

## FOUNDATIONS OF PSYCHOBIOLOGY II – Code 800141

### 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

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**Office number:** 2008-1 (Speech Therapy pavilion, Side 2)

**Office hours:** by appointment

### SYNOPSIS

**BRIEF DESCRIPTOR:** functional neuroanatomy, sensory systems, brain plasticity, homeostasis, psychoneuroimmunology.

#### REQUIREMENTS:

- Medium/Advanced English level
- The course Fundamentals of Psychobiology I in the first semester will help the student to be familiar with the contents of genetics, structural and functional aspects of neurons, as well as with the mechanisms of interneuronal communication, which will allow them to better assimilate the contents of this course.

#### OBJECTIVES:

- To know the basic morphological characteristics of the human nervous system and to learn to differentiate, from a macroscopic point of view, the different regions of the central nervous system.
- To know the functional anatomy of the different divisions of the nervous system.
- To understand the processes of sensory coding as well as the general organization of the sensory pathways, both from a structural and functional point of view.
- To know the mechanisms and interaction of different processes involved in behavioral regulation.
- To know the basis and applicability of the different psychobiological techniques and methodologies.
- To know how to interpret the experimental results obtained by means of psychobiological techniques.

### COMPETENCIES

#### General competencies

GC3: To know and understand the main processes and stages of psychological development throughout the life cycle in its aspects of normality and abnormality.

GC4: To know and understand the biological foundations of human behavior and psychological functions.

GC6: To know and understand research methods and data analysis techniques.

#### Transversal competencies

TC1: Analysis and synthesis.

TC2: Elaboration and defense of adequately grounded arguments.

TC5: Ability to gather and interpret relevant data within the area of psychology to make judgments that include a reflection on relevant social, scientific or ethical issues.

TC6: Teamwork and collaboration with other professionals.

TC7: Critical thinking, in particular, capacity for self-criticism.

TC8: Learning skills necessary to undertake further studies with a high degree of autonomy and to develop and keep up to date the competences, skills and knowledge of the profession.

TC9: Transmit information, ideas, problems, and solutions to both specialized and non-specialized audiences.

### **Specific competencies**

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

## **CONTENTS**

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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

## **TEACHING ACTIVITIES**

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**Theoretical classes:** The contents described above will be addressed, and the student will be encouraged to acquire the indicated general, transversal and specific competences (30%: 45 hours).

**Practical classes:** The objective is to reinforce and clarify the conceptual, methodological and empirical contents previously introduced in the theoretical classes. The practical classes will be carried out in small groups, according to the calendar that will be established and that will be public. The practices will be carried out in any of the environments and with any of the techniques and resources that are unique to psychobiology or shared with other relevant disciplines in psychobiology and psychology (4.7%: 7 hours).

**Other activities:** Seminars, individual and group work, evaluation tests, forums, individual and group tutorials, personal study (65.3%: 98 hours)

## ASSESSMENT

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### Evaluation criteria

The knowledge acquired in the different training activities will be evaluated by means of exams that will represent maximum 70%-80% of the final grade (theoretical contents). Attendance to the practical classes will be mandatory. The works and the participation in the different activities will also be considered for the final grade (20-30%).

According to what is established in article 5 of the Royal Decree 1125/2003, the results obtained by the student will be graded according to the following numerical scale from 0 to 10, with one decimal place, to which the corresponding qualitative grade may be added:

0-4.9: Fail (SS).

5.0-6.9: Pass (AP).

7.0-8.9: Notable (NT).

9.0-10: Outstanding (SB).

## 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. (2019) Biological psychology. Mexico: Cengage.

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)

Schneider, G. E. (2014). Brain structure and its origins: in development and in evolution of behavior and the mind. MIT Press.

Vanderah, T., & Gould, D. J. (2020). Nolte's The Human Brain E-Book: An Introduction to its Functional Anatomy. Elsevier Health Sciences.

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. Fundamentosbiológicos 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) Puellas 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.