STUDY MODULE PROGRAMME (SMP)

Module Code	B	580	M	004	Accredited until				Renewal date	
	Branch of Science		Progr.	Registr. №.						

Entitlement

Biology and Genetics of Skeletal Muscle

Prerequisites

Basic knowledge in Kinesitherapy (Physiotherapy), Sports Sciences, Biomedicine and/or Biology at the level of Bachelor i

Course (module) Learning Outcomes

№.	Learning Outcomes	Teaching / Learning Methods	Assessment Methods
1	to find and understand modern research ideas that are developed based on fundamental and applied interdisciplinary research and evidence-based practice.	Individual project, Literature analysis, One-to-one tutorials, Problem-based learning	Paper
2	To integrate knowledge generated by modern biomedical sciences and research methodology, forsee ways to solve relevant problems based on independent research.	Discussion, Group work, Scientific paper analysis, Seminar, Team project	Oral presentation, Scientific paper (text) analysis
3	To generate original ideas which could be be developed and defended under new conditions sa well as in the process of development of new interventions and technologies.	Case analysis (Case study), Interactive lecture, Literature analysis, Problem-based learning	Test
4	To develop new interventions ir innovations in kinesiotherapy, health promotion and sports training.	Interactive lecture, One-to-one tutorials, Small group tutorials	Examination

Main aim

To equip students with ability to apply knowledge about skeletal muscle biology and genetics in practise for rehabilitation, health promotion and sports.

Summary

The main aim of the model is to equip students with ability to apply knowledge about skeletal muscle biology and genetics in practise for rehabilitation, health promotion and sports. The module covers the following topics about skeletal muscles: (1) Muscle proteins ir contraction mechanism, (2) gene expression and translation as basis for adaptation to medical interventions and exercise training (3) metabolism, (4) maturation and ageing, (5) muscle strengthening mechanisms and technologies (6) Skeletal muscle damage and regeneration

Level of module

Level of programme		Subject group (under the regulation of the area)	Subject level
Cycle	Type		
Second	Master	Bendrojo universitetinio lavinimo	Deepening

Group under financial classification

Syllabus

№.	Sections and themes	Responsible lecturer
1.	Proteins, structure and contraction mechanism of skeletal muscles	
2.	Gene transcription and translations as basis for adaptation to interventions	
3.	Substrate and energy metabolism in skeletal muscles	
4.	Maturation and ageing of skeletal muscles	
5.	Mechanisms and technologies of strength training	

№.	Sections and themes	Responsible lecturer
6.	Damage of skeletal muscle and connective tissue	

Evaluation procedure of knowledge and abilities:

References

№.	Title	Edition in Lithuanian Sports University library		In Lithuanian Sports University bookstore	Number of ex. in the methodical cabinet of the depart.
		Pressmark	Number of exemplars		
1.	Kavitha Mukund, Shankar Subramaniam. Skeletal muscle: A review of molecular structure and function, in health and disease. Wiley Interdiscip Rev Syst Biol Med. 2020 Jan;12(1):e1462. doi: 10.1002/wsbm.1462. Epub 2019 Aug 13. Review.			No	
	Comment:Freely accesible: doi: 10.1002/wsbm.1462.				
2.	Egan B, Zierath JR. Exercise Metabolism and the Molecular Regulation of Skeletal Muscle Adaptation. Cell Metabolism 17, February 5, 2013 http://dx.doi.org/10.1016/j.cmet.2012.12.012			No	
	Comment:Freely accesiblle: http://dx.doi.org/10.1016/j.cmet.2012.12.012				
3.	Lars Larsson, Hans Degens, Meishan Li, Leonardo Salviati, Young il Lee, Wesley Thompson, James L. Kirkland, and Marco Sandri. SARCOPENIA: AGING-RELATED LOSS OF MUSCLE MASS AND FUNCTION. Physiol Rev 99: 427–511, 2019 Published November 14, 2018; doi:10.1152/physrev.00061.2017			No	
	Comment:Freely accesible: doi:10.1152/physrev.00061.2017				
4.	Romagnoli C., Pampaloni B. Brandi ML. Muscle endocrinology and its relation with nutrition. Aging Clinical and Experimental Research 2019 https://doi.org/10.1007/s40520-019-01188-5.			No	
	Comment:Freely Accessible: https://doi.org/10.1007/s40520-019-01188-5.				

Additional literature

№.	Title

Coordinating lecturer

Position	Degree, surname, name	Schedule №.
Professor		459

Subdivision

Entitlement	Code
	2001

Study module teaching form №. 1

Semester		Mode of studies	Structure				Total hours	Credits
			Theory	Seminars	Lab Works	Ind. work		
A	S	D	15	15	0	230	260	10

Languages of instruction:

Lithuanian	L	English	E	Russian	R	French	F	German	G	Other	Oth.

Plan of in-class hours

№. of Themes	Academic hours			№. of Themes	Academic hours		
	Theory	Seminars	Lab Works		Theory	Seminars	Lab Works
1.	2	2	0	4.	2	2	0
2.	3	3	0	5.	5	5	0
3.	2	2	0	6.	1	1	0
				Total:	15	15	0

Schedule of individual work tasks and their influence on final grade

	№. of syllabus	Total hours	Influence on grade, %	Week of presentment of task (*) and reporting (o) 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17-20
Literature analysis	1,2,3,4	60	15	* ... 0 (week 9)
Oral presentation	1,2,34	10	15	* ... 0 (week 11)
Test	70	70	20	* ... 0 (week 14)
Exam	5,6	90	50	* ... 0 (week 16)
Total:	-	230	100	

Study module teaching form №. ⎡2⎤

Semester		Mode of studies	Structure				Total hours	Credits
			Theory	Seminars	Lab Works	Ind. work		
A	S	N	15	15	0	230	260	10

Languages of instruction:

Lithuanian	L	English	E	Russian	R	French	F	German	G	Other	Oth.

Plan of in-class hours

№. of Themes	Academic hours			№. of Themes	Academic hours		
	Theory	Seminars	Lab Works		Theory	Seminars	Lab Works
1.	2	2	0	4.	2	2	0
2.	3	3	0	5.	5	5	0
3.	2	2	0	6.	1	1	0
				Total:	15	15	0

Schedule of individual work tasks and their influence on final grade

	№. of syllabus	Total hours	Influence on grade, %	Week of presentment of task (*) and reporting (o) 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17-20
Oral presentation	10	15	0	* ... 0 (week 3)
Test	70	20	0	* ... 0 (week 6)
Literature analysis	1,2,3,4	15	0	* ... 0 (week 14)
Exam	5,6	90	50	* ... 0 (week 16)
Total:	-	140	50	