PROGRAMME OF STUDIES

1. Description

Number of semesters: 7	*Number ECTS points necessary to obtain qualifications: 210*
Prerequisites: *The basis of the enrollment decision is an RECRUITING FACTOR. It is value depends on second level education certificate. RECRUITING FACTOR is a total of points for qualifying subjects (Mathematics, Physics, Polish, foreign language), calculated in accordance with rules adopted by the Senate.* *RECRUITING FACTOR threshold value depends on the number of candidates.*	*Upon completion of studies graduate obtains* *professional degree of: Bachelor (Engineer)* *1st level qualifications*
Possibility of continuing studies: 2nd level studies	*Graduate profile, employability:* *Graduate in the first level of studies in the field Control Engineering and Robotics has the knowledge in the field of computer science, automatic control, robotics, signal analysis, computation algorithms, and decision-making algorithms. Has the ability to use automation systems, adequate hardware, and professional engineering software. The Graduate is prepared for operation, commissioning, automation and robotics system design in various industrial applications. He can be employed in the electrical industry, electronics, chemical, metallurgy, food processing and environment related industries. Graduates are prepared to enroll in second level studies.*
Indicate connection with University's mission and its development strategy: *The knowledge acquired during studies will not only guarantee a successful professional career but also shape a human with enterprising spirit, welcoming new challenges.*	

2. Fields of science and scientific disciplines to which educational effects apply:

sicence field: technical sciences, science discipline: Control Engineering and Robotics

3. Concise analysis of consistency between assumed educational effects and labour market needs:

Current needs of the labor market are related to the characteristics of industries. Considerably high proliferation of automation robots is typical for various industries. Graduates in the field Automation and Robotics are trained to operate and program automatic control systems uncounted in various industrial processes, with particular emphasis on machinery automation, vehicles automation, electrical power engineering systems and apparatus.

4. List of education modules:

4.1. List of obligatory modules

4.1.1. List of general education modules

4.1.1.1. Liberal-managerial subjects module

No.	Course code	Name of course	Weekly number of hours					Field-of-study educational effect symbol	Number of hours		Number of ECTS points		Form of course	Way of creditin g	Course			
			lec	cl	lab	pr	sem		ZZU	CNPS	total	BK classes			university-wide	practical	kind	type

4.1.1.2. Foreign languages module

No.	Course code	Name of course	Weekly number of hours					Field-of-study educational effect symbol	Number of hours		Number of ECTS points		Form of course	Way of creditin g	Course			
			lec	cl	lab	pr	sem		ZZU	CNPS	total	BK classes			university-wide	practical	kind	type

4.1.1.3. Sporting classes module

No.	Course code	Name of course	Weekly number of hours					Field-of-study educational effect symbol	Number of hours		Number of ECTS points		Form of course	Way of creditin g	Course			
			lec	cl	lab	pr	sem		ZZU	CNPS	total	BK classes			university-wide	practical	kind	type

4.1.1.4. Information technologies module

No.	Course code	Name of course	Weekly number of hours					Field-of-study educational effect symbol	Number of hours		Number of ECTS points		Form of course	Way of creditin g	Course			
			lec	cl	lab	pr	sem		ZZU	CNPS	total	BK classes			university-wide	practical	kind	type
1	INR042501W	Computer technology	1					K1AiR_W11 K1AiR_K04	15	30	1	0,7	T	Z			KO	OB
2	INR042501L	Computer technology			1			K1AiR_U09 K1AiR_K04	15	30	1	0,7	T	Z		P	KO	OB
		Total	1	0	1	0	0		30	60	2	1,4						

Altogether for general education modules

Total number of hours					Total number of ZZU hours	Total number of CNPS hours	Total number of ECTS points	Number of ECTS points
lec	cl	lab	pr	sem				
1	0	1	0	0	30	60	2	1,4

4.1.2. List of basic sciences modules

4.1.2.1. Mathematics module

No.	Course code	Name of course	Weekly number of hours					Field-of-study educational effect symbol	Number of hours		Number of ECTS points		Form of course	Way of crediting	Course			
			lec	cl	lab	pr	sem		ZZU	CNPS	total	BK classes			university-wide	practical	kind	type
1	ARR042104W	Numerical methods	1					K1AiR_W35 K1AiR_K04 K1AiR_K05	15	30	1	0,7	T	Z			PD	OB
2	ARR042104P	Numerical methods				2		K1AiR_U31 K1AiR_K04 K1AiR_K05	30	60	2	1,4	T	Z		P	PD	OB
3	MAT001409W	Algebra and analytic geometry A	2					K1AiR_W01 K1AiR_K03 K1AiR_K07	30	60	2	1,4	T	E	O		PD	OB
4	MAT001409C	Algebra and analytic geometry A		1				K1AiR_U01 K1AiR_K03 K1AiR_K07	15	60	2	1,4	T	Z	O	P	PD	OB
5	MAT001416W	Mathematical Analysis 1.1 A	2					K1AiR_W02 K1AiR_K03 K1AiR_K07	30	150	5	3,5	T	E	O		PD	OB
6	MAT001416C	Mathematical Analysis 1.1 A		2				K1AiR_U02 K1AiR_K03 K1AiR_K07	30	90	3	2,1	T	Z	O	P	PD	OB
7	MAT001423W	Mathematical Analysis 2.1 A	2					K1AiR_W03 K1AiR_K03 K1AiR_K07	30	120	4	2,8	T	E	O		PD	OB
8	MAT001423C	Mathematical Analysis 2.1 A		2				K1AiR_U03 K1AiR_K03 K1AiR_K07	30	90	3	2,1	T	Z	O	P	PD	OB
9	MAT001500W	Ordinary differential equations A	2					K1AiR_W04 K1AiR_K01	30	90	3	2,1	T	Z	O		PD	OB
10	MAT001501W	Applied statistics	2					K1AiR_W05 K1AiR_K01	30	90	3	2,1	T	Z	O		PD	OB
		Total	11	5	0	2	0		270	840	28	19,6						

4.1.2.2. Physics module

No.	Course code	Name of course	Weekly number of hours					Field-of-study educational effect symbol	Number of hours		Number of ECTS points		Form of course	Way of crediting	Course			
			lec	cl	lab	pr	sem		ZZU	CNPS	total	BK classes			university-wide	practical	kind	type
1	FZP003067W	Physics E5	2					K1AiR_W06 K1AiR_K04	30	120	4	2,8	T	E	O		PD	OB
2	FZP003067C	Physics E5		1				K1AiR_U04 K1AiR_K04	15	30	1	0,7	T	Z	O	P	PD	OB
3	FZP003068W	Physics G5	2					K1AiR_W07	30	120	4	2,8	T	E	O		PD	OB
4	FZP003068L	Physics G5			1			K1AiR_U04 K1AiR_U05 K1AiR_K09	15	30	1	0,7	T	Z	O	P	PD	OB
		Total	4	1	1	0	0		90	300	10	7						

4.1.2.3. Chemistry module

No.	Course code	Name of course	Weekly number of hours					Field-of-study educational effect symbol	Number of hours		Number of ECTS points		Form of course	Way of crediting	Course			
			lec	cl	lab	pr	sem		ZZU	CNPS	total	BK classes			university-wide	practical	kind	type

4.1.2.4. Computer science module

No.	Course code	Name of course	Weekly number of hours					Field-of-study educational effect symbol	Number of hours		Number of ECTS points		Form of course	Way of crediting	Course			
			lec	cl	lab	pr	sem		ZZU	CNPS	total	BK classes			university-wide	practical	kind	type
1	ARR041303W	Computer networks	1					K1AiR_W11 K1AiR_W12 K1AiR_W14	15	30	1	0,7	T	Z			PD	OB
2	ARR041303L	Computer networks			1			K1AiR_U09 K1AiR_U10 K1AiR_U12 K1AiR_K01	15	30	1	0,7	T	Z		P	PD	OB
3	ARR042502W	Programming in the C language	2					K1AiR_W12	30	60	2	1,4	T	Z			PD	OB
4	ARR042502L	Programming in the C language			2			K1AiR_U10 K1AiR_K04	30	60	2	1,4	T	Z		P	PD	OB
5	ARR043204W	Programming in MATLAB	1					K1AiR_W13	15	60	2	1,4	T	Z			PD	OB
6	ARR043204L	Programming in MATLAB			2			K1AiR_U11 K1AiR_K03 K1AiR_K04 K1AiR_K05	30	60	2	1,4	T	Z		P	PD	OB
		Total	4	0	5	0	0		135	300	10	7						

Altogether for basic sciences modules

Total number of hours					Total number of ZZU hours	Total number of CNPS hours	Total number of ECTS points	Number of ECTS points
lec	cl	lab	pr	sem				
19	6	6	2	0	495	1440	48	33,6

4.1.3. List of main-field-of-study modules

4.1.3.1. Obligatory main-field-of-study module

No.	Course code	Name of course	Weekly number of hours					Field-of-study educational effect symbol	Number of hours		Number of ECTS points		Form of course	Way of crediting	Course			
			lec	cl	lab	pr	sem		ZZU	CNPS	total	BK classes			university-wide	practical	kind	type
1	ARE009001W	Basics of robotics	2					K1AiR_W33 K1AiR_K04	30	60	2	1,4	T	Z			K	OB
2	ARE009001L	Basics of robotics			1			K1AiR_U29 K1AiR_K04	15	30	1	0,7	T	Z		P	K	OB
3	ARR041201W	Fundamentals of Materials Engineering	2					K1AiR_W08 K1AiR_K03	30	60	2	1,4	T	Z			K	OB
4	ARR041201L	Fundamentals of Materials Engineering			1			K1AiR_U04 K1AiR_U05 K1AiR_U06 K1AiR_K03	15	30	1	0,7	T	Z		P	K	OB
5	ARR041302W	Electric circuits	2					K1AiR_W17	30	90	3	2,1	T	E			K	OB
6	ARR041302C	Electric circuits		2				K1AiR_U15 K1AiR_K01 K1AiR_K04	30	90	3	2,1	T	Z		P	K	OB
7	ARR041304W	Electrical and Magnetic Circuits	3					K1AiR_W16 K1AiR_W17 K1AiR_W18	45	150	5	3,5	T	E			K	OB
8	ARR041304C	Electrical and Magnetic Circuits		1				K1AiR_U15 K1AiR_U16 K1AiR_K03	15	60	2	1,4	T	Z		P	K	OB
9	ARR041308W	Digital signal processing 1	1					K1AiR_W32 K1AiR_K04	15	30	1	0,7	T	Z			K	OB
10	ARR041311P	Digital signal processing 2				2		K1AiR_U28 K1AiR_K03 K1AiR_K05	30	60	2	1,4	T	Z		P	K	OB
11	ARR041312W	Fundamentals of electrical engineering	2					K1AiR_W16 K1AiR_K04	30	90	3	2,1	T	Z			K	OB
12	ARR041312C	Fundamentals of electrical engineering		1				K1AiR_U14 K1AiR_K04	15	60	2	1,4	T	Z		P	K	OB
13	ARR042101W	Fundamentals of control engineering 1	2					K1AiR_W23	30	120	4	2,8	T	E			K	OB
14	ARR042101C	Fundamentals of control engineering 1		2				K1AiR_U21 K1AiR_K05	30	60	2	1,4	T	Z		P	K	OB
15	ARR042102W	Fundamentals of control engineering 2	2					K1AiR_W23	30	90	3	2,1	T	E			K	OB
16	ARR042102C	Fundamentals of control engineering 2		1				K1AiR_U21 K1AiR_K05	15	30	1	0,7	T	Z		P	K	OB
17	ARR042102L	Fundamentals of control engineering 2			2			K1AiR_U21 K1AiR_K05	30	60	2	1,4	T	Z		P	K	OB
18	ARR042103W	Methods and Algorithms of Digital Control Systems	2					K1AiR_W23 K1AiR_W31 K1AiR_K03	30	60	2	1,4	T	Z			K	OB
19	ARR042103L	Methods and Algorithms of Digital Control Systems			1			K1AiR_U11 K1AiR_U28 K1AiR_U27 K1AiR_K03	15	60	2	1,4	T	Z		P	K	OB
20	ARR042301W	Electrical Devices and Power Substations	2					K1AiR_W24 K1AiR_K01	30	60	2	1,4	T	Z			K	OB
21	ARR042401W	Electrical safety	1					K1AiR_W36 K1AiR_K03	15	30	1	0,7	T	Z			K	OB
22	ARR042401L	Electrical safety			1			K1AiR_U32 K1AiR_K03	15	30	1	0,7	T	Z		P	K	OB

23	ARR042503W	Electric power systems	2					K1AiR_W15 K1AiR_W25 K1AiR_K05	30	60	2	1,4	T	Z			K	OB
24	ARR043101W	Engineering graphics	1					K1AiR_W09	15	60	2	1,4	T	Z			K	OB
25	ARR043101L	Engineering graphics			2			K1AiR_U07 K1AiR_K01	30	60	2	1,4	T	Z		P	K	OB
26	ARR043102W	Electrical machines 1	2					K1AiR_W26 K1AiR_K03	30	90	3	2,1	T	E			K	OB
27	ARR043103L	Electrical machines 2			2			K1AiR_U22 K1AiR_K06	30	60	2	1,4	T	Z		P	K	OB
28	ARR043202W	Programmable Logic Controllers	1					K1AiR_W30 K1AiR_K03	15	30	1	0,7	T	Z			K	OB
29	ARR043202L	Programmable Logic Controllers			2			K1AiR_U26 K1AiR_K03	30	60	2	1,4	T	Z		P	K	OB
30	ARR043205W	Electrical Drive 1	2					K1AiR_W27	30	90	3	2,1	T	E			K	OB
31	ARR043205C	Electrical Drive 1		1				K1AiR_U23 K1AiR_K03	15	60	2	1,4	T	Z		P	K	OB
32	ARR043206W	Power electronics 1	2					K1AiR_W28 K1AiR_K01	30	60	2	1,4	T	Z			K	OB
33	ARR043207L	Electrical Drive 2			2			K1AiR_U23 K1AiR_K03 K1AiR_K04	30	30	1	0,7	T	Z		P	K	OB
34	ARR043208L	Power electronics 2			2			K1AiR_U24 K1AiR_K05	30	30	1	0,7	T	Z		P	K	OB
35	ARR043209W	Drives of robots and machine tools	2					K1AiR_W34	30	30	1	0,7	T	Z			K	OB
36	ARR043209L	Drives of robots and machine tools			1			K1AiR_U30 K1AiR_K02 K1AiR_K03	15	30	1	0,7	T	Z		P	K	OB
37	ARR043238W	Fundamentals of microprocessors 1	1					K1AiR_W29 K1AiR_K03	15	60	2	1,4	T	Z			K	OB
38	ARR043238L	Fundamentals of microprocessors 1			1			K1AiR_U25 K1AiR_K03	15	30	1	0,7	T	Z		P	K	OB
39	ARR043239L	Fundamentals of microprocessors 2			2			K1AiR_U25 K1AiR_K03	30	60	2	1,4	T	Z		P	K	OB
40	ARR043301W	Basics of Metrology	2					K1AiR_W19	30	90	3	2,1	T	Z			K	OB
41	ARR043301L	Basics of Metrology			1			K1AiR_U05 K1AiR_U17 K1AiR_K05	15	60	2	1,4	T	Z		P	K	OB
42	ARR043302W	Basics of Electronics 1	2					K1AiR_W20 K1AiR_K01	30	60	2	1,4	T	Z			K	OB
43	ARR043303L	Basics of Electronics 2			2			K1AiR_U18 K1AiR_K03	30	60	2	1,4	T	Z		P	K	OB
44	ARR043304W	Sensors and Transducers	1					K1AiR_W21 K1AiR_K03	15	60	2	1,4	T	E			K	OB
45	ARR043304L	Sensors and Transducers			1			K1AiR_U19 K1AiR_K03	15	30	1	0,7	T	Z		P	K	OB
46	ARR043305W	Industrial Measurement	2					K1AiR_W22 K1AiR_K02	30	90	3	2,1	T	E			K	OB
47	ARR043305L	Industrial Measurement			2			K1AiR_U20 K1AiR_K02	30	60	2	1,4	T	Z		P	K	OB
48	MMM012014W	Mechanics and strength of materials	2					K1AiR_W10 K1AiR_K01	30	60	2	1,4	T	Z			K	OB
49	MMM012014C	Mechanics and strength of materials		1				K1AiR_U08 K1AiR_K01	15	30	1	0,7	T	Z		P	K	OB
		Total	43	9	26	2	0		1200	2910	97	67,9						

Altogether for main-field-of-study modules

Total number of hours					Total number of ZZU hours	Total number of CNPS hours	Total number of ECTS points	Number of ECTS points
lec	cl	lab	pr	sem				
43	9	26	2	0	1200	2910	97	67,9

4.2. List of optional modules

4.2.1. List of general education modules

4.2.1.1. Liberal-managerial subjects module

No.	Course code	Name of course	Weekly number of hours					Field-of-study educational effect symbol	Number of hours		Number of ECTS points		Form of course	Way of crediting	Course			
			lec	cl	lab	pr	sem		ZZU	CNPS	total	BK classes			university-wide	practical	kind	type
1	FLH050811W	Engineering Ethics	1					K1AiR_W37 K1AiR_K02	15	30	1	0,7	T	Z	O		KO	W
2	FLH051511W	Philosophy of science and technology	1					K1AiR_W37 K1AiR_K02	15	30	1	0,7	T	Z	O		KO	W
3	FLH052011W	Philosophy	1					K1AiR_W37 K1AiR_K02	15	30	1	0,7	T	Z	O		KO	W
4	FLH052111W	Theory of knowledge	1					K1AiR_W37 K1AiR_K02	15	30	1	0,7	T	Z	O		KO	W
5	PRH051311W	Legal and ethical aspects of the work of an engineer	1					K1AiR_W39 K1AiR_K10	15	30	1	0,7	T	Z	O		KO	W
6	PRH051911W	Intellectual Property Law	1					K1AiR_W39 K1AiR_K10	15	30	1	0,7	T	Z	O		KO	W
7	PRR041206W	Protection of intellectual property	1					K1AiR_W39 K1AiR_K10	15	30	1	0,7	T	Z	O		KO	W
8	PRR041207W	Protection of intellectual property in engineering activity	1					K1AiR_W39 K1AiR_K10	15	30	1	0,7	T	Z	O		KO	W
9	PRR041208W	Patent and copyright	1					K1AiR_W39 K1AiR_K10	15	30	1	0,7	T	Z	O		KO	W
10	PSH050611S	The basis of negotiations					1	K1AiR_U35 K1AiR_K09	15	60	2	1,4	T	Z	O	P	KO	W
11	PSH050711S	Selfpresentation					1	K1AiR_U35 K1AiR_K09	15	60	2	1,4	T	Z	O	P	KO	W
12	PSH050911S	Self among others					1	K1AiR_U35 K1AiR_K09	15	60	2	1,4	T	Z	O	P	KO	W
13	ZMR042507W	Management bases	1					K1AiR_W38 K1AiR_K02 K1AiR_K04	15	30	1	0,7	T	Z	O		KO	W
14	ZMR042508W	Marketing management	1					K1AiR_W38 K1AiR_K02 K1AiR_K04	15	30	1	0,7	T	Z	O		KO	W
15	ZMR042509W	Management in the conditions of globalization and regionalization	1					K1AiR_W38 K1AiR_K02 K1AiR_K04	15	30	1	0,7	T	Z	O		KO	W
		Total	3	0	0	0	1		60	150	5	3,5						

4.2.1.2. Foreign languages module

No.	Course code	Name of course	Weekly number of hours					Field-of-study educational effect symbol	Number of hours		Number of ECTS points		Form of course	Way of crediting	Course			
			lec	cl	lab	pr	sem		ZZU	CNPS	total	BK classes			university-wide	practical	kind	type
1	JZL100707BKC	Foreign language B2 or C1		4				K1AiR_U33 K1AiR_K01 K1AiR_K08	60	60	2	1,4	T	Z	O	P	KO	W
2	JZL100708BKC	Foreign language B2 or C1		4				K1AiR_U33 K1AiR_K01 K1AiR_K08	60	90	3	2,1	T	Z	O	P	KO	W
		Total	0	8	0	0	0		120	150	5	3,5						

4.2.1.3. Sporting classes module

No.	Course code	Name of course	Weekly number of hours					Field-of-study educational effect symbol	Number of hours		Number of ECTS points		Form of course	Way of crediting	Course			
			lec	cl	lab	pr	sem		ZZU	CNPS	total	BK classes			university-wide	practical	kind	type
1	WFW000000BKC	Sporting classes		2				K1AiR_K08	30	30	0	0	T	Z	O	P	KO	W
		Total	0	2	0	0	0		30	30	0	0						

4.2.1.4. Information technologies module

No.	Course code	Name of course	Weekly number of hours					Field-of-study educational effect symbol	Number of hours		Number of ECTS points		Form of course	Way of crediting	Course			
			lec	cl	lab	pr	sem		ZZU	CNPS	total	BK classes			university-wide	practical	kind	type

Altogether for general education modules

Total number of hours					Total number of ZZU hours	Total number of CNPS hours	Total number of ECTS points	Number of ECTS points
lec	cl	lab	pr	sem				
3	10	0	0	1	210	330	10	7

4.2.2. List of basic sciences modules

4.2.2.1. Mathematics module

No.	Course code	Name of course	Weekly number of hours					Field-of-study educational effect symbol	Number of hours		Number of ECTS points		Form of course	Way of creditin g	Course			
			lec	cl	lab	pr	sem		ZZU	CNPS	total	BK classes			university-wide	practical	kind	type

4.2.2.2. Physics module

No.	Course code	Name of course	Weekly number of hours					Field-of-study educational effect symbol	Number of hours		Number of ECTS points		Form of course	Way of creditin g	Course			
			lec	cl	lab	pr	sem		ZZU	CNPS	total	BK classes			university-wide	practical	kind	type

4.2.2.3. Chemistry module

No.	Course code	Name of course	Weekly number of hours					Field-of-study educational effect symbol	Number of hours		Number of ECTS points		Form of course	Way of creditin g	Course			
			lec	cl	lab	pr	sem		ZZU	CNPS	total	BK classes			university-wide	practical	kind	type

4.2.2.4. Computer science module

No.	Course code	Name of course	Weekly number of hours					Field-of-study educational effect symbol	Number of hours		Number of ECTS points		Form of course	Way of creditin g	Course			
			lec	cl	lab	pr	sem		ZZU	CNPS	total	BK classes			university-wide	practical	kind	type
1	ARR041305W	Database systems	1					K1AiR_W15	15	30	1	0,7	T	Z			PD	W
2	ARR041305P	Database systems				1		K1AiR_U13 K1AiR_K01	15	30	1	0,7	T	Z		P	PD	W
3	ARR041306W	Database in the technique	1					K1AiR_W15	15	30	1	0,7	T	Z			PD	W
4	ARR041306P	Database in the technique				1		K1AiR_U13 K1AiR_K01	15	30	1	0,7	T	Z		P	PD	W
5	ARR041307W	Acquisition systems and identify objects	1					K1AiR_W15	15	30	1	0,7	T	Z			PD	W
6	ARR041307P	Acquisition systems and identify objects				1		K1AiR_U13 K1AiR_K01	15	30	1	0,7	T	Z		P	PD	W
		Total	1			1												

Altogether for basic sciences modules

Total number of hours					Total number of ZZU hours	Total number of CNPS hours	Total number of ECTS points	Number of ECTS points
lec	cl	lab	pr	sem				
1	0	0	1	0	30	60	2	1,4

4.2.3. List of main-field-of-study modules

4.2.3.1. Optional main-field-of-study subjects module

No.	Course code	Name of course	Weekly number of hours					Field-of-study educational effect symbol	Number of hours		Number of ECTS points		Form of course	Way of crediting	Course			
			lec	cl	lab	pr	sem		ZZU	CNPS	total	BK classes			university-wide	practical	kind	type

4.2.3.2. Optional main-field-of-study subjects - AMPU module

No.	Course code	Name of course	Weekly number of hours					Field-of-study educational effect symbol	Number of hours		Number of ECTS points		Form of course	Way of crediting	Course			
			lec	cl	lab	pr	sem		ZZU	CNPS	total	BK classes			university-wide	practical	kind	type
1	ARR043210W	Monitoring and diagnostic systems in industry	2					K1AiR_AMPU_W01	30	90	3	2,1	T	E			K	W
2	ARR043210L	Monitoring and diagnostic systems in industry			2			K1AIR_AMPU_U01 K1AiR_K01 K1AiR_K04 K1AiR_K09	30	30	1	0,7	T	Z		P	K	W
3	ARR043211W	Automation of industrial processes	1					K1AIR_AMPU_W03 K1AiR_K09	15	30	1	0,7	T	Z			K	W
4	ARR043211L	Automation of industrial processes			2			K1AIR_AMPU_U03 K1AiR_K09	30	60	2	1,4	T	Z		P	K	W
5	ARR043212W	Controlled Electrical Drives - fundamentals	2					K1AIR_AMPU_W05	30	90	3	2,1	T	E			K	W
6	ARR043212L	Controlled Electrical Drives - fundamentals			1			K1AIR_AMPU_U05 K1AiR_K03 K1AiR_K09	15	30	1	0,7	T	Z		P	K	W
7	ARR043213W	Industrial drive systems	2					K1AIR_AMPU_W04 K1AIR_AMPU_W09 K1AiR_K09	30	60	2	1,4	T	Z			K	W
8	ARR043213P	Industrial drive systems				1		K1AIR_AMPU_U04 K1AiR_K09	15	30	1	0,7	T	Z		P	K	W
9	ARR043214W	Artificial intelligence methods	2					K1AIR_AMPU_W06	30	90	3	2,1	T	E			K	W
10	ARR043214L	Artificial intelligence methods			1			K1AIR_AMPU_U06 K1AiR_K03 K1AiR_K04 K1AiR_K09	15	30	1	0,7	T	Z		P	K	W
11	ARR043215W	Distributed automation systems	1					K1AIR_AMPU_W07 K1AiR_K09	15	30	1	0,7	T	Z			K	W
12	ARR043215L	Distributed automation systems			2			K1AIR_AMPU_U07 K1AiR_K09	30	60	2	1,4	T	Z		P	K	W
13	ARR043216W	Smart Measuring and Control Systems	1					K1AIR_AMPU_W08 K1AiR_K09	15	30	1	0,7	T	Z			K	W
14	ARR043216L	Smart Measuring and Control Systems			1			K1AIR_AMPU_U08 K1AiR_K09	15	30	1	0,7	T	Z		P	K	W
15	ARR043219P	Computer-aided design of converter fed drives.				2		K1AiR_U09 K1AIR_AMPU_U04 K1AiR_K03 K1AiR_K05 K1AiR_K09	30	60	2	1,4	T	Z		P	K	W
16	ARR043306W	Analogue and Digital Measurement Systems	1					K1AiR_AMPU_W02 K1AiR_K09	15	30	1	0,7	T	Z			K	W
17	ARR043306L	Analogue and Digital Measurement Systems			2			K1AIR_AMPU_U02 K1AiR_K09	30	30	1	0,7	T	Z		P	K	W
		Total	12	0	11	3	0		390	810	27	18,9						

4.2.3.3. Optional main-field-of-study subjects - ASE module

No.	Course code	Name of course	Weekly number of hours					Field-of-study educational effect symbol	Number of hours		Number of ECTS points		Form of course	Way of crediting	Course			
			lec	cl	lab	pr	sem		ZZU	CNPS	total	BK classes			university-wide	practical	kind	type
1	ARR042105W	Control Apparatus and Systems	1					K1AiR_ASE_W01	15	60	2	1,4	T	E			K	W
2	ARR042105P	Control Apparatus and Systems				2		K1AIR_ASE_U01 K1AiR_K03 K1AiR_K05	30	60	2	1,4	T	Z		P	K	W
3	ARR042106W	Theory of automata	1					K1AIR_ASE_W04	15	30	1	0,7	T	Z			K	W
4	ARR042106L	Theory of automata			2			K1AIR_ASE_U04 K1AiR_K09	30	30	1	0,7	T	Z		P	K	W
5	ARR042107W	Decision making methods	2					K1AIR_ASE_W07	30	90	3	2,1	T	Z			K	W
6	ARR042107S	Decision making methods					1	K1AIR_ASE_U07 K1AiR_K03 K1AiR_K09	15	30	1	0,7	T	Z		P	K	W
7	ARR042201W	Optoelectronic	1					K1AIR_ASE_W02 K1AiR_K09	15	30	1	0,7	T	Z			K	W
8	ARR042201L	Optoelectronic			1			K1AIR_ASE_U02 K1AiR_K09	15	30	1	0,7	T	Z		P	K	W
9	ARR042202W	Power system protection - fundamentals	2					K1AIR_ASE_W03	30	90	3	2,1	T	E			K	W
10	ARR042202L	Power system protection - fundamentals			1			K1AIR_ASE_U03 K1AiR_K09	15	30	1	0,7	T	Z		P	K	W
11	ARR042202P	Power system protection - fundamentals				1		K1AIR_ASE_U03 K1AiR_K09	15	30	1	0,7	T	Z		P	K	W
12	ARR042203W	Power system operation and control	2					K1AIR_ASE_W08	30	60	2	1,4	T	E			K	W
13	ARR042203L	Power system operation and control			1			K1AIR_ASE_U09 K1AiR_K09	15	30	1	0,7	T	Z		P	K	W
14	ARR042302W	Static converters in electric power engineering	1					K1AIR_ASE_W09 K1AiR_K09	15	30	1	0,7	T	Z			K	W
15	ARR042302L	Static converters in electric power engineering			1			K1AIR_ASE_U08 K1AiR_K09	15	30	1	0,7	T	Z		P	K	W
16	ARR042504W	Smart Metering	2					K1AIR_ASE_W05 K1AiR_K01	30	30	1	0,7	T	Z			K	W
17	ARR042504L	Smart Metering			1			K1AIR_ASE_U05 K1AiR_K01	15	30	1	0,7	T	Z		P	K	W
18	ARR042505W	Distributed control systems for electric power	2					K1AIR_ASE_W06	30	60	2	1,4	T	Z			K	W
19	ARR042505S	Distributed control systems for electric power					1	K1AIR_ASE_U06 K1AiR_K09	15	30	1	0,7	T	Z		P	K	W
		Total	14	0	7	3	2		390	810	27	18,9						

4.2.3.4. Training module

No.	Course code	Name of course	Weekly number of hours					Field-of-study educational effect symbol	Number of hours		Number of ECTS points		Form of course	Way of crediting	Course			
			lec	cl	lab	pr	sem		ZZU	CNPS	total	BK classes			university-wide	practical	kind	type
1	ARR040055Q	Professional practice (6-week)				40		K1AiR_U34 K1AiR_K03	240	180	6	4,2	T	Z		P	K	W
		Total	0	0	0	40	0		240	180	6	4,2						

4.2.3.5. Diploma dissertation module

No.	Course code	Name of course	Weekly number of hours					Field-of-study educational effect symbol	Number of hours		Number of ECTS points		Form of course	Way of crediting	Course			
			lec	cl	lab	pr	sem		ZZU	CNPS	total	BK classes			university-wide	practical	kind	type
1	ARR041059D ARR042059D ARR043059D	Engineering Thesis				9		K1AIR_AMPU_U10 K1AiR_K05	135	450	15	10,5	T	Z		P	K	W
2	ARR043058S	Diploma seminar					2	K1AIR_AMPU_U09 K1AiR_K09	30	90	3	2,1	T	Z		P	K	W
3	ARR041059D ARR042059D ARR043059D	Engineering Thesis				9		K1AIR_ASE_U11 K1AiR_K05	135	450	15	10,5	T	Z		P	K	W
4	ARR042058S	Diploma seminar					2	K1AIR_ASE_U10 K1AiR_K09	30	90	3	2,1	T	Z		P	K	W
		Total	0	0	0	9	2		165	540	18	12,6						

Altogether for main-field-of-study modules

Total number of hours					Total number of ZZU hours	Total number of CNPS hours	Total number of ECTS points	Number of ECTS points
lec	cl	lab	pr	sem				
14	0	7	52	4	795	1530	51	35,7

4.3 Training module (Faculty Council resolution on principles of crediting training – attachment no.2)

Name of training:	Professional practice (6-week)		
Number of ECTS points	**Number of ECTS points for BK classes**	**Training crediting mode**	**Code**
6	**4,2**	**report from training**	**ARR040055Q**
Training duration	**Training objective**		
6 weeks	The goal of practice is to gain industrial experience, familiarize yourself with basic technical equipment and technological facilities, to acquaint himself with the work of higher technical inspection in a company. In particular: • broaden the knowledge gained at university and develop the skills to use it, • familiarize students with specific professional environment, • developing specific skills directly related to the setting of the internship, • develop skills to communicate effectively, • knowledge of organizational structure, the principles of the work organization and the sharing of responsibilites, procedures, work planning, control, •improve the skills of self-organization, teamwork, effective time management, diligence, responsibility for assigned tasks, •improve the ability to use a foreign language in professional contexts		

4.4. Diploma dissertation module

Type of diploma dissertation:	inżynier	
Number of diploma dissertation semesters	**Number of ECTS points**	**Code**
1	**18**	**ARR042058S** **ARR043058S** **ARR041059D** **ARR042059D** **ARR043059D**
Character of diploma dissertation		
Design, computer program, computer simulations and its analysis, a prototype of a simple technical system and the results of the experimental studies on it, the development of a technical documentation for the designed and/or build piece of equipment.		
Number of BK ECTS points:	**12,6**	

5. Ways of verifying assumed educational effects

Type of classes	Ways of verifying assumed educational effects
lecture	examination, progress/final test
class	progress/final test
laboratory	pretest, report from laboratory
project	project defence
seminar	participation in discussion, topic presentation, essay
training	report from training
diploma dissertation	prepared diploma dissertation

6. Total number of ECTS points, which student has to obtain from classes requiring direct academic teacher-student contact (enter total of ECTS points for courses/groups of courses denoted with code BK)

147 ECTS

7. Total number of ECTS points, which student has to obtain from basic sciences classes

Number of ECTS points for obligatory subjects	48
Number of ECTS points for optional subjects	2
Total number of ECTS points	50

MAT001416W

8. Total number of ECTS points, which student has to obtain from practical classes, including laboratory classes

Number of ECTS points for obligatory subjects	59
Number of ECTS points for optional subjects	42
Total number of ECTS points	101

9. Minimum number of ECTS points, which student has to obtain doing education modules offered as part of university-wide classes or other main field of study

45 ECTS

10. Total number of ECTS points, which student may obtain doing optional modules (min. 30% of total number of ECTS points)

63 ECTS

11. Range of diploma dissertation

The diploma examination problems are available on the Faculty website.

12. Requirements concerning deadlines for crediting courses/groups of courses for all courses in particular modules

No.	Course code	Name of course	Crediting by deadline of... (number of semester)
1	MAT001409W	Algebra and analytic geometry A	I
2	ARR041312W	Fundamentals of electrical engineering	I
3	INR042501W	Computer technology	I
4	FZP003067W	Physics E5	I
5	MAT001416W	Mathematical Analysis 1.1 A	I
6	ARR041302W	Electric circuits	II
7	ARR043302W	Basics of Electronics 1	II
8	ARR043301W	Basics of Metrology	II
9	MAT001423W	Mathematical Analysis 2.1 A	II
10	ARR041304W	Electrical and Magnetic Circuits	III
11	ARR043238W	Fundamentals of microprocessors 1	III
12	ARR042101W	Fundamentals of control engineering 1	IV
13	ARR043102W	Electrical machines 1	IV
14	ARR043204W	Programming in MATLAB	V
15	MAT001500W	Ordinary differential equations A	V
16	ARR043205W	Electrical Drive 1	V
17	ARR043206W	Power electronics 1	V
18	ARE009001W	Basics of robotics	V
19	ARR040055Q	Professional practice (6-week)	VI

13. Plan of studies (attachment no.1)

Approved by faculty student government legislative body:

.....	.....
Date	Name and surname, signature of student representative
.....	.....
Date	Dean’s signature