1. BASIC INFORMATION

Course	Physiology
Degree program	Psychology
School	Biomedical Sciences School
Year	1st
ECTS	6
Credit type	Basic
Language(s)	Spanish/ English
Delivery mode	Presential
Semester	S2
Academic year	2025/2026
Coordinating professor	Beatriz Navarro Galve
Professor	Inmaculada González and Nuria Saiz Aparicio

2. PRESENTATION

Within the importance of Psychology in the field of neurosciences, this subject aims to provide students with the necessary knowledge to understand the functions of the human body, and acquire a complete and comprehensive vision of it. The nervous system will be studied, including the physiological characteristics that allow neurons to receive, process and transmit information. The interaction between the nervous system and the multiple effector systems will be approached from a holistic point of view (motor system, neuroendocrine system and immune system).

3. LEARNING OUTCOMES

Knowledge

KN08: Characterize the different attentional networks, their neuroanatomical bases, the experimental paradigms responsible for their evaluation and the different neuropsychological diagnoses associated with them.

- Describe the cellular physiology of nerve cells and the principles of cellular excitability
- Describe the cellular physiology of nerve cells and the principles of cellular excitability
- Identify the physiological mechanisms of sensory coding, motor response, and higher cognitive functions and their integration into the central nervous system
- Identify the different cells that make up the nervous system and their function

- Relate the sensitive, integrative and effectual function of the nervous and endocrine system with the development of behavior.

Skills

SK07: To analyze the contribution of biological, cultural, and psychosocial foundations in the development of psychological differences in both individuals and groups

- To analyze the mechanisms of neuroendocrine communication and its function in the regulation of the homeostasis of the human body.

Competencies

COMP01: To know the functions, characteristics and limitations of the different theoretical models of Psychology in the field of Health Psychology

COMP02: To know the basic laws of the different psychological processes in the field of Health Psychology

COMP03: To know the main processes and stages of psychological development throughout the life cycle in its aspects of normality and abnormality in the field of Health Psychology

COMP04: Know the biological foundations of human behavior and psychological functions

COMP05: To know the psychosocial principles of the functioning of groups and organizations

COMP13: Be able to describe and measure variables (personality, intelligence and other aptitudes, attitudes, etc.) and cognitive, emotional, psychobiological and behavioural processes

COMP14: Be able to identify differences, problems, and needs

COMP32: Be able to measure and obtain data relevant to the evaluation of interventions

COMP36: Know and adjust to the deontological obligations of Psychology.

4. SYLLABUS

Unit 1. Neurobiology of the nervous system.
1.1 Organization of the Nervous System
1.2. Cells of the nervous system: neurons and glia
1.3. Encephalon
1.4. Spinal Cord

Unit 2. Synaptic Transmission
2.1. Membrane potencial
2.2. Synapses and signal integration
2.3. Neurochemistry: Neurotransmitters and receptors

Unit 3. Introduction to CNS Physiology
3.1. Research Methods in Neuroscience
3.2. Brain Waves

3.3. Biological Bases of Sleep
3.4. Biological Basis of Perception and Attention
3.4. Biological Basis of Language
3.5. Biological Basis of Mental Disorders and Disconnection Syndromes.

Unit 4. Afferent division: Somatosensory system
4.1. Components
4.2. Biological bases of the sensory-motor system
4.2. Sensorial processing:
  4.2.1. Touch and pressure
  4.2.2. Temperature
  4.2.3. Pain
  4.2.4. Propioception

Unit 5. Efferent division
5.1. Anatomical structures involved
5.2. Somatic nervous system
5.3. Autonomic nervous system
5.4. Regulation of cardiorespiratory function

Unit 6. Neuroendocrine system
6.1. Hormonal Communication Overview
6.2. Hypothalamic-pituitary axis
6.3. Biological Basis of Biological Rhythms
6.4. Biological Basis of Emotion, Stress, and Aggression
6.5. Regulation of intake

Unit 7. Motor control
7.1. Motor pathways
7.2. Motor control
7.3. Motor unit and neuromuscular synapses

Unit 8. Higher cognitive functions
8.1. Biological Basis of Higher Cognitive Processes
8.2. Biological bases of learning and memory
8.3. Reward system and addiction mechanism

5. TEACHING-LEARNING METHODOLOGIES

The following are the types of teaching-learning methodologies that will be applied:

- Master class
- Student's presentations

- Laboratory work and workshops
- Problem-Based Learning (PBL)

6. FORMATIVE ACTIVITIES

The types of training activities that will be carried out and the student's dedication in hours to each of them are identified below:

Learning activity	Number of hours
Lectures	20h
Asynchronous lectures	10h
Formative assessment	8h
Test of knowledge	2h
Problem solving	15h
Tutorials	5h
Practical exercises	10h
Research	10h
Laboratory work and workshops	20h
Autonomous work	50h
TOTAL	**150h**

7. ASSESSMENT

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

Assessment system	Weight %
Test of knowledge: Combined exam of 30 multiple-choice questions with 4 answer options (70% of the grade) and short questions (30% of the grade).	50%
Cases Analysis and Problem-Based Learning: 1. Virtual Laboratory Labster (2.5%) 2. Activity on the neurophysiology of learning and memory. Critical reading of an article and assessment using a questionnaire delivered	5%

through CANVAS (2.5%)	
Reports and writings: Questionnaires on pre-lab materials (30%) and on the work completed during the lab (70%). Integrated curriculum activities will be conducted with content from degree-level subjects. Attendance at all sessions is mandatory in order to pass this module.	25%
Student report on the laboratory sessions: 1. Submission of a group laboratory notebook at the end of the laboratory session (10%). Attendance at the laboratory sessions is mandatory in order to pass this module. 2. Attendance at the theoretical-practical laboratory sessions integrated into a case study with course content and evaluation of the laboratory session´s content through a questionnaire (5%)	15%
Laboratory practicals: A practical test will be conducted in the laboratory at the end of the course, the OSPE (Objective Structured Practical Assessment) to evaluate the acquisition of basic skills. The OSPE is mandatory to pass the course.	5%

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.

Attendance

According to Art. 1.4 of the Regulation for the Evaluation of Official Degree Degrees of the European University of Madrid (of the continuous evaluation): "The obligation to justify at least 50% attendance at classes is established as part of necessary for the evaluation process and to comply with the student's right to receive advice, assistance and academic follow-up from the teacher. For these purposes, students must use the technological system that the University puts at their disposal, to accredit their daily attendance to each of their classes. This system will also serve to guarantee objective information on the active role of the student in the classroom.

Those students who have not achieved a 50% attendance rate in the first exam period may be graded as failing and must pass the corresponding objective exams in the second exam period for the subject, where they must obtain a grade equal to or higher than 5.0 out of 10.

7.1. Ordinary exam call

To pass the subject in the ordinary call, you must obtain a grade greater than or equal to 5.0 out of 10.0 in the final grade (weighted average) of the subject. The student's final grade will be obtained from the weighting of the partial grades of each of the modules (knowledge test and active methodologies), as indicated below. If the grade in either the exam or the weighted average of the activities — is below 5, the course will be considered failed. The grades published on the virtual campus will be provisional until the test is reviewed.

In order to pass the subject, it will be necessary to obtain a grade greater than or equal to 5.0 out of 10.0 in the following sections:

- in the knowledge test (final exam of the subject)
- in the module of active methodologies (case analysis and problem solving, reports and writings, laboratory sessions, and student reports of the laboratory sessions).
- In the final grade of the subject (weighted average): 50% active methodology module and 50% theory module (knowledge test)

In the event that any of the assessable components have not been passed, and consequently the course is failed, the official grade recorded will correspond to the lowest-scoring component.

In the event of a modification to the assessment date, as per the application of the UEM regulations for changing the date of assessable tests, the format of the test may vary for that of the general call.

PLAGIARISM AND USE OF AI

Any student who resorts to or uses illicit means during an evaluation test, or who improperly claims authorship of academic work required for assessment, will receive a failing grade ("0") in all evaluation tests for the exam period in said subject in which the violation occurred, and may also face disciplinary action following the opening of a disciplinary proceeding.

AI-Generated Content: AIGC-Generated Content (AIGC) tools, such as ChatGPT and other language models (LLMs), cannot be used to generate work. These tools cannot be held responsible in any way for the content written in the work. The use of AI must be authorized by the teacher in each activity. If a student has used these tools to develop any part of their work, their use should be described in detail in the work. The student is fully responsible for the accuracy of the information provided by the tool and for correctly referencing any supporting work. Tools used to improve spelling, grammar, and general editing are not included in these guidelines. The final decision on the appropriateness of the reported use of an artificial intelligence tool rests with the professor, the academic coordinator, and the direction of the degree.

Delay in the delivery of mandatory activities

Late submission of mandatory assignments will result in the activity not being assessed, and a numerical grade of 0 will be assigned.

Laboratory workshops

Mandatory Uniform Use: To participate in laboratory sessions, students are required to wear the full uniform (lab coat). Any student who does not attend with the complete uniform will not be allowed to take part in the session and will receive a grade of 0 for the corresponding assessment activities.

Justified Absences: If a student is unable to attend a laboratory session due to a justified reason (as defined in the official regulations), they must inform the teacher in advance. Whenever possible, efforts will be made to reassign the student to another group.

If reassignment is not possible, only one justified absence will be allowed during the laboratory sessions. In such a case, the final grade will be calculated as the weighted average of the completed sessions, excluding

the justified absence. Only one justified absence will be accepted. Any additional absence, whether justified or not, will be graded with a 0 and will be included in the calculation of the final grade.

Final Grade Calculation: The final grade for the laboratory module will be based on the weighted average of all completed sessions, taking into account the conditions described above.

The OSPE is an integrative assessment of knowledge from three subjects: Behavioral Biology, Human Anatomy, and Physiology. If a student has not taken one or more of these subjects during the same academic year, they will be provided with supplementary materials and resources to support their preparation and help them successfully complete the assessment.

7.2. Extraordinary call

To pass the subject in the extraordinary call, the same requirements must be met as in the ordinary call. The activities not passed in the ordinary call must be submitted, after having received the corresponding corrections from the teacher, or those that were not delivered.

To pass the subject in the extraordinary call, you must obtain a grade greater than or equal to 5.0 out of 10.0 in the final grade (weighted average) of the subject. The student's final grade will be obtained from the weighting of the partial grades of each of the modules (knowledge test and active methodologies). If the grade - in either the exam or the weighted average of the activities - is below 5, the course will be considered failed. The grades published on the virtual campus will be provisional until the test is reviewed.

In order to pass the subject, it will be necessary to obtain a grade greater than or equal to 5.0 out of 10.0 in the following sections:

- in the knowledge test (final exam of the subject)
- in the module of active methodologies (case analysis and problem solving, reports and writings, laboratory practice practices, and student report of the internship).
- In the final grade of the subject (weighted average): 50% active methodology module and 50% theory module (knowledge test)

In the event of a change in the assessment date, according to the UEM regulations for changing the date of assessable tests, the format of said test may vary from that of the general call.

The recovery of missed laboratory sessions shall be conducted through a dedicated session during the resit period. This session will assess the core practical competencies required for the course and will include an objective examination covering the theoretical and procedural content addressed in the laboratory sessions.

8. SCHEDULE

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

Actividades evaluables	Fecha
Online questionnaire	Weeks 1 y 2
Online questionnaire Case 1	Weeks 2-3
Online questionnaire Training activity	Weeks 3, 4 y 5
Online questionnaire Case 2	Weeks 5 y 6
Online questionnaire Case 3 "Expert"visit	Weeks 8 y 9
Online questionnaire Training activity	Week 10
Online questionnaire	Week 11
Online questionnaire Case 4	Week 12
Online questionnaire Integrated training activity	Week 13
Online questionnaire Case 5	Weeks 14, 15
OSPE	Week 16
Objective assessment test	Week 16

This schedule may be modified for logistical reasons of the activities. Any modification will be notified to the student in a timely manner.

9. BIBLIOGRAPHY

Recommended bibliography is indicated below:

NEUROPHYSIOLOGY

- Purves, D. (2016) *Neurociencia. Ed.* Médica Panamericana.
- Redolar, D. (2014*) Neurociencia Cognitiva.* Ed Médica Panamericana*.*
- Kolb & Whishaw (2017) *Neuropsicología Humana.* Ed. Médica Panamericana

GENERAL PHYSIOLOGY

- Gal B. (2007) *Bases de Fisiología* (2ª ed.) Tebar*.*
- Silverthon D.U (2014) *Fisiología Humana, un enfoque integrado,* Ed. Médica Panamericana.
- Tortora, J., Derrickson, B. (2018) *Principios de Anatomía y Fisiología.* Médica Panamericana.

10. EDUCATIONAL GUIDANCE AND DIVERSITY UNIT

From the Educational Guidance and Diversity Unit we offer support to our students throughout their university life to help them reach their academic achievements. Other main actions are the students inclusions with specific educational needs, universal accessibility on the different campuses of the university and equal opportunities.

From this unit we offer to our students:

1. Accompaniment and follow-up by means of counselling and personalized plans for students whoneed to improve their academic performance.
2. In terms of attention to diversity, non-significant curricular adjustments are made in terms of methodology and assessment for those students with specific educational needs, pursuing an equal opportunities for all students.
3. We offer students different extracurricular resources to develop different competences that willencourage their personal and professional development.
4. Vocational guidance through the provision of tools and counselling to students with vocational doubts or who believe they have made a mistake in their choice of degree.

Students in need of 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 mail. Your assessment is necessary for us to improve.

Thank you very much for your participation.