COURSE OUTLINE
MOTOR CONTROL AND MOTOR LEARNING IN REHABILITATION (MP14)

1. GENERAL

SCHOOL	School of Health Sciences		
DEPARTMENT	Physiotherapy		
LEVEL OF EDUCATION	Postgraduate		
COURSE CODE	MP14	**SEMESTER OF STUDY**	A
COURSE TITLE	Motor Control and Motor Learning in Rehabilitation		
SELF-ENDED TEACHING ACTIVITIES	**WEEKLY TEACHING HOURS**	**CREDIT UNITS**	
Theory + Exercise tutorials	**2+1**	**7**	
Laboratory			
COURSE TYPE	Special Background		
PREREQUISITE COURSES:	NO		
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek/English		
THE COURSE IS OFFERED TO ERASMUS STUDENTS	NO		
ECLASS COURSE CODE	PHYSIO_P_104		
COURSE RESPONSIBLE	Dr. Eleni V. Kapreli, Professor		
PHONE/ EMAIL	2231060125/ ekapreli@uth.gr		

2. LEARNING OUTCOMES

Learning results
Upon successful completion of the course, the student will be able to: 1) Critically discuss the neurophysiological mechanisms that ensure motor control, motor learning and neuroplasticity.   2) Assess the mechanisms through which pathology may disrupt motor control and quality of human movement.   3) Critically discuss the theories and parameters of motor learning.   4) Practically use the mechanisms of learning and establishing motor skills in the rehabilitation of patients.   5) Plans and adapts his/her instructions to meet the different needs of patients.   6) Critically discuss motor learning techniques and methods with application in clinical practice.   7) Use motor learning techniques and methods practically in the rehabilitation of patients.   8) Process scientific theories and research results and apply them in designing patient rehabilitation programs.

General & Special Skills	
The course aims to develop the following **general** skills: ● Search, analysis and synthesis of data and information, using the	The course aims to develop the following **specific** skills: ● Competence about the content of knowledge ● Ability to implement it scientific knowledge in clinical practice

necessary technologies
- Decision making
- Autonomous work
- Teamwork
- Generating new research ideas
- Exercise criticism and self-criticism
- Promotion of free, creative and inductive thinking

- Patient communication

3. COURSE CONTENT

1. Introduction to motor control and motor skill, motor skill classification models.
2. Neurophysiological Mechanisms of Motor Control, Neuromuscular Synapse, Perceptual and Executive Systems.
3. Kinetic Control theories and systems.
4. Assessment of motor control - methodological design.
5. Neurophysiological mechanisms of impaired motor control after injury/pathology, factors causing dysfunction, mechanisms of neuroplasticity.
6. Definition of motor learning, memory and stages of learning, techniques in rehabilitation.
7. Remote task guidance.
8. Motor learning applications in rehabilitation: Motivation, attention, feedback.
9. Assessment of motor learning - methodological design.
10. Applications of motor learning in rehabilitation: Organizing sessions.
11. Study of various new techniques and methods of motor learning I: mirror therapy, biofeedback, constraint induced movement therapy.
12. Study of various new motor learning techniques and methods II: Non-invasive Cerebral Stimulation, Virtual Reality, Robotics, Video Games.
13. Study of various new techniques and methods of motor learning III: Mental Practice.

4. TEACHING AND LEARNING METHODS - ASSESSMENT

METHOD OF TEACHING	Face-to-face, Hybrid education, Distance education at 20%
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	Use of PC, projector, video, and ICT (eclass, email, MS Teams, google docs) in teaching and communicating with students
TEACHING ORGANIZATION	

Activity	Semester Workload
Lectures / Interactive teaching	39
Independent Study & article analysis	80
Elaboration of work study	11
Writing assignments	25
Correction of tasks	20
Total Course (25 workload hours per credit unit)	*175*

STUDENT EVALUATION	The evaluation of the students is carried out in accordance with the regulation of the P.M.S. and the relevant decisions of the Department Assembly as a weighting of their grade in the written exams (65%) and their performance in the assignments (35%). Written exams include Multiple Choice Tests, and

	Analytical/Combined Response Questions.
	Assignments (3 assignments) are done in groups (in groups of 2-3 people), submitted via eclass at a predetermined time to be checked for plagiarism by Turnitin plagiarism software. The assignments are graded both by the course manager and by the students based on specific evaluation criteria that are accessible by the students (listed in the presentation of their assignment).

5. RECOMMENDED BIBLIOGRAPHY

- Suggested Bibliography:

1. *Anne Shumway-Cook, Marjorie H Woollacott , Jaya Rachwani , Victor Santamaria (2022) Motor Control: Translating Research into Clinical Practice Sixth, North American Edition, LWW*
2. *Cohen, H. (1998) Neuroscience for Rehabilitation (2nd edition) London, Lippincott Williams & Wilkins.*
3. *Edwards W. (2010) Motor Learning and Control: From Theory to Practice. Cengage Learning .*
4. *Latash M. and Lestienne F. (2006) Motor control and learning, Springer*
5. *Lundy-Ekman, L. (2017) Neuroscience: Fundamentals for Rehabilitation (5th edition) Oxford, Saunders.*
6. *Magill R (2020) Motor Learning and Control: Concepts and Applications (12th edition), McGraw-Hill Humanities*
7. *Schmidt, RA and Lee, T. (2018) Motor Control and Learning - 6th Edition: A Behavioral Emphasis Human Kinetics*

- Related scientific journals:

1. *Motor Control, https://journals.humankinetics.com/view/journals/mcj/mcj-overview.xml*
2. *International Journal of Motor Control and Learning, https://ijmcl.com/*
3. *Perceptual and Motor Skills, https://journals.sagepub.com/home/pms*