COURSE OUTLINE

(1) GENERAL

SCHOOL	
ACADEMIC UNIT	**Interdisciplinary Graduate Programme in the BRAIN and MIND sciences**
LEVEL OF STUDIES	7
COURSE CODE	**B&M-105** SEMESTER **Fall**
COURSE TITLE	Introduction to Molecular & Cellular Neuroscience

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
lectures	6	6
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*	General Background
PREREQUISITE COURSES:	N/A
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	English
IS THE COURSE OFFERED TO ERASMUS STUDENTS	YES
COURSE WEBSITE (URL)	

(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*

In this unit, students understand and can explain basic principles of the functional and anatomical organization of the nervous system.

Specifically, upon successful completion of the course, students understand:
- the electrical properties of membranes,
- the generation of the electrical signal,
- the processing and integration of the signal within neurons,
- the transmission of the neural signal at the chemical synapse, and
- the underlying molecular structural elements.

Upon successful completion of the course, students:
- demonstrate an overall assessment of the knowledge comprising the subject of the unit,
- understand the basic theories, concepts, and principles governing neuronal function,

- can reproduce the knowledge they have acquired and communicate it clearly and unambiguously to both specialized and non-specialized audiences,
- can solve problems based on the knowledge they have acquired.

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

(3) SYLLABUS

- Introduction to the study of neurons
- Resting potential
- Action potential
- Postsynaptic potentials
- Synaptic integration
- Learning and memory: two cellular examples
- Mechanisms of neurotransmitter synthesis, storage, and release
- Structure and function of neurotransmitter receptors
- Molecular basis of neuronal excitability
- Genetic regulation of memory and learning

(4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY *Face-to-face, Distance learning, etc.*	Face-to-face
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY *Use of ICT in teaching, laboratory education, communication with students*	Integration of ICT in teaching Utilizing the elearn platform for uploading teaching materials Communication via "e-learn" and e-mail

TEACHING METHODS *The manner and methods of teaching are described in detail.* *Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography,*	Activity	Semester workload
	Lectures	30
	non-directed study	120

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	Course total	*150*
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.*	Evaluation Language: English Assessment Methods: Multiple-choice questionnaires, short-answer questions Written exam (oral examination available in special cases) Evaluation criteria are outlined in the study guide and communicated to students at the beginning of the course.	

(5) ATTACHED BIBLIOGRAPHY

- Suggested bibliography:
- Principles of Neural Science, 4th Edition, Edited by Kandel ER, Schwartz JH, Jessell TM, McGraw Hill, 2000.
- Principles of Neural Science, 5th Edition, Edited by Kandel ER, Schwartz JH, Jessell TM, Siegelbaum SA, Hudspeth AJ, McGraw Hill, 2012.
- Principles of Neural Science, 6th Edition, Edited by Kandel ER, Koester JD, Mack SH., Siegelbaum SA, McGraw Hill, 2021.
- Neuroscience, 6th Edition, Purves D, Augustine G, Fitzpatrick D, Hall W, LaMantia A, White L, Mooney R, and Platt M, Oxford University Press, 2018.
- Fundamental Neurosciece, 4th Edition, Edited by Squire L, Berg D, Bloom FE, du Lac S, Ghosh A, Spitz NC, Academic Press, 2012.