DESCRIPTION OF THE PROGRAM OF STUDIES

1. Description

1.1 Number of semesters: 3	*1.2 Total number of ECTS points necessary to complete studies at a given level: 90*
1.3 Total number of hours: *1080*	*1.4 Prerequisites (particularly for second-level studies):* *Completed undergraduate or graduate degree in the field, in which contents of Electrical Engineering related to Circuit Theory and Theory of Electromagnetic Field are contained as well as knowledge gained from at least one of the courses: Electrical Drives, Electrical Devices, Fundamentals of Control Theory, High Voltage Engineering.*
1.5 Upon completion of studies graduate obtains professional degree of: *master of science, engineer*	*1.6 Graduate profile, employability:* *A graduate of the second degree studies in the specialization Electrical Power Engineering has advanced and well-established knowledge of the power system operation, automation, protection and control techniques in power engineering. Has ability to use computer tools for designing and modeling. It is capable of creative work and to make decisions and lead work-team labor. He is prepared to continue their education in Doctoral School.*
1.7 Possibility of continuing studies: *Doctoral School*	*1.8 Indicate connection with University's mission and its development strategy:* *The knowledge gained during their studies not only lead to success in their future careers of the graduate, but also shapes the human being with a sense of entrepreneurship, creativeness and openness to new challenges.*

2. Detailed description:

2.1 Total number of learning outcomes in the program of study:

W (knowledge) = 21
U (skills) = 21
K (competences) = 7
W + U + K = 49

2.2 For the main field of study assigned to more than one discipline - the number of learning outcomes assigned to the discipline:

D1 (major): 49

2.3 For the field of study assigned to more than one discipline - percentage share of the number of ECTS points for each discipline:

D1 100 % ECTS points

2.4a. For the general academic profile field of study – the number of ECTS points assigned to the classes related to the University's academic activity in the discipline or disciplines to which the faculty is assigned:

82 ECTS

2.5. Concise analysis of compliance of the assumed learning outcomes with the needs of the labor market:

Learning outcomes refer not only to the broadly understood electrical engineering, i.e. the generation, transmission, distribution, transforming, and utilization of electrical energy, but due to the demands of modern techniques and technologies currently used in electrical power engineering and industry - include electronic and microprocessor technology , computer science, management, and marketing. Obtaining the intended learning outcomes will enable graduates to find attractive and interesting work in all industries, especially in the electrical power engineering sector. The graduate is also prepared to start business in electrical engineering field. Proceedings on the learning outcomes were refereed and discussed at meetings of the Faculty of Electrical Engineering Convent, including representatives of industrial enterprises in the Polish territory, with particular emphasis on the Lower Silesia and the neighboring provinces. During meetings the needs of labor market were explained and discussed.

2.6. The total number of ECTS points that a student must obtain in classes requiring direct participation of academic teachers or other persons conducting classes and students (enter the sum of ECTS points for courses / groups of courses marked with the BK1 code)

63 ECTS

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

Number of ECTS points for obligatory subjects	5
Number of ECTS points for optional subjects	0
Total number of ECTS points	5

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

Number of ECTS points for obligatory subjects	21
Number of ECTS points for optional subjects	28
Total number of ECTS points	49

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

8 ECTS points

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

36 ECTS points

3. Description of the process leading to learning outcomes acquisition:

Teachers delivering the individual courses during the first lecture present the aim and program of the respective course as well as explain the assumed teaching outcomes. Indicate a need of the self-work of student and explain how to use basic and supplementary literature for a given course. Motivate to attend regularly the classes and to use consultations.

4. List of education blocks:

4.1. List of obligatory blocks

4.1.1. List of general education blocks

4.1.1.1. Liberal-managerial subjects block

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

4.1.1.2. Foreign languages block

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

4.1.1.3. Sporting classes block

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

4.1.1.4. Information technologies block

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

Altogether for general education blocks

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				
0	0	0	0	0	0	0	0	0

4.1.2. List of basic sciences blocks

4.1.2.1. Mathematics block

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	ELR051311W ELR052111W ELR052511W	Numerical methods in engineering	1					K2ETK_W2 K2ETK_K2	15	30	1	0,7	T	Z			PD	OB
2	ELR051311P ELR052111P ELR052511P	Numerical methods in engineering				1		K2ETK_U2 K2ETK_K2	15	30	1	0,7	T	Z		P	PD	OB
		Total	1	0	0	1	0		30	60	2	1,4						

4.1.2.2. Physics block

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	ELR053307W	Electrical Measurement Nonelectrical Values	1					K2ETK_W5 K2ETK_K2	15	60	2	1,4	T	Z			PD	OB
2	ELR053307L	Electrical Measurement Nonelectrical Values			1			K2ETK_U4 K2ETK_K2	15	30	1	0,7	T	Z		P	PD	OB
		Total	1	0	1	0	0		30	90	3	2,1						

4.1.2.3. Chemistry block

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

Altogether for basic sciences blocks

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				
2	0	1	1	0	60	150	5	3,5

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

4.1.3.1. Obligatory main-field-of-study block

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	ELR051310W	Selected problems of circuit theory	2					K2ETK_W1	30	90	3	2,1	T	E			K	OB
2	ELR051310C	Selected problems of circuit theory		1				K2ETK_U1 K2ETK_K1	15	30	1	0,7	T	Z		P	K	OB
3	ELR052211W	Short-circuits in power systems	2					K2ETK_W3 K2ETK_K3	30	60	2	1,4	T	Z			K	OB
4	ELR053209W	Electromechanical drive systems	2					K2ETK_W4	30	90	3	2,1	T	E			K	OB
5	ELR053209L	Electromechanical drive systems			1			K2ETK_U3 K2ETK_K1	15	30	1	0,7	T	Z		P	K	OB
		Total	6	1	1	0	0		120	300	10	7						

Altogether for main-field-of-study blocks

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				
6	1	1	0	0	120	300	10	7

4.1.4. List of specialization blocks

4.1.4.1. Obligatory specialization subjects block

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	ELR051107W	Lightning and overvoltage protection	1					S2EEN_W9 K2ETK_K3	15	60	2	1,4	T	Z			S	OB
2	ELR051107L	Lightning and overvoltage protection			1			S2EEN_U9 K2ETK_K3	15	30	1	0,7	T	Z		P	S	OB
3	ELR052112W	Fundamentals of digital power system protection and control	1					S2EEN_W4	15	90	3	2,1	T	E			S	OB
4	ELR052112L	Fundamentals of digital power system protection and control			1			S2EEN_U4 K2ETK_K2 K2ETK_K6	15	30	1	0,7	T	Z		P	S	OB
5	ELR052113W	Digital Modelling in Power Systems	1					K2ETK_W3 S2EEN_W5	15	30	1	0,7	T	Z			S	OB
6	ELR052113L	Digital Modelling in Power Systems			1			K2ETK_U1 S2EEN_U5 K2ETK_K2	15	30	1	0,7	T	Z		P	S	OB
7	ELR052212W	Power System Protection	1					S2EEN_W2 K2ETK_K7	15	30	1	0,7	T	Z			S	OB
8	ELR052212L	Power System Protection			2			S2EEN_U1 S2EEN_U2 K2ETK_K7	30	90	3	2,1	T	Z		P	S	OB
9	ELR052213L	MV Network security			2			S2EEN_U10 K2ETK_K2	30	60	2	1,4	T	Z		P	S	OB
10	ELR052215W	Fiber optics	1					S2EEN_W7 K2ETK_K6	15	30	1	0,7	T	Z			S	OB
11	ELR052215L	Fiber optics			1			S2EEN_U7 K2ETK_K6	15	30	1	0,7	T	Z		P	S	OB
12	ELR052311W	Computer Aided Design (CAD) in Energetic	2					S2EEN_W8 K2ETK_K1	30	60	2	1,4	T	Z			S	OB
13	ELR052311L	Computer Aided Design (CAD) in Energetic			1			S2EEN_U8 K2ETK_K1	15	60	2	1,4	T	Z		P	S	OB
14	ELR052417W	Modern electrical devices 1	1					S2EEN_W11	15	30	1	0,7	T	Z			S	OB
15	ELR052418L	Modern electrical devices 2			1			S2EEN_U12 K2ETK_K6	15	30	1	0,7	T	Z		P	S	OB
16	ELR052512W	Power Systems Operation and Control 1	2					S2EEN_W1 K2ETK_K6	30	90	3	2,1	T	E			S	OB
17	ELR052514L	Power Systems Operation and Control 2			2			S2EEN_U6 K2ETK_K6	30	60	2	1,4	T	Z		P	S	OB
18	ELR052515W	Modern technologies in electric power transmission and distribution	2					S2EEN_W1 S2EEN_W6	30	90	3	2,1	T	E			S	OB
19	ELR052516W	Load management	1					S2EEN_W1 S2EEN_W10 K2ETK_K3	15	30	1	0,7	T	Z			S	OB
20	ELR052517W	Energy management in energy systems	2					S2EEN_W10 K2ETK_K6	30	60	2	1,4	T	Z			S	OB
21	ELR052521P	Control and monitoring systems in the power industry				2		S2EEN_U6 K2ETK_K6	30	60	2	1,4	T	Z		P	S	OB
22	ELR053107W	Electromechanical Systems in Renewable Energy	2					S2EEN_W3	30	60	2	1,4	T	Z			S	OB
23	ELR053107L	Electromechanical Systems in Renewable Energy			1			S2EEN_U3 K2ETK_K7	15	30	1	0,7	T	Z		P	S	OB
		Total	17	0	13	2	0		480	1170	39	27,3						

Altogether for specialization blocks

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	0	13	2	0	480	1170	39	27,3

4.2. List of optional blocks

4.2.1. List of general education blocks

4.2.1.1. Liberal-managerial subjects block

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	FLH051621S	Ethics in bussiness					1	K2ETK_U7 K2ETK_K6	15	50	2	1,4	T	Z	O	P	KO	W
2	PKH050421S	Social communication					1	K2ETK_U7 K2ETK_K6	15	50	2	1,4	T	Z	O	P	KO	W
3	PKH050521S	The art of public speaking					1	K2ETK_U7 K2ETK_K6	15	50	2	1,4	T	Z	O	P	KO	W
4	PRR051216W	Standardization and engineering law	1					K2ETK_W7 K2ETK_K3 K2ETK_K5	15	25	1	0,7	T	Z	O		KO	W
5	PRR051217W	Engineering law	1					K2ETK_W7 K2ETK_K3 K2ETK_K5	15	25	1	0,7	T	Z	O		KO	W
6	PRR051218W	Technical Standardization	1					K2ETK_W7 K2ETK_K3 K2ETK_K5	15	25	1	0,7	T	Z	O		KO	W
7	ZMR052513W	Management of a Company	1					K2ETK_W6 K2ETK_K3 K2ETK_K6	15	50	2	1,4	T	Z	O		KO	W
8	ZMR052521W	Management in the power industry	1					K2ETK_W6 K2ETK_K3 K2ETK_K6	15	50	2	1,4	T	Z	O		KO	W
		Total	2				1		45	125	5	3,5						

4.2.1.2. Foreign languages block

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	JZL100709BKC	Foreign language B2+ or C1+		1				K2ETK_U5 K2ETK_K1	15	30	1	0,7	T	Z	O	P	KO	W
2	JZL100710BKC	Foreign language A1 or A2		3				K2ETK_U6 K2ETK_K1	45	60	2	1,4	T	Z	O	P	KO	W
		Total	0	4	0	0	0		60	90	3	2,1						

4.2.1.3. Sporting classes block

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

4.2.1.4. Information technologies block

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

Altogether for general education blocks

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				
2	4	0	0	1	105	215	8	5,6

4.2.2. List of basic sciences blocks

4.2.2.1. Mathematics block

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

4.2.2.2. Physics block

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

4.2.2.3. Chemistry block

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

Altogether for basic sciences blocks

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				
0	0	0	0	0	0	0	0	0

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

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

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

Altogether for main-field-of-study blocks

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				
0	0	0	0	0	0	0	0	0

4.2.4. List of specialization blocks

4.2.4.1. Specialization subjects block

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	ELR051109W	High Voltage Measurement and diagnostics of insulation	2					S2EEN_W14 K2ETK_K3 K2ETK_K6	30	60	2	1,4	T	Z			S	W
2	ELR052114W	Logic design	2					S2EEN_W12	30	60	2	1,4	T	E			S	W
3	ELR052114L	Logic design			1			S2EEN_U11 K2ETK_K2 K2ETK_K6 K2ETK_K7	15	30	1	0,7	T	Z		P	S	W
4	ELR052115W	Artificial intelligence methods in power system protection and control	2					S2EEN_W12	30	60	2	1,4	T	E			S	W
5	ELR052115L	Artificial intelligence methods in power system protection and control			1			S2EEN_U11 K2ETK_K2 K2ETK_K6	15	30	1	0,7	T	Z		P	S	W
6	ELR052116W	Peripheral devices of Programmable Logic Controllers	1					S2EEN_W13	15	30	1	0,7	T	Z			S	W
7	ELR052116L	Peripheral devices of Programmable Logic Controllers			1			S2EEN_U12 K2ETK_K2 K2ETK_K7	15	30	1	0,7	T	Z		P	S	W
8	ELR052214W	PLC and Wireless Communication for Monitoring and Metering	2					S2EEN_W12 K2ETK_K6	30	60	2	1,4	T	E			S	W
9	ELR052214S	PLC and Wireless Communication for Monitoring and Metering					1	S2EEN_U11 K2ETK_K6	15	30	1	0,7	T	Z		P	S	W
10	ELR052312W	Intelligent electrical installations – computer planning and applications	1					S2EEN_W13	15	30	1	0,7	T	Z			S	W
11	ELR052312P	Intelligent electrical installations – computer planning and applications				1		S2EEN_U12 K2ETK_K6	15	30	1	0,7	T	Z		P	S	W
12	ELR052411W	Electric shock protection systems in high-voltage installations	2					S2EEN_W14 K2ETK_K1	30	60	2	1,4	T	Z			S	W
13	ELR052413W	Environmental aspects of the development of the electric power system	2					S2EEN_W14 K2ETK_K3	30	60	2	1,4	T	Z			S	W
14	ELR052414W	Operation and maintenance of electrical equipment	2					S2EEN_W14 K2ETK_K6	30	60	2	1,4	T	Z			S	W
15	ELR052518W	Automation of Electric Power Systems	2					S2EEN_W12	30	60	2	1,4	T	E			S	W
16	ELR052518L	Automation of Electric Power Systems			1			S2EEN_U11 K2ETK_K6	15	30	1	0,7	T	Z		P	S	W
17	ELR053218W	Power electronics converters in energetics	2					S2EEN_W12	30	60	2	1,4	T	E			S	W
18	ELR053218L	Power electronics converters in energetics			1			S2EEN_U11 K2ETK_K7	15	30	1	0,7	T	Z		P	S	W
		Total	5	0	2	0	0		105	210	7	4,9						

4.2.4.2. Training block

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

4.2.4.3. Diploma dissertation block

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	ELR051159D ELR052159D ELR053159D	Master's thesis				12		S2EEN_U14 K2ETK_K4 K2ETK_K6	180	540	18	12,6	T	Z		P	S	W
2	ELR052158S	Diploma seminar					2	S2EEN_U13 K2ETK_K6	30	90	3	2,1	T	Z		P	S	W
		Total	0	0	0	12	2		210	630	21	14,7						

Altogether for specialization blocks

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	2	315	840	28	19,6

4.3 Training module (Faculty Council resolution on principles of crediting training – attachment ...)

Name of training:			
Number of ECTS points	**Number of ECTS points for BK classes**	**Training crediting mode**	**Code**
		report from training	
Training duration	**Training objective**		

4.4. Diploma dissertation module

Type of diploma dissertation:	magister	
Number of diploma dissertation semesters	**Number of ECTS points**	**Code**
1	**21**	**ELR052158S** **ELR051159D** **ELR052159D** **ELR053159D**
Character of diploma dissertation		
Master Thesis can be classified as computational, theoretical, or may contain a description and analysis of performed experimental studies. In each case contains a section in which the author alone interpret and draw conclusions from own research. Intellectual contributions of student should be clearly visible.		
Number of BK ECTS points:	**14,7**	

5. Ways of verifying assumed learning outcomes

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

6. Range of diploma dissertation

The diploma examination problems are available on the Faculty website.

7. Requirements concerning deadlines for crediting courses/groups of courses for all courses in particular blocks

No.	Course code	Name of course	Crediting by deadline of... (number of semester)
1			
2			
3			
4			

8. Plan of studies (attachment no. 1 to Description of the Programme of Studies)

Approved by faculty student government legislative body:

....

Date Name and surname, signature of student representative

....

Date Dean’s signature