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	8	30	30			E	3																					
8	Informatics And Basics Of Programming	**30**	**10**		**20**		10		20		E	3																																	
9	Engineering Graphics	**30**			**30**				30			3																																	
10	Fundamentals Of Biomedical Engineering	**120**	**40**		**80**		40		80		E	14																																	
11	Physics	**105**	**30**	**60**	**15**									30				2	15	30				3	15		15			5															
12	Introduction to Anatomy and Physiology	**30**		**30**																30				2																					
13	Biomedical Data	**60**			**60**										60		E	5																											
14	Engineering Technologies In Medicine And Sports	**60**	**30**		**30**								30		30		E	5																											
15	Iintroduction To Problem Based Learning	**45**				**45**										45		6																											
16	Elective Course	**150**	**150**										30					2	30					2	30					2	30					2	30					2					
17	Practice																																										4				
18	Bachelor Project	**45**				**45**																																						45	15
	DESIGN OF BIOMECHATRONIC DEVICES	**1110**	**380**	**405**	**235**	**90**	**65**	**105**	**130**			**28**	**120**	**150**	**90**	**45**		**32**	**90**	**120**				**13**	**45**	**30**	**15**			**9**	**30**					**2**	**30**					**6**				**45**	**15**
M1	**Basics of Mechanical Engineering**																																												
1	Mechanics	**60**	**30**			**30**													30			30	E	6																					
2	Strength of Materials	**75**	**15**		**30**	**30**																			15		30	30	E	5															
3	Multibody Dynamics	**45**	**15**		**30**																										15		30			4									
M2	**Engineering Design**																																												
4	Zapis konstrukcji	**30**			**30**																30			3																					
5	Design and optimization of medical equipment	**60**	**15**			**45**																			15			45		4															
6	Basics of machine construction	**90**	**30**			**60**													15			15		2	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		2															
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**		**17**	**105**		**90**	**120**		**21**	**75**		**225**	**75**		**28**	**75**		**300**			**24**	**60**		**165**	**30**	**15**
	Total	**2625**	**770**	**405**	**1090**	**360**	**65**	**105**	**130**			**28**	**120**	**150**	**90**	**45**		**32**	**165**	**120**	**75**	**45**		**30**	**150**	**30**	**105**	**120**		**30**	**105**		**225**	**75**		**30**	**105**		**300**			**30**	**60**		**165**	**75**	**30**
		Total/Hours per week					**300**					**20**	**405**					**27**	**405**					**27**	**405**					**27**	**405**					**27**	**405**					**27**	**300**				**20**

Programme valid from the academic year: 2023/2024