LITHUANIAN SPORTS UNIVERSITY

STUDY MODULE PROGRAMME (SMP)

Module Code	B	115	M	006	Accredited until	2020	06	01	Renewal date		
	Branch of Science		Progr.	Registr. №.							

Entitlement

Biomechanical Analysis of Sport Techniques

Prerequisites

Bachelor's degree

Course (module) Learning Outcomes

№.	Learning Outcomes	Teaching / Learning Methods	Assessment Methods
1	Develop a critical understanding of the theoretical basis of sport biomechanics analysis.	Discussion, Interactive lecture, Literature analysis, Seminar	Examination
2	Will be able to perform quantitative and qualitative analysis of sport performance biomechanics; critically evaluate techniques used in motion analysis;	Case analysis (Case study), Discussion, Laboratory classes, Practical exercises (tasks), Scientific paper analysis	Assignments, Control work, Laboratory notes and report
3	Will be able to plan, execute and present scientific research, apply a range of computer programs and computer devices and be familiar with modern electronic systems;	Case analysis (Case study), Discussion, Individual project, Scientific paper analysis, Seminar	Oral presentation, Paper
4	Will be able to evaluate information gathered to provide constructive feedback to coaches, athletes and researches for technique improvement and injury prevention.	Case analysis (Case study), Discussion, Seminar	Oral presentation

Main aim

This module aims to develop the students' ability to select techniques and assessment tools to define a study related to sports biomechanics; to classify and analyse different kinetic and kinematic variables; and to develop their experience in practical sport biomechanics, applications and diagnostic tools

Summary

The module is designed for various areas of professionals seeking access to modern biomechanics research methods applicable to sports by analyzing athletes' performance, wishing learn how to perform different sports techniques biomechanical analysis, to deliver data analysis for athletes and coaches, provide guidance for improving the athlete's technique and biomechanical research methods.

Level of module

Level of programme		Subject group (under the regulation of the area)	Subject level
Cycle	Type		
Second	Master	Mokslo srities pagrindų	

Group under financial classification

Syllabus

№.	Sections and themes	Responsible lecturer
1.	Biomechanics of sport injury prevention.	303 doc. dr. Danguolė Satkunskienė
1.1	Static and dynamic posture and joints alignment.	303 doc. dr. Danguolė Satkunskienė
1.2	Static and dynamic mechanical loads applied to the athletes'.	303 doc. dr. Danguolė Satkunskienė
1.3	Mechanical properties of soft tissues and injury prevention.	303 doc. dr. Danguolė Satkunskienė
2.	The Techniques for Biomechanical Analysis of Athletes'	303 doc. dr. Danguolė

№.	Sections and themes	Responsible lecturer
	performance.	Satkunskienė
2.1	Analysis of muscles activity (EMG).	787 dr. Marius Brazaitis
2.2	Techniques for Ground reaction force and foot pressure force analysis.	303 doc. dr. Danguolė Satkunskienė
3.	Biomechanical models to analyze sport performance.	303 doc. dr. Danguolė Satkunskienė
4.	Applications and practical examples in sport context.	303 doc. dr. Danguolė Satkunskienė
4.1	Golf	55 doc. dr. Gediminas Mamkus
4.2	Swimming	303 doc. dr. Danguolė Satkunskienė
4.3	Walking	303 doc. dr. Danguolė Satkunskienė
4.4	Jumping	303 doc. dr. Danguolė Satkunskienė
4.5	Running	303 doc. dr. Danguolė Satkunskienė

Evaluation procedure of knowledge and abilities:

Ten grade criterion scale and summative evaluation system are applied. The semester's individual work tasks are evaluated by grades; the final grade is given during the examination session while multiplying particular grades by the lever coefficient and summing up the products.

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.	PAYTON, C., & BARTLETT, R. (Eds.). (2007). Biomechanical evaluation of movement in sport and exercise: the British Association of Sport and Exercise Sciences guide. Routledge.	PDF		No	
	Comment:Free pdf format on the internet				
2.	CALDWELL, G., HAMILL, J., KAMEN, G., SAUNDERS N. WHITTLESEY, D. GORDON E. ROBERTSON. (2004) Research Methods in Biomechanics. Human Kinetics. Campaign, Illinois	612.7 Re-192	1	No	
3.	HAMILL, J., KNUTZEN, K.M. (2003). Biomechanical basis of human movement. USA: Williams & Wilkins.	612.76 Ha211	1	No	
4.	BARTLETT, R., & BUSSEY, M. (2013). Sports biomechanics: reducing injury risk and improving sports performance. Routledge.	PDF		No	
5.	O'Donoghue (2010) Research methods for sports performance analysis / Peter O'Donoghue. -- London : Routledge, 278 p. :	796.01 Od22	1	No	

Additional literature

№.	Title
1.	Lorimer, A.V. and Hume, P.A., 2016. Stiffness as a risk factor for achilles tendon injury in running athletes. Sports Medicine, 46(12), pp.1921-1938.
2.	Tam, N., Santos-Concejero, J., Coetzee, D. R., Noakes, T. D., & Tucker, R. (2017). Muscle co-activation and its influence on running performance and risk of injury in elite Kenyan runners. Journal of sports sciences, 35(2), 175-181.

№.	Title
3.	Suchomel, T.J., Lamont, H.S. and Moir, G.L., 2016. Understanding vertical jump potentiation: A deterministic model. Sports medicine, 46(6), pp.809-828.
4.	Gabbett, T.J., 2016. The training-injury prevention paradox: should athletes be training smarter and harder?. Br J Sports Med, pp.bjsports-2015.

Coordinating lecturer

Position	Degree, surname, name	Schedule №.
	Assoc. Prof. Dr. Danguolė Satkunskienė	303

Subdivision

Entitlement	Code
a	2005

Study module teaching form №. 1

Semester		Mode of studies	Structure				Total hours	Credits
			Theory	Seminars	Lab Works	Ind. work		
A	S	D	8	40	9	333	390	15

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	2	5	2	4.1	0	4	0
1.2	1	6	1	4.2	1	5	2
1.3	1	5	2	4.3	0	1	0
2.1	1	3	1	4.4	0	2	0
2.2	1	4	1	4.5	0	2	0
3.	1	3	0				
				Total:	8	40	9

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
Control work	1.1; 1.2; 4,3; 4.5	66	20	*			0													
Control work	1.3	66	20				*				0									
Control work	2	66	20								*		0							
Oral presentation	3,4	66	20											*					0	
Exam	1-4	69	20											*					0	
Total:	-	333	100																	