
Ano Letivo 2022-23

Unidade Curricular NEUROCIÊNCIAS COGNITIVAS

Cursos CIÊNCIAS BIOMÉDICAS - MECANISMOS DE DOENÇAS (2.º ciclo)

Unidade Orgânica Faculdade de Medicina e Ciências Biomédicas

Código da Unidade Curricular 14341055

Área Científica CIÊNCIAS BIOMÉDICAS

Sigla

Código CNAEF (3 dígitos) 729

**Contributo para os Objetivos de
Desenvolvimento Sustentável - 3, 4, 9
ODS (Indicar até 3 objetivos)**

Línguas de Aprendizagem Inglês

Modalidade de ensino

Teóricas e teóricas-práticas

Docente Responsável

Karl Magnus Petersson

DOCENTE	TIPO DE AULA	TURMAS	TOTAL HORAS DE CONTACTO (*)
Karl Magnus Petersson	PL; T; TP	T1; TP1; PL1	25T; 5TP; 15PL

* Para turmas lecionadas conjuntamente, apenas é contabilizada a carga horária de uma delas.

ANO	PERÍODO DE FUNCIONAMENTO*	HORAS DE CONTACTO	HORAS TOTAIS DE TRABALHO	ECTS
1º	S2	25T; 5TP; 15PL	168	6

* A-Anual; S-Semestral; Q-Quadrimestral; T-Trimestral

Precedências

Sem precedências

Conhecimentos Prévios recomendados

Conhecimento em Psicologia Cognitiva / Biológica / Neurobiológica no nível BSc é útil. Além disso, o conhecimento elementar em Neurociência e Biologia / Química / Física é útil.

Objetivos de aprendizagem (conhecimentos, aptidões e competências)

Nesta unidade curricular apresentam-se diferentes conceitos e modelos necessários à compreensão das bases biológicas dos processos cognitivos, comportamentais e emocionais. Será dado destaque aos resultados obtidos com metodologias e técnicas actuais, incluindo os métodos de neuroimagem, que permitem investigar as bases neuronais de processos cognitivos como a memória, linguagem, atenção e processos emocionais. Ao concluir a unidade curricular, o estudante deverá mostrar as seguintes competências: a) saber caracterizar a organização de diferentes processos cognitivos e emocionais; b) saber relacionar os diferentes aspectos da cognição e do comportamento com as suas bases biológicas; c) saber quais os tópicos actuais de investigação em Neurociências Cognitivas; e d) conhecer as principais metodologias de investigação em Neurociências Cognitivas; e) discutir tópicos actuais neste domínio científico.

Conteúdos programáticos

- (1) Brain and mind from the perspective of Cognitive Neuroscience
- (2) Basic concepts in neurobiology
- (3) Basic neuroanatomy & stereotactic coordinate systems
- (4) Brain imaging methods
- (5) Cognitive, behavioral & modeling methods
- (6) EEG & eye-tracking lab
- (7) The perception-action cycle, sensation and perception
- (8) Brain development & plasticity
- (9) The encoding-retrieval cycle, learning and memory
- (10) Higher cognition, language, cognitive control & working memory

Metodologias de ensino (avaliação incluída)

The theoretical classes follow the classical lecture method. Nevertheless, the student is constantly invited to participate in order to better understand the different concepts and topics presented in the course. Students will be evaluated by written examinations at the end of the course. In order to pass the course the student will score an average of at least 10 (max 20). In case the student does not achieve an average of at least 10, the student will be provided the opportunity to pass the course through a final written exam.

Bibliografia principal

- (1) Gazzaniga, M. S., Ivry, R. B., Mangun, G. R., Steven, M. S. (2009). *Cognitive Neuroscience: The Biology of Mind* , 3rd Edition.
- (2) Additional literature: Brian Kolb & Ian Q. Whishaw, 2008. *Fundamentals of Human Neuropsychology* , 6th edition.
- (3) Various papers from *scientific journals* , which will be made available for downloading at the course homepage.

Academic Year 2022-23

Course unit COGNITIVE NEUROSCIENCE

Courses BIOMEDICAL SCIENCES
Common Branch

Faculty / School

Main Scientific Area

Acronym

CNAEF code (3 digits) 729

Contribution to Sustainable Development Goals - SGD
(Designate up to 3 objectives) 3, 4, 9

Language of instruction English

Teaching/Learning modality Lectures and laboratory demonstrations

Coordinating teacher Karl Magnus Petersson

Teaching staff	Type	Classes	Hours (*)
Karl Magnus Petersson	PL; T; TP	T1; TP1; PL1	25T; 5TP; 15PL

* For classes taught jointly, it is only accounted the workload of one.

Contact hours	T	TP	PL	TC	S	E	OT	O	Total
	25	5	15	0	0	0	0	0	168

T - Theoretical; TP - Theoretical and practical ; PL - Practical and laboratorial; TC - Field Work; S - Seminar; E - Training; OT - Tutorial; O - Other

Pre-requisites

no pre-requisites

Prior knowledge and skills

Knowledge in Cognitive/Biological/Neurobiological Psychology at the BSc level is helpful. In addition, elementary knowledge in Neuroscience and Biology/Chemistry/Physics is useful.

The students intended learning outcomes (knowledge, skills and competences)

This course presents concepts and models, based on neurobiology and information processing, needed to understand the neurobiological basis of cognition, emotion and behavior. Emphasis will be given to results obtained with current methodologies and techniques, including neuroimaging methods, which allow to investigate the neural basis of cognitive processes such as memory, language, attention and emotional processes. After completing the course, students must show the following skills: a) characterize the organization of different cognitive and emotional processes; b) know how to relate the different aspects of cognition and behavior to their biological basis; c) be acquainted with current research topics in Cognitive Neuroscience; d) identify the principal research methodologies in Cognitive Neuroscience; and e) know how to discuss current topics in this scientific field.

Syllabus

- (1) Brain and mind from the perspective of Cognitive Neuroscience
 - (2) Basic concepts in neurobiology
 - (3) Basic neuroanatomy & stereotactic coordinate systems
 - (4) Brain imaging methods
 - (5) Cognitive, behavioral & modeling methods
 - (6) EEG & eye-tracking lab
 - (7) The perception-action cycle, sensation and perception
 - (8) Brain development & plasticity
 - (9) The encoding-retrieval cycle, learning and memory
 - (10) Higher cognition, language, cognitive control & working memory
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Teaching methodologies (including evaluation)

The theoretical classes follow the classical lecture method. Nevertheless, the student is constantly invited to participate in order to better understand the different concepts and topics presented in the course. Students will be evaluated by written examinations at the end of the course. In order to pass the course the student will score an average of at least 10 (max 20). In case the student does not achieve an average of at least 10, the student will be provided the opportunity to pass the course through a final written exam.

Main Bibliography

- (1) Gazzaniga, M. S., Ivry, R. B., Mangun, G. R., Steven, M. S. (2009). *Cognitive Neuroscience: The Biology of Mind* , 3rd Edition.
- (2) Additional literature: Brian Kolb & Ian Q. Whishaw, 2008. *Fundamentals of Human Neuropsychology* , 6th edition.
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