

**Human Anatomy: Locomotor System**

Code: 101935  
ECTS Credits: 6

| Degree                      | Type | Year | Semester |
|-----------------------------|------|------|----------|
| 2501230 Biomedical Sciences | FB   | 1    | 2        |

## Contact

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## Teaching groups languages

You can check it through this [link](#). To consult the language you will need to enter the CODE of the subject. Please note that this information is provisional until 30 November 2023.

## Prerequisites

Although there are no prerequisites established officially, it is advisable that the student has achieved basic competencies for English because the course is in English, self-learning, working in groups and pre-college Biology. Because the student will do practices in the dissection/osteotheca labs, he will acquire the commitment to preserve the confidentiality and professional secrecy of the data to which they can access. Also, is necessary have taken the "good practice test" and must agree in maintaining an attitude of professional ethics throughout all his actions.

## Objectives and Contextualisation

It is a basic subject, scheduled in the second semester of the first year of the Degree in Biomedical Sciences. The objectives are the study of the general anatomical organization of the human body, the principles of the initial embryonic development and the locomotor system, as well as the study of the descriptive and topographic anatomy of the trunk and head, of the upper and lower limbs, and the descriptive and topographic anatomy of the cardiovascular system. This subject has its natural continuation in the second year, in the subjects Human Anatomy: internal organs, Structure and Function of the Nervous System and in Biology of Development and Teratogenesis. The student who approves this course must be able to describe, with international anatomical nomenclature, and recognize the anatomical structures that make up the different parts of the locomotor system and the cardiovascular system in health, as well as to describe the principles of embryonic development, normal and locomotor system, in order to understand their alterations.

## Competences

- Act with ethical responsibility and respect for fundamental rights and duties, diversity and democratic values.

- Apply knowledge acquired to the planning and implementation of research, development and innovation projects in a biomedical research laboratory, a clinical department laboratory or the biomedical industry.
- Describe biomedical problems in terms of causes, mechanisms and treatments.
- Display knowledge of the bases and elements applicable to the development and validation of diagnostic and therapeutic techniques.
- Display knowledge of the basic life processes on several levels of organisation: molecular, cellular, tissues, organs, individual and populations.
- Display knowledge of the concepts and language of biomedical sciences in order to follow biomedical literature correctly.
- Make changes to methods and processes in the area of knowledge in order to provide innovative responses to society's needs and demands.
- Read and critically analyse original and review papers on biomedical issues and assess and choose the appropriate methodological descriptions for biomedical laboratory research work.
- Students must be capable of applying their knowledge to their work or vocation in a professional way and they should have building arguments and problem resolution skills within their area of study.
- Students must be capable of collecting and interpreting relevant data (usually within their area of study) in order to make statements that reflect social, scientific or ethical relevant issues.
- Students must be capable of communicating information, ideas, problems and solutions to both specialised and non-specialised audiences.
- Students must develop the necessary learning skills to undertake further training with a high degree of autonomy.
- Students must have and understand knowledge of an area of study built on the basis of general secondary education, and while it relies on some advanced textbooks it also includes some aspects coming from the forefront of its field of study.
- Take account of social, economic and environmental impacts when operating within one's own area of knowledge.
- Work as part of a group with members of other professions, understanding their viewpoint and establishing a constructive collaboration.

## Learning Outcomes

1. Act with ethical responsibility and respect for fundamental rights and duties, diversity and democratic values.
2. Apply acquired knowledge of anatomy to the production of well-structured review articles.
3. Correctly use the international anatomical nomenclature.
4. Describe the anatomical organisation of the cardiovascular system.
5. Describe the anatomical organisation of the musculoskeletal system.
6. Describe the general anatomical organisation of the systems of the human body in a healthy state.
7. Distinguish between normal anatomical structures by using different imaging diagnostic techniques.
8. Explain the formation of the cardiovascular system and of its principal disorders.
9. Explain the formation of the embryonic disc and its principal derivatives.
10. Explain the formation of the musculoskeletal system and of its principal disorders.
11. Identify the anatomical structures that constitute the different systems in a healthy state in the main stages in an individual's life cycle.
12. Identify the principal techniques used in an anatomy laboratory.
13. Make changes to methods and processes in the area of knowledge in order to provide innovative responses to society's needs and demands.
14. Students must be capable of applying their knowledge to their work or vocation in a professional way and they should have building arguments and problem resolution skills within their area of study.
15. Students must be capable of collecting and interpreting relevant data (usually within their area of study) in order to make statements that reflect social, scientific or ethical relevant issues.
16. Students must be capable of communicating information, ideas, problems and solutions to both specialised and non-specialised audiences.
17. Students must develop the necessary learning skills to undertake further training with a high degree of autonomy.
18. Students must have and understand knowledge of an area of study built on the basis of general secondary education, and while it relies on some advanced textbooks it also includes some aspects coming from the forefront of its field of study.

19. Take account of social, economic and environmental impacts when operating within one's own area of knowledge.
20. Work as part of a group with members of other professions, understanding their viewpoint and establishing a constructive collaboration.

## Content

### CONTENTS:

THEORETICAL CLASSES (TE typology) (37 hours).

UNIT 1: GENERAL ANATOMY. Terms of position and direction. International Anatomical terminology. General anatomical organization of the human body.

UNIT 2: GENERAL EMBRYOLOGY and PRINCIPLES OF THE LOCOMOTOR DEVELOPMENTAL. Zygote, morula and blastula. Gastrulation: formation of the definitive embryonic leaves and their main derivatives. Principles of the development of the locomotor system.

UNIT 3: ANATOMY OF THE LOCOMOTOR SYSTEM: UPPER LIMB. General organization of the upper limb. Joints and muscles of the shoulder girdle. Elbow joint and muscles of the arm. Topographic anatomy of the shoulder and arm girdle. Wrist and hand joints. Muscles of the forearm and hand. Topographic anatomy of the forearm and hand. Vessels and nerves of the upper limb.

UNIT 4: ANATOMY OF THE LOCOMOTOR SYSTEM: LOWER LIMB. General organization of the lower limb. Hip joint and muscles of the hip. Knee joint and thigh muscles. Topographic anatomy of the pelvic girdle and thigh. Foot and ankle joints. Muscles of the leg and foot. Topographic anatomy of the leg and foot. Vessels and nerves of the lower limb.

UNIT 5: ANATOMY OF THE LOCOMOTOR SYSTEM: TRUNK. SPINE. General organization. Joints of the spine: syndesmosis (ligaments), synchondrosis (intervertebral disc) and synovial (zygapophyseal). Craniovertebral joints. Muscles of the trunk: classification. Short and long muscles of the medial tract. Short and long muscles of the lateral tract. Prevertebral muscles. Overview of the spine's movements. CHEST. General organization. Joints of the thorax: synchondrosis and synovial. Muscles of the chest: supracostals, intercostals, subcostals, posterior serratus, triangular of the sternum and diaphragm muscles. Overview of the mechanical breathing. ABDOMEN. General organization. Muscles of the abdomen: rectus, obliquus and transverse. Posterior muscles: psoas and quadratus lumbar. Fascia transversalis. Inguinal canal. PELVIS. General organization. Joints and ligaments of the pelvis: sacroiliac and symphysis. Pelvic cavity as a whole. PERINEUM. General organization. Fasciae and muscles of the perineum.

UNIT 6: ANATOMY OF THE LOCOMOTOR SYSTEM: HEAD AND NECK. General organization of the head. Views and cranial fossae. Internal base of the skull. Orbital and Nasal Cavities. Articulations of the skull: syndesmosis, synchondrosis and synovial (temporomandibular). Muscles of the face and the chewing. General organization of the neck: compartments and fasciae. Muscles of the neck: scalenus, infrahyoids and craniozonals (sternocleidomastoid and trapezius). Cervical plexus

UNIT 7: ANATOMY OF THE CARDIOVASCULAR SYSTEM. General organization. Pulmonary and Systemic circulation. Anatomy of the heart: external and internal morphologies. Heart vessels and nerves. Pericardium. Pulmonary trunk, pulmonary arteries and pulmonary veins. Artery aorta: ascending aorta, aortic arch and descending aorta. Iliac arteries. Subclavian arteries. Carotid arteries. Superior vena cava system. Inferior vena cava system. Venous intercaval systems. Lymphatic system.

SEMINARS (SEM typology) (6 hours per student)

Seminar 1: osteology of the upper limb-I

Seminar 2: osteology of the upper limb-II

Seminar 3: osteology of the lower limb-I

Seminar 4: osteology of the lower limb-II

Seminar 5: osteology of the thorax, spine

Seminar 6: osteology of the head

LABORATORY PRACTICES (in dissection room) (PLAB typology) (12 hours per student). To access at the dissection room, it is COMPULSORY to wear a gown and gloves, and have taken the good practice test. It is NOT allowed to take photographs and/ or videos in the dissection room.

Practice 1: Identify, in anatomical preparations, the structures (joints, muscles, vessels, nerves) of the upper limb

Practice 2: Identify, in anatomical preparations, the structures (joints, muscles, vessels, nerves) of the pelvis, and the lower limb.

Practice 3: Identify, in anatomical preparations, the heart and the vascular system (arteries, veins). Identify, in anatomical preparations, muscles, vessels and nerves of head and neck.

## Methodology

### METHODOLOGY

#### Directed activities

Classes to teach the theory program (TE) (37h)

Seminars for bones study (SEM) (6h)

Dissection lab practices (PLAB) (12h)

#### Supervised activities

Personalized and/or group tutoring, face-to-face or virtual

Tutorials *on line*

#### Autonomous activities

Reading of texts and articles, study and creation of diagrams, summaries and conceptual assimilation of the contents. Preparation of seminars and dissection activities.

#### Innovative teaching

Group leadership in Anatomy Seminars and Practicals

OBJECTIVE: In your career in the future, either in Industry or in Academia (PhD), you will become a group leader, so its essential to learn these skills.

ACTIVITY: During the seminars and dissection room practical you will be in groups of 5-6 students. Your job is to study the seminar and practical material before you start. Then, you can help or answer any question the people in your group.

ASSESSMENT and OUTCOME: I will ask you 5-10 questions and keep the record as a guide for future development of this idea but it doesn't count to your grade. You will feel the responsibility of answering questions from your group and skills and provide a feedback report to the teacher.

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.

## Activities

| Title   | Hours | ECTS | Learning Outcomes                   |
|---|-------|------|-------------------------------------|
| Type: Directed  |       |      |                                     |
| Laboratory practices (dissection lab)                               | 12    | 0.48 | 5, 4, 7, 11, 12, 20, 3              |
| Seminars (osteology)  | 6     | 0.24 | 2, 5, 6, 7, 11, 12, 20, 3           |
| Theory  | 37    | 1.48 | 5, 4, 6, 7, 10, 9, 8, 11, 12, 20, 3 |
| Type: Supervised  |       |      |                                     |
| Virtual classes and tutorials                                       | 12    | 0.48 | 2, 5, 4, 6, 7, 10, 8, 11, 12, 3     |
| Type: Autonomous  |       |      |                                     |
| Preparation of the written works, self-study, comprehensive reading | 75    | 3    | 2, 5, 4, 7, 11, 12, 20, 3           |

## Assessment

The competence of students in the subject are evaluated through two partial exams, each with a weight of 50% to the final grade of the subject. The subject of each partial exam can be eliminatory if the students reach a minimum grade of 5.00. All students will have two opportunities to pass the two parts of the subject: partial exam (during the semester) and retrieval exam (at the end of the semester).

"Single assessment is not an option in this course"

### PARTIAL EXAMS:

The subject will program 2 partial exams with a weight of 50% each.

- First partial: This partial exam will focus on the contents of the first part of the semester (lecturers, practical labs and seminars).
- Second partial: It will focus on the contents of the second part of the semester (lecturers, practical labs and seminars).

Each partial will consist of: written evaluations based on lectures, SEM and PLAB contents.

- Test evaluation - Multiple-choice questions: test with 5 answers, only 1 true and with a penalty of 0.25 points for incorrect answers. This test represents 60% of the partial mark.
- Written evaluation (no test) - This exam represents 40% of the partial mark.

The mark of each partial = test evaluation (60%) + no test evaluation (40%).

### RECOVERY EXAM:

The students who have eliminated subjects in the partial evaluations will not be obligated to make the final evaluation or recovery.

Students with the following criteria have to attend the final evaluation:

- Students who have not eliminated material in 1 or 2 partials.
- Students who have not submitted to any of the partial exams.
- Students who have eliminated material but want to upgrade one or both partial exams. In these cases:
  - 1) An email must be sent to the coordinator of the subject at least 1 week before the recovery exam.
  - 2) Although the student presents to the recovery exam to upgrade, it is mandatory to have a minimum grade of 5.0 on each partial exam, otherwise, the student will have failed the subject.

The recovery exam of each partial will consist of written evaluations objective tests based on lectures, SEM, and PLAB contents. The student who has to recover the 2 partials, will recover the 1st part + the 2nd part. It will have, then, a partial note of recovery of the 1st part and another of the 2nd part.

To pass the recovery exam, it is mandatory a minimum mark of 5.0. In case the student has a good grade in one partial exam but the other does not have a minimum grade of 5.0, the student will NOT have passed the partial recovery exam and therefore the student will have failed the subject.

#### GRADE OF THE SUBJECT:

Grade of the subject = grade of the 1st part (50%) + grade of the 2nd part (50%).

The final grade of the subject will have a numerical expression, with a decimal on the scale of 0-10 and with the qualitative equivalence in accordance with the criteria of the UAB, of "fail" (0-4.9), "pass" (5.0-6.9), "good" (7.0-8.9) and "excellent" (9.0-10.0). The following indications of the UAB will be rounded off to the nearest whole number when it is one-tenth of a value that entails a qualitative change of qualification. "High honours" will be among students who have achieved an excellent qualification. The number of "High honours awarded" may not exceed 5% as established by the academic regulations of the UAB.

To pass the subject it is necessary to obtain, after the recovery exam, a minimum grade of 5.0 in each partial. In case that a part has a good mark but in the other part the mark is less than 5.0, the student's mark will be 4.8 points maximum, although the weighted sum of the two parts is greater than or equal to 5.0. The mark of each part is that obtained in the partial exams or in the recovery exam.

It is considered non-evaluable student, who has NOT performed a minimum of two training activities (2 written assessments).

#### ANNOUNCEMENTS, REVISIONS:

Exams (day, hour, classroom ...) and revision of the marks will be announced through the UAB moodle and class representatives. The procedure for reviewing marks will be in accordance with the current regulations of the UAB and in any case be individually.

### Assessment Activities

| Title                              | Weighting | Hours | ECTS | Learning Outcomes                                  |
|------------------------------------|-----------|-------|------|--|
| Written assessment no. 1 (no test) | 20%       | 2     | 0.08 | 1, 19, 2, 5, 6, 7, 9, 8, 11, 12, 16, 14, 15, 20, 3 |
| Written assessment no. 2 (no test) | 20%       | 2     | 0.08 | 1, 19, 2, 4, 7, 10, 8, 11, 12, 16, 14, 15, 20, 3   |
| Written assessment no. 2 (test)    | 30%       | 2     | 0.08 | 1, 2, 4, 10, 8, 11, 13, 18, 17, 3                  |
| Written evaluation No 1 (test)     | 30%       | 2     | 0.08 | 1, 2, 5, 6, 10, 9, 11, 13, 18, 17, 3               |

## Bibliography

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### ANATOMY

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## **Software**

Is not necessary