1. BASIC INFORMATION

Course	Anatomy of the Musculoskeletal and Nervous System
Degree program	Physical Therapy degree
School	Faculty of Sports Sciences
Year	1st
ECTS	6 ECTS (150 hours)
Credit type	MANDATORY
Language(s)	SPANISH, FRENCH AND ENGLISH
Delivery mode	PRESENTIAL
Semester	2nd semester
Academic year	24-25
Coordinating professor	Jaime Almazán/Charles Cotteret
Professor	Jaime Almazán Polo

2. PRESENTATION

In line with one of the general objectives of the University, which is to train professionals, knowledge of anatomy is essential to understand the language of health. The anatomy of the musculoskeletal system and nervous system is the base on which the physical therapist's scientific knowledge is based. The knowledge and skills that are developed in this subject are necessary to know and understand other subjects that are taught in the curricular development of the Degree and respond to the depth with which the contents related to the acquisition and development of basic professional skills.

3. COMPETENCES AND LEARNING OUTCOMES

Core skills (CS):

- CS 1: Students have demonstrated possession and understanding of knowledge in an area of study that is based on general secondary education, and is usually found at a level that, although supported by advanced textbooks, also includes some aspects that involve knowledge from the forefront of their field of study.

- CS 2: That students know how to apply their knowledge to their work or vocation in a professional manner and possess the skills that are usually demonstrated through the development and defense of arguments and problem solving within their area of study.
- CS 4: That students can transmit information, ideas, problems and solutions to both a specialized and non-specialized audience.
- CS 5: That students have developed those learning skills necessary to undertake further studies with a high degree of autonomy.

Cross-curricular skills (CCC):

- CCS 3: Organization and planning capacity
- CCS 4: Capacity for analysis and synthesis
- CCS 3: Critical reasoning.
- CCS 19: Autonomous learning.

Specific skills (SS):

- SS 29: Know and use the International Anatomical Nomenclature to name the different anatomical structures.
- SS 30: Describe anatomical structures with appropriate language.
- SS 33: Recognize anatomical structures with imaging techniques.
- SS 34: Have the ability to understand and synthesize simple anatomical articles.
- SS 36: Respect the practice material.
- SS 112: Identify and know the morphology of the bone, joint, muscular, nervous and vascular components of the musculoskeletal system.
- SS 113: Relate the shape of the elements of the musculoskeletal system with their function.
- SS 114: Know and identify the components of the nervous system, and their function.
- SS 115: Know the relationships between anatomical structures.

Learning outcomes (LO):

- LO 1: Understanding of fundamental concepts related to the contents of the subject.
- LO 2: Description of the anatomical structures included in the subject.
- LO 3: Ability to establish relationships between the structure and function of different elements of the neurological and locomotor systems.

- LO 4: Recognition of anatomical structures through imaging techniques.
- LO 5: Comprehension and synthesis of texts related to the subject.

The following table shows the relationship between the competencies developed during the course and the learning outcomes pursued:

Core competencias (CC)	Learning outcomes (LO)
CS 29, CS 36, CCS 3	LO1: Understanding of fundamental concepts related to the contents of the subject.
SS 30, SS 112, CCS 4, CS 4	LO2: Description of the anatomical structures included in the subject.
SS 113, SS 114, CCS 13, CS 2, CS 5	LO3: Capacidad de Establecer de relaciones entre la estructura y la función de diferentes elementos de los aparatos neurológico y locomotor.
SS 33, SS 115, CCS 13	LO4: Ability to establish relationships between the structure and function of different elements of the neurological and locomotor systems.
SS 34, CCS 19, CS 1	LO5: Comprehension and synthesis of texts related to the subject.

4. CONTENT

The subject is organized into five learning units, which, in turn, are divided into topics:

THEMATIC BLOCK I: Peripheral Nervous System.

Topic 1. Peripheral nervous system

Spinal nerves. Nervous plexus; Nervous System generalities. Cranial nerves, generalities.

THEMATIC BLOCK II: Trunk musculoskeletal system

Topic 2. Vertebral column.

Study of the entire spine. General, regional and individual characteristics of the vertebrae. spinal joints

Topic 3. Skeleton of the thorax.

Generalities. Ribs. Breastbone. Thoracic joints.

Topic 4. Muscles of the Back

Deep plane. Muscles of the vertebral canals. Intermediate plane. M. serratus posterior. M. Rhomboids. M. Levator scapulae. Shallow plane. M .Trapeze . M, latissimus dorsi.

Topic 5. Muscles of the thorax

Intercostal muscles. Triangular muscle of the sternum. Diaphragm muscle.

Topic 6. Muscles of the Abdomen

Anterior and anterolateral muscles groups of the abdomen.

THEMATIC BLOCK III: LOWER EXTREMITY (osteology, arthrology, myology, vascularization)

Topic 7. Osteology of the lower extremity.

Coxal. Femur. Patella. Tibia and fibula. Foot bones.

Topic 8. Pelvic girdle.

Sacro-iliac joint. Pubic symphysis. Study of the pelvis and its ligaments.

Topic 9. Coxofemoral joint.

Generalities. Articular surfaces. Joint capsulo-ligament system. Functional anatomy.

Topic 10. Knee joint.

Generalities. Articular surfaces. Joint capsulo-ligament system. Functional anatomy.

Topic 11. Joint complex of the ankle.

Generalities. Articular surfaces. Joint capsulo-ligament system. Functional anatomy.

Topic 12. Joints of the foot.

Subtalar joint. Transverse tarsal or midtarsal joint (Chopart). Intertarsal joints of the second row of the tarsus. Tarsometatarsal joints (Lisfranc) Intermetatarsal joints. Metatarsophalangeal joints. Interphalangeal joints, Generalities. articular surfaces. Union media. Functional anatomy.

Topic 13. Muscles of the hip.

Generalities and classification. Anterior muscle plane. Iliopsoas muscle. Gluteal region.

Topic 14. Muscles of the thigh.

Generalities and classification of the thigh muscles. Anterior muscle group. Intermediate muscle group. Deep muscle group. Medial muscle group.

Topic 15. Muscles of the leg.

Generalities and classification. Anterior muscle group. Lateral muscle group. Posterior muscle group.

Topic 16. Short muscles of the foot.

Generalities and classification. Dorsal muscles. Plantar muscles.

Topic 17. Functional anatomy of the foot.

Plantar vault. Foot support points. Functional anatomy of the motor muscles of the ankle joint and of the other joints of the foot.

Topic 18. Vascularization of the lower limb.

Femoral and popliteal arteries. Leg arteries. Arteries of the foot and fingers. Veins and lymphatics of the lower limb.

Topic 19. Innervation of the lower extremity.

THEMATIC BLOCK IV: UPPER EXTREMITY (osteology, arthrology, myology, vascularization)

Topic 20. Shoulder girdle.

Clavicle. Scapula. Sternocostoclavicular joint. Acromioclavicular joint.

Topic 21. Osteology of the upper limb.

Humerus, ulna and radius. Bones of the hand.

Topic 22. Shoulder joint complex.

Generalities. articular surfaces. Joint capsulo-ligament system . Functional anatomy.

Topic 23. Elbow joint.

humeroulnar joint. humeroradial joint. Proximal radioulnar joint

Topic 24. Joints of the carpus and the hand.

Wrist joint. Carpo-metacarpal joints. Metacarpophalangeal joints. Interphalangeal joints.

Topic 25. Muscles of the shoulder.

Generalities and classification. Anterior muscle group. Lateral muscle group. Medial muscle group. Posterior muscle group.

Topic 26. Muscles of the arm.

Generalities and classification. Ventral muscles: M. brachialis and M. biceps. Dorsal muscles: M. triceps and M. anconeus.

Topic 27. Muscles of the forearm.

Generalities and classification.

Medial muscle group. Lateral muscle group. Posterior muscle group. Fibrous and synovial sheaths.

Topic 28. Short muscles of the hand and fingers.

Generalities and classification. Medial muscle group. Thenar group. Hypothenar group..Aponeurosis of the hand.

Topic 29. Vascularization of the upper limb.

Axillary, brachial, ulnar, and radial arteries. Veins and lymphatics of the upper limb.

Topic 30. Innervation of the upper extremity.

THEMATIC BLOCK V: HEAD AND NECK

Topic 31. Study of the head as a whole.

Bones of the neurocranium. Bones of the splanchnocranium. cranial norms. Temporo-mandibular joint.

Topic 32. Muscles of the head and mimic.

Generalities and classification. Chewing muscles. Muscles of facial expression.

Topic 33. Trigeminal and facial nerves.

Description and branche's distribution.

Topic 34. Muscles of the neck.

Muscles of the anterior region of the neck. Muscles of the posterior region of the neck.

Topic 35. Cervical plexus.

Constitution. Collateral and terminal branches.

5. TEACHING-LEARNING METHODOLOGIES

The types of teaching-learning methodologies used are indicated below:

- Master class.
- Simulation environments.
- Cooperative learning.
- Autonomous Learning.

6. LEARNING ACTIVITIES

Listed below are the types of learning activities and the number of hours the student will spend on each one:

Campus-based mode:

Learning activity	Number of hours
Tutoring classes	10
Analysis of practical cases	14
Class practices	24
Master Class	22
Self-study	50
Virtual seminars	20
Laboratory practices	10
TOTAL	**150**

7. ASSESSMENT

Listed below are the assessment systems used and the weight each one carries towards the final course grade:

Campus-based mode:

Assessment system	Weight
Theoretical knowledge test	50%
Practical application tasks	30%
Practical examination of recognition of anatomical structures	20%

When you access the course on the *Campus Virtual*, you'll find a description of the assessment activities you have to complete, as well as the delivery deadline and assessment procedure for each one.

7.1. First exam period (Ordinary call)

To pass the subject in ordinary call, the continuous evaluation process of the different training activities must be passed. The general evaluation scheme, divided by blocks, is as follows:

Evaluable blocks	Evaluation system	Weight (%)
1	Theoretical knowledge test	50%
2	Practical application tasks	30%
3	Practical examination of anatomical structures recognition	20%

It is essential that the grade in evaluable blocks 1, 2 and 3 be equal to or greater than 5 in each of them to pass the subject. The student's final grade will be obtained from the weighting of the partial grades of each one of the blocks, as indicated in the table and detailed below. In the case of not having passed the subject, the grade in the minutes will always be that of the block with the lowest score. The grades published on the virtual campus will be provisional until the review of the test is completed.

The evaluation methodology for the three evaluable blocks may be based on: multiple choice questions, short questions, open questions with and without length limitation, correspondence questions, questions with embedded answers, information summary tables, papers, oral presentations, etc.

In the event of a modification of the evaluation date, according to the application of the regulations for changing the date of evaluable tests, the format of said test may vary with respect to that of the general call.

7.2. Second exam period (Extra-ordinary call)

To pass the subject in an extraordinary call, all the requirements set out above for the ordinary call must be acquired.

8. SCHEDULE

This table shows the delivery deadline for each assessable activity in the course:

EVALUATION PERIODS		EVALUABLE ACTIVITIES	
Week 1-6	BLOCK I-II	Laboratory practical class 0, 1 2 and 3	Test on line
Week 7	EVALUATION	Theoretical knowledge test; Practical application task; Practical examination of recognition of anatomical structures	
Week 8 -11	BLOCK III	Laboratory practical class 4, 5 and 6	Test on line
Week 11-15	BLOCK IV	Laboratory practical class 7, 8 and 9	Test on line
Week 16	EVALUATION	Theoretical knowledge test; Practical application task; Practical examination of recognition of anatomical structures	

This schedule may be subject to changes for logistical reasons relating to the activities. The student will be notified of any change as and when appropriate.

9. BIBLIOGRAFÍA

The main reference work for this subject is:

- GRAY (2015) Anatomía para estudiantes. 3ª Edición. Elsevier.

The recommended Bibliography is:

- SOBOTTA. (2012) Atlas de anatomía humana. Anatomía general y aparato locomotor. 23ª edición. Elsevier.
- PLATZER. (2008) Atlas de anatomía con correlación clínica. Panamericana.
- PROMETHEUS (2015) Anatomía. Manual para el estudiante. Elsevier.
- DRAKE. (2013) Gray, Anatomía básica. Elsevier.
- GRAY (2015) Anatomía para estudiantes. 3ª Edición. Elsevier.
- TORTORA (2013) Principios de Anatomía y Fisiología. 13ª Edición. Panamericana.
- THIBODEAU (2012). Estructura y función del cuerpo humano 14ª edición. Elsevier.
- NETTER (2014). Cuaderno de anatomía para colorear 2ª edición. Elsevier.
- CAEL (2013). Anatomía Funcional. Estructura, función y palpación del aparato locomotor para terapeutas manuales. Panamericana.
- MOORE (2013) Anatomía con orientación clínica. 7ª Edición. Wolters Kluer Health/Lippincott Williams & Wilkins.

10. DIVERSITY MANAGEMENT UNIT

From the Educational Orientation and Diversity Unit (ODI) we offer support to our students throughout their university life to help them reach their academic achievements. Other pillars of our action are the inclusion of students with specific educational support needs, universal accessibility on the different campuses of the university and equalization of opportunities.

From this Unit, students are offered:

1. Accompaniment and follow-up by carrying out counseling and personalized plans for students who need to improve their academic performance.
2. In terms of attention to diversity, non-significant curricular adjustments are made, that is, at the level of methodology and evaluation, in those students with specific needs for educational support, thereby pursuing equal opportunities for all students.
3. We offer students different extracurricular training resources to develop various skills that will enrich their personal and professional development.
4. Vocational guidance by providing tools and advice to students with vocational doubts or who believe they have made a mistake in choosing the degree.

Students who need educational support can write to us at: orientacioneducativa@universidadeuropea.es

11. ONLINE SURVEYS

Your opinion matters!

The Universidad Europea encourages you to participate in several surveys which help identify the strengths and areas we need to improve regarding professors, degree programs and the teaching-learning process.

The surveys will be made available in the “surveys” section in virtual campus or via e-mail.

Your assessment is necessary for us to improve.

Thank you very much for your participation.