Course Title	**Early mobilization and rehabilitation of critically ill patients**				
Course Code	PHYS312				
Course Type	Elective				
Level	Bachelor (Level 1)				
Year / Semester	3^{d} / Spring				
Instructor's Name	Dr Emmanuel Papadopoulos				
ECTS	6	**Lectures / week**	3	**Laboratories/week**	
Course Purpose	The purpose of this course is to deepen the knowledge and clinical competence of students in the mobilization and rehabilitation of patients hospitalized in the intensive care unit since the majority of patients leaving the ICU have significant functional disorders and are unable to undertake work duties even 1 year later. This combines the student's knowledge not only from the respiratory system, but also from the musculoskeletal and neurological, so as to contribute to the timely intervention of the physiotherapist from the acute phase to prevent colonizations and the onset of rehabilitation				
Learning Outcomes	After the completion of the program, students will be able to: • conduct a detailed physiotherapeutic evaluation of the critically ill patient • Identify the main problems from all systems • design a holistic evidence-based program of superficial prevention and physiotherapy intervention based on reasoned clinical reasoning. • cooperate harmoniously with the interdisciplinary team both in the design and in the therapeutic intervention • reassess and record the outcome of the therapeutic program • contribute to the restoration of the physical, functional and cognitive abilities of the patient				
Prerequisites	None	Co-requisites	None		
Course Content	• Impact of hospitalization in the ICU • Principles of evaluation of a critically ill patient • Evaluation of the cardiorespiratory system • Evaluation of the musculoskeletal system • Evaluation of the neuromuscular system • Functional evaluation scales • Clinical reasoning – design of a therapeutic program • Physiotherapeutic interventions in the ICU for the respiratory, musculoskeletal and neurological system				

	• The role of physiotherapy in the prevention and treatment of pressure ulcers • The contribution of physiotherapy to the elimination of the ventilator • Use of modern equipment in the evaluation and therapeutic intervention in the ICU • Physiological effects of early mobilization • Physiotherapy - Functional rehabilitation of patients after the ICU
Teaching Methodology	The course is delivered to the students through lectures, using computer-based presentations programmes. Case Studies, Discussion, Questions / Answers are also used depending on the content of the lecture. Lecture notes and presentations are available online for use by students in combination with textbooks. Relevant material published in international scientific journals is also used to follow the latest developments related to the subject of the course.
Bibliography	**Textbooks:** Papadopoulos E, (2009) 'Physiotherapy in Intensive Care', In: Roussos Ch. Intensive Care Paschalidis Publications, 2009, Athens. Gerovasili V, Papadopoulos E, Nanas S. Early Mobilization and Rehabilitation after Intensive Care, 2011, Gramma Publications, Athens Papadopoulos E, Kouvarakos, A, Nanas S, (2012) 'The role of Physiotherapy in the prevention and treatment of pressure ulcers'. In: Evidence Based Physiotherapy, Maggina N, Hellenic Society of Intensive Care Medicine. Gerovasili V, Papadopoulos E, Stamatakis G, Nanas S. 'Polyneuromyopathy of the critical care patient In: Koroneos, A, Zervakis, D. and Nanas S. In: Clinical Intensive Care-Current Management, Part B', 161-176, (2011) **References:** Stiller K. (2002) Physiotherapy in Intensive Care: Towards an Evidence-Based Practice. Chest, 118(6): 1801-1813, Ntoumenopoulos G, Gild A, Cooper DJ. (1998) The effect of manual lung hyperinflation and postural drainage on pulmonary complications in mechanically ventilated patients. Anaesth Intensive Care, 26(5): 492-6, Mark Elkins, Ruth Dentice, (2015) Inspiratory muscle training facilitates weaning from mechanical ventilation among patients in the intensive care unit: a systematic review, Journal of Physiotherapy, Volume 61, Issue 3, Pages 125-134, ISSN 1836-9553, https://doi.org/10.1016/j.jphys.2015.05.016.

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Gerovasili V, Karatzanos E, Papadopoulos E, Nanas S, et al. (2007) Electrical muscle stimulation has a systemic effect on the microcirculation of ICU patients, ERS.

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Campos, Bueno, Thatiana B, Anjos, J.et al (2022). Early Neuromuscular Electrical Stimulation in Addition to Early Mobilization Improves Functional Status and Decreases Hospitalization Days of Critically Ill Patients. Critical Care Medicine: April 12, Volume - Issue - 10. doi: 10.1097/CCM.0000000000005557

	Nonoyama T, Shigemi H, Kubota M, Matsumine A, Shigemi K, Ishizuka T. (2022) Neuromuscular electrical stimulation in the intensive care unit prevents muscle atrophy in critically ill older patients: A retrospective cohort study. Medicine (Baltimore). Aug 5;101(31): e29451. doi: 10.1097/MD.0000000000029451. Burgess LC, Venugopalan L, Badger J, Street T, Alon G, Jarvis JC, Wainwright TW, Everington T, Taylor P, Swain ID. (2021) Effect of neuromuscular electrical stimulation on the recovery of people with COVID-19 admitted to the intensive care unit: A narrative review. J Rehabil Med. Mar 18;53(3) Felten-Barentsz et al, (2020) Recommendations for Hospital-Based Physical Therapists managing patients with COVID-19, Physical Therapy, 100(9) Kalirathinam et al (2020) Comprehensive physiotherapy management in covid-19 – a narrative review, Scientia Medica Porto Alegre, v. 30, p. 1-9. Engel, Heidi J et al. "ICU early mobilization: from recommendation to implementation at three medical centers." Critical care medicine vol. 41,9 Suppl 1 (2013): S69-80. doi:10.1097/CCM.0b013e3182a240d5 Baron, M.V., Silva, P.E., Koepp, J. et al. (2022) Efficacy and safety of neuromuscular electrical stimulation in the prevention of pressure injuries in critically ill patients: a randomized controlled trial. Ann. Intensive Care **12**, 53 https://doi.org/10.1186/s13613-022-01029-1 Needham, Dale M et al. (2009) "Technology to enhance physical rehabilitation of critically ill patients." Critical care medicine vol. 37,10 Suppl S436-41. doi:10.1097/CCM.0b013e3181b6fa29 Koester, K., Troeller, H., Panter, S., Winter, E. and Patel, J.J. (2018), Overview of Intensive Care Unit-Related Physical and Functional Impairments and Rehabilitation-Related Devices. Nutrition in Clinical Practice, 33: 177-184. https://doi.org/10.1002/ncp.10077 Szeto, G.P.Y., Ho, P., Ting, A.C.W. et al.(2015) Work-related Musculoskeletal Symptoms in Surgeons. J Occup Rehabil **19**, 175–184 (2009). https://doi.org/10.1007/s10926-009-9176-1Occupational Safety and Health Administration (OSHA), 2015
Assessment	**<u>Continuous Assessment (50%):</u>**

	The assessment may include any combination of the following: • **Written and/or oral**, and it consists of multiple – choice, short answer, open ended questions and/or essay questions, that align with the learning outcomes, to assess the theoretical knowledge gained. The questions ensure that students will demonstrate a deep understanding of the subject matter and apply their knowledge to solve problems or analyse scenarios. • **Assignments and projects** provide opportunities for students to apply their theoretical knowledge in practical ways. The assignments are designed in a way that require critical thinking, research, analysis, and synthesis of information. Projects can be individual, self directed learning or group-based and should align with the learning outcomes. Students are evaluated on the quality of their work, the depth of understanding displayed, and their ability to effectively communicate their ideas. Assignments and projects may be individual or group work. • Use of **case studies or problem-solving exercises** to assess how students can apply theoretical knowledge to real-life situations. Students are presented with scenarios that require analysis, critical thinking, and the application of theoretical concepts and they are assessed based on their ability to perform verbal presentations, viva voce examinations, identify and evaluate relevant information, propose solutions, and provide justifications for their choices. • **Online quizzes or interactive assessments**: Online quizzes or interactive assessments, reflective writing can be used through the Moodle platform, to create quizzes with various question formats. These assessments can be self-paced or timed, and immediate feedback can be provided to students. • **Classroom discussions and debates**: Students engage in classroom discussions and debates to assess their theoretical knowledge. Active participation is encouraged to hone their critical thinking skills by posing open-ended questions and facilitating dialogue. • **Peer and self-assessment**: Students are assigned to review and provide feedback on each other's work, encouraging them to critically evaluate their peers' understanding and provide constructive suggestions. **Final Exam (50%):** comprehensive final exam, to assess students' overall theoretical knowledge. These assessment covers a broader range of topics and learning outcomes from the entire program of study, to gauge the students' understanding and integration of knowledge across different areas.
Language	Greek / English