

**COURSE OUTLINE**  
**CLINICAL NEUROSCIENCE AND REHABILITATION (MP21)**

**1. GENERAL**

<b>SCHOOL</b>	School of Health Sciences		
<b>DEPARTMENT</b>	Physiotherapy		
<b>LEVEL OF EDUCATION</b>	Master's Degree Program		
<b>COURSE CODE</b>	MP21	<b>SEMESTER OF STUDY</b>	B
<b>COURSE TITLE</b>	Clinical Neuroscience and Rehabilitation		
<b>SELF-ENDED TEACHING ACTIVITIES</b>	<b>WEEKLY TEACHING HOURS</b>	<b>CREDIT UNITS</b>	
<i>Theory + Exercise tutorials</i>	2	6	
<i>Laboratory</i>	2	2	
<b>COURSE TYPE</b>	Special Background		
<b>PREREQUISITE COURSES:</b>	NO		
<b>LANGUAGE OF INSTRUCTION and EXAMINATIONS:</b>	Greek/English		
<b>ERASMUS STUDENTS</b>	NO		
<b>ECLASS COURSE CODE</b>	<a href="#">GD-LAMIA110</a>		
<b>COURSE RESPONSIBLE</b>	Dr. George Paras, Assistant Professor		
<b>PHONE/ EMAIL</b>	2231060234 / <a href="mailto:gparas@uth.gr">gparas@uth.gr</a>		

**2. LEARNING OUTCOMES**

<b>Learning results</b>	
<b>Upon successful completion of the course, the student will be able to:</b>	
<ol style="list-style-type: none"> <li>1) Interprets the nature and function of the Nervous System, the Control Mechanisms of Mobility and the Recovery of Motor Function.</li> <li>2) Study and analyzes the theoretical, research and clinical parameters in dealing with disorders of the nervous system.</li> <li>3) Selects the correct diagnostic means – tools for assessment and measurement, depending on the type of pathology.</li> <li>4) Develops critical thinking, to analyze and interpret the basic principles of the various Treatment Systems and the mechanisms of effect of therapeutic means and techniques on the basis of scientifically based knowledge and clinical practice.</li> <li>5) Defines the Conceptual - therapeutic framework, designs rehabilitation programs and solves a variety of problems based on sound clinical reasoning.</li> <li>6) Work collaboratively with health professionals of other specialties within the framework of the interdisciplinary approach.</li> </ol>	
<b>General &amp; Special Skills</b>	
<p>The course aims to develop the following <b>general</b> skills:</p> <ul style="list-style-type: none"> <li>• Search, analysis and synthesis of data and information, using the necessary technologies</li> <li>• Decision making</li> </ul>	<p>The course aims to develop the following <b>specific</b> skills:</p> <ul style="list-style-type: none"> <li>• Ability to connect scientifically documented theoretical knowledge with clinical practice</li> <li>• Ability to develop correct clinical reasoning on the basis of cases</li> <li>• Ability to analyze and interpret motor behavior</li> </ul>

- Autonomous work
- Teamwork
- Generating new research ideas
- Exercise criticism and self-criticism
- Promotion of free, creative and inductive thinking
- Interdisciplinary Approach

### 3. COURSE CONTENT

#### Theoretical part:

1. Neuroscience and Neurorehabilitation up today.
2. The Nervous System. Neural Organization, Neuroplasticity and Levels of Processing.
3. Neurological Rehabilitation - Theoretical Background (neurophysiological mechanisms, motor control and learning).
4. Clinical Observation, Assessment and Measurement in Neurological Physiotherapy.
5. Treatment Planning - Defining a Therapeutic Framework and Rehabilitation Program.
6. The New Technologies in the Service of Neurorehabilitation.
7. Study - Treatment of Muscle Tone Disorders and Muscle Weakness.
8. Study - Treatment of Neuromuscular Coordination, Balance and Gait Disorders.
9. Study - Treatment of Sensory, Cognitive and Perceptual Deficits.
10. Basic Principles of Rehabilitation in Different Age Groups and Special Populations – Particularities.
11. Management of Neurological Disorders in Different Clinical Settings.
12. The Interdisciplinary Approach to Neurorehabilitation.
13. Special Clinical Topics.

#### Laboratory part :

1. Neurological examination in lesions of different systems.
2. Assessment and recording of gait patterns of neurological patients.
3. Assessment of balance using devices.
4. Biomechanical assessment of the lower extremities.
5. Footprint – static and dynamic footprint analysis.
6. Evaluation of muscle tone disorders.
7. Tools (tests) for recording the patients' functional level.
8. Mobility and balance recording tools (tests).
9. Diagnostic tests in pediatric neurological physical therapy.
10. Special techniques of mobilization and control of the static function of neurological patients.
11. Clinical training – use of specific techniques on real patients.
12. Interactive systems – virtual reality.
13. Orthotics, mobility aids and support equipment.

### 4. TEACHING AND LEARNING METHODS - ASSESSMENT

<b>METHOD OF TEACHING.</b>	Face-to-face, Hybrid education, Distance education at 20%		
<b>USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES</b>	Use of PC, projector, video, and ICT (e -clas , e- mail, MS Teams, google docs ) in teaching and communicating with students		
<b>TEACHING ORGANIZATION</b>	<b>Activity</b>	<b>Semester Workload</b>	
	Lectures / Workshop / Interactive teaching	52	

	Independent Study & article analysis	80	
	Elaboration of work study	30	
	Writing assignments	38	
	Total Course (25 workload hours per credit unit)	<b>200</b>	
<b>STUDENT EVALUATION</b>	<p>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%). The written exams include study questions - analysis of clinical cases and special topics regarding the science of Neurorehabilitation. Answers are interpreted based on sound clinical reasoning, principles of motor control/learning, and basic science. A prerequisite is the correct critical thinking and analytical approach.</p> <p>The work is done individually and concerns issues of special clinical interest. They are submitted through the e- class at a predetermined time to be checked for plagiarism by Turnitin plagiarism software. Assignments are graded by the course instructor. Emphasis is placed on the originality of the topic – research question and contribution to physical therapy clinical practice.</p>		

## 5. RECOMMENDED BIBLIOGRAPHY

### - Proposed Bibliography :

1. Car J., Shepherd R. (2003) Neurological Rehabilitation: Optimizing Motor Performance. Butterworth-Heinemann.
2. Lazaro R., Reina-Guerra S., Quiben M. (2019) Umphred's Neurological Rehabilitation, 7<sup>th</sup> edition. Elsevier.
3. Lennon S., Ramdharry G., Verheyden G. (2018) Physical Management in Neurological conditions. 4<sup>th</sup> edition, Elsevier.
4. Palisano R., Orlin M., Schreiber J. (2021) Campbell's Physical Therapy for Children. 5<sup>h</sup> English, 1<sup>h</sup> Greek Edition . Editions Paschalidis – Broken Hill.
5. Schmidt R., Lee T., Winstein C. (2018) Motor Control & Learning: A Behavioral Emphasis. 6<sup>th</sup> edition. Human Kinetics.
6. Shumway - Cook A ., Woollacott M. \_ (2012) Motor Control – From Research to Clinical Practice. 3rd edition. Broken Hill Publications.
7. Stokes Maria. (2004) Physical Management in Neurological Rehabilitation. Second edition. Elsevier, Mosby.

### - Related Scientific Journals:

1. Developmental Medicine & Child Neurology, <https://onlinelibrary.wiley.com/journal/14698749>
2. Journal of Neurorehabilitation, <http://www.medtextpublications.com/journal-of-neurorehabilitation-home.php>
3. Motor Control, <https://journals.humankinetics.com/view/journals/mcj/mcj-overview.xml>
4. Pediatric Physical Therapy, <https://journals.lww.com/pedpt/pages/default.aspx>