COURSE DESCRIPTION

1. GENERAL

SCHOOL	SCHOOL OF HEALTH SCIENCES		
DEPARTMENT	FACULTY of MEDICINE		
LEVEL OF EDUCATION	*POSTGRADUATE*		
COURSE CODE	NEURO-202	**SEMESTER OF STUDIES**	2nd
COURSE TITLE	**PSYCHOPHARMACOLOGY**		
COURSE MANAGER	ANNA VASILAKI		
INSTRUCTORS	Anna Vasilaki, Eftichia Asprodini, invited speakers		

TEACHING ACTIVITIES	TEACHING HOURS PER WEEK	CREDIT UNITS
Lectures	4 *(4 hours per week X 7 weeks)*	4
Add rows if needed. The teaching organization and teaching methods used are described in detail in 4.		

COURSE TYPE	Elective
PREREQUISITE COURSES:	None
LANGUAGE OF TEACHING and EXAMS:	English
THE COURSE IS OFFERED TO ERASMUS STUDENTS	Yes
COURSE ELECTRONIC PAGE (URL)	

2. LEARNING OUTCOMES

Learning Outcomes

The learning outcomes of the course are described, the specific knowledge, skills and competences of an appropriate level that students will acquire after the successful completion of the course.

Psychopharmacology is the study of the effects of drugs on the brain and behavior. It aims to understand the neurochemical and neuroanatomical mechanisms that underlie behavior and mental processes, as well as to develop drugs that can modify these processes with the aim of treating psychiatric disorders. Psychopharmacology is an interdisciplinary field which assimilates knowledge from neuroscience, pharmacology, psychology and other fields. Its goal is to develop safe and effective drugs to relieve the symptoms of mental illness and improve the quality of life of people with psychiatric disorders.

Upon successful completion of the course, the students will have acquired the necessary **knowledge**, **abilities** and **skills** to understand, interpret and communicate on psychopharmacological topics. In particular, they will be able to:

✓ understand the basic principles of pharmacokinetics, pharmacodynamics as well as the basic molecular, cellular, neurochemical and neuroanatomical mechanisms of action of drugs used in the treatment of psychiatric disorders
✓ clearly communicate their conclusions and knowledge on psychopharmacology topics and the rationale and logical assumptions on which they are based, both to specialized and non-specialized audiences

- ✓ collect and interpret relevant information regarding the safety, efficacy, effectiveness, indications, side effects, and potential addictive properties of drugs used in the treatment of psychiatric disorders or substances that could potentially affect behavior, and shape related opinions and concerns.
- ✓ recognize the value of personalized pharmacotherapy and communicate information, ideas, problems, and solutions to both specialized and non-specialized audiences.
- ✓ combine the knowledge they gained during their undergraduate studies with the knowledge provided by this course and handle complex issues, as well as formulate opinions even with incomplete or limited information. These opinions will include considerations of the social and ethical responsibilities arising from the development and use of drugs used in the treatment of psychiatric disorders
- ✓ develop the skills needed to acquire further knowledge in psychopharmacology in the future, so to continue their studies with a greater degree of autonomy.

In addition, the course will enable students to develop *general competencies* including:

- ✓ Research, analysis and synthesis of data and information, using the necessary technologies
- ✓ Decision-making
- ✓ Autonomous work
- ✓ Teamwork
- ✓ Respect for diversity and multiculturalism
- ✓ Demonstration of social, professional and ethical responsibility and sensitivity to gender issues
- ✓ Criticism and self-criticism
- ✓ Promotion of free, creative and inductive thinking

3. COURSE CONTENT

1. **Introduction to Psychopharmacology (2h)**
   Definition and history of psychopharmacology
   The role of neurotransmitters in regulating behavior and mood

2. **Neuropharmacology (4h)**
   Drug-receptor interactions
   Pharmacokinetics and pharmacodynamics

3. **Antidepressants (2h)**
   Types of antidepressants
   Mechanisms of action
   Side effects and limitations

4. **Anxiolytics (2h)**
   Types of anxiolytics
   Mechanisms of action
   Side effects and limitations

5. **Antipsychotics (2h)**
   Types of antipsychotics
   Mechanisms of action
   Side effects and limitations

6. **Mood stabilizers (2h)**
   Types of mood stabilizers
   Mechanisms of action

Side effects and limitations

7. **Drug addiction and abuse (4h)**

    Mechanisms of addiction

    Commonly abused drugs

    Treatment options

8. **Special populations (4h)**

    Psychopharmacology drugs in children: ADHD[1], ODD[2] and CD[3] disorders

    Psychopharmacology drugs in the elderly: Adverse and beneficial effects of polypharmacy

9. **Methods of Research & ECC[4] concerns in Psychopharmacology drug development & treatment (2h)**

    Techniques in Behavioral Pharmacology and Neuropharmacology

    ECC concerns: animal experimentation, informed consent, conflict of interest and gender equality in Psychopharmacology drug development

    Off-label use and stigmatization in Psychopharmacology drug use

10. **Future directions (4h)**

    Novel drug targets:

    - Microbiome-gut-brain axis and
    - neuroimmune interactions in mental health disorders

    Personalized medicine, precision drug delivery & digital therapeutics

    Machine learning and AI in drug discovery and development

4.   TEACHING AND LEARNING METHODS - EVALUATION

TEACHING METHODS *Face-to-face, Distance learning, etc.*	In the classroom *(face-to-face)* and remotely *(MS Teams)*.
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES *Use of ICT in Teaching, Laboratory Training, Communication with students*	*Use of ICT in teaching:* ✓ Supervisory material of lectures in an electronic format. Posting on the e-learn electronic platform ✓ Use of the Microsoft Teams web app for remote lectures ✓ Use of a web application (http://www.icp.org.nz) for of students' practice in pharmacokinetics during the respective lecture as well as by each student for their practice at a time of their choice. *Use of ICT in communication with students:* ✓ All announcements will be posted on the Postgraduate Program's electronic platform. ✓ The lecture schedule and evaluation criteria will be available on both the e-learn and MS Teams platforms. ✓ Each student is required to complete an electronic class evaluation form.

---

[1] *Attention Deficit Hyperactivity Disorder*

[2] *Oppositional Defiant Disorder*

[3] *Conduct Disorder*

[4] *Ethics and Code of Conduct*

	✓ Students can communicate with the instructors electronically via MS Teams for scientific or administrative issues that arise during the semester.	
TEACHING ORGANIZATION	*Activity*	*Semester Workload (hours)*
	Lectures	28
	Literature study & analysis	20
	Practical training in pharmacokinetics	1
	Preparatory study for the written exams	62
	Total *(25 hours of workload per credit)*	***111***
STUDENT EVALUATION *Description of the evaluation process*	Course evaluation in English: I. Written exams (75% of final grade) comprised of multiple choice, matching, fill-in-the-blank, true/false and short answer questions or a combination of these. II. Oral Presentation (25% of the final grade): 10-minute presentation of a cutting-edge Psychopharmacology topic based on the study and analysis relevant literature. *The evaluation criteria and methods will be thoroughly explained during the first course meeting and will also be available online through e-learn and MS Teams.*	

5. RECOMMENDED BIBLIOGRAPHY

Textbooks
- ✓ **Stahl's Essential Psychopharmacology - Neuroscientific Basis and Practical Applications**, 5^n Edition, Cambridge University Press, **2021**.
- ✓ **Psychopharmacology Drugs, the Brain, and Behavior**, 3^n Edition, Oxford University Press, **2018**.

Related Scientific Journals
- ✓ **Psychopharmacology**: *Official Journal of the European Behavioural Pharmacology Society (EBPS).*
- ✓ **Neuropsychopharmacology**: *Official Journal of the American College of Neuropsychopharmacology (ACNP)*
- ✓ **Journal of Psychopharmacology**: *Official Journal of the British Association of Psychopharmacology (ACNP)*
- ✓ **Biological Psychiatry**: *An Official Journal of the Society of Biological Psychiatry*
- ✓ **Neuropharmacology**
- ✓ **Trends in Pharmacological Sciences**