

Course Title	<b>THERAPEUTIC EXERCISE</b>			
Course Code	SSTEX411-1			
Course Type	PHYSICAL EDUCATION AND SPORT SCIENCE ELECTIVE			
Level	BSc (Level 1)			
Year / Semester	4th / Fall			
Teacher's Name	Dr Spyridon Athanasopoulos, Dr Emmanouil Papadopoulos, Dimitris Sokratous			
ECTS	6	Lectures / week	1	Laboratories / week / 2
Course Purpose	<p>The purpose of this course is to study and understand therapeutic exercise and its application in sport rehabilitation. Students should also be able to evaluate, record and determine the quantity and quality of movement in relation to the principles of biomechanics, know and evaluate in subjective and objective ways the functional deficit and organize a rehabilitation program that will include therapeutic exercise and will be based on evidence-based practice.</p>			
Learning Outcomes	<p>After completing the course, students will be able to:</p> <ul style="list-style-type: none"> <li>• Understand all kinds of therapeutic exercise.</li> <li>• Understand all kinds of therapeutic relaxation.</li> <li>• Evaluate the types of muscle contractions in relation to exercise.</li> <li>• Evaluate how the Length dynamics and the tachodynamics affect the choice of therapeutic exercise.</li> <li>• Evaluate muscle strength and muscular endurance in exercise programs.</li> <li>• Understand the effects of immobilization on the musculoskeletal system.</li> <li>• Know the interaction of pain with therapeutics exercise and relaxation.</li> <li>• Understand the effect of exercise on proprioception, neuromuscular coordination and motor control.</li> <li>• Examine the indications and contraindications of therapeutic exercise</li> <li>• Understand the role of digital physiotherapy techniques and applications in therapeutic exercise</li> </ul> <p>At the end of the practical part of the course students will be able to:</p> <ul style="list-style-type: none"> <li>• Design therapeutic exercise programs targeted at specific muscle</li> </ul>			

	<p>dysfunctions.</p> <ul style="list-style-type: none"> <li>• apply all kinds of therapeutic exercise.</li> <li>• apply therapeutic means of relaxation.</li> <li>• assess joint mobility.</li> <li>• apply therapeutic exercises aimed at reducing musculoskeletal pain.</li> <li>• apply therapeutic exercises to improve proprioception, neuromuscular coordination, and motor control.</li> </ul>		
Prerequisites	No	Corequisites	No
Course Content	<p>Therapeutic Exercise</p> <ul style="list-style-type: none"> <li>• Introduction to movement and therapeutic exercise – Introduction to muscle function and the role of muscle in movement and recovery.</li> </ul> <p>Principles of biomechanics and Rehabilitation</p> <ul style="list-style-type: none"> <li>• Torque – force – strength – Power, Inertia – friction – gravity</li> <li>• Principles of movement and balance, levers, support base, support surfaces, pulleys and their role in rehabilitation</li> <li>• Length-dynamic and tachodynamic relationship</li> </ul> <p>Types of movement</p> <ul style="list-style-type: none"> <li>• Passive movement – indications – contraindications</li> <li>• Assisted – suspended movement</li> <li>• Active movement (concentric, eccentric, isometric contraction, isotonic, isokinetic exercise)</li> </ul> <p>Resistance exercise</p> <ul style="list-style-type: none"> <li>• Defining a Resistance Exercise</li> <li>• Resistance Exercise Objectives</li> <li>• Precautions &amp; Contraindications of Resistance Exercise</li> <li>• Force assessment, methods, techniques and tools</li> <li>• Progressiveness - parameters for the progressiveness of the strengthening exercise program</li> <li>• Types of resistance training</li> <li>• Resistance exercise techniques</li> </ul> <p>Stretching and range of motion</p> <ul style="list-style-type: none"> <li>• Effects of immobilization on soft tissues and joints</li> <li>• Evaluation of range of motion, stretching/elasticity</li> <li>• Techniques and methods for stretching and restoring range of motion and elasticity of biological structures</li> <li>• Mechanical properties of contractile tissue</li> <li>• Relaxation techniques</li> <li>• Therapeutic methods for soft tissue elongation</li> </ul>		

	<ul style="list-style-type: none"> <li>• Precautions &amp; Contraindications for therapeutic soft tissue elongation methods</li> </ul> <p>Proprioception and Kinesthesia</p> <ul style="list-style-type: none"> <li>• Aesthetic Information and Properties of muscle sensation</li> <li>• Effects of proprioceptive information changes on posture and movement</li> <li>• Static and Dynamic Equilibrium</li> <li>• Proprioception Assessment</li> <li>• Restoring Balance</li> <li>• Classification of balance exercises</li> <li>• Progressivity of balance exercises</li> </ul> <p>Hydrotherapy</p> <ul style="list-style-type: none"> <li>• Adaptations of water-based exercise, Hydrotherapeutic means</li> <li>• Indications, contraindications and precautions of water exercise,</li> <li>• Water exercise techniques and aids,</li> <li>• Individual and group exercise of patients</li> </ul> <p>Walking</p> <ul style="list-style-type: none"> <li>• Separation of Gait Cycle Phases</li> <li>• Gait characteristics/parameters</li> <li>• Gait Assessment</li> <li>• Separation of normal and pathological gait patterns</li> <li>• Gait retraining and aids</li> </ul> <p>Digital technology in the assessment and implementation of therapeutic exercise (electronic platforms, tablet and smartphone applications)</p>
Teaching Methodology	<p><b>Theory</b></p> <p>The teaching of the course includes lectures on the offer of the theoretical background. The teaching uses detailed notes with PowerPoint and material rich in images and videos. Methods like case studies, clinical scenarios, discussion, questions/answers are used in the teaching methodology depending on the course's nature, and clinical scenarios. Research-documented material published in international scientific journals is also used to monitor the latest developments related to the course's subject.</p> <p><b>Laboratory</b></p> <p>During the laboratory courses, students are trained and apply the different types of therapeutic exercise in small groups and develop their clinical skills so that they can successfully and safely apply in a real clinical environment.</p>
Bibliography	<b>Main Writings</b>

	<p>Kisner, C., Colby, L. A., &amp; Borstad, J. (2017). <i>Therapeutic exercise: foundations and techniques</i>. FaDavis.</p> <p>Hislop EJ and Montgomery J (2013) <i>Daniels και Worthingham's Έλεγχος της Μυϊκής Λειτουργικής Ικανότητας</i>. Επιστημονικές Εκδόσεις Παρισιάνου.</p> <p>Φουσέκης, Κ., (2015). <i>Εφαρμοσμένη Αθλητική Φυσικοθεραπεία</i>. Επιστημονικές Εκδόσεις Πασχαλίδη.</p> <p>Comerford, M., &amp; Mottram, S. (2012). <i>Kinetic control-e-book: The management of uncontrolled movement</i>. Elsevier Health Sciences.</p> <p>Haff, G. G., &amp; Triplett, N. T. (Eds.). (2015). <i>Essentials of strength training and conditioning</i> 4th edition. Human kinetics.</p> <p>Boyle, M. (2016). <i>New functional training for sports</i>. Human Kinetics.</p> <p><b>References:</b></p> <p>Ortega-Castillo, M., Cuesta-Vargas, A., Luque-Teba, A., &amp; Trinidad-Fernández, M. (2022). The role of progressive, therapeutic exercise in the management of upper limb tendinopathies: A systematic review and meta-analysis. <i>Musculoskeletal Science and Practice</i>, 102645.</p> <p>Han, J., Luan, L., Adams, R., Witchalls, J., Newman, P., Tirosh, O., &amp; Waddington, G. (2022). Can therapeutic exercises improve proprioception in chronic ankle instability? A systematic review and network meta-analysis. <i>Archives of Physical Medicine and Rehabilitation</i>.</p>
Assessment	<p><b>Continuous evaluation (50%):</b></p> <p>The assessment may include any combination of the following:</p> <ul style="list-style-type: none"> <li>• <b>The use of case studies or problem-solving exercises (20%):</b> to assess how students can apply theoretical knowledge in real-life situations. Students are presented with scenarios that require analysis, critical thinking and application of theoretical contents and are evaluated based on their ability to make oral presentations, to be examined with <i>viva voce</i>, identify and evaluate relevant information, propose solutions and justify their choices.</li> <li>• <b>Class discussions:</b> Students participate in class discussions to assess their theoretical knowledge. Active participation is encouraged to hone their critical thinking skills, asking open-ended questions, and facilitating their dialogue.</li> </ul>

	<p><b>Laboratory assessment (30%):</b> consists of the assessment of expected skills and abilities, critical thinking, problem-solving, and teamwork skills. During laboratory classes, students are closely monitored as they engage with the tasks assigned to them, and notes are taken on actions, approaches, and any relevant observations that demonstrate the understanding of the subject matter and application of their skills. After the evaluation of the laboratory work, constructive feedback is provided to students. Highlight their strengths and areas for improvement, linking them to learning outcomes to help students understand their progress and guide them in their further development. Depending on the laboratory work, peer review may be integrated, where students evaluate each other's work against the established criteria to promote self-reflection, collaboration, and deeper understanding of the subject.</p> <p><b>Final exam (50%):</b> Comprehensive final exam to assess students' overall theoretical knowledge. These assessments cover a wider range of topics and learning outcomes from across the curriculum, to assess students' understanding and integration of knowledge in various areas.</p>
Language	Greek / English