

COURSE OUTLINE

(1) GENERAL

SCHOOL			
ACADEMIC UNIT	Interdisciplinary Graduate Programme in the BRAIN and MIND sciences		
LEVEL OF STUDIES	7		
COURSE CODE	B&M-R-105	SEMESTER	depending on availability
COURSE TITLE	Motor and Cognitive Neurophysiology		
INDEPENDENT TEACHING ACTIVITIES <i>if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits</i>	WEEKLY TEACHING HOURS	CREDITS	
laboratory exercises	6	9-27	
<i>Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).</i>			
COURSE TYPE <i>general background, special background, specialised general knowledge, skills development</i>	Special background, skills development		
PREREQUISITE COURSES:	B&M -102 Introduction to Systems Neuroscience I. Perception B&M -102A Introduction to Systems Neuroscience II. Movement & Cognitive Functions B&M -103 Introduction to Computational Neuroscience B&M 232 Introduction to Statistics and Programming in Matlab Also recommended: B&M-210 Cerebral Cortex: Perception & Movement B&M-236 Introduction to signal processing with applications in the analysis of discrete and continuous neuronal signals		
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	English		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	YES		
COURSE WEBSITE (URL)	https://elearn.uoc.gr/course/view.php?id=4454		

(2) LEARNING OUTCOMES

<p>Learning outcomes <i>The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.</i></p> <p><i>Consult Appendix A</i></p> <ul style="list-style-type: none"> • <i>Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area</i> • <i>Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B</i> • <i>Guidelines for writing Learning Outcomes</i>
<p>The research conducted at the Laboratory of Movement Physiology (Medical School, University of Crete) has two main long-term objectives. The first is to investigate the neural basis of object grasping and manipulation, a fundamental motor behavior for humans. The second relates to the study of the neural mechanisms underlying social cognition, through which we understand the actions and</p>

interpret the intentions of others to successfully organize our interactions with them.

Upon completion of the laboratory exercise, the student:

- Reproduces, analyzes, integrates, and applies the knowledge acquired from studying the compulsory and elective courses of the program within the research framework of the rotation.
- Is capable of using this knowledge as a foundation for original ideas and research.
- Can apply acquired knowledge at a high level of abstraction.
- Can think conceptually, develop, and deepen arguments.
- Analyzes and conducts complex scientific tasks.
- Is capable of collaborating with colleagues and supervisors.
- Takes responsibility for the outcomes of his/her work.
- Communicates clearly and accurately with both specialized and non-specialized audiences, conveying conclusions and knowledge that may result from original research, self-study, or experience.

If the laboratory exercise evolves into a thesis, the student's further engagement with the research topic enables him/her to:

- Independently conduct fundamental research based on methodological knowledge.
- Contribute originally to the development and application of ideas in the research field.
- Recognize the limitations of existing knowledge in the scientific domain and at the interface between related scientific fields, adjusting his/her actions accordingly.
- Identify and analyze complex problems and solve them with strategic thinking and creativity.
- Take responsibility for managing complex processes.
- Communicate effectively with colleagues, specialists, and non-specialists, as well as supervisors, adapting their communication based on the context and using conventions relevant to the field of study.

General Competences

Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?

Search for, analysis and synthesis of data and information, with the use of the necessary technology

Adapting to new situations

Decision-making

Working independently

Team work

Working in an international environment

Working in an interdisciplinary environment

Production of new research ideas

Project planning and management

Respect for difference and multiculturalism

Respect for the natural environment

Showing social, professional and ethical responsibility and sensitivity to gender issues

Criticism and self-criticism

Production of free, creative and inductive thinking

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Others...

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- Search for, analysis and synthesis of data and information, with the use of the necessary technology
- Adapting to new situations
- Decision-making
- Working independently
- Team work
- Working in an international environment
- Working in an interdisciplinary environment
- Production of new research ideas
- Project planning and management
- Showing social, professional and ethical responsibility and sensitivity to gender issues
- Criticism and self-criticism
- Production of free, creative and inductive thinking

(3) SYLLABUS

Training in research methods for investigating the role of frontal cortical areas in the action execution and perception.

Students will receive training in the following techniques:

- Extracellular recording of single-neuron activity in behaving animals
- Analysis of single-neuron, multi-unit, and local field potential activity
- Analysis of neuronal populations responses
- Intracranial electrical stimulation
- Reversible inactivation of cortical areas
- Animal training and basic surgical techniques
- Recording and analysis of behavioral parameters

(4) TEACHING and LEARNING METHODS - EVALUATION

<p>DELIVERY <i>Face-to-face, Distance learning, etc.</i></p>	Face-to-face	
<p>USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY <i>Use of ICT in teaching, laboratory education, communication with students</i></p>	Use of shared analysis codes. Use of publisher databases/electronic repositories of scientific articles	
<p>TEACHING METHODS <i>The manner and methods of teaching are described in detail.</i> <i>Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc.</i></p> <p><i>The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS</i></p>	Activity	Semester workload
	Study and analysis of bibliography	50-150
	project	100-300
	essay writing	25-75
	non-directed study	50-150
	225-675	
<p>STUDENT PERFORMANCE EVALUATION <i>Description of the evaluation procedure</i></p> <p><i>Language of evaluation, methods of evaluation, summative or conclusive, multiple choice questionnaires, short-answer questions, open-ended questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other</i></p> <p><i>Specifically-defined evaluation criteria are given, and if and where they are accessible to students.</i></p>	<p>Evaluation Language: English</p> <p>The student's dedication to conducting the study, autonomy and independence, critical review and analysis of the literature, progress over time, and the quality of the report are evaluated.</p> <p>Evaluation criteria are outlined in the study guide and communicated to students at the beginning of the course.</p>	

(5) ATTACHED BIBLIOGRAPHY

<p>- Suggested bibliography: Scientific articles published in reputable scientific journals within the research interests of the Laboratory of Movement Physiology.</p>
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