

## PLAN OF STUDIES

<b>FACULTY:</b>	Electrical Engineering
<b>MAIN FIELD OF STUDY:</b>	Industrial Control Engineering
<b>EDUCATION LEVEL:</b>	2nd level, 2nd level studies
<b>FORM OF STUDIES:</b>	full-time
<b>PROFILE:</b>	general academic
<b>SPECIALIZATION:</b>	Automation of Machines, Vehicles and Apparatus
<b>LANGUAGE OF STUDY:</b>	polish

# 1. Set of obligatory and optional courses and groups of courses in semestral arrangement

## Semester 1

### Obligatory courses

number of ECTS points: 27

No.	Course code	Name of course	Weekly number of hours					Learning 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	APR011309W	Mathematical optimisation	2					K2APR_W1	30	90	3	2,1	T	E			PD	OB
2	APR011309L	Mathematical optimisation			1			K2APR_U1 K2APR_K6	15	60	2	1,4	T	Z		P	PD	OB
3	APR012111W	Fundamentals of system modelling	1					K2APR_W2	15	30	1	0,7	T	Z			K	OB
4	APR012111L	Fundamentals of system modelling			1			K2APR_U2 K2APR_K1 K2APR_K2	15	30	1	0,7	T	Z		P	K	OB
5	APR012112W	Control theory	2					K2APR_W2 K2APR_W1 K2APR_W3 K2APR_K1 K2APR_K2 K2APR_K3 K2APR_K4	30	90	3	2,1	T	E			K	OB
6	APR012511W	Control object identification	2					K2APR_W4 K2APR_K2	30	60	2	1,4	T	Z			PD	OB
7	APR012511L	Control object identification			1			K2APR_U3 K2APR_K2	15	30	1	0,7	T	Z		P	PD	OB
8	APR013104W	Electrical micromachines for industrial automation	2					S2AMPU_W2 K2APR_K6	30	60	2	1,4	T	Z			S	OB
9	APR013218W	Controlled Electrical Drives – selected problems	2					S2AMPU_W1	30	120	4	2,8	T	E			S	OB
10	APR013218L	Controlled Electrical Drives – selected problems			2			S2AMPU_U1 K2APR_K6 K2APR_K7	30	60	2	1,4	T	Z		P	S	OB
11	APR013237W	DSP in Industrial Automation	1					S2AMPU_W4 K2APR_K6	15	30	1	0,7	T	Z			S	OB
12	APR013237L	DSP in Industrial Automation			2			S2AMPU_U3 K2APR_K6	30	60	2	1,4	T	Z		P	S	OB
13	APR013307W	Microprocessor measuring transducers	2					S2AMPU_W3 K2APR_K1	30	60	2	1,4	T	Z			S	OB
14	APR013307L	Microprocessor measuring transducers			1			S2AMPU_U2 K2APR_K1	15	30	1	0,7	T	Z		P	S	OB
<b>Total</b>			<b>14</b>		<b>8</b>				<b>330</b>	<b>810</b>	<b>27</b>	<b>18,9</b>						

### Optional courses

minimum 30 hours in semester, 3 ECTS points

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
<b>Optional courses block: Foreign Language</b>								<b>ECTS</b>	<b>1</b>	<b>hours</b>	<b>1</b>							
1	JZL100709BKC	Foreign language B2+ or C1+		1				K2APR_U4 K2APR_K1	15	30	1	0,7	T	Z	O	P	KO	W
<b>Optional courses block: Management</b>								<b>ECTS</b>	<b>2</b>	<b>hours</b>	<b>1</b>							
1	ZMR052513W	Management of a Company	1					K2APR_W5 K2APR_K3 K2APR_K6	15	50	2	1,4	T	Z	O		KO	W
2	ZMR052521W	Management in the power industry	1					K2APR_W5 K2APR_K3 K2APR_K6	15	50	2	1,4	T	Z	O		KO	W

Altogether in semester

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	hours	hours	points	points
15	1	8	0	0	360	890	30	21

## Semester 2

### Obligatory courses

number of ECTS points: 27

No.	Course code	Name of course	Weekly number of hours					Learning 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	APR013220W	Robots in industrial processes	1					S2AMPU_W5	15	60	2	1,4	T	Z			S	OB
2	APR013220L	Robots in industrial processes			2			S2AMPU_U4 K2APR_K7	30	60	2	1,4	T	Z		P	S	OB
3	APR013221W	Application of the artificial intelligence techniques in control and diagnostics	2					S2AMPU_W6	30	90	3	2,1	T	E			S	OB
4	APR013221L	Application of the artificial intelligence techniques in control and diagnostics			1			S2AMPU_U5 K2APR_K6	15	30	1	0,7	T	Z		P	S	OB
5	APR013222W	Computer aided modeling and design of control systems	2					S2AMPU_W8 K2APR_K6	30	30	1	0,7	T	Z			S	OB
6	APR013222P	Computer aided modeling and design of control systems				2		S2AMPU_U7 K2APR_K6	30	90	3	2,1	T	Z		P	S	OB
7	APR013223W	Object-oriented programming	1					S2AMPU_W9 K2APR_K6	15	30	1	0,7	T	Z			S	OB
8	APR013223L	Object-oriented programming			1			S2AMPU_U8 K2APR_K6	15	60	2	1,4	T	Z		P	S	OB
9	APR013224W	Power electronics in industry automation	2					S2AMPU_W10	30	90	3	2,1	T	E			S	OB
10	APR013224L	Power electronics in industry automation			1			S2AMPU_U9 K2APR_K6	15	30	1	0,7	T	Z		P	S	OB
11	APR013225L	Programmable Logic Controllers In Industrial Automation			2			S2AMPU_U10 K2APR_K7	30	60	2	1,4	T	Z		P	S	OB
12	APR013227W	Wireless control and monitoring systems	2					S2AMPU_W11 K2APR_K6	30	60	2	1,4	T	Z			S	OB
13	APR013308W	Computer Control of Measurement Systems	2					S2AMPU_W7 K2APR_K7	30	90	3	2,1	T	E			S	OB
14	APR013308L	Computer Control of Measurement Systems			1			S2AMPU_U6 K2APR_K7	15	30	1	0,7	T	Z		P	S	OB
Total			12		8	2			330	810	27	18,9						

Optional courses					minimum	60	hours in semester,				3	ECTS points						
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
<b>Optional courses block: Foreign Language</b>								<b>ECTS</b>		<b>2</b>		<b>hours</b>		<b>3</b>				
1	JZL100710BKC	Foreign language A1 or A2		3				K2APR_U5 K2APR_K1	45	60	2	1,4	T	Z	O	P	KO	W
<b>Optional courses block: Law</b>								<b>ECTS</b>		<b>1</b>		<b>hours</b>		<b>1</b>				
1	PRR051216W	Standardization and engineering law	1					K2APR_W6 K2APR_K3 K2APR_K5	15	25	1	0,7	T	Z	O		KO	W
2	PRR051217W	Engineering law	1					K2APR_W6 K2APR_K3 K2APR_K5	15	25	1	0,7	T	Z	O		KO	W
3	PRR051218W	Technical Standardization	1					K2APR_W6 K2APR_K3 K2APR_K5	15	25	1	0,7	T	Z	O		KO	W

Altogether in semester

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				
13	3	8	2	0	390	895	30	21

### Semester 3

Optional courses										minimum	330	hours in semester,				30	ECTS points			
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	APR011159DP APR012159DP APR013159DP	Master's thesis				12		S2AMPU_U14 K2APR_K4 K2APR_K6	180	540	18	12,6	T	Z		P	S	W		
2	APR013158S	Diploma seminar				2		S2AMPU_U13 K2APR_K6	30	90	3	2,1	T	Z		P	S	W		
<b>Optional courses block: Social Sciences and Ethics</b>											<b>ECTS</b>		<b>2</b>	<b>hours</b>		<b>1</b>				
1	FLH051621S	Ethics in bussiness				1		K2APR_U6 K2APR_K6	15	50	2	1,4	T	Z	O	P	KO	W		
2	PKH050421S	Social communication				1		K2APR_U6 K2APR_K6	15	50	2	1,4	T	Z	O	P	KO	W		
3	PKH050521S	The art of public speaking				1		K2APR_U6 K2APR_K6	15	50	2	1,4	T	Z	O	P	KO	W		
<b>Optional courses block: A</b>											<b>ECTS</b>		<b>3</b>	<b>hours</b>		<b>3</b>				
1	APR012316W	Intelligent buildings and structures installations	2					S2AMPU_W12	30	60	2	1,4	T	E			S	W		
2	APR012316P	Intelligent buildings and structures installations				1		S2AMPU_U11 K2APR_K6	15	30	1	0,7	T	Z		P	S	W		
3	APR013228W	Control of static converters	2					S2AMPU_W12 K2APR_K6	30	60	2	1,4	T	E			S	W		
4	APR013228L	Control of static converters			1			S2AMPU_U11 K2APR_K6	15	30	1	0,7	T	Z		P	S	W		
5	APR013229W	Electrical drives vehicles	2					S2AMPU_W12 K2APR_K6	30	60	2	1,4	T	E			S	W		
6	APR013229P	Electrical drives vehicles				1		S2AMPU_U11 K2APR_K6	15	30	1	0,7	T	Z		P	S	W		
7	APR013232W	Design of Power Converter	2					S2AMPU_W12 K2APR_K1	30	60	2	1,4	T	E			S	W		
8	APR013232P	Design of Power Converter				1		S2AMPU_U11 K2APR_K1	15	30	1	0,7	T	Z		P	S	W		
<b>Optional courses block: B</b>											<b>ECTS</b>		<b>4</b>	<b>hours</b>		<b>4</b>				
1	APR011102W	Electromagnetic Compatibility	1					S2AMPU_W13 K2APR_K3	15	30	1	0,7	T	Z			S	W		
2	APR011102L	Electromagnetic Compatibility			1			S2AMPU_U12 K2APR_K3	15	30	1	0,7	T	Z		P	S	W		
3	APR011310W	Teleinformatic networks in the technics	1					S2AMPU_W13	15	30	1	0,7	T	Z			S	W		
4	APR011310L	Teleinformatic networks in the technics			1			S2AMPU_U12 K2APR_K6	15	30	1	0,7	T	Z		P	S	W		
5	APR013230W	Testing and diagnostics of converter-fed drives	1					S2AMPU_W13	15	30	1	0,7	T	Z			S	W		
6	APR013230L	Testing and diagnostics of converter-fed drives			1			S2AMPU_U12 K2APR_K7	15	30	1	0,7	T	Z		P	S	W		
7	APR013309W	Assessment and Improvement of Power Quality	1					S2AMPU_W13 K2APR_K7	15	30	1	0,7	T	Z			S	W		
8	APR013309L	Assessment and Improvement of Power Quality			1			S2AMPU_U12 K2APR_K7	15	30	1	0,7	T	Z		P	S	W		

Altogether in semester

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				
4	0	3	12	3	330	890	30	21

## 2. Set of examinations in semestral arrangement

Course code	Names of courses ending with examination	Semester
APR011309W	Mathematical optimisation	1
APR012112W	Control theory	1
APR013218W	Controlled Electrical Drives – selected problems	1
APR013221W	Application of the artificial intelligence techniques in control and diagnostics	2
APR013224W	Power electronics in industry automation	2
APR013308W	Computer Control of Measurement Systems	2
one exam from optional courses block A		3

## 3. Numbers of allowable deficit of ECTS points after particular semesters

Semester	Allowable deficit of ECTS points after semester
1	5
2	5

Opinion of student government legislative body

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Date

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Name and surname, signature of student representative

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Date

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Dean's signature