PLAN OF STUDIES

FACULTY: Electrical Engineering

MAIN FIELD OF STUDY: Control Engineering and Robotics

EDUCATION LEVEL: 2nd level, 2nd level studies

FORM OF STUDIES: full-time

PROFILE: general academic

SPECIALIZATION: Automation and Control in Electrical Power Systems

LANGUAGE OF STUDY: polish

Electrical Engineering Faculty Council Resolution of 10.07.2017 r.
In effect since 01.10.2017 r.

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					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	ARR041309W	Mathematical optimisation	2					K2AiR_W01	30	90	3	2,1	T	E			PD	OB
2	ARR041309L	Mathematical optimisation			1			K2AiR_U01 K2AiR_K06	15	60	2	1,4	T	Z		P	PD	OB
3	ARR042111W	Fundamentals of system modelling	1					K2AiR_W02	15	30	1	0,7	T	Z			K	OB
4	ARR042111L	Fundamentals of system modelling			1			K2AiR_U02 K2AiR_K01 K2AiR_K02	15	30	1	0,7	T	Z		P	K	OB
5	ARR042112W	Control theory	2					K2AiR_W02 K2AiR_W01 K2AiR_W03 K2AiR_K01 K2AiR_K02 K2AiR_K03 K2AiR_K04	30	90	3	2,1	T	E			K	OB
6	ARR042113W	Digital techniques in power system control and protection	1					S2ASE_W04 K2AiR_W04 K2AiR_W02 S2ASE_W06	15	30	1	0,7	T	Z			S	OB
7	ARR042113P	Digital techniques in power system control and protection				1		K2AiR_U02 S2ASE_U03 S2ASE_U06 K2AiR_U03 K2AiR_K06 K2AiR_K07	15	30	1	0,7	T	Z		P	S	OB
8	ARR042211W	Electric power system control and operation	2					S2ASE_W01	30	60	2	1,4	T	Z			S	OB
9	ARR042211L	Electric power system control and operation			1			S2ASE_U01 K2AiR_K02	15	30	1	0,7	T	Z		P	S	OB
10	ARR042214W	Fiber Optics	2					S2ASE_W02 K2AiR_K06	30	30	1	0,7	T	Z			S	OB
11	ARR042511W	Control object identification	2					K2AiR_W04 K2AiR_K02	30	60	2	1,4	T	Z			PD	OB
12	ARR042511L	Control object identification			1			K2AiR_U03 K2AiR_K02	15	30	1	0,7	T	Z		P	PD	OB
13	ARR042512W	Automation of electric power systems	2					S2ASE_W01 S2ASE_W03	30	120	4	2,8	T	E			S	OB
14	ARR042512L	Automation of electric power systems			1			S2ASE_U02 K2AiR_K06	15	30	1	0,7	T	Z		P	S	OB
15	ARR042513W	Computer Control of Power System	2					S2ASE_W05	30	60	2	1,4	T	Z			S	OB
16	ARR042513S	Computer Control of Power System					1	S2ASE_U01 S2ASE_U08 K2AiR_K06	15	30	1	0,7	T	Z		P	S	OB
		Total	16		5	1	1		345	810	27	18,9						

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
Optional courses block: Foreign Language										**ECTS**		**1**	**hours**		**1**			
1	JZL100709BKC	Foreign language B2+ or C1+		1				K2AiR_U04 K2AiR_K01	15	30	1	0,7	T	Z	O	P	KO	W
Optional courses block: Management										**ECTS**		**2**	**hours**		**1**			
1	ZMR042513W	Management of a Company	1					K2AiR_W05 K2AiR_K03 K2AiR_K06	15	60	2	1,4	T	Z	O		KO	W
2	ZMR042521W	Management in the power industry	1					K2AiR_W05 K2AiR_K03 K2AiR_K06	15	60	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				
17	1	5	1	1	375	900	30	21

Semester 2

Obligatory courses **number of ECTS points: 27**

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	ARR042115W	Artificial intelligence in power system protection and control	2					S2ASE_W07	30	120	4	2,8	T	E			S	OB
2	ARR042115P	Artificial intelligence in power system protection and control				1		S2ASE_U05 K2AiR_K06 K2AiR_K07	15	30	1	0,7	T	Z		P	S	OB
3	ARR042116W	Fundamentals of digital power system protection and control	2					S2ASE_W08	30	120	4	2,8	T	E			S	OB
4	ARR042116L	Fundamentals of digital power system protection and control			2			S2ASE_U06 K2AiR_K02 K2AiR_K07	30	60	2	1,4	T	Z		P	S	OB
5	ARR042117L	Microprocessor controllers in electrical power engineering			2			S2ASE_U10 K2AiR_K06 K2AiR_K07	30	60	2	1,4	T	Z		P	S	OB
6	ARR042118W	Electromagnetic transients simulation	1					K2AiR_W02 K2AiR_W03 S2ASE_W06	15	30	1	0,7	T	Z			S	OB
7	ARR042118P	Electromagnetic transients simulation				1		K2AiR_U02 K2AiR_U03 S2ASE_U04 K2AiR_K02	15	30	1	0,7	T	Z		P	S	OB
8	ARR042311W	Devices and control standards of electrical installations	2					S2ASE_W09 K2AiR_K06	30	120	4	2,8	T	E			S	OB
9	ARR042311C	Devices and control standards of electrical installations		2				S2ASE_U07 K2AiR_K06	30	60	2	1,4	T	Z		P	S	OB
10	ARR042312W	Intelligent building automation	1					S2ASE_W11	15	30	1	0,7	T	Z			S	OB
11	ARR042312L	Intelligent building automation			1			S2ASE_U09 K2AiR_K07	15	30	1	0,7	T	Z		P	S	OB
12	ARR042312P	Intelligent building automation				2		S2ASE_U07 S2ASE_U09	30	60	2	1,4	T	Z		P	S	OB
13	ARR042514W	Load management	2					S2ASE_W10 K2AiR_K04	30	60	2	1,4	T	Z			S	OB
		Total	10	2	5	4			315	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
Optional courses block: Foreign Language										**ECTS**		**2**	**hours**		**3**			
1	JZL100710BKC	Foreign language A1 or A2		3				K2AiR_U05 K2AiR_K01	45	60	2	1,4	T	Z	O	P	KO	W
Optional courses block: Law										**ECTS**		**1**	**hours**		**1**			
1	PRR041216W	Standardization and engineering law	1					K2AiR_W06 K2AiR_K03 K2AiR_K05	15	30	1	0,7	T	Z	O		KO	W
2	PRR041217W	Engineering law	1					K2AiR_W06 K2AiR_K03 K2AiR_K05	15	30	1	0,7	T	Z	O		KO	W
3	PRR041218W	Technical Standardization	1					K2AiR_W06 K2AiR_K03 K2AiR_K05	15	30	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				
11	5	5	4	0	375	900	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	ARR041159DP ARR042159DP ARR043159DP	Master's thesis				12		S2ASE_U14 K2AiR_K04 K2AiR_K06	180	540	18	12,6	T	Z		P	S	W
2	ARR042158S	Diploma seminar					2	S2ASE_U13 K2AiR_K06	30	90	3	2,1	T	Z		P	S	W
Optional courses block: Social Sciences and Ethics										**ECTS**		**2**	**hours**		**1**			
1	FLH051621S	Ethics in bussiness					1	K2AiR_U06 K2AiR_K06	15	60	2	1,4	T	Z	O	P	KO	W
2	PKH050421S	Social communication					1	K2AiR_U06 K2AiR_K06	15	60	2	1,4	T	Z	O	P	KO	W
3	PKH050521S	The art of public speaking					1	K2AiR_U06 K2AiR_K06	15	60	2	1,4	T	Z	O	P	KO	W
Optional courses block: A										**ECTS**		**3**	**hours**		**3**			
1	ARR041101W	Electromagnetic Compatibility	2					S2ASE_W12 K2AiR_K06	30	60	2	1,4	T	E			S	W
2	ARR041101L	Electromagnetic Compatibility			1			S2ASE_U11 K2AiR_K06	15	30	1	0,7	T	Z		P	S	W
3	ARR042213W	Power System Protection	2					S2ASE_W12	30	60	2	1,4	T	E			S	W
4	ARR042213L	Power System Protection			1			S2ASE_U11 K2AiR_K07	15	30	1	0,7	T	Z		P	S	W
5	ARR042411W	Electrical installations of power objects	2					S2ASE_W12	30	60	2	1,4	T	E			S	W
6	ARR042411C	Electrical installations of power objects		1				S2ASE_U11 K2AiR_K06	15	30	1	0,7	T	Z		P	S	W
7	ARR042517W	Electric energy generation	2					S2ASE_W12 K2AiR_K06	30	60	2	1,4	T	E			S	W
8	ARR042517C	Electric energy generation		1				S2ASE_U11 K2AiR_K06	15	30	1	0,7	T	Z		P	S	W
9	ARR043226W	Monitoring and diagnostic systems in industry	2					S2ASE_W12	30	60	2	1,4	T	E			S	W
10	ARR043226L	Monitoring and diagnostic systems in industry			1			S2ASE_U11 K2AiR_K06 K2AiR_K07	15	30	1	0,7	T	Z		P	S	W
Optional courses block: B										**ECTS**		**2**	**hours**		**2**			
1	ARR041310W	Teleinformatic networks in the technics	1					S2ASE_W13	15	30	1	0,7	T	Z			S	W
2	ARR041310L	Teleinformatic networks in the technics			1			S2ASE_U12 K2AiR_K06	15	30	1	0,7	T	Z		P	S	W
3	ARR042119W	Programmable controllers in automation	1					S2ASE_W13	15	30	1	0,7	T	Z			S	W
4	ARR042119L	Programmable controllers in automation			1			S2ASE_U12 K2AiR_K06 K2AiR_K07	15	30	1	0,7	T	Z		P	S	W
5	ARR043234W	Neural Networks in Control Engineering	1					S2ASE_W13	15	30	1	0,7	T	Z			S	W
6	ARR043234L	Neural Networks in Control Engineering			1			S2ASE_U12 K2AiR_K06	15	30	1	0,7	T	Z		P	S	W
7	ARR043235W	Fuzzy Logic Control	1					S2ASE_W13	15	30	1	0,7	T	Z			S	W
8	ARR043235L	Fuzzy Logic Control			1			S2ASE_U12 K2AiR_K06	15	30	1	0,7	T	Z		P	S	W
Optional courses block: C										**ECTS**		**2**	**hours**		**2**			
1	ARR042313W	Optimization methods in electric power industry	2					S2ASE_W14 K2AiR_K01	30	60	2	1,4	T	Z			S	W
2	ARR042314W	Static converters in industry	2					S2ASE_W14 K2AiR_K06	30	60	2	1,4	T	Z			S	W
3	ARR042315W	Static convertors - applications	2					S2ASE_W14 K2AiR_K06	30	60	2	1,4	T	Z			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				
5	0	2	12	3	330	900	30	21

2. Set of examinations in semestral arrangement

Course code	Names of courses ending with examination	Semester
ARR041309W	Mathematical optimisation	1
ARR042112W	Control theory	1
ARR042512W	Automation of electric power systems	1
ARR042115W	Artificial intelligence in power system protection and	2
ARR042116W	Fundamentals of digital power system protection and	2
ARR042311W	Devices and control standards of electrical installations	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	4
2	3
3	0

Opinion of student government legislative body

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Date	Name and surname, signature of student representative

.....	.....
Date	Dean’s signature