Information about the course

Degree: Bachelor of Science Degree in Medicine

Faculty: Faculty of Medicine and Health Sciences

Code: 341204 **Name:** Human Physiology I

Credits: 6,00 ECTS **Year:** 2 **Semester:** 1

Module: Morphology, structure and function of the human body

Subject Matter: Fisología **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:

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	Clara Gomis Coloma	clara.gomis@ucv.es
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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

Learning outcomes

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

R1 - Know the basic principles of physiology

Learning outcomes of the specified title

Type of AR: Description

- Students have demonstrated to possess and understand knowledge in a study area that starts from the base of the general secondary education, and is usually found at a level that, while supported by advanced textbooks, also includes some aspects that involve knowledge from the forefront of their field of study

R12 - Know how to perform a general physiological examination.

Learning outcomes of the specified title

Type of AR: Description

- Handling basic laboratory materials and techniques. Interpreting a normal analysis

Type of AR: Description

- Performing functional tests, determine vital parameters, and interpret them. Basic physical examination

R2 - Know the functioning of the different devices and systems, having the basis to be able to interpret the pathological clinical situations later

Learning outcomes of the specified title

Type of AR: Description

- Handling basic laboratory materials and techniques. Interpreting a normal analysis

Type of AR: Description

- 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 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

R3 - Being able to relate the basic functioning of the different systems and devices, highlighting the common or particular aspects between them

Learning outcomes of the specified title

Type of AR: Description

- 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

- Performing functional tests, determine vital parameters, and interpret them. Basic physical examination

R4 - Know the normal range of the most common analytical data and correctly interpret normal physiological records

Learning outcomes of the specified title

Type of AR: Description

- Handling basic laboratory materials and techniques. Interpreting a normal analysis

R5 - Actively understand and participate in clinical and/or laboratory practices

Learning outcomes of the specified title

Type of AR: Description

- Handling basic laboratory materials and techniques. Interpreting a normal analysis

Type of AR: Description

- 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

R6 - Show problem-solving ability based on clinical cases based on the physiology that is presented to you

Learning outcomes of the specified title

Type of AR: Description

- 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

R7 - Being able to write an understandable and organized text on various aspects of human physiology

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

R8 - Being able to produce documents on physiology by working 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

R9 - Argumenting with rational criteria from your work

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

Assessment system

Modalidad presencial

Assessed learning outcomes	Granted percentage	Assessment tool
R1, R2, R3, R4, R6, R7, R9, R12	25,00%	Open questions
R1, R2, R3, R4, R6, R9, R12	60,00%	Tests
R4, R5, R6, R7, R8, R9, R12	10,00%	Work
R1, R2, R3, R4, R6, R12	5,00%	Participation in class

Observations

Final exam:
The final exam will consist of multiple choice questions and open questions, and will be worth 85% of the course. Likewise, this exam must be passed with a 5 out of 10 before adding up the rest of the grades to obtain the final grade.
Criteria for granting honors:
Honors may be awarded to the best students, who must have obtained a minimum grade of at least 9, as a requirement to be eligible for it.
If circumstances require it, a special test may be established to determine those students deserving of honors, taking into account the 5% limit of enrolled students.
In second and subsequent calls, only honors that may be available after the first call may be awarded.

Notes:
Single assessment is not permitted in this course.
Use of AI: Students may use AI for personal study of the subject. Students may not use AI for assessable assignments, unless required in a specific activity and instructed by the instructor. If AI is used in any activity, the specific part of the activity, the AI ??tool used, and the purpose must be stated.

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
M6	Laboratory practices
M9	Knowledge acquirance through student interaction and activity
M11	Personalised attention by professor
M14	Online activity on e-learning

M15 Personal study

M17 Discussion and solving issues in group

M18 Work in team

IN-CLASS TRAINING ACTIVITIES

ACTVITY	RELATIONSHIP WITH THE COURSE LEARNING OUTCOMES	METHODOLOGY	HOURS	ECTS
Theory class	R1, R2, R3, R4, R6, R9, R12	Masterclass Content presentations by teacher Knowledges and skills explanation	46,00	1,84
Practices in small groups	R1, R2, R3, R4, R5, R6, R7, R8, R9, R12	Laboratory practices Knowledge acquirance through student interaction and activity Personalised attention by professor Discussion and solving issues in group Work in team	8,00	0,32
Tutoring	R1, R2, R3, R4, R6, R7, R9, R12	Personalised attention by professor	3,00	0,12

Evaluation	R1, R2, R3, R4, R6, R7, R9, R12	Knowledges and skills explanation Online activity on e-learning Personal study Discussion and solving issues in group	3,00	0,12
TOTAL			**60,00**	**2,40**

TRAINING ACTIVITIES OF AUTONOMOUS WORK

ACTVITY	RELATIONSHIP WITH THE COURSE LEARNING OUTCOMES	METHODOLOGY	HOURS	ECTS
No attendance	R1, R2, R3, R4, R5, R6, R7, R8, R9, R12	Knowledge acquirance through student interaction and activity Personalised attention by professor Online activity on e-learning Personal study Discussion and solving issues in group Work in team	90,00	3,60
TOTAL			**90,00**	**3,60**

Description of contents

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

Theoretical content:

Block of content	Contents
Basic physiology	·Introduction. Concept and history of physiology. Related sciences. Functional organization of the human body. ·Internal environment. Body fluids. Functional composition of the body. Homeostasis. Feedback systems. Negative feedback. Positive feedback. ·Transport mechanisms: Osmosis. Diffusion. Passive and active transportation. Regulation of the water compartments: Sodium potassium pump. Hydrostatic pressure. Oncotic pressure ·Properties of the membrane at rest: electrical changes. Stimuli ·Action potential: generation and propagation ·Synapse Physiology: Chemical and Electrical Synapses. Neurotransmitters. Neurons and cholinergic receptors. Neurons and adrenergic receptors. Postsynaptic potentials ·Physiology of muscle arousal and contraction. Properties of muscle tissue. Functions of muscle tissue. Theory of the sliding filament. The neuromuscular junction. Muscular tone. Voluntary contraction and reflexes. Regulation of contraction. Excitation and contraction of the striated muscle. Smooth muscle excitation and contraction.
Blood physiology	·Composition. Plasma: components and functions. Formation of blood cells ·Erythrocytes. Life cycle Iron metabolism. Oxygen transport. Blood groups ·Physiology of hemostasis. Platelets Coagulation cascade

Cardiovascular physiology	·The cardiac muscle: excitation and contraction. Concepts of cardiac electrophysiology. Driving system ·The cardiac cycle. Systole and diastole. Driving system. Valve function ·Cardiac output. Tissue oxygen supply (DO2). Capillary tissue oxygen exchange (IE). Tissue oxygen consumption (VO2). Venous return. ·Coronary perfusion. Functional view of the coronary tree. Regulation. ·Self-regulation. Self-regulation of cardiac output. Self-regulation of tissue perfusion. Self-regulation of blood pressure (perfusion pressure) ·Special circulations
Respiratory physiology	· Introduction to respiration: Cellular and pulmonary respiration. Components of respiratory function. Ventilation, perfusion and gas exchange · Ventilation and perfusion. Ventilation. Pulmonary mechanical characteristics. Perfusion. Ventilation / perfusion ratio. Dead space. Shunt. · Alveolar exchange, transport and tissue exchange of oxygen. · The control of respiration: Receptors. The respiratory center · Non-respiratory functions of the lungs
Physiology of the renal system	·Introduction to renal physiology. Body fluids and functional structure of the nephron. Renal circulation. Renal hemodynamics. Glomerular filtration. Renal blood flow. Kidney clearance. ·Tubular functions. Mechanisms of tubular reabsorption and secretion. Mechanisms of concentration and dilution of urine. Regulation of osmolality. ·Renal regulation of extracellular volume. ·Regulation of acid-base balance. ·Urination
Practical lessons	·Session 1: Action potential ·Session 2: Electromyography ·Session 3: Electrocardiogram ·Session 4: Renal physiology

Temporary organization of learning:

Block of content	Sessions	Hours
Basic physiology	6	12,00
Blood physiology	4	8,00
Cardiovascular physiology	6	12,00
Respiratory physiology	6	12,00
Physiology of the renal system	4	8,00
Practical lessons	4	8,00

References

·Hall, J.E. (2021) Guyton & Hall Texbook of Medical Physiology. 14th edition. Elsevier.
·Boron, W.F., Boulpaep, E.L. (2012) Medical Physiology. Ed. Elsevier Saunders.
·Koeppen, B.M. (2009) Berne and Levy: Physiology. 6th edition. Elsevier .
·Kandel, E.R. (2013) Principles of Neural Sciences. Mc Graw Hill
·Tortora, G.J., Derrikson, D. (2013). Principles of Anatomy and Physiology. 13th edition. Panamericana.
·Ira Fox, S. (2014). Human Physiology. 13th. Mc Graw Hill.
·Silverthorn, D.U. (2014). Human Physiology: An Integrated Approach . 6th. Panamericana.
·Fernandez-Tresguerres, J.A. (2011) Human Physiology. 4th edition. McGrawHill.
·Thibodeau, G.A., Patton, K.T. (2007). Anatomy and Physiology. 6th edition. Elsevier Mosby.
·Barrett, K.E. (2011) Ganong Medical physiology. 23rd edition. MacGraw Hill.