UAB
Universitat Autònoma de Barcelona

# Anatomy and Physiology of speech and Vocal Organs

2026/2027

Code: 101701
Credits: 6

| Degree programme | Type | Course |
|---|---|---|
| Speech therapy | FB | 1 |

## Contact lecturer

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## Group languages

You can consult this information at the end of the document.

## Prerequisites

There are no prerequisites.

It is convinient ti have basic knowledge on cellular biology, physics and chemistry.

Given the need to carry out practices in the dissection room, students must acquire the commitment to preserve the confidentiality and professional secrecy of the data to which they may have access in their learning activities, and must maintain an attitude of professional ethics. in all his actions. You must also have a completed safety certificate that certifies that you have passed the specific test of good practices in the dissection room.

## Objectives

The subject "Anatomy and Physiology of the Voice and Speech Organs" is programmed during the first semester of the first course and develops the knowledge of the general characteristics of the structure and the function of the structures involved in the production of voice and speech: the respiratory system, vocal tract and the organs of phonatory process and the resonance.

The objectives of the subject are to present in an integrated way the knowledge related to the body organs that allow the production of the voice and the speech in the human beings.

Therefore when finishing the course, the student will have to be able to identify and describe the normal function of the body organs that allow the production of the voice and the speech in the human beings.

## Learning outcomes

- CM03 (Evaluate the usefulness of the main tools for the physiological assessment of the nervous system and of the organs of voice and speech.) Evaluate the usefulness of the main tools for the physiological assessment of the nervous system and of the organs of voice and speech.
- CM04 (Correctly interpret the results of the examination of the nervous system and the organs of voice and speech.) Correctly interpret the results of the examination of the nervous system and the organs of voice and speech.
- KM05 (Describe the anatomical features of the nervous system and of the organs of voice and speech.) Describe the anatomical features of the nervous system and of the organs of voice and speech.
- KM06 (Describe the physiology of the nervous system and of the organs of voice and speech, as well as their molecular and cellular basis.) Describe the physiology of the nervous system and of the organs of voice and speech, as well as their molecular and cellular basis.
- KM07 (Describe the meaning of the main terms referring to normal and pathological structural and functional characteristics.) Describe the meaning of the main terms referring to normal and pathological structural and functional characteristics.
- SM03 (Use the nomenclature of cell biology, human anatomy, and the main terms of physiology.) Use the nomenclature of cell biology, human anatomy, and the main terms of physiology.
- SM04 (Perform a basic examination of the organs of voice and speech.) Perform a basic examination of the organs of voice and speech.
- SM05 (Show correct diction and an adequate syntactic and discourse structure in public presentations of papers.) Show correct diction and an adequate syntactic and discourse structure in public presentations of papers.

## Contents

General justification:

The degree of Speech Therapy is defined as a Health Degree, and therefore, in the basic courses, it is necessary to carry out the learning of the structure and function of those organs that will be responsible for the production of the voice and speech and the development of language. These basic lessons must provide to the student enough tools to face successful clinical and, in the longer term, to be able to carry out an effective and rigorous professional task, based on scientific knowledge.

The Speech therapist is a professional who works to prevent, detect, identify, evaluate, diagnose, and provide treatment and follow-up for people of all ages at risk of suffering from speech, voice, language, swallowing disorders and related disorders. In addition, \"he /she teach, supervise, and guides research programs or activities related to related sciences. Therefore, he/she must use the scientific method to measure treatments, evaluate their effectiveness, modify them based on their assessment and disseminate the results \". All of this allows us to justify the importance of this subject for the professional future.

In other words, the speech therapist must know the structure and functioning of the respiratory system, as well as the vocal tract and the organs of the phonatory process and resonance, in order to understand, diagnose, treat, prevent and investigate the alterations that affect voice, speech and language. The program of this subject is oriented precisely to the achievement of these objectives.

GENERAL CONCEPTS

General organization of the human body

- Anatomy concept
- Levels of organization of the human body
- Anatomical position
- Levels and sections of the human body
- Generalities of the musculoskeletal, nervous and vascular systems

Functional organization of the organs related to the voice and the speech

- Respiratory system: Airstream producer
- Larynx: vocal folds oscillation and voice generation
- Vocal tract: Speech resonance
- Articulation: generating speech
- Speech process

## LANGUAGE ORGANS

### 1. RESPIRATORY SYSTEM

Anatomy of the respiratory system

- Division and parts of the respiratory system
- Respiratory tracts and lungs
- Chest bones
- Muscles associated with breathing
- Innervation and vascularization

Physiology of the respiratory system

- Organization and functional characteristics of the respiratory system
- Respiratory functions and non-respiratory functions of the respiratory system
- Physiology of the pleural system
- Ventilatory mechanics

- Elasticity and resistance of the respiratory system. Respiratory work
- Measurement of the ventilatory function: spirometry and elimination of inert gas
- Volumes and lung capacity
- Alveolar ventilation and respiratory dead areas
- Pulmonary ventilation during speech
- Functional organization of the ventilation system control
- Respiratory rhythm: origin and conditioning factors
- Nervous and humoral regulation of ventilation

## 2. PHONATORY SYSTEM

Anatomy of phonatory system

- General characteristics of the larynx
- Cavity: division, mucosa and spaces
- Cartilage of the larynx
- Membranes and ligaments of the larynx
- Muscular larynx
- Innervation and vascularization
- Biomechanics of the larynx

Physiology of the larynx

- Methods of study of the larynx behaviour
- Physiologyof the vibration of the vocal folds: myoelastic and aerodynamic theory
- Phases of the phonation: start, endurance and ending
- Functional characteristics of the oscillation cycle of vocal folds
- Frequency, intensity and timbre of voice. Implication of laryngeal muscles
- Environmental factors that affect the voice
- Voice changes with age
- Voice records
- Nerve control of the larynx

## 3. ARTICULATION AND VOICE RESSONANCE

Anatomy of organs of articulation and resonance

- Location and general structure of the vocal tract
- Skull and face bones
- Skull and face articulation
- Skull and face musculature
- Structure of the nose: nasal pyramid, fossae and paranasal sinuses
- Structure of the mouth: parts, glands, lips, gums and teeth, palate, tongue
- Structure of the pharynx: division, muscles and innervation

Physiology of vocal tract and articulation. Speech

- Functional organization
- Resonance in the vocal tract: frequency of resonance and formants
- Resonance changes with pharyngeal and velopharyngeal movements
- Factors that influence the resonance
- Resonance changes with age
- Function of the articulators in the production of speech
- Role of the salivary glands in the articulation of speech
- Nervous control of the articulators and resonators
- Functional bases of the production and perception of speech

## Learning activities and methodology

| Title | Hours | ECTS | Learning outcomes |
|---|---|---|---|
| Theory classes | 33 | 1.32 | CM03, CM04, KM05, KM06, KM07, SM03, SM04, SM05 |
| Laboratory classes | 10 | 0.4 | CM03, CM04, KM05, KM06, KM07, SM03, SM04, SM05 |
| Preparation of cases seminars | 14 | 0.56 | CM03, CM04, KM05, KM06, KM07, SM03, SM04, SM05 |
| Cases seminars and written review | 10 | 0.4 | CM03, CM04, KM05, KM06, KM07, SM03, SM04, SM05 |
| Tutorial teaching, attended and virtual | 6 | 0.24 | CM03, CM04, KM05, KM06, KM07, SM03, SM04, SM05 |
| Preparation of written review | 16 | 0.64 | CM03, CM04, KM05, KM06, KM07, SM03, SM04, SM05 |
| Preparation of laboratory classes | 14 | 0.56 | CM03, CM04, KM05, KM06, KM07, SM03, SM04, SM05 |
| Self-study | 42 | 1.68 | CM03, CM04, KM05, KM06, KM07, SM03, SM04, SM05 |

## Theory classes:

Systemized explanation of the subject topics, giving relevance to the most important concepts. The student acquires the basic scientific knowledge of the subject attending to theory classes, which will complement by self-study of the topics of the subject program.

Case Seminars:

Presentation of clinical cases related to the subject with learning objectives on which students must work individually or in groups, also in small groups, with personal study.

Laboratory classes:

Practical sessions for the observation of anatomical structures and the practical learning of physiological techniques. Group work and active self-learning are promoted.

Preparation of a written review:

Based on a set of topics proposed for the subject, students must meet in groups of no more than four people, and prepare a revision work that will be evaluated by the teaching team of the subject. The revision work will be presented to the rest of the main class group.

N.B. The proposed teaching and assessment methodologies may experience some modifications as a result of the restrictions on face-to-face learning imposed by the health authorities. The teaching staff will use the Moodle classroom or the usual communication channel to specify whether the different directed and assessment activities are to be carried out on site or online, as instructed by the Faculty".

Annotation: within the schedule set by the centre or degree programme, 15 minutes of one class will be reserved for students to evaluate their lecturers and their courses or modules through questionnaires.

## Assessment

## Continuous assessment activities

| Title | Weight | Hours | ECTS | Learning outcomes |
|---|---|---|---|---|
| 4)EV4 - Preparation of Seminar cases and written review | 15% | 2 | 0.08 | CM03, CM04, KM05, KM06, KM07, SM03, SM04, SM05 |
| 3) EV3 - Continuous evaluation of practices | 15% | 0 | 0 | CM03, CM04, KM05, KM06, KM07, SM03, SM04, SM05 |
| 1) EV1 - 1st Objective multiple-choice response test test (theory and practices) | 35% (theory and practices) | 1.5 | 0.06 | KM05, KM06, KM07, SM03, SM04, SM05 |
| 2) EV2 - 2nd Objective multiple-choice response test (theory and practices) | 35% (theory and practices) | 1.5 | 0.06 | KM05, KM06, KM07, SM03, SM04, SM05 |

Continuous assessment

- The skills of this subject will be assessed through objective tests, portfolio and case solutions, and presentation of work with the instruments detailed in the learning evidence table.

- The subject will be passed when a grade equal to or greater than 5.0 has been achieved as an average of the set of EVs. In order to make the weighted average of the EV grades, it is essential to have obtained a grade

equal to or greater than 5.0 in EV1 and EV2 evidence and a grade equal to or greater than 4.0 in the rest of the evidence (EV3 and EV4). In case of not meeting these requirements, and others that may be established by the subject, the maximum grade to be recorded in the academic record will be 4.5 points.

- Final retake exam: Students who have not obtained a grade equal to or greater than 5.0 as an average of the set of EVs may take a retake test for the evidence not passed. In EV1 and EV2 it will consist of a multiple-choice test, in the case of EV3 it will be a written test on the knowledge taught in this evidence, and in the case of EV4, the student may submit a new written work on the day of the retake exam.

- A student who has submitted evidence of learning with a weight of less than 4.0 points (40%) will be recorded as "not assessable".

- Students in second year of enrollment or higher may be exempted from participating in practical activities and submitting the review work if they have passed EV3 and EV4 of the previous year. In this case, the grade obtained for EV3 and EV4 will be kept, although they will have the right to waive it in writing and retake it from the beginning of the course. It is not planned to replace the evaluation with a synthesis test.

https://www.uab.cat/web/estudiar/graus/graus/avaluacions-1345722525858.htm

The possible translation of the statements of the evaluation tests, all the information will be found on the Faculty's website.

Single evaluation

Students can take advantage of the single evaluation system, according to the Faculty's regulations. The single evaluation is requested electronically (e-form) in the specific period (more information on the Faculty's website). The single evaluation will be based on the same content of the subject program, the acquisition of the same skills and will have the same level of demand as the continuous evaluation. Those students who take advantage of the single evaluation will take EV1, EV2 and EV3 on the same day as EV2 (second evaluation period). They will submit EV4 on the same day.

To evaluate each block, an exam consisting of multiple-choice questions and/or restricted written questions will be carried out to evaluate theoretical knowledge of the subject (EV1 and EV2) and concepts related to laboratory practices and case studies (EV3), each with an approximate weighting of 35% and 15% respectively of the overall grade of each system. To pass the subject, a score equal to or greater than 5.0 in the weighted average of the scores must be obtained. Evidence not submitted has a score of 0 (zero) and evidence submitted is considered passed if it has a rating equal to or greater than 5.0. The subject is considered passed as described for continuous assessment and the same recovery system will be followed as for the single assessment. If the student does not pass these tests, he/she may choose to recover them during the recovery period, under the same conditions as students who follow continuous assessment (see the Recovery section).

Link to the faculty's assessment guidelines:
https://www.uab.cat/web/estudiar/graus/graus/avaluacions-1345722525858.html

The review of grades will follow the same procedure as for continuous assessment.

| Code Evidence | Denomination | Weight | Format (oral, written, or both) | Authorship (individual, collective, or both) | Via (face-to-face, virtual both) | |
|---|---|---|---|---|---|---|
| EV1 | Objective multiple-choice test on theorical and practical knowledge the structure of the respiratory system and the organs of phonation and articulation | 35% | written | individual | Face | First evaluation period |
| | Objective multiple-choice test on theorical and practical knowledge of the Function of | | | | | Second |

| | | | | | | |
|---|---|---|---|---|---|---|
| EV2 | the respiratory system and the organs of phonation and articulation | 35% | written | individual | Face | evaluation period |
| EV3 | Elaboration ofthe use and follow-up of the work by resolving cases | 15% | both | both | both evaluation periods | |
| EV4 | Preparation of the Revision Work | 15% | both | collective | collective | |

As for the return of evidence, it will be done according to the following table:

| Return Type | EV & TYPE | WEEK |
|---|---|---|
| Tutorials | EV1, EV2, EV3: Problems and Short Tests | Durant tot el curs |
| In the classroom | EV3 i EV4: Internships and Exhibition of Works | Durant tot el curs |

For this subject, the use of Artificial Intelligence (AI) technologies is only allowed for EV1 and EV2 exclusively in support tasks, such as bibliographic or information searches, text correction or translations. The student must clearly identify which parts have been generated with this technology, specify the tools used and include a critical reflection on how these have influenced the process and the final result of the activities. The lack of transparency in the use of AI in these assessable activities will be considered a lack of academic honesty and may lead to a partial or total penalty in the grade of the activity, or greater sanctions in serious cases. In the case of EV1 of the single assessment, the use of AI can be done during the preparation of the exercises, not during the oral presentation.

## Bibliography

Fundamental bibliography

Francois Le Huche, Andre Allali. Anatomia y Fisiologia de los órganos de la voz y del habla - Vol. 1. Elsevier-Masson, Barcelona. 2004

David H McFarland. Atlas de Anatomia en Ortofonia. Elsevier-Masson, Barcelona. 2008

Anthony Seikel, David G. Drumright, et ál Anatomy and Physiology for Speech, Language, and Hearing . |6ht edition. 2019

Rodríguez S, Smith-Agreda JM. Anatomia de los órganos del lenguaje, visión y audición. Panamericana, Madrid. 2003

Begoña Torres, Ferran Gimeno. Bases anatòmiques de la veu. Proa-Biblioteca Universitària, Barcelona. 1995

Complementary biblioography

Bustos Sánchez,Benoit Amy de la Bretèque, Diana Grandi, Cori Casanova, Salvador Casadevall, Ana Lou, Andreu Sauca, Queralt Botey, Ferran Ferran, Marta Jordana, Gemma Solà, Pepi Martín, Núria Rebull, Hellen Rowson, Ricard Monge. Intervención logopédica en transtornos de la voz. Editorial Paidotribo. Barcelona. 2013

Coll-Florit Marta, Gerardo Aguado, Alicia Fernández-Zúñiga, Sara Gambra, Enrique Perelló, Josep Maria Vila-Rovira. Transtornos del habla y de la voz. Editorial UOC. Barcelona. 2013

Richard L Drake, Wayne Vogl, Adam WM Mitchell. Anatomía de Gray para estudiantes. 2a edició (o posteriors) Elsevier, Barcelona, 2010

Nielsen M, Miller S. Atlas de Anatomía humana. Panamericana, Madrid 2011

Gerard J Tortora, Bryan Derrickson. Introducción al cuerpo humano: fundamentos de anatomía y fisiología. Panamericana, 2008.

## Software

No specific software is needed

### Course groups and languages

The information provided is provisional until November 30. After this date, you will be able to consult the language of each group through this link. To access the information, you will need to enter the course CODE

| Type of teaching | Group | Language | Semester | Shift |
|---|---|---|---|---|
| (TE) Theory | 1 | Catalan | first semester | morning-mixed |
| (PAUL) Classroom practices | 11 | Catalan | first semester | afternoon |
| (PAUL) Classroom practices | 12 | Catalan | first semester | afternoon |
| (PLAB) Practical laboratories | 111 | Catalan | first semester | afternoon |
| (SEM) Seminars | 111 | Catalan | first semester | afternoon |
| (PLAB) Practical laboratories | 112 | Catalan | first semester | afternoon |
| (SEM) Seminars | 112 | Catalan | first semester | afternoon |
| (PLAB) Practical laboratories | 113 | Catalan | first semester | afternoon |
| (SEM) Seminars | 113 | Catalan | first semester | afternoon |
| (PLAB) Practical laboratories | 114 | Catalan | first semester | afternoon |
| (PLAB) Practical laboratories | 115 | Catalan | first semester | afternoon |