Kazimierz Pulaski University of Technology and Humanities

STUDY PLAN No. .....

Field of study: **Mechanical Engineering** **2023/2024**

Field of specialisation: **1. Computer aided engineering**
2. Designing and manufacturing machines

Educational level: *first-cycle studies*
Qualification level (PRK): *6*
Education profile: *general academic*
Science discipline: *engineering mechanics - 100%*
Code ISCED: *0715*
Mode of study: *full-time studies*
Professional title awarded to graduates: *engineer*

No.	Subject name	Examination after sem.	Credit after sem.	Hours: Sum – Didactic classes	Hours including: Form of didactic classes L	C	Lab	P	S	other IGK	ZBN	ECTS	I year, I semester L	C	Lab	P	S	ECTS	I year, II semester L	C	Lab	P	S	ECTS
	A. Group of basic science subjects																							
	A. Group of basic classes																							
1	Mathematics	2	1.2	150	60	90	0	0	0	10	140	12	30	45				6	30	45				6
2	Physics		2.3	90	30	30	30	0	0	10	100	8							30	30				5
3	Chemistry		1	30	15	0	15	0	0	2	68	4	15		15			4						
4	Engineering mechanics I	3	1,2,3	90	45	45	0	0	0	10	125	9	15	15				3	15	15				3
5	Strength of materials	3	3	90	30	30	30	0	0	10	75	7												
6	Fluid mechanics		3	45	15	15	15	0	0	5	50	4												
7	Fundamentals of Technical Thermodynamics	4	4	60	15	15	30	0	0	5	60	5												
	Razem grupa zajęć A			**555**	210	225	120	0	0	52	618	49	60	60	15	0	0	13	75	90	0	0	0	14
	B. Group of course subjects																							
	$B_{1.}$ Group of obligatory course core subject																							
1	Engineering graphics		1.2	105	30	0	75	0	0	10	60	7	15		30			3	15		45			4
2	Materials science		1.2	75	30	0	45	0	0	15	85	7	30		15			4			30			3
3	Theory of machines	1		30	30	0	0	0	0	2	18	2	30					2						
4	Environmental management and ecology		1	15	15	0	0	0	0	2	8	1	15					1						
5	Work safety and ergonomics		1	15	15	0	0	0	0	2	8	1	15					1						
6	Technologies of Industry 4.0		1	15	15	0	0	0	0	2	8	1	15					1						
7	Experiment theory		2	30	0	0	0	30	0	2	18	2											30	2
8	3D CAD systems		2	30	0	0	30	0	0	10	23	2.5									30			2.5
9	Manufacturing engineering		2.3	75	30	0	45	0	0	2	48	5							30		15			3
10	Metrology and measurement systems		3	45	30	0	15	0	0	3	40	3.5												
11	Electrical engineering and electronics	3	3	60	30	0	30	0	0	2	38	4												
12	Finite element method I		4	30	15	0	15	0	0	10	35	3												
13	Fundamentals of technical diagnostics		4	45	15	0	30	0	0	10	15	3												
14	Transmission system design		4	45	15	0	0	30	0	5	25	3												
15	Mechatronics and automatics		4	60	30	0	30	0	0	5	63	5												
16	Machine construction technology	4	4	45	30	0	15	0	0	5	38	3.5												
17	Fundamentals of machine design	5	4.5	135	60	15	0	60	0	15	150	12												
	$B_{2.}$ Group of optional course subject																							
	Sum of group B_2			**0**	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Sum of group B			**855**	390	15	330	120	0	102	680	65.5	120	0	45	0	0	12	45	0	120	30	0	14.5
	C. Field of specialisation module (choice 1 out of 2)																							
	C_{1A}. Group of course subject in the field Computer Aided Engineering - obligatory																							
1	Programming and numerical methods		5	30	15	0	0	15	0	2	18	2												
2	Elective project		5	30	0	0	0	30	0	2	18	2												
3	Kinematics and dynamics of multibody systems		5	45	15	0	30	0	0	2	28	3												
4	Mechanics of structures	5	5	75	30	30	15	0	0	2	48	5												
5	Mechanical vibration	5	5	60	30	0	0	30	0	5	35	4												
6	Computer aided design		5.6	90	30	0	30	30	0	10	50	6												
7	Finite element method II		5.6	60	15	0	45	0	0	5	35	4												
8	CAE systems in mechanics		5.6	60	0	0	60	0	0	5	35	4												
9	3D printing		6	45	15	0	15	15	0	2	28	3												
10	Computer Analysis of Structures	6	6	45	15	0	0	30	0	2	28	3												
11	Numerical modeling of heat-flow problems	6	6	45	15	0	30	0	0	2	28	3												
12	Industrial Controllers PLC		6	30	15	0	15	0	0	2	18	2												
13	Senior project		6	30	0	0	0	0	30	2	18	2												
14	Optimization of construction	7	7	45	15	0	0	30	0	2	28	3												
15	Embedded systems		7	45	15	0	30	0	0	2	28	3												
16	Numerical modeling of fluid - structure interaction		7	45	15	0	0	30	0	2	28	3												
17	Application of CAD/CAE systems		7	30	0	0	0	30	0	2	18	2												
	Sum of group C_{1A}			**810**	240	30	270	240	30	51	489	54	0	0				0	0	0	0			0
	C_{1B}. Group of course subject in the field Computer Aided Engineering - (choice 3 out of 5)																							
1	ERP systems		6	90	45	0	0	45	0	6	54	6												
2	System engineering		6	0	0	0	0	0	0			0												
3	Industrial robots		6	0	0	0	0	0	0			0												
4	Measurements and analysis of signals		6	0	0	0	0	0	0			0												
5	Reverse engineering		6	0	0	0	0	0	0			0												
	Sum of group C_{1B}			**90**	45	0	0	45	0	6	54	6	0	0				0	0	0	0			0
	Sum of group C_1			**900**	285	30	270	285	30	57	543	60	0	0				0	0	0	0			0
	C 2A. Group of course subject in the field Designing and manufacturing machines - obligatory																							
1	Special technologies	5	5	60	30	0	0	30	0	5	35	4												
2	Fundamentals of nanotechnology		5	30	15	0	15	0	0	2	18	2												
3	Dimensional analysis of the construction		5	30	15	15	0	0	0	2	18	2												
4	CNC machine tools	5	5	45	15	0	30	0	0	2	28	3												
5	Machining by cutting and cutting tools		5	30	15	0	15	0	0	2	18	2												
6	Measurement systems and uncertainty estimation		5	30	15	15	0	0	0	2	18	2												
7	Advanced solid modelling in CAD systems		5	30	0	0	30	0	0	2	18	2												
8	Design of energy devices		5	45	15	0	0	30	0	2	28	3												
9	Student's project		5	45	0	0	0	45	0	5	25	3												

No.	Subject name	II year, III semester L	C	Lab	P	S	ECTS	II year, IV semester L	C	Lab	P	S	ECTS	III year, V semester L	C	Lab	P	S	ECTS	III year, VI semester L	C	Lab	P	S	ECTS	IV year, VII semester L	C	Lab	P	S	ECTS
	A. Group of basic science subjects																														
	A. Group of basic classes																														
1	Mathematics																														
2	Physics			30			3																								
3	Chemistry																														
4	Engineering mechanics I	15	15				3																								
5	Strength of materials	30	30	30			7																								
6	Fluid mechanics	15	15	15			4																								
7	Fundamentals of Technical Thermodynamics							15	15	30			5																		
	Razem grupa zajęć A	60	60	75	0	0	17	15	15	30	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	B. Group of course subjects																														
	$B_{1.}$ Group of obligatory course core subject																														
1	Engineering graphics																														
2	Materials science																														
3	Theory of machines																														
4	Environmental management and ecology																														
5	Work safety and ergonomics																														
6	Technologies of Industry 4.0																														
7	Experiment theory																														
8	3D CAD systems																														
9	Manufacturing engineering			30			2																								
10	Metrology and measurement systems	30		15			3.5																								
11	Electrical engineering and electronics	30		30			4																								
12	Finite element method I							15		15			3																		
13	Fundamentals of technical diagnostics							15		30			3																		
14	Transmission system design							15			30	5	3																		
15	Mechatronics and automatics							30		30			5																		
16	Machine construction technology							30		15			3.5																		
17	Fundamentals of machine design							30	15		30		6	30			30		6												
	$B_{2.}$ Group of optional course subject																														
	Sum of group B_2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Sum of group B	60	0	75	0	0	9.5	135	15	90	60	0	23.5	30	0	0	30	0	6	0	0	0	0	0	0	0	0	0	0	0	0
	C. Field of specialisation module (choice 1 out of 2)																														
	C_{1A}. Group of course subject in the field Computer Aided Engineering - obligatory																														
1	Programming and numerical methods													15			15		2												
2	Elective project																30		2												
3	Kinematics and dynamics of multibody systems													15		30			3												
4	Mechanics of structures													30	30	15			5												
5	Mechanical vibration													30			30		4												
6	Computer aided design													15		30			3	15			30		3						
7	Finite element method II													15		15			2			30			2						
8	CAE systems in mechanics															30			2			30			2						
9	3D printing																			15		15	15		3						
10	Computer Analysis of Structures																			15			30		3						
11	Numerical modeling of heat-flow problems																			15		30			3						
12	Industrial Controllers PLC																			15		15			2						
13	Senior project																							30	2						
14	Optimization of construction																									15			30		3
15	Embedded systems																									15		30			3
16	Numerical modeling of fluid - structure interaction																									15			30		3
17	Application of CAD/CAE systems																												30		2
	Sum of group C_{1A}	0	0				0	0	0	0			0	120	30	120	75	0	23	75	0	120	75	30	20	45	0	30	90	0	11
	C_{1B}. Group of course subject in the field Computer Aided Engineering - (choice 3 out of 5)																														
1	ERP systems																			45			45		6						
2	System engineering																														
3	Industrial robots																														
4	Measurements and analysis of signals																														
5	Reverse engineering																														
	Sum of group C_{1B}	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	45	0	0	45	0	6	0	0			0	0
	Sum of group C_1	0	0				0	0	0	0			0	120	30	120	75	0	23	120	0	120	120	30	26	45	0	30	90	0	11
	C 2A. Group of course subject in the field Designing and manufacturing machines - obligatory																														
1	Special technologies													30			30		4												
2	Fundamentals of nanotechnology													15		15			2												
3	Dimensional analysis of the construction													15	15				2												
4	CNC machine tools													15		30			3												
5	Machining by cutting and cutting tools													15		15			2												
6	Measurement systems and uncertainty estimation													15	15				2												
7	Advanced solid modelling in CAD systems															30			2												
8	Design of energy devices													15			30		3												
9	Student's project																45		3												

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