UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Physiological Psychology - 2

2627-2-E2403P009-T2

Learning area

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

Learning objectives

Knowledge and understanding

- Knowing the neuroanatomical and functional bases of human mind in order to understand the cognitive, emotional and behavioral functions.

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.

Making Judgements

- The course fosters the ability to critically and independently analyze data, concepts, and neuroscientific theories, encouraging personal reflection on complex topics such as consciousness, pain, emotions, empathy, and biological rhythms.

Communication Skills

- Students develop command of the technical language specific to neuroscience, learning to communicate scientific content, findings, and arguments clearly and effectively, both to specialist and non-specialist

audiences.

Learning Skills

- The course promotes autonomous study and personal in-depth exploration, providing methodological and theoretical foundations necessary to pursue further training or research in the field of neuroscience with critical thinking and initiative.

Contents

The course aims to provide students with a basic knowledge of the neuro-functional architecture of the human cognitive and emotional processes. In particular, the neuro-functional bases of the nervous system will be provided, as well as the main theories and models on mental functions developed in the field of Cognitive Neuroscience, in order to favor the understanding of the cognitive, emotional and behavioral functioning of the individuals both in the healthy and clinical population.

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 (no less than 90%) 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
There are no midterm exams.
Final 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.

The final grade is based on the overall score obtained across the different parts of the examination, according to the following grading criteria:
18: minimally sufficient knowledge, with only basic application and interpretation skills;
19–22: sufficient knowledge of the fundamental topics, with some uncertainty in their application;
23–26: satisfactory knowledge, good application skills with some inaccuracies;

27–30: solid knowledge, good command of the subject matter, and sound critical thinking skills;
30 with honours: comprehensive and fully adequate knowledge, complete mastery of the subject matter, and excellent command of disciplinary language. Very good oral communication skills.

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.

Sustainable Development Goals

GOOD HEALTH AND WELL-BEING | QUALITY EDUCATION | RESPONSIBLE CONSUMPTION AND PRODUCTION