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-135	SEMESTER	**depending on availability**
COURSE TITLE	Laboratory rotation in "Quantum Effects in Biological Systems"		

INDEPENDENT TEACHING ACTIVITIES *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*	WEEKLY TEACHING HOURS	CREDITS
laboratory exercises	6	9-27
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).		

COURSE TYPE *general background, special background, specialised general knowledge, skills development*	Special background, skills development
PREREQUISITE COURSES:	
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek (English if requested)
IS THE COURSE OFFERED TO ERASMUS STUDENTS	YES
COURSE WEBSITE (URL)	www.quantumbiology.gr

(2) LEARNING OUTCOMES

Learning outcomes

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.

Consult Appendix A

- *Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area*
- *Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B*
- *Guidelines for writing Learning Outcomes*

The purpose of the laboratory exercise on laser pupillometry, conducted at the Laboratory of Quantum Physics and Quantum Biology of the Department of Physics at the University of Crete, is to study the pupil reflex using a modern optical laser stimulation system.

For the first time, this system enables the photo-stimulation of the retina at specific points, whereas, until now, this has been achieved using a broad beam of light generated by LEDs. We use a laser that is focused on specific points selected optoelectronically, allowing us to measure the response of dynamic pupillometry initiated by specific neural pathways.

In this exercise, students engage with topics related to the physiology of vision, modern photonic systems such as optical fibers, polarizing elements, optoelectronic components, and

lasers at various wavelengths. They also work with high-speed cameras, video data processing on a computer, and the analysis of measurements and errors in a complex experiment.

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	*Project planning and management*
Adapting to new situations	*Respect for difference and multiculturalism*
Decision-making	*Respect for the natural environment*
Working independently	*Showing social, professional and ethical responsibility and sensitivity to gender issues*
Team work	*Criticism and self-criticism*
Working in an international environment	*Production of free, creative and inductive thinking*
Working in an interdisciplinary environment	*……*
Production of new research ideas	*Others…*
	…….

- 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

Exercise in research methods on topics related to the measurement of the pupil light reflex. Depending on the availability of experimental equipment and the duration of the exercise (3 or 6 months), the student will be trained in all or some of the following procedures:

- Photonic systems and lasers
- Optical alignment and optical measurements
- Use of a high-frame-rate camera and data input to a computer
- Video analysis and processing on a computer
- Error analysis

(4) TEACHING and LEARNING METHODS - EVALUATION

<table>
<tr><td>DELIVERY
Face-to-face, Distance learning, etc.</td><td>Face-to-face</td></tr>
<tr><td>USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY
Use of ICT in teaching, laboratory education, communication with students</td><td>Use of shared analysis codes.
Use of publisher databases/electronic repositories of scientific articles</td></tr>
<tr><td>TEACHING METHODS
The manner and methods of teaching are described in detail.
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.

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</td><td>
<table>
<tr><th>Activity</th><th>Semester workload</th></tr>
<tr><td>Study and analysis of bibliography</td><td>50-150</td></tr>
<tr><td>project</td><td>100-300</td></tr>
<tr><td>essay writing</td><td>25-75</td></tr>
<tr><td>non-directed study</td><td>50-150</td></tr>
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<tr><td>Course total</td><td>225-675</td></tr>
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<tr><td>STUDENT PERFORMANCE EVALUATION
Description of the evaluation procedure

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

Specifically-defined evaluation criteria are given, and if and where they are accessible to students.</td><td>Evaluation Language: English
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.
Evaluation criteria are outlined in the study guide and communicated to students at the beginning of the course.</td></tr>
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(5) ATTACHED BIBLIOGRAPHY

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