BIOMEDICAL ENGINEERING, 1st CYCLE (BACHELOR)
SCOPE OF DIPLOMA: DESIGN OF BIOMECHATRONIC DEVICES

		Hours					I						II						III						IV						V						VI						VII				
	Basic courses	**Total**	**W**	**C**	**L**	**P**	**W**	**C**	**L**	**P**	**E**	**ECTS**	**W**	**C**	**L**	**P**	**E**	**ECTS**	**W**	**C**	**L**	**P**	**E**	**ECTS**	**W**	**C**	**L**	**P**	**E**	**ECTS**	**W**	**C**	**L**	**P**	**E**	**ECTS**	**W**	**C**	**L**	**P**	**E**	**ECTS**	**W**	**C**	**L**	**P**	**ECTS**
1	Physical Education	60		60				30						30																															
2	Foreign Language	120		120				30				2		30				2		30				2		30			E	2															
3	Techniques And Tools For Communication	30	15	15			15	15				3																																	
4	Introduction To Entrepreneuship	30	30										30					2																											
5	Intellectual Property Protection	15	15																15					1																					
6	Mathematics For Engineers	30		30				30				3																																	
7	Mathematics	150	60	90									30	60			E	7	30	30			E	4																					
8	Informatics And Basics Of Programming	30	10		20		10		20			3																																	
9	Engineering Graphics	30			30				30			3																																	
10	Fundamentals Of Biomedical Engineering module I	60	20		40		20		40		E	6																																	
11	Fundamentals Of Biomedical Engineering module II	45	15		30		15		30		E	5																																	
12	Physics	105	30	60	15									30				3	15	30				4	15		15			3															
13	Chemistry	25	10		15		10		15			3																																	
14	Introduction to Anatomy and Physiology	20	20																20					1																					
15	Biomedical Data	60			60										60		E	5																											
16	Engineering Technologies In Medicine And Sports	60	30		30								30		30		E	5																											
17	Iintroduction To Problem Based Learning	45				45										45		6																											
18	Elective Course UBZO	150	150										30					2	30					2	30					2	30					2	30					2					
19	Practice																																			4									
20	Bachelor Project	45				45																																					45	15
	DESIGN OF BIOMECHATRONIC DEVICES	**1110**	**405**	**375**	**240**	**90**	**70**	**105**	**135**			**28**	**120**	**150**	**90**	**45**		**32**	**110**	**90**				**14**	**45**	**30**	**15**			**7**	**30**					**2**	**30**					**6**				**45**	**15**
M1	**Basics of Mechanical Engineering**																																												
1	Mechanics	60	30			30													30			30	E	5																					
2	Strength of Materials	75	15		30	30																			15		30	30	E	6														
3	Multibody Dynamics	45	15		30																										15		30			4									
M2	**Engineering Design**																																												
4	Construction record	30			30																30			2																					
5	Design and optimization of medical equipment	60	15			45																			15			45		4														
6	Basics of machine construction	90	30			60													15			15		3	15			30	E	4				15		2								
7	Computer-Aided Design	30			30																						30			2														
8	Fundamentals of Materials Science	30	15		15														15		15			2																					
9	Certification of Medical Devices	45	15			30																									15			30		2									
M3	**Applied Biomechanics**																																												
10	Structure and Functions of the Human Musculoskeletal System	45	30			15																			30			15		3														
11	Engineering Biomechanics	60	30		30																				30		30			4														
12	Movement Analysis of Living Organisms	60	15		45																																15		45			4			
13	Sports Biomechanics	45	15		30																																15		30		E	3			
14	Biomechanics of Sports Injuries	45	15			30																									15			30		2									
15	Modeling and Identification of Loads in the Human Musculoskeletal System	45	15		30																																						15		30		3
M4	**Engineering Calculations**																																												
16	Engineering Calculations and Optimization Methods	45	15		30														15		30			4																					
17	Research Methodology and Statistical Analysis of Biomedical Data	45	15		30																																15		30			3			
M5	**Modern Technologies Supporting Rehabilitation and Sport**																																												
18	Modern Methods of Physiotherapy in the Treatment of Diseases and Dysfunctions of the Musculoskeletal System	45	15		30																										15		30		E	4									
19	Engineering Assistance in the Selection and Design of Orthopedic Equipment	45	15		30																																						15		30		3
20	Medical Robots	45	15			30																																					15			30	2
21	Computer-Aided Systems for Diagnosing and Treatment the Human Musculoskeletal System	45	15		30																																						15		30		2
22	Engineering Support for Manual Therapy, Speech Therapy and Oligophrenopedagogics	45	15		30																																15		30			3			
M6	**Control Systems for Biomechatronic Devices**																																												
23	Biomedical Signals Processing	30			30																												30			2									
24	Fundamentals of Programming of Biomechatronic Devices	60	15		45																										15		45		E	5									
M7	**Computer Systems for Design and Engineering Analysis**																																												
25	CAD/CAM Engineering Support Systems	90			90																												45			4			45		E	3			
26	CAS Systems	45			45																												45			3									
27	Reverse Engineering and CAE Systems	60			60																																		60			3			
M8	**Virtual Reality Technologies in Biomechatronics**																																												
28	Basics of Spatial Modeling in Virtual Reality	90	15		75																																15		30			3		45		3
29	Modeling in the Virtual Reality Environment	60			60																																		30			2		30		2
		1515	**390**		**855**	**270**													**75**		**75**	**45**		**16**	**105**		**90**	**120**		**23**	**75**		**225**	**75**		**28**	**75**		**300**			**24**	**60**		**165**	**30**	**15**
	Total	**2625**	**795**	**375**	**1095**	**360**	**70**	**105**	**135**			**28**	**120**	**150**	**90**	**45**		**32**	**185**	**90**	**75**	**45**		**30**	**150**	**30**	**105**	**120**		**30**	**105**		**225**	**75**		**30**	**105**		**300**			**30**	**60**		**165**	**75**	**30**
		Total/Hours per week							**310**			**21**			**405**			**27**			**395**			**26**			**405**			**27**			**405**			**27**			**405**			**27**		**300**			**20**

Programme valid from the academic year: 2026/2027