

Subject card

Subject name and code	Exercise physiology, PG_00154694						
Field of study	Medical Biology						
Date of commencement of studies	October 2025		Academic year of realisation of subject		2026/2027		
Education level	Master's studies		Subject group		Optional subject group Subject group related to scientific research in the field of study		
Mode of study	full-time studies		Mode of delivery		at the university		
Year of study	2		Language of instruction		Polish		
Semester of study	4		ECTS credits		2.0		
Learning profile	academic		Assessment form		credit		
Conducting unit							
Name and surname of lecturer (lecturers)	Subject supervisor		dr Mateusz Karnia				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	0.0	0.0	30.0	0.0	0.0	30
	E-learning hours included: 0.0						
	Additional information: Laboratory						
Learning activity and number of study hours	Learning activity	Participation in didactic classes included in study plan		Participation in consultation hours		Self-study	SUM
	Number of study hours	30		6.0		14.0	50
Subject objectives	1. Familiarising students with the biological mechanisms accompanying physical exertion and types of exercise loads, along with the adaptive changes in individual body systems as a result of physical exertion of varying intensity (adaptive changes as a result of sprint, strength, endurance training, etc.). 2. To familiarise students with the practical implementation of exercise tests using indirect and direct methods for exercises of varying intensity and characteristics. Translated with DeepL.com (free version)						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[BIOLMEDMU2_K02] is ready to recognize the importance of knowledge in solving cognitive and practical problems and to seek expert advice when having difficulty solving a problem on his own	The student is prepared to critically assess their knowledge in the field of exercise physiology, understands its importance in solving cognitive and practical problems, and is able to seek expert opinions when specialized interpretation of physical performance and physiological assessment results is required.	[SK1] oral statement/conversation/discussion
	[BIOLMEDMU2_W01] has an in-depth knowledge of scientific fields and disciplines relevant to medical biology and the studied specialty and knows their main development trends	The student has in-depth knowledge of exercise physiology, including the regulation of aerobic and anaerobic performance, adaptive responses of body systems to physical effort, and current research trends in medical biology related to the assessment and modulation of physical performance.	[SW4] test/exam - oral or written
	[BIOLMEDMU2_U04] is able to identify errors and omissions in practice	The student is able to identify methodological errors and procedural shortcomings in the performance of physical fitness tests and in the interpretation of exercise physiology assessment results.	[SU8] observation of student's independent or team work
	[BIOLMEDMU2_U01] can proficiently, but critically, use the scientific literature and databases necessary in the activities of medical biology and related disciplines	The student is able to critically use scientific literature and specialized databases in the field of exercise physiology to interpret physical performance test results and to understand exercise-induced adaptation mechanisms in medical biology.	[SU1] oral statement/conversation/discussion
Subject contents	Programme content 1. The concept of physical fitness, aerobic and anaerobic fitness, and selected factors determining their level. The concept of exercise tolerance and its physiological determinants. The concept of physical exercise, classification of exercise, sources of energy. Practical part: measurement, calculation and analysis of basic body composition components. Orthostatic test 2. Changes in oxygen uptake and circulatory parameters under the influence of exercise of varying intensity. Practical part: determination of maximum oxygen uptake according to the Astrand and Ryhming nomogram. Direct measurement of maximum oxygen uptake (exercise refusal test/ramp test). 3. Adaptive changes in the respiratory system under the influence of exercise of varying intensity and duration. Practical part: Determination of PWC 170, 150, 130 values. 4. Anaerobic exercise, the concept of power. Practical part: direct measurement of anaerobic capacity (WANT), indirect measurements of power. 5. Physiological basis of warm-up. Practical part: interval exercise, static exercise. 6. Fatigue and rest. Basic concepts, types, symptoms and causes of fatigue. Practical part: Harvard test, calculation of the restitution efficiency index. Long-term exercise at constant intensity. Translated with DeepL.com (free version) 7. Training as a process of adaptation to increasing loads. Adaptive changes in children and adults under the influence of endurance, strength and speed training. Practical part: Anaerobic threshold measurement method, conducting a field test. 8. Issues related to physical exertion in model organisms. Practical part: measurement of strength, coordination and endurance using rats and laboratory mice as examples.		
Prerequisites and co-requisites	Completed a course in animal and human physiology / general physiology.		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
		51.0%	100.0%

Recommended reading	Basic literature	- Górski J. Physiological basis of physical exercise, PZWL, Warsaw, 2008 - Physiological tests in the assessment of physical fitness, PWN, Warsaw, 2010
	Supplementary literature	- Materials (review papers in English and Polish) provided by the lecturer or suggested by students
	eResources addresses	
Example issues/ example questions/ tasks being completed		
Work placement	Not applicable	

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