# Information about the course

**Degree:** Bachelor of Science Degree in Medicine

**Faculty:** Faculty of Medicine and Health Sciences

**Code:** 341202 **Name:** Anatomy III

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

**Module:** Morphology, structure and function of the human body

**Subject Matter:** Anatomía **Type:** Formación Básica

**Branch of knowledge:** Ciencias de la Salud

**Department:** Anatomy and Physiology

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

**Language/-s in which it is given:** Spanish

**Teachers:**

| | | |
|---|---|---|
| 342A | Jorge Miguel Barcia Gonzalez **(Profesor responsable)** | jm.barcia@ucv.es |
| | Pedro Antonio Riesgo Suarez | pant.riesgo@ucv.es |
| | Maria Oltra Sanchis | maria.oltra@ucv.es |
| | Jose Luis Llacer Ortega | jl.llacer@ucv.es |
| | Francisco Tomas Aguirre | paco.tomas@ucv.es |
| 342B | Jorge Miguel Barcia Gonzalez **(Profesor responsable)** | jm.barcia@ucv.es |
| | Pedro Antonio Riesgo Suarez | pant.riesgo@ucv.es |
| | Maria Oltra Sanchis | maria.oltra@ucv.es |

342B Jose Luis Llacer Ortega jl.llacer@ucv.es

Francisco Tomas Aguirre paco.tomas@ucv.es

## Module organization

### Morphology, structure and function of the human body

| Subject Matter | ECTS | Subject | ECTS | Year/semester |
|---|---|---|---|---|
| Anatomía | 27 | Anatomy II | 9 | 2/1 |
| | | Anatomy III | 6 | 2/2 |
| | | Embryology and Anatomy I | 12 | 1/2 |
| Biología | 6 | Cell Biology | 6 | 1/1 |
| Bioquímica | 9 | Biochemistry and Molecular Biology | 9 | 1/2 |
| Física | 6 | Biophysics | 6 | 1/2 |
| Fisología | 12 | Human Physiology I | 6 | 2/1 |
| | | Human Physiology II | 6 | 2/2 |
| Morfología y estructura microscópica del cuerpo humano | 6 | Histology | 6 | 2/1 |

## Recommended knowledge

Not required. It is recommended to have prior knowledge in biology or natural sciences equivalent to basic high school level. It is advisable to have completed and passed the subjects of Embryology and Anatomy I and Anatomy II (RECOMMENDED)

## Learning outcomes

Al finalizar la asignatura, el estudiante deberá demostrar haber adquirido los siguientes resultados de aprendizaje:

### R13 - Use dissection instrumentation in practical work, acquiring the ability to handle surgical material

Learning outcomes of the specified title

**Type of AR:** Description

- Recognizing with macroscopic, microscopic and imaging techniques the morphology and structure of tissue, organs and systems

**Type of AR:** Description

- Students have developed the learning skills needed to undertake further studies with a high degree of autonomy

### R14 - Know the main concepts that integrate anatomical terminology, its fundamentals and clinical and surgical utility

Learning outcomes of the specified title

**Type of AR:** Description

- Knowing the morphology, structure and function of the skin, blood, circulatory, digestive, locomotive, reproductive, excretor and respiratory systems; endocrine system, immune system and central and peripheral nervous system. Growth, maturation and aging of different devices and systems. Homeostasis. Adaptation to the environment

- Recognizing with macroscopic, microscopic and imaging techniques the morphology and structure of tissue, organs and systems

- Understanding and recognizing the normal structure and function of the human body, at the molecular, cellular, tissue, organic and systems levels, at the different stages of life and in both sexes

**Type of AR:** Description

- Developing professional practice with respect for other health professionals, acquiring teamwork skills

- Students can pass on information, ideas, problems and solutions to both a specialized and non-specialized audience

- Students have developed the learning skills needed to undertake further studies with a high degree of autonomy

- Students have the ability to collect and interpret relevant data (usually within their area of study) to make judgments that include a reflection on relevant social, scientific or ethical topics

- Students know how to apply their knowledge to their job or vocation in a professional way and possess the competences that are usually demonstrated through the elaboration and defense of arguments and the resolution of problems within their area of study

## R17 - Using dissection instrumentation in practical work

Learning outcomes of the specified title

**Type of AR:** Description

- Students have developed the learning skills needed to undertake further studies with a high degree of autonomy

- Students know how to apply their knowledge to their job or vocation in a professional way and possess the competences that are usually demonstrated through the elaboration and defense of arguments and the resolution of problems within their area of study

## R18 - Apply general knowledge of Anatomy

Learning outcomes of the specified title

**Type of AR:** Description

- Students can pass on information, ideas, problems and solutions to both a specialized and non-specialized audience

- Students have developed the learning skills needed to undertake further studies with a high degree of autonomy

- Students know how to apply their knowledge to their job or vocation in a professional way and possess the competences that are usually demonstrated through the elaboration and defense of arguments and the resolution of problems within their area of study

## R22 - Know the cytoarchitecture and functional systems of the CNS

Learning outcomes of the specified title

**Type of AR:** Description

- Recognizing with macroscopic, microscopic and imaging techniques the morphology and structure of tissue, organs and systems

**Type of AR:** Description

- Students can pass on information, ideas, problems and solutions to both a specialized and non-specialized audience

- Students have developed the learning skills needed to undertake further studies with a high degree of autonomy

- Students have the ability to collect and interpret relevant data (usually within their area of study) to make judgments that include a reflection on relevant social, scientific or ethical topics

- Students know how to apply their knowledge to their job or vocation in a professional way and possess the competences that are usually demonstrated through the elaboration and defense of arguments and the resolution of problems within their area of study

## R23 - Distinguishing the different levels of CNS organization

Learning outcomes of the specified title

**Type of AR:** Description

- Knowing the morphology, structure and function of the skin, blood, circulatory, digestive, locomotive, reproductive, excretor and respiratory systems; endocrine system, immune system and central and peripheral nervous system. Growth, maturation and aging of different devices and systems. Homeostasis. Adaptation to the environment

**Type of AR:** Description

- Students can pass on information, ideas, problems and solutions to both a specialized and non-specialized audience

- Students have developed the learning skills needed to undertake further studies with a high degree of autonomy

- Students have the ability to collect and interpret relevant data (usually within their area of study) to make judgments that include a reflection on relevant social, scientific or ethical topics

- Students know how to apply their knowledge to their job or vocation in a professional way and possess the competences that are usually demonstrated through the elaboration and defense of arguments and the resolution of problems within their area of study

## R24 - Use different work techniques in the anatomy lab

Learning outcomes of the specified title

**Type of AR:** Description

- Recognizing with macroscopic, microscopic and imaging techniques the morphology and structure of tissue, organs and systems

**Type of AR:** Description

- Developing professional practice with respect for other health professionals, acquiring teamwork skills

- Students have developed the learning skills needed to undertake further studies with a high degree of autonomy

## R25 - Know and use basic CNS dissection techniques

Learning outcomes of the specified title

**Type of AR:** Description

- Recognizing with macroscopic, microscopic and imaging techniques the morphology and structure of tissue, organs and systems

**Type of AR:** Description

- Developing professional practice with respect for other health professionals, acquiring teamwork skills

- Students have developed the learning skills needed to undertake further studies with a high degree of autonomy

## R26 - Applying general knowledge of neuroanatomy: case resolution

Learning outcomes of the specified title

**Type of AR:** Description

- Students can pass on information, ideas, problems and solutions to both a specialized and non-specialized audience

- Students have the ability to collect and interpret relevant data (usually within their area of study) to make judgments that include a reflection on relevant social, scientific or ethical topics

- Students know how to apply their knowledge to their job or vocation in a professional way and possess the competences that are usually demonstrated through the elaboration and defense of arguments and the resolution of problems within their area of study

## R27 - Extract qualitative information morphology and function of CNS

Learning outcomes of the specified title

**Type of AR:** Description

- Knowing the morphology, structure and function of the skin, blood, circulatory, digestive, locomotive, reproductive, excretor and respiratory systems; endocrine system, immune system and central and peripheral nervous system. Growth, maturation and aging of different devices and systems. Homeostasis. Adaptation to the environment

**Type of AR:** Description

- Students can pass on information, ideas, problems and solutions to both a specialized and non-specialized audience

- Students have the ability to collect and interpret relevant data (usually within their area of study) to make judgments that include a reflection on relevant social, scientific or ethical topics

- Students know how to apply their knowledge to their job or vocation in a professional way and possess the competences that are usually demonstrated through the elaboration and defense of arguments and the resolution of problems within their area of study

## R29 - Be able to produce documents on anatomy and work as a team.

Learning outcomes of the specified title

**Type of AR:** Description

- Developing professional practice with respect for other health professionals, acquiring teamwork skills

- Students know how to apply their knowledge to their job or vocation in a professional way and possess the competences that are usually demonstrated through the elaboration and defense of arguments and the resolution of problems within their area of study

## R31 - Being able to write an understandable and organized text on various aspects of descriptive and functional neuroanatomy.

Learning outcomes of the specified title

**Type of AR:** Description

- Students can pass on information, ideas, problems and solutions to both a specialized and non-specialized audience

- Students have the ability to collect and interpret relevant data (usually within their area of study) to make judgments that include a reflection on relevant social, scientific or ethical topics

- Students know how to apply their knowledge to their job or vocation in a professional way and possess the competences that are usually demonstrated through the elaboration and defense of arguments and the resolution of problems within their area of study

## R9 - Know the main concepts that integrate anatomical terminology, its fundamentals and clinical and surgical utility

Learning outcomes of the specified title

**Type of AR:** Description

- Knowing the morphology, structure and function of the skin, blood, circulatory, digestive, locomotive, reproductive, excretor and respiratory systems; endocrine system, immune system and central and peripheral nervous system. Growth, maturation and aging of different devices and systems. Homeostasis. Adaptation to the environment

- Recognizing with macroscopic, microscopic and imaging techniques the morphology and structure of tissue, organs and systems

- Understanding and recognizing the normal structure and function of the human body, at the molecular, cellular, tissue, organic and systems levels, at the different stages of life and in both sexes

**Type of AR:** Description

- Students have developed the learning skills needed to undertake further studies with a high degree of autonomy

- Students have the ability to collect and interpret relevant data (usually within their area of study) to make judgments that include a reflection on relevant social, scientific or ethical topics

# Assessment system

**Modalidad presencial**

| Assessed learning outcomes | Granted percentage | Assessment tool |
|---|---|---|
| R9, R14, R18, R22, R23, R26, R27 | 70,00% | Tests |
| R13, R17, R18, R24, R25 | 5,00% | Practices |
| R23, R26 | 25,00% | Practice exam |

**Observations**

The final grade for the subject is composed of the following sections:
·**Multiple-choice exam 70%**. Multiple-choice questions. Incorrect answers deduct (one-third of a correct answer). Unanswered questions do not deduct points.
·**Practicals 30%** (attendance and work in practical sessions + exam on the identification of studied neuroanatomical structures).
Both parts must be passed to pass the subject.
This course does not offer the option of single assessment, as it requires the mandatory completion of practical activities with active student participation.
In accordance with the current regulations on the evaluation and grading of the subject at UCV, the mention of "Honors" may be awarded to students who have obtained a grade equal to or greater than 9.0. The number of "Honors" mentions cannot exceed five percent of the students enrolled in the group in the corresponding academic year, unless the number of enrolled students is less than 20, in which case only one "Honors" mention may be awarded.
Regarding the "EVALUACIÓN ÚNICA", the subject is governed by the Regulations of the Faculty of Medicine and Health
On the Use of AI:

Students are allowed to use AI for the following purposes:
·Clarifying doubts related to learning activities
·Assisted learning (e.g., alternative explanations or self-assessment exercises)
·Searching for alternative study resources and references
Students are not allowed to use AI for the following purposes:
·Recording or transcribing, in whole or in part, any classroom activity in order to generate AI-produced summaries or notes
·Generating text for assignments related to Activity X
·Presenting AI-generated work as their own
·Providing AI tools with prompts, exercises, or assessment tasks to obtain automated answers
Citation and Attribution Criteria:
·If AI is used in any activity, students must indicate which part of the activity involved AI, which tool was used, and for what purpose.

**MENTION OF DISTINCTION:**

In accordance with the regulations governing the assessment and grading of subjects in force at UCV, the distinction of "Matrícula de Honor" (Honours with Distinction) may be awarded to students who have achieved a grade of 9.0 or higher. The number of "Matrículas de Honor" (Honours with Distinction) may not exceed five percent of the students enrolled in the group for the corresponding academic year, unless the number of enrolled students is fewer than 20, in which case a single "Matrícula de Honor" (Honours with Distinction) may be awarded. Exceptionally, these distinctions may be assigned globally across different groups of the same subject. Nevertheless, the total number of distinctions awarded will be the same as if they were assigned by group, but they may be distributed among all students based on a common criterion, regardless of the group to which they belong. The criteria for awarding "Matrícula de Honor" (Honours with Distinction) will be determined according to the guidelines stipulated by the professor responsible for the course, as detailed in the "Observations" section of the evaluation system in the course guide.

## Actividades formativas

The methodologies to be used so that the students reach the expected learning outcomes will be the following:

| | |
|---|---|
| M1 | Masterclass |
| M4 | Content presentations by teacher |
| M5 | Knowledges and skills explanation |
| M8 | Group activities supervised by professor |

M9 Knowledge acquirance through student interaction and activity

M10 Anatomy dissection practices

M11 Personalised attention by professor

M12 Tests to understand the level of knowledge acquirance and skills

M14 Online activity on e-learning

M15 Personal study

M19 Group work for searching, discussion and information research

**IN-CLASS TRAINING ACTIVITIES**

| ACTVITY | RELATIONSHIP WITH THE COURSE LEARNING OUTCOMES | METHODOLOGY | HOURS | ECTS |
|---|---|---|---|---|
| Theory class | R9, R14, R22, R23, R26, R27, R29, R31 | Masterclass<br>Content presentations by teacher<br>Knowledges and skills explanation | 40,00 | 1,60 |
| Practices in small groups | R13, R17, R18, R23, R24, R25 | Group activities supervised by professor<br>Knowledge acquirance through student interaction and activity<br>Anatomy dissection practices<br>Personalised attention by professor | 10,00 | 0,40 |

| | | | | |
|---|---|---|---|---|
| Tutoring | R18, R26 | Knowledges and skills explanation<br>Group activities supervised by professor<br>Online activity on e-learning | 2,00 | 0,08 |
| Evaluation | R9, R14, R18, R22, R23, R26, R27, R29, R31 | Knowledge acquirance through student interaction and activity<br>Tests to understand the level of knowledge acquirance and skills<br>Online activity on e-learning | 4,00 | 0,16 |
| **TOTAL** | | | **56,00** | **2,24** |

**TRAINING ACTIVITIES OF AUTONOMOUS WORK**

| ACTVITY | RELATIONSHIP WITH THE COURSE LEARNING OUTCOMES | METHODOLOGY | HOURS | ECTS |
|---|---|---|---|---|
| No attendance | R9, R14, R22, R23, R26, R27 | Knowledge acquirance through student interaction and activity<br>Online activity on e-learning<br>Personal study<br>Group work for searching, discussion and information research | 94,00 | 3,76 |
| **TOTAL** | | | **94,00** | **3,76** |

## Description of contents

Descripción de contenidos necesarios para la adquisición de los resultados de aprendizaje.

### Theoretical content:

| Block of content | Contents |
|---|---|
| INTRODUCTION | Introduction to the Study of the Nervous System. General Organization and Basic Principles. Embryonic Development of the CNS and PNS |
| Meninges, ventricles, and sinuses | Meninges, ventricles, and sinuses: CSF circuit, cisterns, spaces, arachnoid granulations. |
| Spinal Cord | Morphology of the Spinal Cord. External configuration and relationships. Spinal meninges. Structure of the spinal cord: Cytoarchitecture and myeloarchitecture. Ascending and descending pathways, hierarchical organization. |
| BRAINSTEM | Morphology of the Brainstem: External and internal configuration of the medulla oblongata, pons, and midbrain. Nuclear organization of the cranial nerves. |
| Cranial nerves | Trigeminal Nerve (CN V): Branches and pathways of the V1, V2, and V3 divisions. Nuclei and circuits associated with CN V: Principal nucleus, mesencephalic nucleus, spinal nucleus, motor nucleus of the trigeminal nerve.<br>Facial Nerve (CN VII): Pathway, branches, and associated nuclei. Sphenopalatine, submandibular, and sublingual ganglia. Lacrimonasal nerve, superior salivatory nucleus, solitary tract nucleus. Motor nucleus of the facial nerve. Nervous relationships between CN V and CN VII.<br>Nerves IX, X, XI, and XII: Associated nuclei, pathways, and destinations. Inferior salivatory nucleus, ambiguous nucleus, solitary tract nucleus, motor nucleus of CN X, spinal portion of the accessory nerve, motor nucleus of the hypoglossal nerve (CN XII). |

| | |
|---|---|
| Cerebellum | Cerebellum: Architectural organization, macroscopic anatomy, peduncles. Main divisions of the cerebellum: Vestibulocerebellum, Spinocerebellum, Cerebrocerebellum. Cerebellar efferents. |
| Diencephalon | Diencephalon. Division of the diencephalon: Epithalamus, thalamus, Hypothalamus-Pituitary, hypothalamic-hypophyseal portal system. Thalamus. Systematization of its nuclei. |
| BRAIN | Cerebral Cortex: Cortical organization, aggregates of white matter: Commissures, tracts... Macroscopic anatomy: fissures, gyri, and lobes. Main cortical areas. |
| LIMBIC | Limbic Circuit: Hippocampus, amygdala, cingulate cortex. |
| Vascularization | Arterial and venous vascularization of the Cortex, Diencephalon, and Brainstem. Vascularization of the spinal cord. |
| Sense organs | Sense of Vision. Eyeball: Sclero-corneal layer. Vascular tunic: Choroid, ciliary body, and iris. Anatomy of the retina. Refractive media of the eyeball. Corneal curvature. Lens. Vitreous body. Clinical anatomy of the aqueous humor. Eye appendages. Optic pathway (CN II). Cranial Nerves III, IV, VI. Ocular motor column: Origin (nuclei), pathway, and destinations.<br>Olfaction (CN I) and Taste, Gustatory papillae receptors. Ear (CN VIII). Anatomy of the external ear. Anatomy of the middle ear: Tympanic cavity and its contents, pharyngotympanic tube, and mastoid cells. Anatomy of the inner ear: Bony labyrinth and membranous labyrinth. |
| Autonomic Nervous System | Anatomical and Functional Concept of the Autonomic Nervous System: Anatomy of the Cervical, Thoracic, and Abdominopelvic Sympathetic System. Anatomy of the Parasympathetic System |
| PRACTICALS | Neuroanatomy Practicals in the Lab |
| Basal Ganglia | Basal Ganglia: Caudate, putamen, globus pallidus, substantia nigra, subthalamic nucleus. Topography. Basic circuitry: Direct and indirect pathways. |

| | |
|---|---|
| Sensory and Motor systems | Organization and summary |

Temporary organization of learning:

| Block of content | Sessions | Hours |
|---|---|---|
| INTRODUCTION | 2 | 4,00 |
| Meninges, ventricles, and sinuses | 1 | 2,00 |
| Spinal Cord | 2 | 4,00 |
| BRAINSTEM | 2 | 4,00 |
| Cranial nerves | 2 | 4,00 |
| Cerebellum | 1 | 2,00 |
| Diencephalon | 2 | 4,00 |
| BRAIN | 2 | 4,00 |
| LIMBIC | 1 | 2,00 |
| Vascularization | 1 | 2,00 |
| Sense organs | 2 | 4,00 |
| Autonomic Nervous System | 1 | 2,00 |
| PRACTICALS | 6 | 12,00 |
| Basal Ganglia | 1 | 2,00 |

| | | |
|---|---|---|
| Sensory and Motor systems | 2 | 4,00 |

## References

https//www.clinicalkey.com/student
FItzgerald. Neuroanatomía clínica y neurociencia FitzGerald, Gruener, Mtui, Mtui, Gruener & Dockery, Elsevier 7th edition 2017
Young Pa, Young PH: Neuroanatomía clínica functional. Barcelona: Masson-Williams & Wilkins: 1998
Snell. Neuroanatomía clínica. 7 edición. lippincot
Netter: atlas de neurociencia + student consult (2ª ed.) (en papel) masson, 2010
Gray's anatomy e-book: the anatomical basis of clinical practice, edition 41 Susan standringaugust 7, 2015 elsevier health sciences
Atlas De Anatomía Humana - 8ª Edición Tapa dura – 23 jun 2015 de Johannes W. Rohen (Redactor), Chihiro Yokochi (Redactor), Elke Lütjen-Drecoll (Redactor)
Marian C. DIAMOND EL CEREBRO HUMANO: LIBRO DE TRABAJO (ARIEL, 1998)

Rhoton Rhoton's Atlas of Head, Neck, and Brain, Thieme 2017
WILSON-PAUWELS, L.; AKESSON, E. J.; STEWART, P. A. Nervios craneales. En la salud y la enfermedad. 3ª Edición.