

COURSE SYLLABUS

Physiological Psychology

Degree in Psychology

Centro Universitario Cardenal Cisneros

University of Alcalá

Academic Year 2024/25 2nd Year – 1st Term

COURSE SYLLABUS

Name of the subject:	PHYSIOLOGICAL PSYCHOLOGY
Code:	562013
Study:	Degree in Psychology
Department and Area of knowledge:	Psychology (Biological bases of behaviour)
Character:	Compulsory
ECTS credits:	6

Year and Term:	2nd Year, 1st Term
Lecturers:	Group A: Lucía Utrera Group B: Ana Sofía Urraca Group C: Esmeralda Fuentes
Office hours:	Appointment upon request by e-mail. Ana Sofía Urraca: Fridays from 12 to 13 hours Lucía Utrera: Tuesdays from 11 to 12 hours
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Language:	Spanish

1. INTRODUCTION

INTRODUCTION

This subject is part of the module *Biological Bases of Behaviour* and is a continuation of the subject *Foundations of Psychobiology* (1st year, 1st term) and *Behavioural Neuroscience* (1st year, 2nd term).

The main aim of the subject is for the student to become familiar with the research techniques used in Physiological Psychology (removal, post-mortem) and Psychophysiology (EEG, ERPs, EMG, EOG, AED), as well as to know some of the main applications of these techniques to processes such as sleep and biological rhythms, ingestion and eating behaviour, sexual and reproductive behaviour, and the basic cognitive processes of perception, memory and language.

The subject is associated with the CUCC "**Desarrollo de Destrezas Académicas en los Títulos de Grado**" (The Development of Academic Skills in Undergraduate Degrees), **oral presentations** with common guidelines and criteria will be given; therefore it includes these kinds of activities as part of the assessment.

In addition, an **innovative teaching methodology** will be employed in the subject, namely PBL (**Problem-Based Learning**), as well as the use of the **Laboratory of Psychology**.

Finally, this subject is included within **the English Friendly programme**. The aim of this programme is to assist foreign students adequately. To this end, the following resources and possibilities are available:

- There is an English version of this course syllabus.
- The foreign student will be provided with a selection of references of books and journal articles that include the contents of the subject.
- A model of the exam in English will be provided upon request.
- The teacher is available for personal tutorials and communication in English.

Nevertheless, a minimum B2 level of Spanish is recommended, as well as some basic knowledge about the anatomy of the nervous system.

Prerequisites y Recommendations

To take this subject, it is highly recommended to have passed *Fundamentals of Psychobiology* and *Behavioural Neuroscience*, both taught in the first year.

2. COMPETENCES

According to the regulations of the learning assessments of the University of Alcalá, approved in ordinary session of the Board of Directors on 24 March 2011 and modified in ordinary session of the Board of Directors on 5 May 2016, the competences are the set of knowledge, skills and attitudes that will enable a graduate to confront the resolution of problems or the intervention in an issue in a given academic, professional or social context with confidence.

The competences that the student will have to develop in this subject are described below in more detail.

Generic competences:

GC1. To acquire the knowledge and understand the principles of Psychology as a scientific discipline, including theory, methods and application fields, with the support of advanced textbooks and documentation incorporating cutting-edge knowledge in this field of study.

GC3. To be able to collect and interpret relevant data on human behaviour, at both individual and social levels and in different contexts, to express reasoned opinions of social, scientific or ethical nature in the psychological field.

GC4. To be able to convey information, ideas, problems and solutions about human behaviour to both general, and specialised, audiences.

Specific competences:

SC1. To know and understand the functioning, characteristics, contributions and limitations of different theoretical models in Psychology.

SC2. To know and understand the basic laws and principles of the different psychological processes.

SC3. To know and understand the processes and main stages of psychological development throughout the life cycle in their aspects of normality and abnormality.

SC4. To know and understand the biological foundations of human behaviour and psychological functions.

Transversal competences:

TC1. To be able to express oneself correctly in Spanish in the professional field.

TC2. To be able to manage information and knowledge in the professional field, including the use of basic information and communication technological tools.

TC3. To understand and express oneself in a foreign language, particularly English, in his/her own disciplinary field.

TC4. To consider ethics and intellectual integrity as essential values of professional practice.

TC6. To have the capacity for teamwork.

3. CONTENTS

The contents of the subject, which will allow working on the already mentioned competences, are described in the following table:

MODULE	UNIT NUMBER	UNIT	HOURS
I. Research techniques in Physiological Psychology and Psychophysiology.	1	Techniques in physiological psychology: removal, post-mortem analysis.	4
	2	Techniques in psychophysiology (I): EEG, ERPs	7
	3	Techniques in psychophysiology (II): EMG, EKG, AED	6
II. Biological and physiological processes related to normal and pathologic psychological processes.	4	Sleep and biological rhythms. Sleep disorders.	7
	5	Reproduction and sexual behaviour. Variability in sexual behaviour. Sexual dysfunctions.	7
	6	Ingestion and eating behaviour. Eating disorders.	7
	7	Psychophysiology of perception, memory and language. Neuropsychological disorders.	10
TOTAL			48

4. TEACHING-LEARNING METHODOLOGY. FORMATIVE ACTIVITIES.

4.1. Credit distribution (To specify in hours)

This subject consists of 50 hours of in-person classes (1/3 of the ETCS credits assigned, 100% of class attendance) and 100 hours of independent learning (2/3 of ETCS credits assigned, 0% of class attendance).

Total number of hours (6 ECTS): 150	
Number of hours of classroom attendance 50:	30 hours of whole-group lessons
	15 hours of practical lessons
	3 hours of seminars
	2 hours of assessment tasks
Number of hours of independent learning 100:	100 hours

4.2. Methodological strategies, materials and resources

Teaching-learning methodology:

The **classes**, corresponding to one third of ECTS credits, will be structured throughout the term in three different modalities: theoretical classes, practical classes and seminars.

- ✓ **Theoretical classes.** Different methodologies will be employed. Part of the theoretical contents will be provided and/or explained by the teacher, and others will be sought out and elaborated by the students. When requested by the teacher, students must attend class with the lesson prepared and the content will be commented on, debated or clarified in class. Theoretical self-learning activities are included in this modality.
- ✓ **Practical classes.** These will be done individually or in groups and guided by the teacher. Such activities will include case-studies, problem solving, analysis and discussion of documentary and audio-visual information (articles, videos, scientific documents), as well as the presentation of completed work. In addition, the guidelines for autonomous individual and group work will be provided in practical classes. Practical classes will be held using the **PBL method (problem-based learning)** in an interdisciplinary manner with three other subjects, also related, of the same term. Likewise, at least one seminar session will be dedicated to the use of techniques and equipment of the **Laboratory of Psychology**.
- ✓ **Seminars.** They will consist of monographic sessions with the participation of students, supervised by the teacher.

On the other hand, two thirds of the ECTS credits of the subject will be dedicated to **independent learning**. This includes the time needed to complete the tasks and activities that will be turned in or presented in class, to study and to prepare for exams. To pass, it is paramount that the student uses this time to achieve the desired learning outcomes.

Materials and resources:

The resources and materials that will be used in this subject will be varied and will respond to the different methodologies, modalities and scenarios in which the subject will be taught. Students will be provided with the basic material for the study of the different units of the subject, including written, audio-visual and multimedia material. Regarding physical resources, students will have access to the library and computers to carry out research for their work, as well as to the virtual community of the CUCC and the laboratory of Psychology.

5. ASSESSMENT: assessment criteria, report criteria and assessment procedures

The regulation of the learning assessments of the University of Alcalá (approved in ordinary session of the Board of Directors on 24 March 2011 and modified in ordinary session of the Board of Directors on 5 May 2016), establishes the following elements:

- Learning outcomes: are verifiable statements of what a student should know, understand and be able to do after obtaining a specific mark, or after finishing a program or its components.
- Assessment criteria: are the criteria that specify the dimensions and issues that will be assessed in learning.

- Report criteria: distribution of the marks according to the weighting of the assessment criteria, proficiency level or expected outcomes.

The above-mentioned elements for this subject are listed below.

Learning outcomes

The learning outcomes for the subject of *Biological Bases of Behaviour* set out in the Verification Report of the Degree in Psychology, and relevant to the present subject, are indicated in the following table. It also shows the specific competences for verifying each learning outcome.

Specific competence	Related learning outcomes
SC1. To know and understand the functioning, characteristics, contributions and limitations of different theoretical models in Psychology.	• The student understands the concept of Psychobiology and knows the different factors that contribute to the explanation of human behaviour. • The student knows the methods and techniques that Psychobiology uses to study behaviour.
SC2. To know and understand the basic laws and principles of the different psychological processes.	• The student understands and explains human behaviour by integrating different perspectives.
SC4. To know and understand the biological foundations of human behaviour and psychological functions.	• The student understands the biological bases of behaviour and the intervention of nervous and endocrine systems in the main psychological processes. • The student knows the organization of the basic components and structures of the nervous system, as well as their interaction with other systems. • The student understands the human behaviour, its development and the compensation possibilities offered by the nervous system thanks to neuroplasticity, present throughout the life cycle, from the perspective of the Psychobiology of Development. • The student knows the biological bases of the different psychological disorders.

In addition, the appropriate development of **transversal competences** would imply the achievement of the following learning outcomes, which will be assessed transversally by the different assessment instruments mentioned in the table of the section "Report criteria" (namely: theoretical classes, practical classes, seminars and exam).

Transversal competence	Related learning outcomes
To be able to express oneself correctly in Spanish in the professional field.	The student produces oral presentations and written reports using formal style.
To be able to manage information and knowledge in the professional field, including the use of basic information and communication technological tools	The student looks for and uses documentary sources relevant for the discipline. The student analyses and interprets research and publications on the subject. The student argues in terms of scientific thinking, and relates theory and evidence within research in the field of health sciences.
To understand and express oneself in a foreign language, particularly English, in his/her own disciplinary field.	The student is able to understand and analyse texts on the subject in English and use them for his/her work.

To have the capacity for teamwork.	The student cooperates with others and contributes to a common project goal. He/she assumes individual responsibility within collective work.
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Assessment criteria:

The following assessment criteria are indicators of the Learning Outcomes and will be used to assess the degree of competence development related to this subject:

1. The student defines and conceptually delimits Physiological Psychology and Psychophysiology accurately and using appropriate terminology.
2. The student identifies and correctly discriminates the functioning and applicability of methods and techniques used in Physiological Psychology and Psychophysiology to study behaviour, and defines and describes them accurately and using appropriate terminology.
3. The student demonstrates an appropriate use and application of some methods and techniques employed in Psychophysiology to study behaviour.
4. The student answers questions correctly that are related to the anatomical and functional bases of the basic, normal and pathologic biological processes such as sleep and biological rhythms, sexual and reproductive behaviour, and liquid ingestion and eating.
5. The student quantifies, analyses and interprets data related to psychobiological functions and behaviours such as sleep, eating or sexual behaviour, and relates them with different potential explanatory variables.
6. The student understands the concept of neuroplasticity of the human brain, by searching English sources, within the field of application of cognitive and clinical neuroscience.

The first three assessment criteria assess the development of the specific competence 1, while the others assess the development of the specific competences 2 and 4.

Report criteria:

The following tables explain the assessment criteria with their respective weights and the instruments to be used in the assessment of the subject, for the continuous and final modalities for both ordinary and extraordinary assessment periods.

Continuous assessment. Ordinary and extraordinary assessment periods:

Assessment criteria derived from the specific competences	Assessment instruments				
	Exam	Practical classes	Seminars	Theoretical activity	%

The student defines and conceptually delimits Physiological Psychology and Psychophysiology accurately and using appropriate terminology.	5%				5%
The student identifies and correctly discriminates the functioning and applicability of methods and techniques used in Physiological Psychology and Psychophysiology to study behaviour, and defines and describes them accurately and using appropriate terminology.	5%	5%	5%		15%
The student demonstrates an appropriate use and application of some methods and techniques employed in Psychophysiology to study behaviour.		5%	10%*		15%
The student answers questions correctly that are related to the anatomical and functional bases of the basic, normal and pathologic biological processes such as sleep and biological rhythms, sexual and reproductive behaviour, and liquid ingestion and eating.	30%				30%
The student quantifies, analyses and interprets data related to psychobiological functions and behaviours such as sleep, eating or sexual behaviour, and relates them with different potential explanatory variables.		20%			20%
The student understands the concept of neuroplasticity of the human brain, by searching English sources, within the field of application of cognitive and clinical neuroscience.				15%	15%
TOTAL	40%	30%	15%	15%	100%

Final assessment. Ordinary assessment period (if requested by the student at the beginning of the term) and extraordinary (if the student fails the continuous assessment modality):

Assessment criteria	Instruments	Exam
The student defines and conceptually delimits Physiological Psychology and Psychophysiology accurately and using appropriate terminology.		5%
The student identifies and correctly discriminates the functioning and applicability of methods and techniques used in Physiological Psychology and Psychophysiology to study behaviour, and defines and describes them accurately and using appropriate terminology.		15%
The student demonstrates an appropriate use and application of some methods and techniques employed in Psychophysiology to study behaviour.		15%
The student answers questions correctly that are related to the anatomical and functional bases of the basic, normal and pathologic biological processes such as sleep and biological rhythms, sexual and reproductive behaviour, and liquid ingestion and eating.		30%
The student quantifies, analyses and interprets data related to psychobiological functions and behaviours such as sleep, eating or sexual behaviour, and relates them with different potential explanatory variables.		20%
The student understands the concept of neuroplasticity of the human brain, by		15%

searching English sources, within the field of application of cognitive and clinical neuroscience.	
EXAM	100%

Assessment procedure

The assessment system is based on the regulatory policy of the learning assessment procedure of the University of Alcalá (approved in ordinary session of the Board of Directors on 24 March 2011 and modified in ordinary session of the Board of Directors on 5 May 2016), that states the following rules:

1. This subject has two assessment periods: an ordinary one in January and an extraordinary one in June.
2. **Ordinary assessment period** characteristics:
 - In principle, the ordinary assessment period will employ **continuous assessment**. The type, characteristics and modality of the instruments and strategies that are part of the assessment process, as well as the weighting between them, should be based on the continuous assessment of the student. *Continuous assessment* is defined as the assessment system, which includes the evaluation of competence development (acquisition of theoretical and practical knowledge, skills and attitudes) throughout the learning process of the subject. The continuous assessment process uses different strategies and gathers information related to the entire teaching-learning process during the teaching of the subject. This does not exclude the information that could be gathered from the final exam.
 - Requirements for continuous assessment:
 - Submittal of the requested activities (at least 80% of proposed activities) by the means specified by the teacher in each case and on the indicated date.
 - When the student does not attend the lesson and/or fails to turn in the requested activity, it should be for a justified reason (illness with doctor's note, accident, serious family problem, etc.). In any case, the justification of non-attendance preserves the student's right to continuous assessment, but it does not mean that the teacher should allow him/her to redo the activity in any way or accept it after the deadline.
 - The different practical classes and the seminars will be assessed as specified by the teacher, including the submittal of documents, oral presentations, or tests to assess the knowledge acquired in these activities.
 - (*) In accordance with the section 6.4. of the regulatory policy of learning assessment of the UAH, in order to pass the subject, the student must pass the practical activities carried out in the laboratory.
 - If the student does not fulfil these requirements, he/she could not attend the exam and will appear in the report certificate as No-show (according to the

section 9.5 of the regulations of the UAH). In this case, the student should attend the extraordinary assessment period.

- **Final assessment** in the ordinary period:
 - If a student cannot commit to the continuous assessment mode in the ordinary period, he/she should formally request the final assessment from the teacher of the subject no later than the second week of lessons. The teacher must indicate if he/she accepts it or not, and submit the request to the *Subdirección de Ordenación Académica del Centro* (sub-direction of academic organisation of the centre) for the final decision. The realization of on-site practices, work and family obligations, health problems and disability could be reasons for requesting the final assessment, but each case will be evaluated individually (section 10.2 of the regulations of the UAH).
 - Students who did not request final evaluation at the beginning of the term, and have not met the criteria for continuous assessment, will not be eligible for this final assessment in the ordinary assessment period (section 10.5 of the regulations of the UAH).

3. **Extraordinary assessment period** characteristics:

- The extraordinary period will only **final assessment**. This option is intended for students who:
 - Have fulfilled the continuous assessment criteria (submittal of activities and attending practical classes and seminars) but have not taken or have failed the exam in the ordinary assessment period.
 - Have not fulfilled the continuous assessment criteria in the ordinary period because they have not turned in the activities or they have not attended the practical classes and/or seminars in the minimum percentage stipulated.
 - Have requested the final assessment at the beginning of the term but have not attended the ordinary assessment period.

4. **Regardless of the assessment (continuous or final), to pass the subject the student must achieve all competences of the subject in at least 50%, by means of the different assessment tests outlined in this course syllabus.**

- For more information about the assessment procedures, please see the following document:
<https://www.uah.es/export/shared/es/conoce-la-uah/organizacion-y-gobierno/galleries/Secretaria-General/Normativa-Evaluacion-Aprendizajes.pdf>

6. BIBLIOGRAPHY

For the contents on neuroanatomical and physiological bases:

Carlson, N.R. (2014). *Fisiología de la Conducta*. Madrid: Pearson.

This is a basic book for any student of Psychology within the field of neuroscience. It exposes the anatomy and physiology of the brain and the functioning of the different sensory and motor systems, sleep, feeding, and many other biological processes. It is highly recommended.

Carretié, L. e Iglesias, J. (2008). (4ª reimpresión). *Psicofisiología. Fundamentos Metodológicos*. Madrid: Pirámide.

This book introduces the student, in a simple and pedagogical way, to the main data collection techniques used in Psychophysiology (electroencephalogram, evoked potentials, electromyogram, skin conductance, etc.) after a presentation of some principles on electricity and biological signals.

Diamond, M. C.; Scheibel, A. B. y Elson, L. M. (2014). *El cerebro humano. Libro de trabajo*. Barcelona: Ariel.

This book is highly recommended for the student who starts with the anatomy of the nervous system. It presents many schematic drawings of the different structures of the nervous system and allows them to be coloured by means of a chromatic code that greatly facilitates the learning of these structures.

Enríquez de Valenzuela, P. (2014). *Neurociencia Cognitiva*. Madrid: Sanz y Torres.

This text of Cognitive Neuroscience offers a current vision of the main contributions of the discipline to the study of psychological processes in human subjects.

Kandel, E.R.; Schwartz, J.H., Jessell, T.M. (2001, 4ª Ed.) (Eds.). *Principios de Neurociencia*. Madrid: McGraw Hill/Interamericana.

This book extensively presents the anatomy and physiology of the central nervous system from a biological perspective, and is oriented to medical students, but also to students of Psychology who want to study the contents of the subjects of Neuroscience in more depth.

Redolar Ripollo, D. (2013) *Neurociencia Cognitiva*. Madrid: Ed. PANAMERICANA

This book presents the contents of cognitive neuroscience from a multidisciplinary perspective by using approaches based on teaching competencies. Special emphasis is given to the understanding of the different mechanisms and systems of nervous system functioning. It addresses the cognitive processes, reinforcement, sexual behaviour, sleep and consciousness. The work is accompanied by a multitude of pedagogical resources: graphic material to summarise some of the cardinal aspects of the topics developed, highlighted texts in each chapter reinforcing the main text, such as a conceptual summary, key concepts and complementary texts and a website with access to students containing different learning resources including videos, complementary content and self-assessment questions.

Another recommended bibliography for this area:

- Colmenares Gil, F. (2013) *Bases Biológicas de la Conducta I*. Madrid: Centro de Estudios Financieros.
- Del Abril Alonso, A. y cols. (2009) *Fundamentos de psicobiología*. Madrid: Sanz y Torres
- Kalat, J. (2004). *Psicología biológica*. Madrid: Paraninfo.
- Perea, M.V. (2010). *Fundamentos biológicos de la conducta: libro de trabajo*. Amaru Ediciones.
- Pinel, J. (2007). *Biopsicología*. Madrid: Pearson Educación.
- Rosenzweig, R.; Breedlove, M.; Watson, N. y Morgado, I. (2005) *Psicobiología: una introducción a la neurociencia conductual, cognitiva y clínica*. Barcelona: Ariel.
- Swaab, D. (2014). *Somos nuestro cerebro. Cómo pensamos, sufrimos y amamos*. Barcelona: Plataforma Editorial.

For contents related to normal and altered psychological processes:

Junqué, C. y Barroso, J. *Manual de Neuropsicología*. Madrid: Síntesis, 2009.

A complete handbook suitable as introductory text to neuropsychology; it is simple, yet technical. Suitable and understandable for undergraduate students.

Kolb, B. Y Whishaw, I.Q. (2006, 5ª Ed.). *Neuropsicología Humana*. Madrid: Médica Panamericana.

This handbook includes an extensive review of anatomy and physiology, as well as cognitive, experimental and clinical psychology. Part I provides the basic information needed for those who start studying the brain. The following parts consider the relationships between brain and behaviour by focusing first on the general organization of the cerebral hemispheres (Part II) and anatomy (Part III), and then on psychological functions (Part IV). Finally, Part V explains the neurological disorders and their rehabilitation.

Lezak, M., Howieson, D.B. y Loring, D.W. (2004) (5th Ed.). *Neuropsychological Assessment*. New York: Oxford University Press.

Comprehensive classic handbook of Neuropsychology that has incorporated advances in neuroimaging and knowledge about the structure and functions of the brain by presenting coloured neuro-radiological images of both healthy and pathological brains in its successive editions. It analyses both classic and modern batteries and tests for neuropsychological assessment. It is the most widely reference handbook used in neuropsychological evaluation. It is recommended for students interested in this field of knowledge who want to study it in depth and are proficient in English.

Peña-Casanova, J. (2007). *Neurología de la Conducta y Neuropsicología*. Madrid: Médica Panamericana.

Thirty-one professionals from different clinical, university and research fields make updated contributions in neurology of behaviour and neuropsychology: the relationships between the brain and behaviour, cognitive capacities and emotions. The book ranges from biological bases of behaviour to rehabilitation, including the following neuropsychological disorders: aphasia, apraxias, agnosias, alexias, agraphias, disorders of the corporal scheme, acalculias, amusias, amnesias, executive function disorders and dementias.

Portellano, J.A. (2005). *Introducción a la Neuropsicología*. Mc Graw Hill.

The book is intended for professionals and students in the healthcare, educational or psychosocial fields interested in brain damage. Neuropsychology, along with other disciplines involved in this pathology, aims to improve the diagnosis, treatment and guidance of the brain damage, with the purpose of improving the quality of life of the affected people.

Sacks, O. (2006). *El Hombre que Confundió a su Mujer con un Sombrero*. Barcelona: Anagrama.

Sacks, O. (1995). *Un antropólogo en Marte*. Barcelona: Anagrama.

These two works written by Sacks are essential for the student of Neuropsychology, as they bring the student closer to the assessment and symptomatology of different clinical cases using simple, pleasant and close language. It is compulsory reading for the future psychologist.

Tirapu Ustárriz, J., Ríos Lago, M. y Maestú Unturbe, F. *Manual de Neuropsicología*. Barcelona: Viguera, 2008

This handbook by three Spanish professionals of Neuropsychology makes a comprehensive review of normal and pathological processes in the different cognitive domains, proposing assessment tests for each one. It is also suitable for undergraduate students.