



LITHUANIAN SPORTS UNIVERSITY

STUDY MODULE PROGRAMME (SMP)

Module Code	S	273	B	16S	Accredited until			Renewal date		
	Branch of Science		Progr.	Registr. №.						

Entitlement

Motor Control and Learning

Prerequisites

Anatomy and Physiology

Course (module) Learning Outcomes

№.	Learning Outcomes	Teaching / Learning Methods	Assessment Methods
1	Gain up-to-date knowledge and a clear understanding of muscles, nerves, motion control, neuromechanics and training, motion testing technologies	Discussion, Group work, Interactive lecture, Problem-based learning, Seminar	Mid-term examination
2	Will be able to creatively apply modern movement training technologies in practice	Discussion, Formal lecture, Group work, Reflection on action	Mid-term examination
3	Will be able to identify and analyze muscle, movement management and training processes	Case analysis (Case study), Group work	Directed private laboratory work
4	Will be able to organize and conduct research using modern methods of integrated movement training technologies	Laboratory classes	Laboratory notes and report
5	Will be able to check the validity and reliability of test methodologies and collect data using a variety of diagnostic methods using standardized procedures	Laboratory classes	Laboratory examination

Main aim

On the basis of the achievements of modern fundamental and applied movement science, to provide students with knowledge and skills: a) to analyse models, mechanisms and technologies of motor control, learning and development, b) to systematize the achievements of modern fundamental and applied interdisciplinary science, and carrying out applied research, to improve motor control and learning technologies / methodologies in practice.

Summary

Study module encompasses: a) mechanics of muscle contraction and relaxation; b) biomechanical and neurophysiological mechanisms, principles and patterns of motor control; c) neuromechanics of running, jumping, throwing and manipulative movements; d) motor learning theories as well patterns, principles and neuroplasticity of learning; e) research methodology of motor control and learning processes; f) application opportunities of fundamental research data in practice.

Level of module

Level of programme		Subject group (under the regulation of the area)
Cycle	Type	
First	Bachelor	

Group under financial classification

Syllabus

№.	Sections and themes	Responsible lecturer
1.	Introduction to motor control	
2.	Anatomy of motor control I	
3.	anatomy of motor control II	
4.	Models of motor control	
5.	Regularities and principles of motor control	
6.	Brain plasticity - the basis of learning I	
7.	Brain plasticity - the basis of learning I	

№.	Sections and themes	Responsible lecturer
8.	Learning Neuroscience I	
9.	Learning Neuroscience II	
10.	Basic principles of sensory movements	
11.	Stress	

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.	Skurvydas A. Judesių mokslas: metodologija, mokymas, valdymas, raumenys, sveikatinimas, treniravimas, reabilitacija // Kaunas, 2017.		50	Yes	
2.	Skurvydas A. Modernioji neuroreabilitacija: judesių valdymas ir proto treniruotė // Kaunas, LKKA, 2011.		50	Yes	
3.	Schmidt R.A., Lee T.D. Motor Control and Learning: A Behavioral Emphasis // Champaign, Illinois: HumanKinetics, 2008.		1	Yes	
4.	Wolpert, D.M., Diedrichsen, J., Flanagan, J.R. Principles of sensorimotor learning // Nat Rev Neurosci. 2011 7;12(12). IF: 29.5.			No	
5.	Franklin, D.W., Wolpert, D.M. Computational mechanisms of sensorimotor control // Neuron. 2011, 3;72(3):425-42. IF:14.9.			No	
6.	Diamond A, Lee K. Interventions shown to aid executive function development in children 4 to 12 years old // Science. 2011, 19;333(6045):959-64. Review. IF: 31.3.			No	

Additional literature

№.	Title
1.	Wolpert, D.M., Diedrichsen, J., Flanagan, J.R. Principles of sensorimotor learning // Nat Rev Neurosci. 2011 7;12(12). IF: 29.5
2.	Schiaffino, S., Reggiani C. Fiber types in mammalian skeletal muscles // Physiol Rev. 2011; 91(4):1447-531. IF: 28.
3.	Stergiou, N. Innovative Analyses of Human Movement. – Champaign, Illinois: Human Kinetics, 2004.
4.	Enoka, R. Neuromechanics of Human Movement // Champaign, Illinois: HumanKinetics, 2008.

Coordinating lecturer

Position	Degree, surname, name	Schedule №.
Associate Professor		195

Subdivision

Entitlement	Code
Department of Health Promotion and Rehabilitation	2006

Study module teaching form №. 1

Semester	Mode of studies	Structure				Total hours	Credits	
		Theory	Seminars	Lab Works	Ind. work			
A	S	D	30	30	0	200	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.	1	0	1	7.	3	0	3
2.	2	0	2	8.	3	0	3
3.	3	0	3	9.	3	0	3
4.	3	0	3	10.	3	0	3
5.	3	0	3	11.	3	0	3
6.	3	0	3				
				Total:	30	0	30

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
Mid-term examination	1-11	100	50	*															0	
Reporting for laboratory work	2-11	100	50	*															0	
Total:		-	200	100																

Study module teaching form №. 2

Semester	Mode of studies	Structure				Total hours	Credits
		Theory	Seminars	Lab Works	Ind. work		
A	S	N	30	30	0	200	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
				Total:	0	0	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
Mid-term examination	1-11	0	50	*															0	
Reporting for laboratory work	2-11	100	50	*															0	
Total:		-	100	100																

Study module teaching form №. 3

Semester	Mode of studies	Structure				Total hours	Credits
		Theory	Seminars	Lab Works	Ind. work		
A	S	D	30	30	0	200	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.	1	0	1	7.	3	0	3
2.	2	0	2	8.	3	0	3
3.	3	0	3	9.	3	0	3
4.	3	0	3	10.	3	0	3
5.	3	0	3	11.	3	0	3

№. of Themes	Academic hours			№. of Themes	Academic hours		
	Theory	Seminars	Lab Works		Theory	Seminars	Lab Works
6.	3	0	3				
				Total:	30	0	30

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				
Mid-term examination	1-11	100	50	*				0									0							0
Reporting for laboratory work	2-11	100	50	*																				0
Total:		-	200	100																				

Study module teaching form №. 4

Semester	Mode of studies	Structure				Total hours	Credits
		Theory	Seminars	Lab Works	Ind. work		
A	S	N	30	30	0	200	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.	1	0	1	7.	3	0	3
2.	2	0	2	8.	3	0	3
3.	3	0	3	9.	3	0	3
4.	3	0	3	10.	3	0	3
5.	3	0	3	11.	3	0	3
6.	3	0	3				
				Total:	30	0	30

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				
Mid-term examination	1-11	100	50	*				0									0							0
Reporting for laboratory work	2-11	100	50	*																				0
Total:		-	200	100																				