

INTRODUCTION TO NEUROBIOLOGY & GENETICS

1. GENERAL

SCHOOL	SOCIAL SCIENCES		
DEPARTMENT	PSYCHOLOGY		
LEVEL	<i>Undergraduate</i>		
COURSE CODE	Ψ-1401	SEMESTER	1 st
COURSE TITLE	INTRODUCTION TO NEUROBIOLOGY & GENETICS		
COURSE INSTRUCTOR	Andreas Kastellakis Associate Professor of Physiological Psychology		
TEACHING ACTIVITIES	WEEKLY HOURS	ECTS	
Lectures, demonstration of videos	3	6	
COURSE TYPE	Special Background (Compulsory)		
PREREQUISITES COURSES:	None		
INSTRUCTION/EXAM LANGUAGE:	Greek		
OFFERED TO ERASMUS STUDENTS	YES (independent study of English literature under the guidance of the instructor, 3 small essays and 1 term paper in English)		
COURSE WEB PAGE (URL)	https://elearn.uoc.gr/course/view.php?id=85 (Password required)		

2. LEARNING OUTCOMES

Learning Outcomes
<p>The aim of this course is to provide an introduction to basic cellular functions underlying behavior. It is designed to train students for upper-level neuroscience courses. Special emphasis is given to topics covering structure, development, organization and evolution of the human Central Nervous System (CNS). In addition, the course is aimed to provide an introduction to genetics and its relationships with CNS and behavior.</p> <p>At the end of the course, the students should be able to:</p> <ul style="list-style-type: none"> • demonstrate a general background information on basic concepts in Neurobiology & Genetics • be familiar with methods and techniques most commonly used for studying neurobiology <p>Especially, the students should be able to:</p> <ul style="list-style-type: none"> • demonstrate an understanding of the basic concepts pertinent to cell biology; • identify the basic structure of the nerve cell, and the various functions of different components of the nerve cells; • describe the structure and function of the nervous systems and • understand the importance of genetic parameters in the manifestation of pathophysiological conditions / behaviors

General Competences

- Search for, analysis and synthesis of data and information, with the use of the necessary technology
- Working independently
- Working in an interdisciplinary environment
- Criticism and self-criticism
- Production of free, creative and inductive thinking

3. COURSE CONTENT

- The relationship between Biology and Psychology: Foundations of Biopsychology.
- The chemical components of a cell.
- The cell as a basic unit of life: Structure and function.
- The neural cell.
- Membrane permeability and transport of small molecules and macromolecules (special emphasis is given in the role of blood-brain barrier).
- Development and tissue differentiation with emphasis on neural development.
- Neuroanatomy.
- Enzymes and metabolic production of ATP.
- The cell cycle.
- Introduction to classic Genetics.
- Introduction to molecular Genetics.
- Mutations (with emphasis in mutations affecting neural function and behavior).
- Evolutionary theory (evolution and behavior) with emphasis on the phylogenetic history of the nervous system (in short).

4. INSTRUCTIONAL AND LEARNING METHODS - EVALUATION

INSTRUCTION METHOD	In class (face-to-face). These meetings include lectures, short video demonstrations, and discussions.		
INFORMATION AND COMMUNICATION TECHNOLOGIES USED	Use of ICT in teaching Support for learning (communication with students and delivery of all course material) via the UoC e-learn online platform.		
TEACHING ORGANIZATION	<i>Activity</i>	<i>Semester Work load</i>	<i>ECTS credits</i>
	Lectures	39	1,56
	Independent study for the 1st progress test	13	0,52
	Independent study for the 2nd progress test	13	0,52
	Independent study for the 3rd progress test	13	0,52
	Participation in	0,75	0,03

	progress tests		
	Independent Study	72	2,88
	Participation in final exams	2	0,08
	Course Total	152,75	6,11
STUDENT EVALUATION	<p>The evaluation is in Greek for the students of UoC and in English for the Erasmus students.</p> <p>The evaluation will be by means of:</p> <p>I. 3 short progress tests (20%) and</p> <p>II. a two-hour written exam at the end of the semester or by means of two exams (non-cumulative; a midterm and a final exam) (80%).</p> <p>The evaluation criteria are presented during the 1st lecture of the semester. Moreover, all criteria are available to the students via the web-site of course on UoC e-learn platform.</p>		

5. BIBLIOGRAPHY

This course is comprised of a range of different free, online materials (lecture notes, slides & videos). However, the course makes primary use of the following materials:

Basic bibliography:

- Panagis, G. (2002). *Behavioral Neuroscience: Principles, Methods, Techniques & Laboratory Exercises*. Nikosia: Broken Hill Editions Ltd (Greek edition).
- Papadopoulos, G. (2003). *Functional Organization of the CNS*. Thessaloniki: University Studio Press (Greek edition).

Additional Reading:

- Barker, R. A., Barasi, S., & Neal, M. J. (2006). *Neuroscience at a glance* (2nd ed., Editor in Greek: D. Sakas). Athens: Parisianou Publications (Greek edition).
- Campbell, N.A., Reece, J.B., Urry, L.A., Cain, M.L., Wasserman, S.A., Minorsky, P.V., & Jackson R.B. (2010). *Biology* (8th ed., Editor in Greek: N. Moschonas). Heraklion: Crete University Press (Greek edition).
- Felten, D. L., & Jözefowicz, R. (2004). *Netter's Atlas of Human Anatomy: Human neuroanatomy* (Vol. IV). Nikosia: Broken Hill Editions Ltd (Greek edition).
- Smith C. U. M. (2003). *Elements of Molecular Neurobiology* (3rd ed.). New York: Wiley.