



## Information about the subject

**Degree:** Bachelor of Science Degree in Speech and Language Therapy

**Faculty:** Faculty of Psychology

**Code:** 1171102 **Name:** Functional anatomy of the organs of speech and hearing II

**Credits:** 6,00 **ECTS Year:** 1 **Semester:** 2

**Module:** Basic Training

**Subject Matter:** Physiology **Type:** Basic Formation

**Field of knowledge:** Health sciences

**Department:** Neuropsychobiology, Methodology and Basic and Social Psychology

**Type of learning:** Classroom-based learning

**Languages in which it is taught:** Spanish

**Lecturer/-s:**

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## Module organization

### Basic Training

Subject Matter	ECTS	Subject	ECTS	Year/semester
Physiology	12,00	Functional anatomy of the organs of speech and hearing II	6,00	1/2
		Fundamentals of Neuroscience	6,00	1/2
Anatomy	6,00	Functional anatomy of the organs of speech and hearing I	6,00	1/1
Psychology	36,00	Basic Psychological Processes	6,00	1/1
		Developmental psychology	6,00	1/1
		Psycholinguistics	6,00	2/1
		Psychology of Education	6,00	2/2
		Psychology of language development	6,00	1/2
		Research Methodology	6,00	2/1
Clinical linguistics	6,00	Linguistics applied to speech and language therapy	6,00	1/1

## Recommended knowledge

The students will have previously taken the subject "Functional anatomy of the organs of the language and hearing 1", so they will already be familiar with the anatomical nomenclature and have acquired a broad and unitary knowledge of the organization and functioning of the human body, absolutely essential for the understanding of this subject.



## Learning outcomes

At the end of the course, the student must be able to prove that he/she has acquired the following learning outcomes:

- R1 To identify the different anatomical structures involved in hearing.
- R2 To know the respiratory system as a structure of fundamental importance for the elaboration of voice, speech and language.
- R3 To describe the functional anatomy of the oral and nasal cavities, larynx, and musculature involved in voice emission.
- R4 To understand the functional integration of the anatomical structures involved in hearing and the production of voice, speech and language.
- R5 To know and relate the macroanatomy of the nervous system with its functionality and some physiological characteristics.



## Competencies

Depending on the learning outcomes, the competencies to which the subject contributes are  
(please score from 1 to 4, being 4 the highest score):

BASIC		Weighting			
		1	2	3	4
CB3	Students have the ability to gather and interpret relevant data usually within their field of study to inform judgments that include reflection on relevant social, scientific or ethical			X	
CB4	Students can communicate information, ideas, problems and solutions to both specialist and non-specialist			X	
CB5	Capacity to develop those learning skills needed to undertake further studies with a high degree of autonomy				X

  

SPECIFIC		Weighting			
		1	2	3	4
CE1	Understand and integrate the biological foundations of Speech: Anatomy and Physiology				X
CE2	Understand and integrate the psychological foundations of Speech: language development, psychological development, Neuropsychology of language, basic processes and Psycholinguistics		X		
CE33	Final project involving transversally applicable material; to be carried out in association with different subjects		X		
CE37	Master the terminology that allows one to interact effectively with other professionals				X
CE47	Know and be able to integrate the biological (anatomical and physiological), psychological (and evolutionary development processes), linguistic and pedagogical foundations of speech therapy intervention in communication, language, speech, hearing, speech and non-verbal oral functions				X
CE54	Manage communication technologies and information			X	



TRANSVERSAL	Weighting			
	1	2	3	4
CT1 Use the techniques of verbal and nonverbal communication in order to optimize relevant communicative situations			X	
CT7 Having an open and flexible attitude to lifelong learning			X	
CT8 Know and use of technical advances in the exercise of their profession				X



## Assessment system for the acquisition of competencies and grading system

Assessed learning outcomes	Granted percentage	Assessment method
R1, R2, R3, R4, R5	50,00%	Written exam
R1, R2, R3, R4, R5	40,00%	Practical work assignments assessment
R1, R2, R3, R4, R5	10,00%	Attendance and participation of in-person formative activities

### Observations

**WRITTEN TEST: 50%** Open questions (20%): written exam that mainly assesses theoretical knowledge and the student's ability to relate, integrate and express knowledge coherently in written language. Multiple choice tests (30%): multiple choice tests with one of the five possible correct answers. Provide a deeper understanding of the content learned by the student and prepare him to deal with this assessment model **ASSESSMENT OF PRACTICES: 40%** Anatomical imaging tests (10%): exam in which the student must identify the anatomical structures previously observed in class Oral test (10%): oral exam in which the student answers the questions asked by the teacher, verbally explaining the knowledge he has acquired and allowing interaction with the teacher Presentation (10%): the student presents orally, with or without audiovisual media support, about a topic or task assigned by the teacher. Final portfolio (10%): individually, students design a document presenting it to be evaluated by the teacher. It will consist of an anatomical atlas of the structures studied in the subject.

**ATTENDANCE AND PARTICIPATION: 10%**

Attendance to class (5%): It will never exceed 5% of the final grade. Class participation (5%): the teacher evaluates participation and progress in the acquisition of knowledge and skills by students during masterclasses and practices **CRITERIA FOR THE GRANT OF HONOR REGISTRATION:** To obtain it, a grade equal to or greater than 9, participation in all class activities and final work of the subject with the highest grade of the class. Also, and in accordance with the general regulations, you can only give an honorary registration for every 20 students not for a fraction of 20, with the exception of the case of groups of less than 20 students in total, in which you can give an enrollment.



## Learning activities

The following methodologies will be used so that the students can achieve the learning outcomes of the subject:

- M1 On-Campus Class
- M2 Practical Class
- M3 Seminar
- M4 Laboratory
- M5 Individual Work
- M6 Group Work
- M7 Work Exhibition
- M8 Clinical Case Analysis
- M9 Prácticas en clínicas y centros



## IN-CLASS LEARNING ACTIVITIES

	LEARNING OUTCOMES	HOURS	ECTS
ON-CAMPUS CLASS. Teacher presentation of contents, analysis of competences, explanation and in-class display of skills, abilities and knowledge M1, M8	R1, R2, R3, R4, R5	24,00	0,96
PRACTICAL CLASSES. Group work sessions supervised by the professor. Case studies, diagnostic tests, problems, field work, computer room, visits, data search, libraries, on-line, Internet, etc. Meaningful construction of knowledge through interaction and student activity M2, M8	R1, R3, R4	12,00	0,48
GROUP WORK EXHIBITION. Application of multidisciplinary knowledge M6, M7, M8	R4	6,00	0,24
SEMINAR. Supervised monographic sessions with shared participation M3	R4	6,00	0,24
OFFICE ASSISTANCE. Personalized and small group attention. Period of instruction and/or orientation carried out by a tutor to review and discuss materials and topics presented in classes, seminars, papers, etc. M5, M6, M8	R1, R2, R3, R4, R5	9,00	0,36
ASSESSMENT. Set of oral and/or written tests used in initial, formative or additive assessment of the student M5, M8	R1, R2, R3, R4	3,00	0,12
<b>TOTAL</b>		<b>60,00</b>	<b>2,40</b>





## LEARNING ACTIVITIES OF AUTONOMOUS WORK

	LEARNING OUTCOMES	HOURS	ECTS
GROUP WORK. Group preparation of readings, essays, problem solving, seminars, papers, reports, etc. to be presented or submitted in theoretical lectures, practical and/or small-group tutoring sessions. Work done on the university e-learning platform M6, M7, M8	R1, R2, R3, R4, R5	36,00	1,44
INDEPENDENT WORK. Student study: Individual preparation of readings, essays, problem solving, seminars, papers, reports, etc. to be presented or submitted in theoretical lectures, practical and/or small-group tutoring sessions. Work done on the university e-learning platform M3, M5, M7, M8	R1, R2, R3, R4, R5	54,00	2,16
<b>TOTAL</b>		<b>90,00</b>	<b>3,60</b>



## Description of the contents

Description of the necessary contents to acquire the learning outcomes.

Theoretical contents:

Content block	Contents
DIDACTIC UNIT 1 ANATOMY OF HEARING. PHYSICAL STUDY OF SOUND. HEARING.	<ul style="list-style-type: none"><li>·<b>Topic 1:</b> Outer and middle ear. Pinna. Ear canal. Tympanic membrane. Tympanic cavity. Middle ear bones: malleus, incus and stapes. Joints, muscles. Eustachian tube. Mastoid cells. Inner ear. Cochlea. Vestibule and semicircular canals. Internal auditory canal.</li><li>·<b>Topic 2:</b> Physical study of sound. Characteristics of sound waves. The outer and middle ear. Functions. Physiology of the eardrum-ossicular chain. The middle ear as impedance adapter. Air and bone transmission of sound.</li><li>·<b>Topic 3:</b> Transmission of sound waves, mechanical vibration cochlea. Organ of Corti: morphofunctional aspects. Tonotopic organization. Auditory pathway. Information systems and acoustic vestibular. Auditory cortical areas. Acoustic tract injuries.</li></ul>



## DIDACTIC UNIT 2- FUNCTIONAL ANATOMY OF RESPIRATION.

·**Topic 4:** The respiratory system: general concepts on respiration. Organs of the respiratory system and their functional significance. Structure and morphology of the lower passageway: trachea, bronchi and bronchial tree. Contents of the thoracic cavity, pleura and pleural cavity. Lungs. Mediastinum.

·**Topic 5:** Muscles of respiration. Primary muscles of inspiration: the diaphragm. Anatomy of the diaphragm. Diaphragmatic mechanics. Accessory muscles of inspiration. Expiratory muscles: abdominal muscles. Expiration control. Accessory muscles of expiration.

·**Topic 6:** Respiratory Physiology. The measurement of respiration. Structure-function of the respiratory system. Respiratory cycle: pulmonary ventilation, pulmonary pressures and flows. Types of breathing: clavicular breathing, thoracic breathing, diaphragmatic breathing. Ventilation. Transport of respiratory gases. Control of breathing. Lung volumes and capacities. External and internal respiration.

## DIDACTIC UNIT 3: FUNCTIONAL ANATOMY OF PHONATION.

·**Topic 7** - Anatomical elements of the larynx. Hyoid bone and laryngeal cartilages. Ligaments and membranes. Intrinsic and extrinsic muscles.

·**Topic 8** - Anatomy of the vocal folds. Body-cover model. Theories of phonation. Aero-elastic theory. Mechanism of phonation. Vocal cycle. Changes in the vocal folds by hormonal action throughout life.

·**Topic 9** - Laryngeal functions: Role in speech: vocal attack, termination, sustained phonation. Vocal registers. The chest voice and the passage of the voice: glottal fry, falsetto. Frequency, tone and pitch changes. Vocal intensity and intensity changes. Clinical considerations.



## DIDACTIC UNIT 4- FUNCTIONAL ANATOMY OF ARTICULATION AND RESONATION.

·**Topic 10** – Concept of resonance and articulation.

Resonators and organs articulators (I). Cavities of the vocal tract. Nasal passages and sinuses. External nose. Nasal cavities: Regions of the nasal cavities. Sense of smell.

·**Topic 11** - Resonators and articulator (II). Oral cavity.

Tongue. Muscles of the tongue. Muscles of facial expression

·**Topic 12** - Resonators and articulators (III). Pharynx.

Division: rhino-pharynx, oropharynx, laryngopharynx.

Pharyngeal wall. Muscles of the soft palate.

·**Topic 13** - Source-filter theory. Physiology of articulation and resonance. Speech function: lips, mandible, tongue, velum. Development of articulatory ability. Development of the vocal tract. Coordinated articulation. The mouth as a resonant cavity: timbre, coverage and voice projection. The pharynx as a resonant cavity, voce di gola. The sinuses as a resonant cavity.

## DIDACTIC UNIT 5- FUNCTIONAL ANATOMY OF MASTICATION AND SWALLOWING

·**Topic 14** - Anatomy and physiology of mastication and swallowing: Temporo-mandibular joint. Masticatory muscles.

Biomechanics of mastication. Dentition: dental

development, dental occlusion. Salivary glands: parotid,

submandibular and sublingual glands. Physiology of

swallowing. Description of the three phases of swallowing.



## Temporary organization of learning:

Block of content	Number of sessions	Hours
DIDACTIC UNIT 1 ANATOMY OF HEARING. PHYSICAL STUDY OF SOUND. HEARING.	7,00	14,00
DIDACTIC UNIT 2- FUNCTIONAL ANATOMY OF RESPIRATION.	3,00	6,00
DIDACTIC UNIT 3: FUNCTIONAL ANATOMY OF PHONATION.	6,00	12,00
DIDACTIC UNIT 4- FUNCTIONAL ANATOMY OF ARTICULATION AND RESONATION.	6,00	12,00
DIDACTIC UNIT 5- FUNCTIONAL ANATOMY OF MASTICATION AND SWALLOWING	8,00	16,00



## References

### BASIC BIBLIOGRAPHY

- Cobeta et al. Patología de la voz. Ponencia oficial de la SEORL. Valencia. Marge Médica Books (2013).
- Gil-Carcedo, L. M. Otología. Ed Panamericana. (2011).
- Jackson- Menaldi, C. La voz patológica. Ed Panamericana. (2002)
- Jackson- Menaldi, C. La Voz normal. Ed Panamericana. (2005).
- Le Huche, La Voz . Tomos I y II . Ed Manson (2003).
- McCoy S., Your Voice: An Inside View. Multimedia Voice Science and Pedagogy. - Inside View Press, Princeton, NJ. (2006).
- Rodríguez, S.;Smith-Agreda, J. Anatomía de los órganos del lenguaje, visión y audición. Editorial Panamericana (1998).
- Seikel, AJ., Anatomy and Physiology for Speech, Language, and Hearing by Ed Singular 2ª edición (1999).
- Torres Gallardo B., Gimeno Pérez, F. Anatomía de la voz.. Editorial Paidotribo. (2008)

### RECOMMENDED BIBLIOGRAPHY

- Basterra, J. Otorrinolaringología y patología cervicofacial. Barcelona. Masson (2004).
- McFarland. Atlas de Anatomía en Ortofonía. Lenguaje y deglución. Edit. Elsevier-Masson. Barcelona (2008).
- Palastanga, N. Anatomía y movimiento humano. Estructura y funcionamiento. Barcelona. Ed. Paidotribo (2000).
- Prado Calleros, H.; Arrieta Gómez, J.; Prado Abarca, A. Práctica de la otorrinolaringología y cirugía de cabeza y cuello. Editorial Médica Panamericana. Madrid (2012)
- Rouviere H. , Delmás A. , Anatomía Humana. Descriptiva, topográfica y funcional. Tomo I Cabeza y cuello. Ed Masson (2001)
- Sobotta , Atlas de Anatomía.. Edit Panamericana, Madrid. Atlas de consulta.
- Thibodeau G.A., Patton K. T. Anatomía y Fisiología. Estructura y función del cuerpo humano. Editorial Mosby. 6ª ed. (2007).

### WEBS

- <http://msjensen.cehd.umn.edu/webanatomy/>
- <http://www.getbodysmart.com/index.htm>
- <http://www.wiley.com/college/apcentral/anatomydrill/>
- <http://aclanganatomy.com/>
- <https://www.wiley.com/college/bio/tortora366927/resources/student/splash.html>
- [https://www.google.es/?gws\\_rd=ssl#q=leonardo+coscarelli+youtube](https://www.google.es/?gws_rd=ssl#q=leonardo+coscarelli+youtube)
- <http://www.iqb.es/cbasicas/anatomia/musculos/musculos1.htm>
- <http://www.ugr.es/~dlcruz/index.htm>
- <http://depts.washington.edu/msatlas/>
- <http://www9.biostr.washington.edu/da.html>
- <http://www.bartleby.com/107/>



- <http://www.meddean.luc.edu/lumen/meded/grossanatomy/dissector/mml/index.htm>
- <http://www.uni-mainz.de/FB/Medizin/Anatomie/workshop/Klinisches/Clinic.html>
- <http://www.artnatomia.net/es/artnatomy2014.html><http://www.otorrinoweb.com/es/>
- <http://www.otorrinoweb.com/es/>
- <https://www.wiley.com/college/bio/tortora366927/resources/student/splash.html>



## Addendum to the Course Guide of the Subject

Due to the exceptional situation caused by the health crisis of the COVID-19 and taking into account the security measures related to the development of the educational activity in the Higher Education Institution teaching area, the following changes have been made in the guide of the subject to ensure that Students achieve their learning outcomes of the Subject.

**Situation 1: Teaching without limited capacity** (when the number of enrolled students is lower than the allowed capacity in classroom, according to the security measures taken).

In this case, no changes are made in the guide of the subject.

**Situation 2: Teaching with limited capacity** (when the number of enrolled students is higher than the allowed capacity in classroom, according to the security measures taken).

In this case, the following changes are made:

### 1. Educational Activities of Onsite Work:

All the foreseen activities to be developed in the classroom as indicated in this field of the guide of the subject will be made through a simultaneous teaching method combining onsite teaching in the classroom and synchronous online teaching. Students will be able to attend classes onsite or to attend them online through the telematic tools provided by the university (videoconferences). In any case, students who attend classes onsite and who attend them by videoconference will rotate periodically.

In the particular case of this subject, these videoconferences will be made through:

Microsoft Teams

Blackboard Collaborate Ultra

Kaltura





### **Situation 3: Confinement due to a new State of Alarm.**

In this case, the following changes are made:

#### **1. Educational Activities of Onsite Work:**

All the foreseen activities to be developed in the classroom as indicated in this field of the guide of the subject, as well as the group and personalized tutoring, will be done with the telematic tools provided by the University, through:

Microsoft Teams

Blackboard Collaborate Ultra

Kaltura

Explanation about the practical sessions:

Training activities "PRACTICES WITH ANATOMIC MODELS IN THE LABORATORY OF NEUROSCIENCE ", which could not be completed in the period prior to entering force of the State of Alarm, will be replaced by the training activities "ANATOMY VIDEOS", that can be found on Campus.



## 2. System for Assessing the Acquisition of the competences and Assessment System

### ONSITE WORK

#### Regarding the Assessment Tools:

The Assessment Tools will not be modified. If onsite assessment is not possible, it will be done online through the UCVnet Campus.

The following changes will be made to adapt the subject's assessment to the online teaching.

Course guide		Adaptation	
Assessment tool	Allocated percentage	Description of the suggested changes	Platform to be used
WRITTEN TEST- OPEN QUESTIONS	20	ORAL TEST	Microsoft Teams
ORAL TEST- PRACTICES	10	CANCELLED	
ORAL PRESENTATION	10	TASK OF IMAGES IN CAMPUS (15%)	CAMPUS UCV
FINAL PORTFOLIO	10	FINAL PORTFOLIO (15%)	CAMPUS UCV

The other Assessment Tools will not be modified with regards to what is indicated in the Course Guide.

#### Comments to the Assessment System:



The assessment instrument "WRITTEN TEST- OPEN QUESTIONS" is replaced by the instrument "ORAL TEST, keeping Learning Outcomes and the percentage (20%).

The assessment instrument "ORAL TEST- PRACTICES" is cancelled.

The assessment instrument "ORAL PRESENTATION" is replaced by the instrument "TASK OF IMAGES IN CAMPUS", keeping Learning Outcomes and changing the percentage (10%) to 15%,

The assessment instrument "FINAL PORTFOLIO" doesn't change, keeping Learning Outcomes and changing the percentage (10%) to 15%

The rest of the assessment instruments remain unchanged, being applied virtually through the UCV campus.