UAB
Universitat Autònoma de Barcelona

Human Anatomy: General Anatomy and Musculoskeletal System

Code: 103592
ECTS Credits: 6

2024/2025

Degree	Type	Year
2502442 Medicine	FB	1

Contact

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Teachers

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Teaching groups languages

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

Prerequisites

Although there are no prerequisites established officially, it is advisable that the student has achieved basic competencies for 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 because of their learning activities and have taken the good practice test. He must also agree in maintaining an attitude of professional ethics throughout all his actions. Is necessary have the security certificate that proves having passed the test of good practices in the dissection room.

Objectives and Contextualisation

The subject *Human Anatomy: generalities and locomotor apparatus* is taught in the first semester of the first year of the Degree in Medicine. The objectives are the study of the general organization of the human body, initial embryonic development principles, and the locomotor apparatus, as well as the study of the anatomy of the trunk and the limbs.

This subject has its natural continuity in the second half of the first year and in the second year. Other subjects of the degree, such as Histology, Physiology and Pathophysiology and Clinical Semiology, complement these subjects.

The student who passes this subject must be able to describe, with an international anatomical nomenclature, and to recognize the general anatomical organization of the human body, the principles of its development, and the anatomical structures that integrate the trunk and extremities of healthy human beings.

Competences

- Be able to work in an international context.
- Communicate clearly, orally and in writing, with other professionals and the media.
- Convey knowledge and techniques to professionals working in other fields.
- Critically assess and use clinical and biomedical information sources to obtain, organise, interpret and present information on science and health.
- Demonstrate knowledge and understanding of descriptive and functional anatomy, both macro- and microscopic, of different body systems, and topographic anatomy, its correlation with basic complementary examinations and its developmental mechanisms.
- Demonstrate understanding of the basic sciences and the principles underpinning them.
- Demonstrate understanding of the causal agents and the risk factors that determine states of health and the progression of illnesses.
- Demonstrate understanding of the structure and function of the body systems of the normal human organism at different stages in life and in both sexes.
- Formulate hypotheses and compile and critically assess information for problem-solving, using the scientific method.
- Maintain and sharpen one's professional competence, in particular by independently learning new material and techniques and by focusing on quality.
- Organise and plan time and workload in professional activity.
- Recognise the professional values of excellence, altruism, sense of duty, compassion, empathy, honesty, integrity and commitment to scientific methods.
- Use information and communication technologies in professional practice.

Learning Outcomes

1. Apply knowledge of anatomy to the production of structured review texts.
2. Be able to work in an international context.
3. Communicate clearly, orally and in writing, with other professionals and the media.
4. Convey knowledge and techniques to professionals working in other fields.
5. Describe anatomical structures through inspection, palpation and/or different diagnostic imaging techniques.
6. Describe the anatomical structures, the organisation and the morphogenesis of the musculoskeletal system, respiratory system, digestive system, and urogenital system.
7. Describe the factors that determine the form, general aspect and proportions of the human body in health at different stages in life and in both sexes.
8. Describe the fundamental scientific principles of human anatomy.
9. Describe the general anatomical organisation of the systems of the human body in health.
10. Explain the formation of the embryonic disc and its principal derivatives.
11. Formulate hypotheses and compile and critically assess information for problem-solving, using the scientific method.

12. Identify the anatomical structures that constitute the different body systems in good health in the major stages of the life cycle and in both sexes.
13. Identify the anatomical structures that make up the different body systems in health, through inspection, palpation and / or different macroscopic methods and different diagnostic imaging techniques.
14. Identify the main techniques used in a human anatomy laboratory.
15. Identify the morphogenetic mechanisms of the main alterations to the development of the musculoskeletal system, respiratory system, digestive system, and urogenital system.
16. Identify, at a basic level, the donation system and the protocols for the use of bodies in the medicine faculty.
17. Know and make correct use of the international anatomical nomenclature.
18. Maintain and sharpen one's professional competence, in particular by independently learning new material and techniques and by focusing on quality.
19. Organise and plan time and workload in professional activity.
20. Use information and communication technologies in professional practice.

Content

CONTENTS

THEORY (TE)

UNIT 1: GENERAL ANATOMY

Introduction to anatomy. Basic terms. International anatomical nomenclature. Generalities of the skeletal system: bones and cartilages. Generalities of the articular system: fibrous, cartilaginous and synovial joints. Generalities of the muscular system: skeletal muscles and annexes. Overview of the vascular system: heart, arteries, veins and lymphatic system. Overview of the nervous system: central and peripheral nervous systems. Spinal nerves.

UNIT 2: GENERAL EMBRYOLOGY AND MORPHOGENESIS OF THE LOCOMOTOR APPARATUS

Introduction to embryology. General concepts. Fertilization and zygote formation. Cleavage of the zygote: blastomeres. Morulation. Blastocyst. Gastrulation. Main derivatives of the germ layers: ectoderm, mesoderm, endoderm. Morphogenesis of the trunk. Morphogenesis of the limbs.

UNIT 3: ANATOMY OF THE LOWER LIMB

Pelvic girdle: joints and ligaments. Hip joint. Muscles: organization. Dorsal-anterior group (iliopsoas, psoas minor, pectineus). Dorsal-posterior group (piriformis, gluteus muscles, tensor fasciae latae). Ventral group (obturator muscles, gemellus muscles, quadratus femoris, adductor muscles, and gracilis). Topographic anatomy of the pelvic girdle. Lumbar and sacral plexuses. Internal and external iliac arteries and veins. Knee joint. Muscles: organization. Dorsal group or anterior region (quadriceps femoris, and sartorius). Ventral group or posterior region (popliteus, biceps femoris, semitendinosus, and semimembranosus). Topographic anatomy of the thigh. Femoral artery and vein. Nerves: femoral, obturator, lateral femoral cutaneous, genitofemoral, posterior femoral cutaneous and sciatic. Foot and ankle joints. Foot arches. Muscles: organization and compartments. Dorsal-anterior group or anterior compartment (tibialis anterior, extensor hallucis longus, extensor digitorum longus, and fibularis tertius). Dorsal-lateral group or lateral compartment (fibularis longus and fibularis brevis). Ventral group or posterior compartment (tibialis posterior, flexor hallucis longus, flexor digitorum longus, and triceps surae muscles). Topographic anatomy of the leg and ankle. Popliteal artery and vein. Nerves: tibial and common fibular. Muscles: organization. Dorsal region (extensor digitorum brevis and extensor hallucis brevis). Plantar region (plantar aponeurosis; flexor digitorum brevis, flexor accessorius or quadratus plantae, lumbrical muscles and interossei muscles; abductor hallucis, flexor hallucis brevis and adductor halluces muscles; abductor digiti minimi and flexor-opponens digiti minimi muscles). Arteries and veins: tibioperoneal trunk, anterior tibial, posterior tibial and fibular vessels. Dorsalis pedis, medial and lateral plantar vessels. Deep plantar arch. Nerves: superficial and deep fibular nerves, tibial nerve, medial and lateral plantar nerves. Overview of the superficial venous system, lymphatic system and cutaneous innervation of the lower limb.

UNIT 4: ANATOMY OF THE UPPER LIMB

Shoulder girdle joints: sternoclavicular, acromioclavicular and glenohumeral joints. Muscles: organization. Dorsal muscles (rotator cuff: subscapularis, supraspinatus, infraspinatus and teres minor muscles; teres major, latissimus dorsi and deltoid). Ventral muscles (subclavius, pectoralis muscles, and coracobrachialis). Trapezius, levator scapulae, rhomboid minor and major and serratus anterior muscles. Topographic anatomy of the shoulder girdle. Brachial plexus. Axillary artery and vein. Elbow joint and radio-ulnar syndesmoses. Muscles: organization and compartments. Posterior compartment (triceps and anconeus). Anterior compartment (brachialis and biceps brachii). Topographic anatomy of the arm. Nerves: axillary, radial, median, musculocutaneous, ulnar, medial cutaneous of the forearm and medial cutaneous of the arm. Brachial (humeral) artery and veins. Wrist and hand joints. Muscles: organization and compartments. Posterior compartment (supinator, abductor pollicis longus, extensor pollicis brevis, extensor pollicis longus, and extensor indicis; extensor digitorum, extensor digiti minimi and extensor carpi ulnaris). Postero-lateral compartment (brachioradialis, extensor carpi radialis longus, and extensor carpi radialis brevis). Anterior compartment (pronator quadratus, flexor digitorum profundus, flexor pollicis longus, flexor digitorum superficialis, pronator teres, flexor carpi radialis, palmaris longus, and flexor carpi ulnaris). Topographic anatomy of the forearm and wrist. Hand muscles: organization. Tenar muscles (adductor pollicis, flexor pollicis brevis, opponens pollicis, and abductor pollicis brevis). Hypothenar muscles (opponens digiti minimi, flexor digiti minimi brevis, abductor digiti minimi and palmaris brevis). Intermediate muscles (dorsal and palmar interossei muscles and lumbricals). Palmar aponeurosis. Radial, ulnar and interosseous arteries and veins. Arterial palmar arches. Median, ulnar (cubital) and radial nerves. Overview of the superficial venous system, lymphatic system and cutaneous innervation of the upper limb.

UNIT 5: TRUNK ANATOMY

Vertebral column: general organization. Intervertebral joints. Craniovertebral joints. Lumbosacral and sacrococcygeal joints. Muscles: organization and classification. Short and long muscles of the medial tract (interespinales, spinalis, rotatores, multifidus and semispinalis muscles). Short and long muscles of the lateral tract (intertransversarii, longissimus, iliocostalis and splenius muscles). Suboccipital muscles (rectus capitis posterior major and minor, obliquus capitis inferior and superior). Prevertebral muscles (rectus capitis anterior and lateralis, longus capitis and longus colli). Innervation. Thorax: general organization. Joints: costovertebral, sternocostal and interchondral joints. Muscles: intercostal muscles, subcostales, transversus thoracic, levatores costarum, and serratus posterior muscles. Diaphragm. Innervation. Abdomen: general organization. Muscles: anterolateral (rectus, pyramidalis, external oblique, internal oblique and transversus abdominis mucles) and posterior (psoas and quadratus lumborum muscles) muscles. Inguinal canal. Perineum: general organization. Perineal body and anococcygeal ligament. Pelvic diaphragm: levator ani and ischiococcygeus muscles. Anal triangle: external anal sphincter. Urogenital triangle: urethral sphincter muscle, deep and superficial transverse perineal muscles, bulbospongiosus and ischiocavernosus muscles. Innervation: pudendal nerve.

SEMINARS (SEM) (see seminar regulations)

Seminar 1: general anatomy and osteology of the pelvis. General anatomy: planes, directions, and relationships. Bones and joints. The terminology applied in descriptive anatomy. Introduction to the techniques applied to imaging diagnosis of the musculoskeletal system. Osteology of the pelvis: coxal, sacral and coccyx. Pelvis as a whole and differential characters. Correlation of the osteology of the pelvis with techniques of diagnosis by imaging.

Seminar 2: osteology of the lower limb. Bones: femur, patella, tibia, fibula, tarsus, metatarsus, sesamoid and phalanges bones. Plantar arch. Correlation of the osteology of the lower limb with techniques of diagnosis by imaging.

Seminar 3: osteology of the upper limb. Bones: clavicle, scapula, humerus, radius, ulna, carpus, metacarpus, sesamoid and phalanges bones. Correlation of the osteology of the upper limb with techniques of diagnosis by imaging.

Seminar 4: osteology of the spine and thorax. Vertebral column. Vertebrae: general features. Cervical, thoracic and lumbar vertebrae. Curvatures. Correlation of the osteology of the vertebral column with techniques of

diagnosis by imaging. Thorax. Bone and cartilage: sternum and ribs. The thoracic wall as awhole. Correlation of theosteology ofthe thorax with techniques of diagnosis by imaging.

PRACTICAL LABS (in dissection room) (PLAB)

Practice 1 (general anatomy). General organization of the musculoskeletal system (bones, joints, muscles, and annexes). General organization of the cardiovascular system (heart, arteries, veins and lymphatic). General organization of the nervous system (brain, spinal cord, meninges, cranial and spinal nerves). Correlation of the anatomical preparations with techniques of diagnosis by imaging.

Practice 2 (lower limb). Pelvis, hip, knee, ankle and foot joints. Muscles of the pelvic girdle, thigh, leg, ankle, and foot. Arteries and veins of the lower extremity. Lumbar and sacral plexus: constitution, collateral and terminal branches. Superficial venous and lymphatic systems of the lower limb. Correlation of the anatomical preparations with techniques of diagnosis by imaging.

Practice 3 (upper limb). Shoulder girdle, elbow, wrist and hand joints. Muscles of the shoulder girdle, arm, forearm, and the hand. Arteries and veins of the upper limb. Brachial plexus: constitution, collateral and terminal branches. Superficial venous and lymphatic systems of the upper limb. Correlation of the anatomical preparations with techniques of diagnosis by imaging.

Practice 4 (back, thorax, abdomen, and perineum). Vertebral column and craniovertebral joints. Thorax joints. Muscles of the spine: paravertebrals, suboccipitals, and prevertebrals. Muscles and fascia of the thorax. Muscles and fascia of the abdomen. Inguinal canal. Muscles and fascia of the perineum. Correlation of the anatomical preparations with techniques of diagnosis by imaging.

Activities and Methodology

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Laboratory practices (dissection lab)	8	0.32	3, 17, 7, 9, 5, 6, 4, 11, 13, 12, 14, 16, 19
Seminars (SEM)	8	0.32	1, 3, 17, 7, 9, 5, 6, 4, 11, 13, 12, 14, 19, 20
Theory (TE)	37	1.48	3, 17, 7, 8, 9, 5, 6, 10, 11, 15, 13, 12, 14, 16, 18, 19, 20
Type: Supervised			
Personal or groupal tutorials and on line tutorials	15	0.6	1, 17, 7, 9, 5, 6, 11, 13, 12, 14, 18, 19, 2, 20
Type: Autonomous			
Reading articles, preparation of works, self-study	75	3	1, 3, 17, 7, 8, 9, 5, 6, 4, 10, 11, 15, 13, 12, 14, 16, 18, 19, 2, 20

Directed activities

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

Seminars for bones study (SEM) (8hs)

Dissection lab practices (PLAB) (8hs)

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 prior to conducting the seminars and dissection activities.

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

Continous Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
Continuous evaluation of dissection practices	4%	1	0.04	1, 3, 17, 7, 5, 6, 4, 11, 13, 12, 14, 16, 18, 19, 2, 20
Objective test (theory contents)	66%	3	0.12	3, 17, 7, 8, 9, 5, 6, 4, 10, 11, 15, 13, 12, 14, 16, 18, 19, 2, 20
Structured objective evaluations (practical and seminars contents)	30%	3	0.12	1, 3, 17, 9, 5, 6, 4, 11, 13, 12, 14, 16, 18, 19, 2

EVALUATION

The chievement of subject contents will be assessed through two partial exams and the continuous assessment of the practices.

Each partial includes:

- Evaluation of the contents of the theory classes and seminars by means of an objective test. The questions will have 4 possible options with only one valid. Wrongly answered questions have a penalty of 1/3 points. Blank questions do not penalize.
- Contents of seminars and practice lessons will be evaluated by means short question and structure identification tests. In this case, wrong answers do not involve a penalty.

Continuous evaluation of practice sessions

At the end of each practice, there will be a short test to identify the anatomical structures that have been studied during the session.

Specific weight of each test

- Test-type exams: 56% of the final qualification (28% for each part).
- Structure identification exams and short question test: 20% of the final qualification (10% for each partial).
- Continuous assessment of practice sessions: 4% of the final qualification (1% for each practice).

Sufficiency criteria

To approve the subject, the following criteria must be met without exception:

- The pondered average qualification of all tests must be equal to or greater than 5.0.
- The pondered average qualification of each partial exam must be higher than 4.0.

There is no minimum qualification in the section corresponding to the continuous assessment.

Attendance at theoretical classes, practice sessions and seminars is NOT mandatory.

Qualification calculation

To calculate the scores, the following formulas will be applied:

Partial exams = (test score x 0.69) + (practical exam and seminar score x 0.31)

Final qualification = (first partial score x 0.48) + (second partial score x 0.48) + (continuous assessment qualification x 0.04)

Recovery and qualification improvement

Students who have not passed the sufficiency criteria may opt to recorey tests. Students who wish to raise their qualification can also repeat the tests after giving up the previous qualifications obtained in the partial examens.

The recovery test will have the same structure (format, number of questions, etc.) and the same criteria and percentages established for each partial will apply. Students will be free to choose which tests they take to meet the sufficiency criteria.

Continuous evaluation is not recoverable

SINGLE EVALUATION IS NOT AVAILABLE FOR THIS SUBJECT (agreement approved by the Permanent Board of the Faculty of Medicine, March 30, 2023).

Bibliography

EMBRIOLOGIA

Cochard, L.R. (2005) Netter - Atlas de Embriología humana. 1ª edición. Ed. Masson SA. Disponible.

Moore, K.L., Persaud, T.V.N., Torchia, M.G. (2020) Embriología clínica. 11ª edición. Ed. Elsevier. Disponible.

Sadler, T.W. (2019) Langman Embriología Médica. 14ª edición. Ed. Wolters Kluwer. Disponible.

ANATOMIA

Anastasi, G.; Gaudio, E.; Tacchetti, C. (2022) Anatomía humana - atlas - (editor de la edición en español: Alfonso Rodríguez Baeza). 3 volúmenes. 2ª edición. Ed. Edra - edi-ermes. Disponible.

Anastasi, G.; Gaudio, E.; Tacchetti, C. (2022) Anatomía humana - atlas - (editor de la edición en español: Alfonso Rodríguez Baeza). 1 volumen. 2ª edición. Ed. Edra - edi-ermes. Disponible.

Dalley, A.F., Agur, A.M. (2022) Moore - Anatomía con orientación clínica. 9ª edición. Ed. Wolters Kluvers.

Dauber, W. (2021) Feneis Nomenclatura anatómica ilustrada. 11ª edición. Ed. Elsevier. Disponible.

Drake, R.L., Vogl, W., Mitchell, A.W.M. (2020) Gray - Anatomía para estudiantes. 4ª edición. Ed. Elsevier. Disponible.

Gilroy, A.M., MacPherson, B.R., Wikenheiser, J. (2022) Prometheus - Atlas de Anatomía. 4ª edición. Ed. Médica Panamericana. Disponible.

Loukas, M., Benninger, B., Shane Tubbs, R. (2019) Guía fotográfica de disección del cuerpo humano. 2ª edición. Ed. Elsevier. Disponible.

Netter, F.H. (2019) Atlas de Anatomía humana. 7ª edición. Ed. Elsevier. Disponible.

Paulsen, F. Waschke J. (2018) Sobotta Atlasde Anatomía Humana. 24ª edición. Ed. Elsevier. Disponible.

Rohen, J.W., Yokochi, C., Lütjen-Drecoll, E. (2021) Atlas de Anatomía humana. Estudio fotográfico del cuerpo humano. 9ª edición. Ed. Elsevier. Disponible.

Schünke, M., Schulte, E., Schumacher, U. (2022) Prometheus - Texto y atlas de Anatomía. 5ª edición. Ed. Médica Panamericana. Disponible.

Spratt, J.D.; Salkowski, L.R.; Loukas, M. (2021) Weir y Abrahams. Atlas de Anatomía Humana por técnicas de imagen. 6ª edición. Ed. Elsevier. Disponible.

Standring, S. (2021) Gray's. Anatomy. The Anatomical Basis of Clinical Practice. 42th edition. Ed. Elsevier. Disponible.

Waschke J, Koch M, Kurten S, Schulze-Tanzil G, Spittau B. (2018) Sobotta. Texto de Anatomía. 1ª edición. Ed. Elsevier. Disponible.

Weber, E.D.; Vilensky, J.; Carmichael, S.W., Lee, K.S. (2015) Netter Anatomia Radiológica Esencial. 2ª edición. Ed. Elsevier. Disponible.

Very important:

access to the Campus Virtual of the UAB

access to library website of the UAB to consult available bibliography

Software

Is not necesary specific programs

Language list

Name	Group	Language	Semester	Turn
(PLAB) Practical laboratories	101	Catalan/Spanish	first semester	morning-mixed
(PLAB) Practical laboratories	102	Catalan/Spanish	first semester	morning-mixed
(PLAB) Practical laboratories	103	Catalan/Spanish	first semester	morning-mixed
(PLAB) Practical laboratories	104	Catalan/Spanish	first semester	morning-mixed
(PLAB) Practical laboratories	105	Catalan/Spanish	first semester	morning-mixed

(PLAB) Practical laboratories	106	Catalan/Spanish	first semester	morning-mixed
(PLAB) Practical laboratories	107	Catalan/Spanish	first semester	morning-mixed
(PLAB) Practical laboratories	108	Catalan/Spanish	first semester	morning-mixed
(PLAB) Practical laboratories	109	Catalan/Spanish	first semester	morning-mixed
(PLAB) Practical laboratories	110	Catalan/Spanish	first semester	morning-mixed
(PLAB) Practical laboratories	111	Catalan/Spanish	first semester	morning-mixed
(PLAB) Practical laboratories	112	Catalan/Spanish	first semester	morning-mixed
(PLAB) Practical laboratories	113	Catalan/Spanish	first semester	morning-mixed
(PLAB) Practical laboratories	114	Catalan/Spanish	first semester	morning-mixed
(PLAB) Practical laboratories	115	Catalan/Spanish	first semester	morning-mixed
(PLAB) Practical laboratories	116	Catalan/Spanish	first semester	morning-mixed
(PLAB) Practical laboratories	117	Catalan/Spanish	first semester	morning-mixed
(PLAB) Practical laboratories	118	Catalan/Spanish	first semester	morning-mixed
(SEM) Seminars	101	Catalan/Spanish	first semester	morning-mixed
(SEM) Seminars	102	Catalan/Spanish	first semester	morning-mixed
(SEM) Seminars	103	Catalan/Spanish	first semester	morning-mixed
(SEM) Seminars	104	Catalan/Spanish	first semester	morning-mixed
(SEM) Seminars	105	Catalan/Spanish	first semester	morning-mixed
(SEM) Seminars	106	Catalan/Spanish	first semester	morning-mixed
(SEM) Seminars	107	Catalan/Spanish	first semester	morning-mixed
(SEM) Seminars	108	Catalan/Spanish	first semester	morning-mixed
(SEM) Seminars	109	Catalan/Spanish	first semester	morning-mixed
(SEM) Seminars	110	Catalan/Spanish	first semester	morning-mixed
(SEM) Seminars	111	Catalan/Spanish	first semester	morning-mixed
(SEM) Seminars	112	Catalan/Spanish	first semester	morning-mixed
(SEM) Seminars	113	Catalan/Spanish	first semester	morning-mixed
(SEM) Seminars	114	Catalan/Spanish	first semester	morning-mixed
(SEM) Seminars	115	Catalan/Spanish	first semester	morning-mixed
(SEM) Seminars	116	Catalan/Spanish	first semester	morning-mixed
(SEM) Seminars	117	Catalan/Spanish	first semester	morning-mixed
(SEM) Seminars	118	Catalan/Spanish	first semester	morning-mixed

(TE) Theory	101	Catalan/Spanish	first semester	afternoon
(TE) Theory	102	Catalan/Spanish	first semester	afternoon
(TE) Theory	103	Catalan/Spanish	first semester	afternoon
(TE) Theory	104	Catalan/Spanish	first semester	afternoon