Swallowing (Fiberoptic Endoscopic (FEES)).
6. Familiarity with the concepts, principles and application, and characteristics of **Neurofeedback** and interpretation of the results and methods of its implementation.
7. Analyzing language samples using **CHILDES, SALT** and similar software, concepts, principles, application, tool specifications and interpretation of results.
8. Familiarity with the concepts, principles, application, specifications of **Eye Tracking**, and interpretation of the results and methods of its implementation.
9. Familiarity with the concepts, principles, application, specifications of **Vital stim**, and interpretation of the results and methods of its implementation.
10. Familiarity with the concepts, principles, application, specifications of **Nasoendoscopy**, and interpretation of the results and methods of its implementation.

11. Familiarity with the concepts, principles, application, specifications of **Articulography**, and interpretation of the results and methods of its implementation.

12. Familiarity with the concepts, principles, application, specifications of **Computerized speech lab (CSL)**, and interpretation of the results and methods of its implementation.

13. Familiarity with **X observer software**, implementation and interpretation of its results.

Practical outline (68 hours):

1. Observation, practical implementation and interpretation of **EMG** results in laryngeal muscles and normal and voice disordered samples.

2. Observation, practical implementation and interpretation of **tDCS** results in in healthy and language impaired people.

3. Observation, practical implementation and interpretation of **ERP** results in in healthy and language impaired people (children and adults).

4. Observation, practical implementation and interpretation of **rTMS** results in in healthy and language impaired people.

5. Observation, practical implementation and interpretation of **Neurofeedback** results in healthy and language impaired people.

6. Practical implementation of **Fiberoptic Endoscopic Evaluation of Swallowing (FEES)** and interpretation of its results.

7. Familiarity and doing coding in software such as **CHILDES, SALT** and similar and analyzing language samples.

8. Observation, practical implementation and interpretation of **Eye Tracking** results in healthy people and people with language disorders.

9. Observation, practical implementation and interpretation of **Vital stim** results in healthy people and people with swallowing disorders. (Dysphasia).

10. Observation, practical implementation and interpretation of **Nasoendoscopy** results in healthy people and people with voice and resonance disorders.

11. Observation, practical implementation and interpretation of **Ariculography** results in healthy people and people with speech disorders.

12. Observation, practical implementation and interpretation of **Computerized speech lab (CSL)** results in healthy people and people with speech disorders.

13. Observation, practical implementation and interpretation of **X observer** results in in healthy people and people with communication disorders.

Student evaluation method:

Evaluation of students in the cognitive field in the middle and at the end of the course is done descriptively and 4 options in the field of skill using a written report, checklist and practical implementation of the methods.

References:

According to each subject, instructions for the relevant equipment will be taught.

Name of Course: Seminar in Speech and Language Disorders

Course code: 18

Prerequisite: Advanced concepts of statistics and their practical application in statistical analysis software, advanced research method

Course credit: 1 credit

Course credit type: Practical

General purpose of the course:

During this course, the student must choose a research topic in one of the specialized fields including prevention, diagnosis, rehabilitation, counseling and management in speech therapy and, while applying critical thinking and evaluation methods, be able to present the reviewed findings in a systematic format in oral (Speech) and written (Systematic report) form.

At the end of this course, while proposing a research topic, the student must present the prepared study protocol.

Course description:

The student is required to choose a research topic and then analyze, criticize and evaluate it according to the evidence. The student will have opportunities to present the activities during the course. Choosing the topic and stating the problem, how to choose the appropriate method and approach for research and comprehensive and complete review of all aspects of the topic and developing a study protocol will be the product of this educational process.

Practical outline: (34 hours)

1. Choosing the subject area for study
2. The necessity of carrying out research based on national priorities, research conducted and research gaps in the desired field in the world and the country.
3. Determining the target population, determining the interventions with the measures to be carried out, the comparisons to be made and the result of the desired study (PICO)

Determine the type of study:

- Determining how to sample
- Determination of variables and data collection tools and implementation method
- Determining how to analyze data and statistical tests
- Compilation of the final study protocol report and its presentation

Evaluation method:

- Active participation in all meetings and report on actions taken
- Compilation of the final study protocol report and its presentation

References:

1- Specialized books and articles in the field of speech therapy.
2- Cumpston, M., Li, T., page, M. J., Chandler, J., Welch, V. A., Higgins, J. P., & Thomas, J. Updated guidance for trusted systematic reviews: a new edition of the Cochrane Handbook for Systematic Reviews of Interventions. Cochrane Database Syst Rev, 10, ED …142.
3- Liberati, A., Altman, D.G., Tetzlaff, J., Mulrow, C., Gøtzsche, P.C., Ioannidis, J.P., Clarke, M., Devereaux, P.J., Kleijnen, J. and Moher, D. (2009) The PRISMA Statement for Reporting Systematic Reviews and Meta-Analyses of Studies That Evaluate Health Care Interventions: Explanation and Elaboration. Journal of clinical epidemiology, 62 (10), e1-e34.
4- Moher D, Shamseer L, Clarke M, Ghersi D, Liberati A, Petticrew M, Shekelle P, Stewart LA; PRISMA-P Group. Preferred reporting items for systematic review andmeta-analysis protocols (PRISMA-P) 2015 statement. Systematic Reviews, 4(1),1.
5- Authoring a PhD: How to Plan, Draft, Write and Finish a Doctoral Thesis or Dissertation. Macmillan International Higher Education.
6- Eco, U. How to write a thesis. MIT Press.
7- Lunenburg, F.C., & Irby, B. J. Writing a successful thesis or dissertation: Tips and strategies for students in the social and behavioral sciences. Corwin press.
8- Murry. R. How to write a thesis. McGraw-Hill Education (UK)

Course title: Ethics in Speech Therapy

Course code: 19

Prerequisite: None

Course credit: 1 credit

Course credit type: Theoretical

General purpose of the course:

At the end of the course, the student should be familiar with the principles and rules of ethics in rehabilitation, have acquired the ability to teach and promote responsibility, understand and feel the ethical connection. know the importance of applying each of the ethical principles and rules in the rehabilitation of patients and research, and to have acquired the preliminary skills in recognizing and critically inferring ethical issues and problems.

Course description:

Ethics as an inherent capital and a component that expresses the link between science and conscience. In ethics, we deal with words such as humanity, human dignity, respect for rights, individual and social freedoms, and the true value of human beings. Medical ethics applies to all aspects of medical science and rehabilitation. Like medical ethics, ethics in speech therapy can be studied in 3 basic axes: ethics in education, ethics in research, ethics in treatment and clinical. Ethical education should provide an environment so that students can perform their moral duties in a favorable manner in addition to their legal and religious duties in complex medical conditions with commitment and respect for patients.

Outline: 17 theoretical hours

1. History of ethics in health/rehabilitation (Iran and the world).
2. Theoretical foundations of purpose, originality, Islamic view of man, nature and characteristics of a committed therapist.
3. The general principles of moral philosophy and moral schools in the field of ethics (medicine and rehabilitation).
4. Professional confidentiality and telling the truth in the relationship between the therapist, the patient and her family
5. The therapist's relationship with the patient, colleagues and other health service personnel
6. Ethical considerations in speech therapy education
7. Ethical considerations in speech therapy research
8. Ethical codes in speech therapy
9. Professional commitment and professionalism
10. Informed consent in clinical and research matters
11. Human research, abuse and impartiality in health research

12. Medical care, health care reform, social justice in health, regulation of health services, ethics committee

13. The role of forensic medicine in speech therapy professional ethics

14. Charter of patient rights in medical and rehabilitation sciences

Student evaluation method:

Evaluation in the cognitive field in the middle and at the end of the course is done descriptively and with four options.

References:

1- Singer, P.A., & Viens, A. M. (Eds.): The Cambridge textbook of bioethics. Cambridge University Press.

2- Zwitter, M. Medical-Ethics- Clinical-Practice. Switzerland: Springer.
3- Body, R. & McAllister, L. Ethics in Speech and Language Therapy. US: Wiley.
4- American Speech – Language-hearing Association. Code of Ethics [Ethics]. Available from http:// www.asha.org/policy.
5- American Speech – Language-hearing Association. Practices and Procedures of the Board of Ethics [Ethics]. Available from http:// www.asha.org/policy.
6- World Medical Association. Translated by Afarin Ghasemzadeh and Nariman Sepahrond. Medical ethics manuscript. Urmia: Urmia University of Medical Sciences.

Course title: Philosophy of Science in Speech and Language Pathology

Course code: 20

Prerequisite: None

Course credit: 1 credit

Course credit type: Theoretical

General purpose of the course:

Acquainting the student with the philosophical approaches of science production and its importance and role in scientific theorizing and science production in human societies, and especially its role in sciences related to human health, is one of the goals of this course in the doctoral course of speech therapy. They also learn theorizing and its importance in criticizing and challenging issues related to communication health in humans.

Course description:

Students become familiar with the philosophical approaches of science production, the importance of theorizing, and trying to model in order to answer questions related to the health of human communication. Also, they learn the reasons for the necessity of familiarizing themselves with the different schools of philosophy of science and he/she gets acquainted with theorizing in testing theories and models related to providing services in speech and language pathology.

Theoretical outlines: 17 hours

1. The necessity of studying the philosophy of science in medical and social sciences and in related to speech therapy

2. The philosophy of health and the challenges in it according to the philosophy of science

3. Science and Pseudo-science

4. Epistemology in the production of science and the reasons for diversity in it

5. Epistemology of scientific knowledge as a social structure

6. Logical positivism, Naturalism, Meaning and Relativism, Interpretation, Objectivity, Hermeneutics and Reflexivity, Structuralism and Constructivism, The relationship between feminism and structuralism, Post-modern and post-structuralism, Discourse view, Pluralism and Pragmatism, Critical realism

7. Theory, model and epistemology in scientific theorizing

8. Logical propositions

9. Comparative study of philosophy, model and theory in speech therapy

10. Development of theory and theorizing and related topics in speech therapy

11. Scientific methods in testing theories related to speech and language pathology

12. The principles of making conceptual models and analyzing conceptual models

Student evaluation method:

Evaluation of students in the cognitive field in the middle and at the end of the course is done descriptively and with four options.

References:

1- Gillies, D. Philosophy of science in the 20th century: four main issues.
2- Stevenson L. Byerly H. (last edit). A thousand faces of science (speech about scientists, values and society).
3- Akasha, Samir, Philosophy of Science.
4- Bunge, M. Philosophy of science: from problem to theory. (vol.1). Taylor & Francis.
5- Frank, P. philosophy of Science: The link between science and Philosophy. Courier Corporation.
6- Gambrill, E. D. Critical thinking and the process of evidence- based practice. New York, NY: Oxford University Press.
7- Hudson, M. W., DeRuiter, M. Professional Issues in Speech-Language Pathology and Audiology. Plural Publishing.
8- Lum, C. Scientific Thinking in Speech and Language Therapy. Psychology Press.
9- Psillos, S. Philosophy of Science A-Z. Edinburgh University Press.

Course title: Idea Generation, Entrepreneurship, and Principles of Business

Course code: 21

Prerequisite: None

Course credit: 1 credit

Course credit type: Theoretical

General purpose of the course:

Considering the need for university graduates to familiarize themselves with the principles of starting and managing a business, the main goal of this course is for students to become familiar with some basic business principles that they need after graduation so that they can to be present in the economic and competitive environment of the country and not have to pay the costs and damages caused by lack of knowledge.

Course description:

In this lesson, some of the most important topics in the field of entrepreneurship and business principles are taught. In the field of entrepreneurship, idea generation is the starting point of activity, and many formal and informal methods are used to create ideas. After creating the idea and feasibility of its implementation, as well as preparation of explanatory plans, business start-up and entrepreneurship begins. Things like legal and legal issues, marketing and branding, competitive advantage, business strategy, financial and accounting management, and industrial psychology are needed in the way of creating and creating a business.

Theoretical outlines: 17 hours

1. Definition of entrepreneurship and related concepts

2. Preparation of business model canvas

3. Familiarity with all types of businesses

4. How to design a business model related to rehabilitation and speech therapy

5- Familiarity with business law, business laws and legal issues related to entrepreneurship

6. Evaluating the idea, assessing the feasibility of investment and preparing a justification plan related to the speech therapy profession

7. Getting to know the basics of organization management including planning, organization, decision making and control

8. Familiarity with the most important business management tools including strategy, marketing, finance and accounting, quality and...

9. Getting to know the commercialization skills of research, technological or innovative achievements

10. The role and importance of information technology in business and its future prospects

11. A theoretical and practical examination of the experiences of successful Iranian entrepreneurs related to the speech therapy profession

Student evaluation method:

Evaluation of students in the cognitive field in the middle and at the end of the course is done descriptively and with four options.

References:

1- Strowalder, A. and Pignier, A. Creating a business model.
2- Cutler, F. Basics of marketing management.
3- Carozza, L.s. Leadership in Speech-Language Pathology. Plural Publishing.

Course title: Clinical Supervision in Speech and Language Pathology

Course code: 22

Prerequisite: None

Course credit: 2 credits

Course credit type: The internship

General purpose of the course:

Supervision training so that they can properly manage and support their students in the areas of how to communicate with clients, adapt students to different clinical environments, evaluate and choose correct, measurable and accessible treatment goals, as well as monitor the implementation of treatment goals.

Course description:

In this course, students will learn about the different roles of a speech and language pathologist as a teacher and supervisor. Also, students learn how to integrate and apply new findings in clinical education and management in different clinical centers.

Outlines :(102 hours of internship)

The student learns the following things in the hospital environment:

1. Defining the role of the supervisor in the hospital environment

2. Supervisor in different departments of speech and language pathology

3. Critical thinking and feedback

4. Self-assessment of abilities and skills using the Run, Grow, Transform model.

5. Formation of SMART goals (specific, measurable, attainable, relevant, time-bound) for progress in supervision

6. Getting to know Anderson's supervisory model (Evaluative/Feedback, Transitional, and Self-Supervision)
    7. Implementation of Anderson's model
    8. The role of technology in supervision
    9. Authority in supervision
    10. Responsibility in supervision
    11. Data collection in supervisory
    12. Writing and changing treatment goals
    13. Communication skills in supervision

14. Standards and rules in different departments of speech and language pathology

15. Ethical considerations in supervision

16. Supervision of special students

17. Clinical reasoning and decision making

18. Health policy

Student evaluation method:

Evaluation of students in the cognitive field in the middle and at the end of the course is done descriptively and with 4 options and in the field of skill using a written report, checklist and practical implementation of methods.

References:

1- Urish, Ongoing competence through mentoring. OT Pract, 9 (3),10.
2- American Speech-Language Hearing Association. Knowledge and skills needed by Speech-Language Pathologists Providing Clinical Supervision.
3- American Speech-Language Hearing Association. Clinical Supervision in Speech-Language Pathology.
4- American Speech-Language Hearing Association. Responsibilities of individuals who mentor Clinical fellows [Issues in Ethics].
5- American Speech-Language Hearing Association. Supervision of student clinicians [Issues in Ethics]. Available from www.asha.org/policy.
6- American Speech-Language Hearing Association. Guidelines for the training, use, and supervision of Speech-Language pathology assistants. Available from www.asha.org/policy.

Course title: Specialized Internship

Course code: 23

Prerequisite: None

Course credit: 1 credit

Course credit type: the internship

General purpose of the course:

Learning advanced clinical activity in speech, language, and swallowing disorders in specialized clinical departments

Course description:

In this course, according to the subject of the project, the opinion of the supervisor and the specialized courses of his/her choice, the student will be present in related hospital and clinical departments and evaluate the relevant clients in a specialized manner and report the treatment results based on theoretical models to the supervisor and the group will report.

Outlines (51 hours of internship) :
In this course, according to the subject of the project, the opinion of the professor of the doctoral course and the special courses of her/his choice will be present in the hospital and clinical departments.

1. Attending specialized neurology departments or clinics and evaluating and treating speech-language disorders with an approach based on communication models of speech-language production and swallowing disorders

2. Attending the stroke rehabilitation department and evaluating communication, speech, language and swallowing disorders with an approach based on communication models of speech, language and swallowing

3. Attending the specialized cleft lip and palate clinic for assessment, treatment and counseling of communication, speech, language and swallowing disorders of clients with an approach based on communication models of speech, language and swallowing

4. Attending a specialized clinic for voice disorders and evaluating, treating and counseling clients with an approach based on voice production models

5. Attending the NICU and PICU departments and evaluating and treating speech and swallowing disorders in infants and children and counseling the families of these clients with an approach based on communication models of speech, language and swallowing

6. Attending a specialized clinic for fluency disorders of speech and evaluation and treatment of fluency disorders of speech based on developmental models of speech and language

7. Attending a specialized clinic or a comprehensive development and evaluation center, treatment and counseling for communication, speech and language disorders based on developmental models of speech and language production

Student evaluation method:

At the end of the course, the student's evaluation in the cognitive field is done by presenting a report in the group meeting and questions and answers, and in the field of skill by using a written report, checklist and practical implementation of the methods.

The main sources of the lesson:

1- McAllister, L. Issues and innovations in clinical education. Advances in Speech Language Pathology, 7 (3), 138-148.
2- Body, R. Ethics in speech and language therapy. John Wiley & Sons.
3- Reilly, S., Douglas, J., & Oates, J. Evidence-based practice and speech pathology: future directions. Murry T, Carrau RL. Clinical management of swallowing disorders. Plural publishing.
4- Volkmar, F. R., Paul. R., Klin, A., & Cohen, D. Handbook of autism and Pervasive Developmental Disorders. Volumes I: Diagnosis, Development, Neurobiology, and Behavior (3de druk). Tijdschrift voor Psychiatrie, 49 (12), 920-920
5- Longerbeam M, Sigafoo J. Language and children with autism spectrum disorder. Reed (ED.). An introduction to children with language disorders. New York: Pearson.
6- Tarbox, J., Dixon, D., Sturmey. P., & Matson, J. L. Handbook of early intervention for autism spectrum disorders. Springer New York.
7- Guitar, B. Stuttering: An integrated Approach to its nature and treatment. Lippincott Williams & Wilkins.
8- Viswanath, N. Treatment of Stuttering: Establish and emerging Interventions, B. Guitar, R. McCauley (Eds.), Lippincott Williams & Wilkins. Baltimore, MD, 448 pp., Hardback.
9- Reardon- Reeves, N., & Yaruss, J. S. School-age stuttering therapy: A practical guide. Stuttering Therapy Resources, Incorporated.
10- Packman, A., Onslow, M., Webber, M., Harrison, E., Arnott, S., Bridgman, K., & Lloyd, W. the Lidcombe Program treatment guide. Lidcombe Program Trainers Consortium. Retrieved from http://sydney.edu.au/health-sciences/asrc/docs/lp_treatment_guide_pdf.
11- O'Brian S, Carey B, Lowe R, Onslow M, Packman A, Cream A. Camperdown program treatment guide. Australian Stuttering Research Center, University of Sydney. Retrieved at http://www.uts.edu.au/sites/default/files/10/Camperdown/20 Program/20 Treatment/20Guide/20.
12- Ward, D., &Scott, K. S. (Eds). Cluttering: A handbook of research, intervention and education. Psychology Press.
13- Pertijs, M. A. J., Oonk, L. C., Beer de JJ, B. E., & Bast, E. J. Clinical guidline stuttering in children, adolescents and adults. Woerden: NVLF.
14- Howard, S., & Lohmander, A. (Eds.). Cleft palate speech: assessment and intervention. John Wiley & Sons.
15- Kummer, A. W. Cleft palate and craniofacial anomalies: Effects on speech and resonance. Nelson Education.
16- Peterson-Falzone, S. J., Trost-Cardamone, J., Karnell, M. P., & Haridin Jones, M. A. The Clinician's Guide to Treating Cleft Palate Speech-E Book. Elsevier Health Sciences.
17- Peterson-Falzone, S. J., Hardin-Jones, M. A., Karnell, M. P., & McWilliams, B. J. Cleft palate speech (pp. 266-291). St. Louis: Mosby.

Course title: Thesis

Course code: 24

Prerequisite: Passing the comprehensive exam

Course credit: 20 credits

Course credit type: Practical

General purpose of the course:

In this lesson, students will get to know the concepts of signal processing and how to use it in clinical research and clinical data analysis.

Course description:

Designing and implementing a research project related to speech therapy in the specialized areas of speech, language, cognition and swallowing for children and adults.

Course description:

The doctoral thesis should be an original and innovative research towards the goals of the speech therapy field. Students must conduct research in accordance with the approvals of the research phase and the thesis development of the educational regulations of the PhD course approved by the Supreme Council of Medical Sciences Planning.

Student evaluation method:

In accordance with the educational regulations of the PhD course approved by the Supreme Planning Council of Medical Sciences.

References:

1- PHILLIPS EM. And PUGH DS. How to ger a PhD, A handbook for students and their supervisors. Open University Press.
2- Educational regulations for specialized doctorates (PhD) approved by the 35th session of the Supreme Council of Medical Sciences Planning, 2016.

   (https://hcmep.behdasht.gov.ir/uploads/369/doc/Ayeen_Phd.pdf)

Course title: Signal Processing in Speech and Language Pathology

Course code: 25

Prerequisite: None

Course credit: 2 credits (1 theoretical - 1 practical)

Course credit type: Theoretical-practical

General purpose of the course:

In this lesson, students will get to know the concepts of signal processing and how to use it in clinical research and clinical data analysis.

Course description:

In this lesson, students get acquainted with discrete and continuous signals and audio, movement and vision signals and learn how to filter, represent, independently and manipulate signals.

Theoretical outline: (17 hours)

1. definitions

2. Applications of digital signal processing

3. Samples of the signal

- a) ECG signal
- b) EEG signal
- c) Earthquake signal
- d) Motor signal
- e) Speech signal
- f) Music signal
- g) Image signal

4. Signal processing operation

5. Basic operations

6. Convolution filtering

7. Correlation

8. Sampling theory

9. Input filter and selection of sampling period

10. Signal reconstruction

11. Investigating the performance of sampling and signal recovery agents

12. Anti-aliasing filter

13. output filter (intermediate filter)

14. Sampling frequency in closed loop system

15. Classification of systems

16. Continuous and discrete signal

17. Reconstruction of phase space

18. Complex signal generation

19. Amplitude modulation

Practical outline: (34 hours)

1. Data collection with electromyography system

2. Basics of processing electromyography signals in BIOMETRIC system software

3. Data collection with MOTION CAPTURE SYSTEM

4. Basics of processing kinematic signals with VICON software

5. Carrying out the following activities:

6. Aliasing

7. Quantization

8. Signal reconstruction

9. PCM Encoder/Decoder

10. Noise elimination

11. Filtering in audio processing

12. Signal compression

13. Simple filter design using averaging and convolution

14. Application of FIR and IIR filters

15. Introduction and implementation of filters for audio processing

16. Basic audio recognition using a simple algorithm

Student evaluation method:

Student evaluation in the cognitive field in the middle and at the end of the course is done descriptively and with four options and in the field of skill using a written report, checklist and practical implementation of the methods.

References:

1. Signals and Systems. Alan Oppenheim and Alan Wilsky. Translated by Hamid Nawab. Publications of the Scientific-Cultural Institute
2. Boutsen, F.R., & Dvorak, J. D. MATLAB Primer for Speech Language Pathology and Audiology. Plural Publishing

Course title: Cognitive Production and Perception Models of Speech and Language

Course code: 26

Prerequisite: Natural patterns of speech and language processing

Course credit: 2 credits

Course credit type: Theoretical

General purpose of the course:

Familiarizing students with Definitions, theories and approaches in the field of cognitive psychology and the history of evolution and types of cognitive models of production and understanding of speech and language.

Course description:

In this course, students will get acquainted with cognitive psychology, the field of practice and theory in it, various models and theories of language perception and speech production, so that in addition to criticizing and analyzing these theories, they can use them in process analysis. normal and speech and language injuries and designing assessment and treatment methods.

Theoretical outline: (34 hours)

1. Introduction of cognitive psychology including the study of learning, memory, attention, perception, reasoning, motor control, conceptualization, language
2. Cognitive revolutions
3. Classical models of information processing
4. Assumptions underlying the box and arrow models: modularity of the mind, double discontinuity
5. Connectionist models: structure and assumptions
6. TRACE connectionist model (McClelland and Elman 1986)
7. Dell's link-oriented model (1986)
8. embodied cognition
9. Emergentist approaches
10. Usage-based theories
11. Models of speech perception
12. Speech production models
13. Movement models of speech
14. Models of sentence production and comprehension

Student evaluation method:

Evaluation of students in the cognitive field in the middle and at the end of the course is done descriptively and four-choice.

1. Ellis, N. C. Essential of a theory of language cognition. The Modern Language Journal,103,39-60.
2. Bybee, J. Language. Usage and cognition. Cambridge University Press.
3. Cognitive Linguistics: The Second Epistemological Revolution in Linguistics, Reza Nilipour, Hermes Publishing.
4. Altmann, G., & Shillcock, R. Cognitive models of speech processing: The second Sperlonga meeting. Psychology Press.
5. Dell, G., S. A spreading-activation theory of retrieval in sentence production. Psychological review, 93 (3) ,283.
6. Mark Tatham and Katherine Morton. A Guide to Speech Production and perception. Edinburgh University Press.
7. Guenther, F. H. Neural control of speech. Mit Press.
8. Thompson, C. K., Faroqi-Shah, Y., & Lee, J. Models of sentence production. The handbook of adult language disorders,328-354.

Course title: Advanced Voice Disorders- Pathology, Assessment, and Treatment

Course code: 27

Prerequisite: Speech, language and swallowing laboratory (Oral and oropharyngeal phases)

Course credit: 2 credits (1 theoretical - 1 practical)

Course credit type: Theoretical-Practical

General purpose of the course:

In this course, the student's theoretical, practical knowledge and skill in the field of pathology, assessment, diagnosis and treatment of voice disorders are increased by focusing on close cooperation with the medical team, using combined methods, and psychogenic approach.

Course description:

In this course, the student is expected to study and investigate in the field of advanced physiology, pathophysiology related to muscle tension dysphonia, how emotions affect the voice, advanced and instrumental evaluation of voice, and observing surgeries of special cases (by being present in the operating room) to discuss and exchange of views with the surgical team. Learn the types of treatments for voice disorders with a focus on the psychogenic approach and the combined approach. Also, carefully examine treatment approaches based on scientific-research evidence and clinical evidence, and be able to propose suitable research proposals to answer possible questions in this field. Learn and perform the method of coding voice disorders in the ICF framework.

Outline: 17 theoretical hours

1. Advanced topics in the histology of the larynx and muscles, the mechanism of neuro-motor control of the larynx
2. Instrumental evaluation including advanced acoustic evaluation, radiographic evaluation of the larynx and pharynx, and instrumental evaluation of airflow.
3. Psychological therapeutic approaches
4. Mixed approach and mixed methods
5. Theoretical foundations related to the mechanism of effect of voice therapy fields, investigating the effectiveness of sound therapy techniques in research studies (evidence-based perspective)
6. Comparison of symptomatic, physiological, psychogenic and combined approaches and their application in the treatment of the same voice disorders
7. Voice disorder in certain populations (such as professional voice users, the elderly, people with hearing loss, transgender people), treatment-resistant muscle tension dysphonia (MTD)
8. Occasional disorders (less common) such as not having a vocal fold
9. Evidence-based decision making (evidenced-based) in chronic voice disorders and irritable larynx

Practical outline: 34 hours

1. Observation of laryngeal surgery (at least 3 cases)

2. Performing nasolaryngoscopy (at least 3 cases)

3. Counseling of voice disorders at the patient's bedside and in hospitals or medical centers(at least 3 items)

4. Preparation of a complete file (medical file, interview, evaluation, selection of treatment approach, treatment methods, final result)

Evaluation of students in the theoretical field will be done through a written exam at the end of the semester, their performance during the academic semester, participation in scientific discussions, and in the practical field, presenting a report on the observation of surgeries, treatment on the patient's bedside, and also presenting a complete file.

References:

1- Gallena, S. K. Voice and laryngeal disorders: a problem-based clinical guide with voice samples. Elsevier Health sciences.
a. (Part IV- "Unsolved" Case Studies-page 17)
2- Izdebski, k. Emotions in the Human Voice Volums2: Clinical Evidence (Vol.2). Plural Publishing.
3- Makiama, K., & Hirano, s. (Eds.). Aging voice. Springer.
4- Hartnick, C. J., & Boseley, M. E. Clinical management of children's voice disorders. Plural Publishing.
5- Adler, R. K., Hirsch, S., & Pickring, J. (Eds.). Voice and communication therapy for the transgender/ gender diverse clients: A comprehensive clinical guide. Plural Publishing.
6- LeBorge, W. D., & Rosenberg, M D. The vocal athlete. Plural Publishing.

   (Chapter18: application of motor learning principles to voice training)

7- Sataloff, R. T., Voice science. Plural Publishing.
8- Sataloff, R. T., Clinical assessment of voice. Plural Publishing.
9- Sataloff, R. T., Treatment of voice. Plural Publishing.
10- Sataloff, R. T., Professional voice: The Science and Art of Clinical Care, 3 Volume Set. Plural Publishing.
11- Stemple, J. C., & Hapner. E. R. Voice therapy: clinical case studies. Plural Publishing.
12- Flasher, L. V., & Fogle, p. T. Counseling skills foe speech-language pathologists and audiologists. Cengage Learning.
13- (Part II. Counseling Skills for Working with Specific Disorders)
14- Michaels, L., & Hellquist, H. B. Ear, nose and throat histopathology. Springer Science & Business Media. (Chapter31- Non-infective inflammatory)
15- Baker, J. Psychosocial Perspectives on the Management of Voice Disorders: Implications for Patients and Clients, Options and strategies for Clinicians. Compton Publishing.

Course title: Advanced studies in Stuttering- Pathology, Assessment, and Treatment

Course code: 28

Prerequisite: None

Course credit: 2 credits (1 theoretical - 1 practical)

Course credit type: Theoretical-Practical

General purpose of the course:

In this course, students discuss the theories and models proposed in the field of stuttering pathology, and then criticize the methods and approaches of stuttering assessment, treatment, and examine the details of their application and analysis for research and clinical use.

Course description:

In this course, the student is expected to review each of the theories and models proposed in the field of stuttering pathology, as well as the methods and approaches of stuttering assessment and treatment. In addition, she/ he carefully examined the treatment approaches based on scientific-research evidence and clinical evidence and could make suitable research proposals to answer possible questions in this field.

Theoretical outline: 17 hours

1. A review of neuropsychological-language models and theories in the pathology of stuttering
2. A review of neurological and genetic findings related to the pathology of stuttering
3. A review of brain imaging and electrophysiological findings in the pathology of stuttering
4. A review of language processing patterns in stuttering including phonological models (EXPLAN and Covert repair hypothesis), grammatical and semantic processing and their application in stuttering treatment
5. A review of emotional processes in stuttering including emotional content and emotional situations, valence, arousal, regulation and their application in the evaluation and treatment of stuttering.
6. A review of treatment approaches based on scientific-research evidence based on the S4 hierarchy (Studies, syntheses, synopses, and systems)

A review of the challenges and methods of assessment and treatment of stuttering in the co-occurrence of stuttering with bilingualism and disorders such as language disorders, speech sounds disorder, mental retardation, autism.

Practical outline: 34 hours

1. Evaluation of a stuttering patient and its explanation based on the neuropsychological theory of language and design of treatment model
2. Evaluation and analysis of results in a stuttering patient and its explanation based on phonological models, grammatical and semantic processing and treatment model design
3. Evaluation and analysis of results based on emotion processing and treatment model design

Student evaluation method:

Evaluation of students will be done through the written exam at the end of the semester, their performance during the academic semester and homework, participation in scientific discussions and scientific reports (About current findings in various fields of pathology, assessment and treatment of stuttering).

References:

1- Guitar B. stuttering: An integrated approach to its nature and treatment.

   Lippincott Williams & Wilkins.

2- Guitar B. McCauley RJ. Treatment of stuttering: Established and emerging.

   Interventions. Wolters Kluwer.

3- Hegde M. N. Treatment Protocols for Stuttering. Plural
4- Pertijs, m. A.J., Oonk, L.C., Beer, de J.J.A., Bunschoten, E.M., Bast, E.J.E.G., Ormondt, van J., Rosenbrand, C, J.G.M., Bezemer, M., Wijngaarden, van L.J., Kalter, E. J., Veenendaal, van h. Clinical Guideline stuttering in Children, Adolescents and Adults. NVLF, Woerden.
5- Ward, D. Stuttering and cluttering: frameworks for understanding and treatment. Psychology Press.
6- Packman, A., & Attanasio, J. S. Theoretical issues in stuttering. Taylor & Francis.
7- Onslow, M., Kelly, E. M. Temperament and early stuttering intervention: Two perspectives. Journal od Fluency Disorders,105765.
8- Onslow, m. Stuttering and It's Treatment: Eleven lectures.

Course title: Cognitive and Communication Disorders

Course code: 29

Prerequisite: None

Course credit: 2 credits (1 theoretical - 1 practical)

Course credit type: Theoretical-Practical

General purpose of the course:

At the end of this course, the student should know the pathology, evaluation and treatment of cognitive disorders caused by communication disorders and learn the methods of evaluating these disorders in order to apply them in the clinic.

Course description:

In this course, the student is expected to be fully familiar with the components of cognition and their function, and to be able to diagnose and evaluate disorders such as Traumatic brain injury (TBI) and dementia, and to plan and implement the treatment of disorders caused by these diseases.

Theoretical outline: 17 hours

1- Recognition and communication

2- Attention

   - Theories and models of attention

   - Attention in neurological cognitive-communication disorders (Right Hemisphere Disorder, Traumatic brain injury (TBI), Dementia, Aphasia)

   - Familiarity with attention evaluation

   - Familiarity with attention therapy

3- Principles of human memory

   - Theory of cognition and memory

   - Multi-stage memory models

   - Familiarity with the evaluation of memory functions

   - Familiarity with different approaches in memory therapy

4- Executive performance

   -Perceptual models of executive functions

- Relationships between executive functions, attention and memory

-Communicative-cognitive results of executive dysfunction (Traumatic brain injury (TBI), Right Hemisphere Disorders, Dementia)

5- Familiarity with executive performance evaluation

6- Familiarity with the treatment of executive dysfunction

1-   Dementia and its types
    - Alzheimer's disease
    -Vascular Dementia
    -Parkinson's disease
    -Lewy Body disease
    -Huntington's disease
    Frontotemporal Dementia
  2- Familiarity with the assessment of cognitive-communication disorders in dementia
  3- Familiarity with the treatment (Direct and Indirect) of cognitive-communication disorders in dementia

Practical outline: 34 hours
  1. Practical implementation, scoring method and interpretation of attention assessments in healthy people
  2. Practical implementation, scoring method and interpretation of memory function evaluations in healthy people
  3. Practical implementation, scoring method and interpretation of evaluations of executive functions in healthy people
  4. Practical implementation, scoring method and interpretation of speech, language and cognitive evaluations (Attention, Memory and Executive Function) in dementia (With a focus on Mild Cognitive Impairment and Alzheimer's)

Student evaluation method:
Evaluation of students in the cognitive field in the middle and at the end of the course is done descriptively and with four options, and in the field of psycho-motor skills, it is done practically.

References:
  1- Kimbarow, M. L. Cognitive Communication Disorders. Plural Publishing, Inc.
  2- Peach, R. K., & Shapirof, L. P. Cognition and Acquired Language Disorders. An Information Processing Approach. Mosby.
  3- Bayles, k. Cognitive-Communication Disorders of MCI and Dementia (Definition, Assessment, and clinical Management). Plural Publishing, Inc.

Course title: Cognitive and Language Development in Normal and Language-Impaired Children

Course code: 30

Prerequisite: None

Course credit: 2 credits (1 theoretical - 1 practical)

Course credit type: Theoretical-Practical

General purpose of the course:

Familiarization of students with theories of language development and recognition and application of theories in children with autism spectrum and developmental language disorder (specific language damage), brain injuries in childhood

Course description:

In this course, students get acquainted with the theories of language development and cognition and learn the theoretical foundations of communication and language disorders in children with autism spectrum disorder and developmental language disorder (specific language impairment). They also learn about the communication, speech, language and academic characteristics of children with brain injuries. Also, they get to know the assessment methods and theory-based treatment strategies in children with language impairment.

Theoretical outline: 17 hours

1. An overview of the theories of the relationship between language and cognition (Piaget's theory, the theory of artificial active memory, the effect of cognition on learning grammar, the theory of mind and its role in language learning, executive function and language learning, Chomsky's perspective and the theory of language modularity are discussed.

2. Introducing the theoretical foundations of communication disorders in children with autism spectrum disorders (such as defects in theory of mind, weakness of central coherence and defects in executive functions)

3. Introducing the theoretical foundations of language disorders in children, developmental language disorders (Specific Language Damage), (Deficits in auditory processing, defects in processing speed, the effect of language characteristics on the child's clinical manifestations)

4. Determining the dimensions of communication, speech, language and academic disabilities of children with brain injuries

5. Providing strategies for evaluation and treatment of communication disorders (Verbal, non-verbal) based on the evidence of children with autism spectrum disorder

6. Providing strategies for evaluation and treatment of communication disorders (Verbal, non-verbal) based on the evidence of children with developmental language disorder (Specific Language Disorder)

7. Providing strategies for evaluation and treatment of communication disorders (verbal, non-verbal) based on the evidence of Children with brain injuries

Practical outline: (34 hours)

1. Practical implementation of evaluations in children with autism spectrum disorder, such as children's communication checklist, questionnaires, and communication function classification system and their interpretation.

2. Practical implementation of therapeutic approaches to improve the communication behavior skills of autism spectrum disorder, Pivotal Response Training, Social Stories Training, Picture Exchange Communication Systems (PECS), Supporting Knowledge in Language and Literacy

3. Finding evidence for language skills assessment techniques (language sample analysis) and cognitive skills (focusing on phonological working memory) in children with developmental language disorder (Specific Language Impairment) and their practical implementation

4. Finding evidence for the treatment techniques of language skills (narrative language-based intervention) and cognitive skills (focusing on phonological working memory) in children with developmental language disorder (specific language damage) and their practical implementation

5. Finding evidence for assessment and treatment techniques of communication disorders (verbal, non-verbal) of children with brain injuries and their practical implementation

Student evaluation method:

Evaluation of students in the cognitive field in the middle and at the end of the course is done descriptively and with four options, and in the field of skills, it is done using written reports, checklists and practical implementation of methods.

References:

1- Martin, I., McDonald, S. Weak coherence, no theory of mind, or executive dysfunction? Solving the puzzle of pragmatic language disorders. Brain Language; 2003: 85, 451-466.
2- Pedreño C, Pousa E, Navarro JB, Pàmias M, Obiols JE. Exploring the Components of Advanced Theory of Mind in Autism Spectrum Disorder. Journal of autism and developmental disorders. 2017 Aug 1;47 (8): 2401-9.
3- Demetriou EA. DeMayo MM, Guastella AJ. Executive Function in Autism Spectrum Disorder: History, Theoretical Models, Empirical Findings, and Potential as an Endophenotype. Frontiers in psychiatry.2019; 10.
4- Volkmar FR, Paul R, Klin A, Cohen DJ (Eds.). Handbook of autism and pervasive developmental disorders: Diagnosis, development, neurobiology, and behavior (Vol. 1&2). John Wiley & Sons.
5- Stavrakaki S (Ed.). Specific language impairment: current trends in research (Vol. 58). John Benjamins Publishing Company.
6- Leonard LB. Children with specific language impairment. MIT.

Course title: Advanced Methods of Evaluation and Treatment in Swallowing Disorders

Course code: 31

Prerequisite: None

Course credit: 2 credits (1 theoretical - 1 practical)

Course credit type: Theoretical-Practical

General purpose of the course:

- Familiarizing students with theories and mechanisms of different phases of swallowing and biomechanics of organs involved in swallowing (oral and pharyngeal phases)

-Familiarizing students with common and complementary treatment methods for swallowing disorders, using new tools in evaluating swallowing disorders and reviewing each of them, and gaining skills in performing FEES and tDCS tools.

Course description:

In this course, the student is expected to review common and complementary treatment approaches and to know and become proficient in the process of evaluation and treatment using tools. Also, to examine the treatment approaches based on Scientific-research evidence and clinical evidences and to be able to put forward suitable research proposals to answer possible questions in this regard.

Theoretical outline: (17 hours)
1. An overview of the physiology and neurophysiology of different phases in swallowing

2. An overview of the biomechanics and kinesiology of the muscles involved in each of the different phases of swallowing (oral and oropharyngeal phases)

1. Different theories of neural control of swallowing

2.The role of cognition and its different theories in swallowing control

3. A review of common and new assessment tools in swallowing (EEG, TMS, FEES, VFS, MASA…)

4. Principles and basics of electromyography and its interpretation in the evaluation of dysphagia

5.Principles and basics of ultrasound and its interpretation in dysphagia evaluation

6. Criticism of common treatment protocols in adult swallowing disorders, such as:
   a) Compensatory therapies
   b) Rehabilitation treatments

7. Getting to know the principles of brain stimulation in swallowing disorders

8. Acquaintance, review of complementary treatment protocols in adult swallowing disorder, such as:
   a) Transcranial Magnetic Stimulation (TMS)
   b) transcranial Direct current Stimulation (tDCS)
   c) Neuromuscular Electrical stimulation (NMES)
   d) Manipulation
   e) Sensory stimulation
   f) Drug treatments and acupuncture

9. Criticism of therapeutic approaches based on scientific-research evidence based on hierarchy (studies, syntheses, synopses and systems: 4S)

10. The principles and basics of using electrotherapy in the treatment of dysphagia

Practical outline: (34 hours)

1. Familiarity with the procedure of using the FEES device and acquiring skills in using it and recording and interpreting the obtained information

2. Familiarity with the procedure of using tDCS brain stimulation and acquiring skills in using it in the treatment of patients with swallowing disorders (oral and oral-pharyngeal phases)

Student evaluation method:

Evaluation of students will be done through the written exam at the end of the semester, their performance during the academic semester and homework, participation in scientific discussions and presentation of scientific reports.

The main references of the course:

1- Murry, T. Clinical Management of Swallowing Disorders. Plural Publishing, Inc.

2- Corbin-Lewis, K., & Liss, J. M. Clinical Anatomy & Physiology of the Swallow Mechanism. Cengage Learning.

3- Carrau, R. L., Howell, R. J., & Murry, T. Comprehensive Management of Swallowing Disorders. Van Haren Publishing.

4- Rosenbek, J. C. Dysphasia in Movement Disorders (Clinical Dysphasia). Plural Publishing, Inc.

5- Langmore, S. E. Endoscopic Evaluation and Treatment of Swallowing Disorders. Georg Thieme Verlag.

6- Michou E., Sasegbon A., hamdy S. Direct and Indirect Therapy: Neurostimulation for the Treatment of Dysphagia After Stroke. In: Ekberg O. (eds) Dysphasia. Medical Radiology. Springer

7- Knotkova, H., Nitsche, M. A., Bikson, M., & Woods, A. J. Practical Guide to Transcranial Direct Current Stimulation: Principles, Procedures and Applications. Springer

Course title: Speech and Resonance Disorders in Cleft Palate

Course code: 32

Prerequisite: None

Course credit: 2 credits (1.5 theoretical – 0.5 practical)

Course credit type: Theoretical-Practical

General purpose of the course:

- Familiarizing students with theories and mechanisms of different phases of swallowing and biomechanics of organs involved in swallowing (oral and pharyngeal phases)

-Familiarizing students with common and complementary treatment methods for swallowing disorders, using new tools in evaluating swallowing disorders and reviewing each of them, and gaining skills in performing FEES and tDCS tools.

Course description:

In this course, after reviewing the structure and function of the speech organs related to cleft palate, students will get to know the models and approaches of language psychology and metacognition in the evaluation and treatment based on evidence of patients with cleft palate. They also learn the use of instrumental methods in evaluation and interventions related to cleft palate and VPI.

Theoretical outline: (26 hours)

1. A review of the function and physical structure and speech production related to cleft palate
2. Evaluation and early interventions of communication skills in cleft palate- Transcription of speech problems related to cleft palate
3. Application of acoustic, endoscopy, ultrasound and MRI examinations in evaluation and biofeedback therapy of speech complications caused by VPI
4. Different models and approaches of speech interventions in different linguistic and cultural contexts in cleft palate
5. Psycholinguistic and metacognitive evaluations and treatments in cleft palate
6. Phonological approaches in the treatment of speech problems related to cleft palate
7. Evidence-based evaluation and treatment in cleft palate

Practical outline: (17 hours)

1. Performing and interpreting endoscopy or acoustic evaluation or ultrasound evaluation or MRI in two patients
2. Speech transcription of two patients

Student evaluation method:

Evaluation of students in the cognitive field in the middle and at the end of the course is done descriptively and with four options.

The main references of the course:

All sources should be provided based on the latest edition.

1- Howard, S., & Lohmander, A. (Eds.). Cleft palate speech: assessment and intervention. John wiley & Sons.
2- Kummer, A. W. Cleft palate and craniofacial anomalies: Effects on speech and resonance. Nelson Education.
3- Peterson-Falzone, S. J., Hardin-Jones, M. A., & Karnell, M. P. Cleft palate speech. St. Louis, Mo: Mosby.

Course title: Speech Motor Control

Course code: 33

Prerequisite: None

Course credit: 2 credits

Course credit type: Theoretical

General purpose of the course:

Familiarity with theories of motor control and speech production

Course description:

In this lesson, students get to know the concepts of motor control, learning and how to produce speech. They also learn the stages of motor learning and the role of different senses in speech and learn how speech motor skills are recovered after injury.

Theoretical outline: (34 hours)

1. Movement control and learning
-   Brain and motor learning
-   Learning and its stages
-   Transfer learning
-   Motor learning and motor function retraining
2. Motion control theories
3. Open and closed systems
4. Movement planning theory
5. Systems theory
6. The role of memory in motor learning
7. The role of senses in movement control
8. Theories of speech production
a) Van der Meer model
b) GEPPTO model
c) FACTS model
d) DIVA model
9. Breathing function during speech production
10. Motor function of the larynx during breathing
11. Motor cortex activity during vowel production and consonant production
12. Movement coordination between larynx, tongue and lips during speech
13. Monitoring speech errors

14. Learning speech motor sequences

15. Neural motor mechanisms involved in speech production

16. The relationship between motor and acoustic features of speech

17. The effect of different disorders on motor control of speech

Student evaluation method:

Evaluation of students in the cognitive field in the middle and at the end of the course is done descriptively and with four options.

The main references of the course:

1- Magill, R. A., & Anderson, D. Motor learning and control. McGraw-Hill Publishing.
2- Shumway-Cook, A., & Woollacott, M. H. Motor control: translating research into clinical practice. Lippincott Williams &Wilkins.
3- Maassen, B., & Van uLieshot, P. (Eds.). Speech motor control: New developments in basic and applied research. Oxford University Press.
4- Guenther, F. H. Neural control of speech. Mit Press.
5- Related Articles

Course title: Cognitive Neurorehabilitation in Aphasia

Course code: 34

Prerequisite: None

Course credit: 2 credits (1 theoretical – 1 practical)

Course credit type: Theoretical-Practical

General purpose of the course:

Familiarizing students with the neuro-cognitive foundations of rehabilitation and types of treatments based on cognitive and neurological rehabilitation in aphasia

Course description:

In this course, students will learn about brain reorganization mechanisms related to language and cognition after aphasia caused by stroke. Effective treatments on cognitive impairments include attention, memory and executive functions with aphasia. They get to know the approaches and models that lead to therapeutic methods based on neuro-cognitive rehabilitation and can criticize them. They become familiar with the effective factors in the treatment of patients with aphasia and become aware of their impact on creating stable linguistic and cognitive changes.

Theoretical outline: (17 hours)

1. A review of language reorganization mechanisms after stroke

2. Intensive treatment

3. Application of learning theories in aphasia rehabilitation

   a. Rehabilitation-learning model
   b. Using learning principles in therapy (massed practice vs spaced practice)
   c. Using the principles of cognitive learning
   d. Using the principles of motor learning
   e. Using the Spaced retrieval

4- Major approaches in the treatment of aphasia

   a) Stimulation approach
   b) Cognitive neuropsychology approach
   c) Cognitive neuro-linguistic approach

5- The effect of complementary treatments and their mechanism of action

   a. Drug therapy

b. -TMS/rTMS

c. -tDCS

6-Limitation-based therapy (CIAT)

7-The effect of neurorehabilitation on sensation

8-Cognitive therapies in aphasia

a. Treatment focused on attention

b. Treatment focused on working memory

c. Treatment focused on executive function

9-Discussion of generalization in the treatment of aphasia

Practical outline: (34 hours)

1. By obtaining the evaluation data of the patient with aphasia based on the following approaches, goals, therapeutic tasks, methods, techniques, compression and the number of sessions, the necessary time of each session and tools should be proposed in the form of a protocol:

a. Cognitive neuropsychology approach

b. Stimulation approach

c. Cognitive neuro-linguistic approach

Student evaluation method:

Evaluation of students in the cognitive field in the middle and at the end of the course is done descriptively and with four options and in the field of skill using written reports, checklists and practical implementation of methods.

The main references of the course:

All sources (except articles) are based on the latest edition.

1- Wixted, J. T., & Thompson- Schill, S. L. Steven 'Handbook of Experimental Psychology and Cognitive Neuroscience, Language and Thought (Vol.3).

   John Wiley & Sons.

2- Faust, M. (Ed.). The handbook of the neuropsychology of language (Vol.2).

   John Wiley & Sons.

3- Stemmer, B., & Whitaker, H. A. (Eds.). Handbook of Neuroscience of Language. Academic press.

4- Carey, L. M. (Ed.). Stroke rehabilitation: insights from neuroscience and imaging. Oxford university press.

5- Murray, L. L. Cognitive treatments for aphasia: Should we and can we help attention and working memory problems? Journal of Medical Speech-Language Pathology, 12 (3), xxv-xxv.

6- Saur, D., & Lange, R., Baumgartner, A., Schraknepper, V., Willmes, K., Rijntjes, M., & Weiller, C. Dynamics of language reorganization after stroke. Brain, 129 (6),1371-1384.

7- Cherney, L. R., Patterson, J. P., Raymer, A., Frymark, T., & Schooling, T. (2008). Evidence-based systematic review: Effects of intensity of treatment and constraint-induced language therapy for individuals with stroke-induced aphasia.

8- Cherney, L. R. (2012). Aphasia treatment: Intensity, dose parameters, and script training. International Journals of speech-Language Pathology, 14(5), 424-431.

9- Berthier ML, Pulvermüller F, Dávila G, Casares NG, Gutiérrez A. Drug therapy of post-stroke aphasia: a review of current evidence. Neuropsychology review, 21(3), 302.

10- Middleton, E. L., Schuchard, J., & Rawson, K. A. (2020). A review of the application of distributed practice principles to naming treatment in aphasia. Topics in Language Disorders, 40(1), 36–53.

11- Lang. C. E., Loshe, K. R., & Birkenmeier, R. L. (2015). Dose and timing in neurorehabilitation: Dose and timing in neurorehabilitation: prescribing motor therapy after stroke. Current Opinion Neurology, 28(6):549.

12- Pulvermuller, F., Neininger, B., Elbert, T., Moher, B., Rockstroh, B., Koebbel, P., & Taub, E. (2001). Constraint-induced therapy of chronic aphasia after stroke. Stroke, 32(7), 1621-1626.

Course title: Evaluation and Analysis Indicators of Speech and Language

Course code: 35

Prerequisite: None

Course credit: 2 credits (1 theoretical – 1 practical)

Course credit type: Theoretical-Practical

General purpose of the course:

At the end of the course, the student should review all the indicators related to speech and language and analyze the existing indicators for evaluating speech and language and discuss their effectiveness in identifying the disorder, determining the baseline, determining the effectiveness of the treatment, and analyze their advantages and disadvantages.

Course description:

In this course, students will review the definition of indicators, indicators in various aspects of speech and language (Including prelinguistic skills, phonology, syntax, semantics (Words, Semantic relations), language Pragmatics, Prosody and Rate of speech)) are analyzed, discussed and reviewed.

Theoretical outline: (17 hours)

1. Reviewing indicators related to pre-linguistic skills (especially expressive movements) and existing measures in the international and domestic fields; Analyzing the effectiveness of these indicators in evaluating children's communication skills, identifying disorders, determining the baseline, and determining the effectiveness of treatment; description of the advantages and disadvantages of these indicators

2. Review of indicators related to phonological skills and quantitative and qualitative measures available in the international and domestic arena; Analyzing the effectiveness of these indicators in evaluating, identifying the disorder, determining the baseline, determining the effectiveness of the treatment; Description of the advantages and disadvantages of these indicators

3. Reviewing indicators related to grammar and syntax skills and metrics available in the international and domestic fields; Analyzing the effectiveness of these indicators in evaluating, identifying the disorder, determining the baseline, determining the effectiveness of the treatment; Description of the advantages and disadvantages of these indicators

4. Reviewing indicators related to semantic skills (Vocabulary, Semantic relationships) and quantitative and qualitative measures available in the international and domestic fields; Analyzing the effectiveness of these indicators in evaluating, identifying the disorder, determining the baseline, and determining the effectiveness of the treatment; Description of the advantages and disadvantages of these indicators

5. A review of the indicators related to pragmatic skills and quantitative and qualitative measures available in the international and domestic fields; Analyzing the effectiveness of these indicators in evaluating, identifying the disorder, determining the baseline, and determining the effectiveness of the treatment; Description of the advantages and disadvantages of these indicators

6. A review of prosody skills and speech rate, quantitative and qualitative measures available in the international and domestic fields; Analyzing the effectiveness of these indicators in evaluating, identifying the disorder, determining the baseline, and determining the effectiveness of the treatment; Description of the advantages and disadvantages of these indicators

Practical outline: (34 hours)

1. Criticize and review authoritative articles and sources to classify and analyze the evidence related to each of the indicators of speech and language in the field of pre-linguistic skills, phonology, syntax, semantics, language pragmatic, tone and rate of speech.

2. Preparation of two speech and language samples for two patients and diagnosis, analysis, evaluation and analysis of the results by referring to the existing indicators of speech and language in native language.

Student evaluation method:

Evaluation of students in the cognitive field in the middle and at the end of the course is done descriptively and with four options and in the field of skill using written reports, checklists and practical implementation of methods.

The main references of the course:

1- Crystal, D. (last edition). Profiling linguistic disability.

2- Lee, L. L. Developmental sentence analysis: A grammatical assessment procedure for speech and language clinicians. Northwestern University Press.

3- Hoff, E. (last edition). Language development. Cengage Learning.

4- Bavin, E. L., & Naigles, L. R. (Eds.). The Cambridge handbook of child language. Cambridge university Press.

5- Hoff, E. (Ed.). (Last edition). Research methods in child language: A practical guide (Vol.9). John Wiley & Sons.

6- Bavin, E. L., & Naigles, L. R. (Eds.). (Last edition). The Cambridge handbook of child language. Cambridge university Press.

7- Ingram, D. (2002). The measurement of whole-word productions. Journal of Child Language, 29(4), 713.

8- Dodd, B. (Last edition). Differential diagnosis and treatment of children with speech disorder. John Wiley & Sons.

9- Paul, R., & Norbury, C. (Last edition). Language disorders from infancy through adolescences-E-Book: Listening, speaking, reading. Writing, and communicating. Elsevier Health Sciences.

10- https://mb-cdi.stanford.edu/

11- Eisenberg, S. L., Guo, L. Y., & Germezia, M. (2012). How grammatical are 3-year-olds? Language, Speech, and Hearing Services in Schools.

12- TOLD, and Wechsler assessment packages.

13- A collection of articles related to the topic of measurement and indicators in the relevant field.