

# FOUNDATIONS OF PSYCHOBIOLOGY II – Code 800141

## Academic Year 2022-23

### COURSE INFORMATION

**Undergraduate Studies:** 0812 – Degree in Psychology (Studies Plan 2009-10)

**Type:** Basic (compulsory)

**ECTS:** 6.0

**Module:** Basic training

**Area:** Physiology

**Year:** First

**Semester:** 2

### INSTRUCTOR INFORMATION

**Name:** Helena Melero Carrasco

**Mail:** hmelero@ucm.es

**Office number:** 2006.H (Speech Therapy pavilion, Side 2)

**Office hours:** First term: Wednesday from 11:00 h to 13:00h and Friday from 14:00h to 15:00h;

Second term: Tuesday from 14:00h to 15:00 h and Wednesday from 10:00h to 12:00h and from 16:00h to 17:00h.

### SYNOPSIS

#### COMPETENCIES

##### General competencies

GC3: Know and understand the main normal and abnormal psychological development processes and stages over the course of the life cycle.

GC6: Know and understand research methods and data analysis techniques.

GC4: Know and understand the biological foundations of human behaviour and psychological functions.

##### Transversal competencies

GC3: Know and understand the main normal and abnormal psychological development processes and stages over the course of the life cycle.

GC6: Know and understand research methods and data analysis techniques.

GC4: Know and understand the biological foundations of human behaviour and psychological functions.

##### Specific competencies

SC4: Be able to describe and measure variables (personality, intelligence and other aptitudes, attitudes, etc.) and cognitive, emotional, psychobiological and behavioural processes).

#### TEACHING ACTIVITIES

**Theoretical classes:** The lectures will be master classes that will include the topics exposed before. Each class will last one hour, three times per week.

**Seminars:** the seminars will be given to reduced groups (1/2 or 1/3 of the total of students). The student's attitude in these seminars will be considered positive or negative in relation to the marked objectives.

**Practical classes:** The practical classes will reinforce and clarify specific concepts previously explained during the theoretical classes. The practices will be given in small groups and the dates of the classes will be previously published. The classes will be held in a laboratory or in rooms with access to computers.

**Presentations:** the activities done by the students will be exposed in class

## Other activities

**Tutorials:** Individually or in group, attended virtually or in presence of the student. The main objective is the consolidation of knowledge.

## ECTs break-down

TEACHING ACTIVITIES	Hours	% of total credits	Attendance
Class sessions	30	20%	100%
Lab sessions	15	10%	100%
Tutorials	5	3 %	50%
Students' work (class assignments and time of study)	97	65%	0%
Assessment activities	3	2%	100%

## BRIEF DESCRIPTION:

The subject Psychobiology II is a basic subject framed in the module Basic Psychology, which provides general knowledge essential for every field of specialization in Psychology. This subject will provide you with an in-depth understanding of the nervous system. Particular attention is given to the relationship between structure and function. During the first part of the course, you will be exposed to a series of lectures that provide a systematic and comprehensive overview of nervous system in terms of its functional components and how these work together to ultimately produce behaviour. In parallel to these lectures, you will participate in practices to help you better understand the structural organization of the nervous system and the inter-relationship between its various components. In the second part of the course, you will be introduced to the study of the principles of neurobiology of specific psychological processes, such as perception and central control of homeostasis. Its contents focus on neuroendocrine system and psychoneuroimmunology.

Latest imaging techniques which are used to study the living brain during health and disease. You will then also re-apply practically what you have learned in terms of neuroanatomy by conducting a basic dissection and neuropathological examination of the human brain as part of a group project. Throughout the course, the anatomy of the brain is understood in terms of its functional roles in perception, movement, learning, language and emotion.

Its content focuses on the study of the principles of neurobiology of motor behaviour and specific psychological processes, such as motivation, emotion, learning and memory. Other issues common in our society such as mental and affective disorders are also considered.

## PRE-REQUISITES

Medium to advanced knowledge of English language

## OBJECTIVES

1. Know the basic morphology of the human nervous system and distinguish different central nervous system areas at a macroscopic level.
2. Know the functional anatomy of the different nervous system divisions.
3. Know the sensorial code processes and the general organization of the sensorial pathways, either from a structural or a functional point of view.
4. Know the mechanisms and the interaction of different processes involved in the regulation of behaviour.
5. Know the fundamentals and applicability of different psychobiological methods and techniques.
6. Interpret the experimental results obtained by psychobiological techniques.

## TOPICS

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### SECTION I: FUNCTIONAL ANATOMY OF THE NERVOUS SYSTEM

1. Development of the Nervous System
2. Structure of the Nervous System
3. The Spinal Cord
4. The Brainstem
5. The Cerebellum
6. The Diencephalon
7. The Telencephalon
8. Neurotransmitter Systems in the CNS
9. The Peripheral Nervous System

### SECTION II: INTRODUCTION TO THE SENSORY SYSTEMS

10. Sensory receptors
11. Organization of the sensory systems

### SECTION III: CENTRAL CONTROL: HOMEOSTASIS.

12. Hypothalamus and homeostasis
13. Neuroendocrine system
14. Psychoneuroimmunology

## ASSESSMENT

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### Evaluation criteria

The acquired knowledge (theoretical and practical classes, seminars and presentations) will be evaluated by exams. The theory-related exam will score 70-80% of the total mark. The attendance to the practices and seminars is mandatory and a requirement to take the exam. The elaboration, originality, synthetic and analytical abilities and presentation of the materials (practices, seminars, and presentations) will be positively evaluated. The evaluation of practices, seminars and presentations will score 20-30% of the final mark.

According to the law "artículo 5 del Real Decreto 1125/2003", the results obtained by the student will be grade from 0 to 10 (including one decimal) following a qualitative calibration:

0-4,9: Suspenso (SS). Fail

5,0-6,9: Aprobado (AP). Pass

7,0-8,9: Notable (NT). Outstanding

9,0-10: Sobresaliente (SB). Excellent

## RESOURCES

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### Textbooks

Basic references

Bear, M. F., Connors, B.W. & Paradiso M. A., Neuroscience: Exploring the Brain. Lippincott Williams & Wilkins. Baltimore, MD (2007, 3rd edition)

Crossman A.R. and Neary, D. Neuroanatomy: An illustrated colour text. Churchill Livingstone: Elsevier (2014, 5th edition)

Fitzgerald MJ T; Gregory G; Mtui R. Clinical Neuroanatomy and Neuroscience. Elsevier Limited (2011, 6th edition)

Kahle W. & Frotscher M. Color Atlas and Textbook of Human Anatomy. Volume 3: Nervous system and sensory organs. Stuttgart-New York: Thieme Medical Publishers (2010, 6th edition).

Kalat, J.W. Biological Psychology. Wadsworth Cengage Learning. Belmont, CA (2009, 10th edition)

Kandel, E.; Schwartz, J.H.; Jesseli, T.M. Principles of Neural Science. McGraw Hill. New York (2007)

Kolb B. & Whishaw I.Q. An introduction to Brain and Behavior. Worth publishers. New York. (2011, 3rd edition)

Nolte J. The human brain: an introduction to functional anatomy (with student consult online access). Mosby Elsevier (2009)

Pinel J. Biopsychology. Allyn & Bacon. Boston (2011; 8th edition)

Purves, D. et al. Neuroscience. Sinauer Associates, Inc., MA (2018, 5th edition)

Watson, Ch; Kirkcaldie M; Paxinos G. The Brain: an introduction to functional anatomy. Elsevier, San Diego, CA (2010, 1st edition)

### **Supplementary references/ material**

Atlas of neuroanatomy:

Felten D. L & Shetty, A. Netter´s Atlas of Neuroscience. Elsevier Saunders (2009, 2nd edition)

Hirsch, M.C. Topographical Anatomy of the Human CNS, (1998) (CD-ROM)

Schünke, M., Schulte, E. Schumacher, U., Voll, M. & Wesker, K. THIEME Atlas of Anatomy. Vol III: Head and Neuroanatomy. Stuttgart-New York: Thieme (2007). It includes an Image Collection: THIEME Atlas of Anatomy Series (DVD-ROM)

Williams Haines, D. Neuroanatomy: An atlas of Structures, Sections and Systems. Lippincott & Wilkins (2010, 6th edition).

### **Other resources** (in Spanish)

Abril, A.; Ambrosio, E; de Blas MR; Caminero AA; García Lecumberri C; de Pablo JM.. Fundamentos de Psicobiología. Madrid: Sanz y Torres, (2009)

Abril, A.; Ambrosio, E; de Blas MR; Caminero AA; de Pablo JM; Sandoval E. Fundamentos biológicos de la Conducta. Madrid: Sanz y Torres. (2001)

Ojeda JL; Icardo JM. Neuroanatomía Humana: aspectos funcionales y clínicos. Masson (2004)

Prats Galino, A. y Juanes Méndez, J.A.: UB Brain V.2.0 (libro). Barcelona Universitat, D.L. (2007)

Puelles López, Martínez Pérez, Martínez de la Torre. Neuroanatomía. Panamericana (2008)

Web sites

<http://www.brainmuseum.org/> This web site provides browsers with images and information from one of the world's largest collection of well-preserved, sectioned and stained brains of mammals.

<http://www.med.harvard.edu/AANLIB/home.html> (The Whole Brain Atlas). This web site shows neuroimages from normal and pathological human brain.