

Brain and Behaviour

Code: 102860
ECTS Credits: 3

Degree	Type	Year	Semester
2502442 Medicine	OT	2	2
2502442 Medicine	OT	3	0
2502442 Medicine	OT	4	0
2502442 Medicine	OT	5	0
2502442 Medicine	OT	6	0

The proposed teaching and assessment methodology that appear in the guide may be subject to changes as a result of the restrictions to face-to-face class attendance imposed by the health authorities.

Contact

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Use of Languages

Principal working language: catalan (cat)
Some groups entirely in English: No
Some groups entirely in Catalan: Yes
Some groups entirely in Spanish: No

Teachers

Albert Fernández Teruel
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Daniel Alveal Mellado
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Prerequisites

There are no previous requirements, but a basic level on psychology.

Objectives and Contextualisation

The course *Cervell i conducta* (Brain and behavior) is taught in the second year of the Degree of Medicine. The general objective of this topic is to offer an introductory overview of Neurosciences of behavior and mental functions: the field known as Cognitive Neuroscience. Thus, the subject explores the neural systems that mediate the normative cognitive functions and the mental alterations. The contents are based on the knowledge that the students

have achieved in previous subjects such as Neuroanatomy, Neurophysiology, Pharmacology and Psychology, that now will be framed in the area of cognitive neuroscience and mental health. The course aims to serve, therefore, as a introduction, and complement at the same time, of Neurology and Psychiatry.

Competences

Medicine

- Accept one's role in actions to prevent or protect against diseases, injuries or accidents and to maintain and promote health, on both personal and community-wide levels.
- Critically assess and use clinical and biomedical information sources to obtain, organise, interpret and present information on science and health.
- Demonstrate basic research skills.
- Demonstrate understanding of the causal agents and the risk factors that determine states of health and the progression of illnesses.
- Demonstrate understanding of the importance and the limitations of scientific thought to the study, prevention and management of diseases.
- Demonstrate understanding of the manifestations of the illness in the structure and function of the human body.
- Demonstrate understanding of the principles of normal human behaviour and its alterations in different contexts.
- Demonstrate, in professional activity, a perspective that is critical, creative and research-oriented.
- Empathise and establish efficient interpersonal communication with patients, family-members, accompanying persons, doctors and other healthcare professionals.
- Engage in professional practice with respect for patients' autonomy, beliefs and culture, and for other healthcare professionals, showing an aptitude for teamwork.
- Identify and measure the affective and emotional components of human behaviour and their disorders.
- Listen carefully, obtain and synthesise relevant information on patients' problems, and understand this information.
- Maintain and sharpen one's professional competence, in particular by independently learning new material and techniques and by focusing on quality.
- Obtain and prepare a patient record that contains all important information and is structured and patient-centred, taking into account all age and gender groups and cultural, social and ethnic factors.
- Obtain and use epidemiological data and assess trends and risks for decision-making on health.
- Organise and plan time and workload in professional activity.
- Perform a general and a system-by-system physical examination appropriate to the patient's age and sex, in complete and systematic way, and a mental evaluation.
- Put forward suitable preventive measures for each clinical situation.
- Recognise and take action in life-threatening situations and others that require an immediate response.
- Recognise the effects of growth, development and ageing on individuals and their social environment.
- Recognise the role of complexity, uncertainty and probability in decision-making in medical practice.
- Recognize one's role in multi-professional teams, assuming leadership where appropriate, both for healthcare provision and for promoting health.
- Use information and communication technologies in professional practice.

Learning Outcomes

1. Account for the relationship between pain and comorbidity and its impact on assessment, diagnosis and treatment, especially in mental disorders such as schizophrenia, cognitive impairment and dementia.
2. Account for the relationship between psychology and the immune system.
3. Argue for and detail specific preventive measures in the area of physical and mental health at different stages in life.
4. Argue for future strategies in various areas of mental health, from a scientific perspective.
5. Assess the participation of several professionals in professional practice, in any context.
6. Attend to research in various areas of mental health: Social psychology, addictions, ageing, child and adolescent psychiatry, neuropsychology, neuro-imaging techniques and alternative therapies.
7. Cite the major neural mechanisms of anxiety, depression, brain ageing and dementia, schizophrenia, aggressive behaviour and addictive behaviour.
8. Define the basic features of nursing intervention in paedopsychiatry and psychogeriatrics.
9. Demonstrate basic research skills.
10. Demonstrate, in professional activity, a perspective that is critical, creative and research-oriented.
11. Describe psychological alternatives to prevent certain deficits associated with ageing.
12. Describe social and family intervention in paedopsychiatry and psychogeriatrics.

13. Describe stress: concept, causes, mechanisms and short- and long-term effects.
14. Describe the epidemiology in paedopsychiatry and psychogeriatrics.
15. Describe the influence of the group and circumstances on an individual's behaviour.
16. Describe the main communicative skills for a clinical interview.
17. Describe the neuropsychology of ageing.
18. Detail the process of neuropsychological assessment and the most important techniques and measures.
19. Develop reasoned and critical science-based argument in the field of mental health.
20. Discuss findings from reliable studies and argue for future strategies in various areas of mental health, from a scientific perspective.
21. Distinguish resource use in paedopsychiatry and psychogeriatrics.
22. Distinguish the clinical expression of mental disorders in the elderly.
23. Draw up a plan to promote healthy behaviours in different types of patients and circumstances.
24. Establish links between behaviour patterns, personality and health.
25. Explain multidisciplinary intervention in the field of mental health.
26. Explain scientific advances with regard to ageing.
27. Explain the emotional disorders of childhood, adolescence and old age.
28. Explain the physiology of ageing and the changes that take place.
29. Explain the process for conducting a diagnostic assessment in the field of children's mental health and mental health in old age.
30. Identify adaptive and non-adaptive lifestyles for physical and mental health.
31. Identify characteristics of appropriate communication with patients and between professionals.
32. Identify pathological grief, its characteristics and strategies for developing and resolving it.
33. Identify psychiatric emergency situations in paedopsychiatry and psychogeriatrics.
34. Identify the biological, psychological and social mechanisms of mental disorders in childhood/adolescence, adulthood and old age, and aggressive behaviour, addictive habits and anomalies in sexual behaviour.
35. Identify the stages of grief and the factors that influence the process of coping with loss and death.
36. Illustrate lifestyle strategies for good ageing.
37. Incorporate the guidelines of the medical code of conduct into the practice of medicine in the field of mental health.
38. Know the pain pathways, and the perception and emotional expression of pain in childhood/adolescence, adulthood and old age, in both normal and pathological conditions.
39. Know the principles of iatrogenesis and the therapeutic window of drugs in situations of fragility and psychogeriatrics.
40. Maintain and sharpen one's professional competence, in particular by independently learning new material and techniques and by focusing on quality.
41. Map out the information to be compiled in a process of medical, psychological and psychiatric assessment.
42. Organise and plan time and workload in professional activity.
43. Predict individual risk variables for physical and mental health.
44. Recognise situations of aggressive behaviour risk in a medical context.
45. Recognise the clinical manifestation of affective disorders and anxiety disorders.
46. Recognise the main neural and endocrine mechanisms of stress-related problems and identify the physical and psychological triggers of harmful stress.
47. Recognise the main neural and endocrine stress mechanisms.
48. Set up a medical record that integrates the information needed in psychological and psychiatric assessment.
49. Understand social and cultural context of ageing.
50. Understand the role of active listening in the clinical interview.
51. Use information and communication technologies in professional practice.
52. Use scientific thought in discussions of physical and mental health.
53. Use scientifically sound clinical and biomedical information sources.

Content

Contents

- I. Neural organization and brain functions.
- II. The brain to learn and remember.
- III. Language, thought and consciousness
- IV. Motivational brain
- V. Neural deterioration and mental disorders

Distributive blocks

- 1. Introduction to cognitive neuroscience
- 2. Evolution of the brain.
- 3. Cerebral cortex: actions, perceptions and cognitions.
- 4. Behavioral and cognitive development. Learning
- 5. Records and amnesia.
- 6. Synaptic and molecular mechanisms of memory
- 7. The language brain
- 8. The thinking brain
- 9. The conscious brain
- 10. The sexual brain
- 11. The aggressive brain
- 12. Emotions and brain
- 13. Neurobiology of addictive behavior.
- 14. Mental disorders I

15. Mental disorders II

16. Cerebral aging and dementias.

Methodology

The 'Brain and behavior' course begins lectures and one laboratory practice. The rest of the teaching content is taught and developed as online tutorials through the Virtual Campus. Presentations, scientific papers and audiovisual material used will be available in the Teaching Material Folders of the course on the Virtual Campus (Moodle). The students present, in addition, a work of interpretation and scientific discussion of works of relevant scientists in the cognitive neuroscience area.

Annotation: Within the schedule set by the centre or degree programme, 15 minutes of one class will be reserved for students to evaluate their lecturers and their courses or modules through questionnaires.

Activities

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
LAB PRACTICES (PLAB)	2	0.08	
LECTURES (TE)	24	0.96	
Type: Supervised			
ONLINE TUTORIALS (MOODLE)	12	0.48	

Type: Autonomous

WORK LABOR / PERSONAL STUDY / READING OF ARTICLES / INTEREST REPORTS	34	1.36	51
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Assessment

The system of evaluation of the acquisition of competences is organized in relation to the three modules: Theory, Laboratory Practice, Research Work.

2. The programming of the assessment activities will be according to the academic calendars established for this course.

3. Attendance and active participation in class and the correction of the exercises carried out in the theory and practice module to continuous assessment mode add up to a weight in the overall 10% grade.

4. The remaining 90% is evaluated by means of an examination with short questions (70% of the final grade) and the oral defense of a research work in which the student 'analyze and discuss relevant scientific work in the area of cognitive neuroscience (20% of the final grade).

5. The test of short questions will consist of 20 short questions and the analysis of a task related to the Laboratory Practice.

6. It is an indispensable requirement to pass the subject by obtaining a minimum grade of 5 for each of the assessment activities.

7. Students who fail to carry out the theoretical, practical or non-evaluation tests, will be considered as Not evaluated by exhausting the rights to the matriculation of the subject.

8. The evaluation process contemplates recovery systems. To participate in the recovery test students must have been previously evaluated in the set of assessment activities whose weight equals to a minimum of two thirds of the total grade of the subject.

9. In the case that a student fails and their average mark is less than 5, the resulting average will be the one of the grade of the final qualification.

Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
Evaluation written through objective tests: tests of multiple choice	70%	1	0.04	3, 1, 2, 4, 6, 7, 49, 50, 39, 38, 8, 9, 10, 11, 13, 14, 15, 12, 17, 16, 18, 22, 20, 21, 19, 23, 48, 41, 24, 29, 26, 28, 25, 27, 31, 32, 30, 35, 34, 33, 36, 37, 40, 42, 43, 47, 46, 45, 44, 52, 53, 51, 5
Attendance and active participation to lectures and seminars	10%	1	0.04	9, 10, 51
Research work and oral communication	20%	1	0.04	9, 10, 40, 42, 51

Bibliography

All the students will have access to this book: Robert Feldman - Understanding Psychology (14th ed) - McGraw-Hill, 2019
<https://www.mheducation.com/highered/product/understanding-psychology-feldman/M9781260194524.html>

Specific bibliography

NR Carlson "Fisiología de la Conducta", (8 Ed.) Barcelona: Ariel, 2005.

ER Kandel, JH Schwartz y ThM Jessell "Neurociencia y Conducta", Madrid: Prentice-Hall Spain, 2001.

MR Rosenzweig, AL Leiman y SM Breedlove, Psicobiología, Barcelona: Ariel, 2005.

Any of the three texts is a good support for the subject and they are useful class for future doctors. For those who

Squire LR, Bloom FE, Spitzer NC, Du Lac S, Ghosh A and Berg D (Eds) "Fundamental Neuroscience" (3rd. Edit), New York Elsevier, 2008.

Ward J "The student's guide to Cognitive Neuroscience", New York: Psychology Press, 2006.

Complementary bibliography

Ch. Koch "The quest for consciousness: a neurobiological approach", Colorado: Roberts and Co, 2004 (Ed. española. Barcelona: Ariel).

A Fernández-Teruel "Farmacología de la conducta: De los psicofármacos a las psicoterapias", Bellaterra: Servei de Publicacions de la UAB, 2008.

ET Rolls ET "Emotions explained", New York: Oxford University Press., 2005.

GF Koob and ML LeMoal, "Neurobiology of addiction", New York: Academic Press, 2005

A Tobeña "Anatomía de la agresividad humana", Barcelona: Galaxia Gutenberg, 2001.

A Tobeña "El cerebro erótico", Barcelona: L'Esfera dels llibres, 2006.

Online resources

The above-mentioned texts have web companions with all kinds of figures and exercises to work online.

Software

There is no need of specific programs.