UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Physiological Psychology - 2

2425-2-E2401P008-T2

Learning area

1: Knowledge and skills useful to understand, promote and change individual psychological functioning

Learning objectives

Knowledge and understanding

• Understanding the neuroanatomical and functional bases of the human mind in order to explain the cognitive and emotional behavior of individuals

Applying knowledge and understanding

Ability to recognize and frame normal and abnormal behaviour in the contex in the contex of the relevant neurofunctional systems.
Ability to identify key diagnostic (behavioural or instrumental) tools to approach neurocognitive disorders and, in general, in neuroscience research.

Contents

This course provides information about the neurofunctional architecture of the homeostasis, of cognition and emotion of human beings.

The course represents the completion of the 1?? year “Anatomical and physiological foundations of psychic activity” course where the basics of neuroanatomy and neurophysiology were provided.

Thus, during this course we will illustrate the most advanced aspects of the neurophysiology of cognitive functions, regulatory functions and human behaviour. The final goal is to allow the student to frame specific behaviours (normal and pathological) in the context of the functioning or malfunctioning of specific neural systems

Detailed program

The extended program explained here indicates the recommended themes and sources, one of the two texts listed below. Of course, given the university level nature of the course, students are free to study on any source they may consider fit, including the teacher's slides. Textbooks: Bear, Connors, Paradiso (BCP). Gazzaniga, Ivry, Mangun (GYM).

1. Introduction to psychological physiology, cognitive neuroscience and their history (Chapter 1. GYM).

2. Methods in cognitive neuroscience: (behavioural and neuropsychological methods, EEG/ERPs,TMS, tDCS, neuroimaging). (Chapter 3. GYM).

3. Rhythms of the brain and sleep (Chapter 19. BCP).

4. The chemical control of behaviour (Chapter 15. BCP).

5. Motivation: food related behaviour, reward mechanisms and addiction (Chapter 16. BCP)

6. Brain and sex and reproduction (Chapter 17. BCP)

7. Emotions (Chapter 18. BCP)

8. Perception: object and faces (Chapter 6 GYM)

9. Attention, spatial cognition and consciousness (Chapter 21. BCP; Chapter 7 GYM)

10. Cognitive aspects of motor control (Chapter 8 GYM)

11. Executive functions and frontal lobes (Chapter 12 GYM)

12. Language and reading (Chapter 20. BCP**)**

13. Memory systems and their abnormalities. (Chapter 24. BCP)

14. Molecular mechanisms of learning and memory (Chapter 25. BCP)

15. Hemispheric specialization (Chapter 4. GYM)

Prerequisites

This course requires a basic knowledge of anatomy and physiology of the nervous system, provided in the course “Anatomical and physiological foundations of psychic activity”.

Teaching methods

Lecture based teaching with PowerPoint slides. Periodic Online self-assessments.

Assessment methods

Erasmus students. Although this course is held in Italian, for Erasmus students, the course materials can also be available in English, and students can take the exam in English if they wish to do so

Assessment methods

Written examination (30 multiple choice questionnaire) followed by an essay and if needed or requested by the student oral examination (optional).

A minimum score of 18/30 at the multiple choice questionnaire is needed to be further assessed and proceed with the examination.

In the multiple choice questionnaire, each question has four alternative answers, only one being correct. One point is given for each correct answer; 0 points are given for errors or omissions.

In the short essay, the student will write on one of two possible subjects corresponding to one of the main themes covered during the course.
For example:

1. Body weight regulation: describe the dynamics of short- and long-term body weight modifications and food related behaviors; the role of the hypothalamus and peripheral chemical signals in determining food related behaviors.

2. Sleep: describe the phenomenology of sleep and its constituent phases. The neural generators, he neurochemistry of the different sleep phases. EEG, PET/fMRI correlates of sleep and dreaming.

Textbooks and Reading Materials

Textbooks

Neuroscience: Exploring the Brain Fourth, North Americ Edition by Bear PhD, Mark F., Connors PhD, Barry W., Paradiso PhD, Mich (2015) Hardcover 4th Edition. Wolters Kluver ISBN-13: 978-0781778176

ISBN-10: 0781778174

Cognitive Neuroscience: The Biology of the Mind (Fifth Edition) Fifth Edition Michael Gazzaniga, Richard B. Ivry, George R. Mangun ISBN-13: 978-0393603170.

ISBN-10: 0393603172

Academic papers made available by the professor.

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