

## PLAN OF STUDIES

<b>FACULTY:</b>	Electrical Engineering
<b>MAIN FIELD OF STUDY:</b>	Electrical Engineering
<b>EDUCATION LEVEL:</b>	2nd level, 2nd level studies
<b>FORM OF STUDIES:</b>	part-time
<b>PROFILE:</b>	general academic
<b>SPECIALIZATION:</b>	Electrical Power Engineering
<b>LANGUAGE OF STUDY:</b>	polish

Resolution no. 745/32/2016-2020 of the Senate of Wrocław University of Science and Technology  
In effect since 01.10.2019 r.

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

## Semester 1

### Obligatory courses

number of ECTS points: 18

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	ELR051167W	Lightning and overvoltage protection	1					S2EEN_W9 K2ETK_K3	11	60	2	1,4	T	Z			S	OB
2	ELR051167L	Lightning and overvoltage protection			1			S2EEN_U9 K2ETK_K3	11	30	1	0,7	T	Z		P	S	OB
3	ELR051371W	Selected problems of circuit theory	2					K2ETK_W1	22	90	3	2,1	T	E			K	OB
4	ELR051371C	Selected problems of circuit theory		1				K2ETK_U1 K2ETK_K1	11	30	1	0,7	T	Z		P	K	OB
5	ELR051372W ELR052172W ELR052572W	Numerical methods in engineering	1					K2ETK_W2 K2ETK_K2	11	30	1	0,7	T	Z			PD	OB
6	ELR051372P ELR052172P ELR052572P	Numerical methods in engineering				1		K2ETK_U2 K2ETK_K2	11	30	1	0,7	T	Z		P	PD	OB
7	ELR052271W	Short-circuits in power systems	2					K2ETK_W3 K2ETK_K3	22	60	2	1,4	T	Z			K	OB
8	ELR053262W	Electromechanical drive systems	2					K2ETK_W4	22	90	3	2,1	T	E			K	OB
9	ELR053262L	Electromechanical drive systems			1			K2ETK_U3 K2ETK_K1	11	30	1	0,7	T	Z		P	K	OB
10	ELR053366W	Electrical Measurement Nonelectrical Values	1					K2ETK_W5 K2ETK_K2	11	60	2	1,4	T	Z			PD	OB
11	ELR053366L	Electrical Measurement Nonelectrical Values			1			K2ETK_U4 K2ETK_K2	11	30	1	0,7	T	Z		P	PD	OB
Total			9	1	3	1			154	540	18	12,6						

Optional courses			minimum					44	hours in semester,				4	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	JZL030001BKC	Foreign language A1 or A2		3				K2ETK_U6 K2ETK_K1	33	60	2	1,4	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	ZMR052571W	Management of a Company	1					K2ETK_W6 K2ETK_K3 K2ETK_K6	11	50	2	1,4	T	Z	O		KO	W
2	ZMR052579W	Management in the power industry	1					K2ETK_W6 K2ETK_K3 K2ETK_K6	11	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				
10	4	3	1	0	198	650	22	15,4

## Semester 2

### Obligatory courses

number of ECTS points: 18

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	ELR052272W	Power System Protection	1					S2EEN_W2 K2ETK_K7	11	30	1	0,7	T	Z			S	OB
2	ELR052272L	Power System Protection			2			S2EEN_U1 S2EEN_U2 K2ETK_K7	22	90	3	2,1	T	Z		P	S	OB
3	ELR052274W	Fiber optics	1					S2EEN_W7 K2ETK_K6	11	30	1	0,7	T	Z			S	OB
4	ELR052274L	Fiber optics			1			S2EEN_U7 K2ETK_K6	11	30	1	0,7	T	Z		P	S	OB
5	ELR052371W	Computer Aided Design (CAD) in Energetic	2					S2EEN_W8 K2ETK_K1	22	60	2	1,4	T	Z			S	OB
6	ELR052371L	Computer Aided Design (CAD) in Energetic			1			S2EEN_U8 K2ETK_K1	11	60	2	1,4	T	Z		P	S	OB
7	ELR052477W	Modern electrical devices 1	1					S2EEN_W11	11	30	1	0,7	T	Z			S	OB
8	ELR052573W	Power Systems Operation and Control 1	2					S2EEN_W1 K2ETK_K6	22	90	3	2,1	T	E			S	OB
9	ELR052574W	Load management	2					S2EEN_W1 S2EEN_W10 K2ETK_K3	22	30	1	0,7	T	Z			S	OB
10	ELR053167W	Electromechanical Systems in Renewable Energy	2					S2EEN_W3	22	60	2	1,4	T	Z			S	OB
11	ELR053167L	Electromechanical Systems in Renewable Energy			1			S2EEN_U3 K2ETK_K7	11	30	1	0,7	T	Z		P	S	OB
<b>Total</b>			<b>11</b>		<b>5</b>				<b>176</b>	<b>540</b>	<b>18</b>	<b>12,6</b>						

### Optional courses

minimum **22**

hours in semester, **2**

ECTS points **1**

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	JZL030002BKC	Foreign language B2+ or C1+		1				K2ETK_U5 K2ETK_K1	11	30	1	0,7	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	PRR051271W	Standardization and engineering law	1					K2ETK_W7 K2ETK_K3 K2ETK_K5	11	25	1	0,7	T	Z	O		KO	W
2	PRR051272W	Engineering law	1					K2ETK_W7 K2ETK_K3 K2ETK_K5	11	25	1	0,7	T	Z	O		KO	W
3	PRR051273W	Technical standardization	1					K2ETK_W7 K2ETK_K3 K2ETK_K5	11	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				
12	1	5	0	0	198	595	20	14

### Semester 3

#### Obligatory courses

number of ECTS points: 18

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	ELR052171W	Fundamentals of digital power system protection and control	1					S2EEN_W4	11	90	3	2,1	T	E			S	OB
2	ELR052171L	Fundamentals of digital power system protection and control			1			S2EEN_U4 K2ETK_K2 K2ETK_K6	11	30	1	0,7	T	Z		P	S	OB
3	ELR052177W	Digital Modelling in Power Systems	1					K2ETK_W3 S2EEN_W5	11	30	1	0,7	T	Z			S	OB
4	ELR052177L	Digital Modelling in Power Systems			1			K2ETK_U1 S2EEN_U5 K2ETK_K2	11	30	1	0,7	T	Z		P	S	OB
5	ELR052273L	MV Network security			2			S2EEN_U10 K2ETK_K2	22	60	2	1,4	T	Z		P	S	OB
6	ELR052478L	Modern electrical devices 2			1			S2EEN_U12 K2ETK_K6	11	30	1	0,7	T	Z		P	S	OB
7	ELR052575L	Power Systems Operation and Control 2			2			S2EEN_U6 K2ETK_K6	22	60	2	1,4	T	Z		P	S	OB
8	ELR052576W	Modern technologies in electric power transmission and distribution	2					S2EEN_W1 S2EEN_W6	22	90	3	2,1	T	E			S	OB
9	ELR052577W	Energy management in energy systems	2					S2EEN_W10 K2ETK_K6	22	60	2	1,4	T	Z			S	OB
10	ELR052580P	Control and monitoring systems in the power industry				2		S2EEN_U6 K2ETK_K6	22	60	2	1,4	T	Z		P	S	OB
Total			6		7	2			165	540	18	12,6						

Optional courses			minimum					44	hours in semester,				4	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: B</b>								<b>ECTS</b>		<b>2</b>		<b>hours</b>		<b>2</b>				
1	ELR052174W	Peripheral devices of Programmable Logic Controllers	1					S2EEN_W13	11	30	1	0,7	T	Z			S	W
2	ELR052174L	Peripheral devices of Programmable Logic Controllers			1			S2EEN_U12 K2ETK_K2 K2ETK_K7	11	30	1	0,7	T	Z		P	S	W
3	ELR052374W	Intelligent electrical installations – computer planning and applications	1					S2EEN_W13	11	30	1	0,7	T	Z			S	W
4	ELR052374P	Intelligent electrical installations – computer planning and applications				1		S2EEN_U12 K2ETK_K6	11	30	1	0,7	T	Z		P	S	W
<b>Optional courses block: C</b>								<b>ECTS</b>		<b>2</b>		<b>hours</b>		<b>2</b>				
1	ELR051168W	High voltage measurement and diagnostics of insulation	2					S2EEN_W14 K2ETK_K3 K2ETK_K6	22	60	2	1,4	T	Z			S	W
2	ELR052471W	Electric shock protection systems in high-voltage installations	2					S2EEN_W14 K2ETK_K1	22	60	2	1,4	T	Z			S	W
3	ELR052473W	Environmental aspects of the development of the electric power system	2					S2EEN_W14 K2ETK_K3	22	60	2	1,4	T	Z			S	W
4	ELR052474W	Operation and maintenance of electrical equipments	2					S2EEN_W14 K2ETK_K6	22	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				
9	0	8	2	0	209	660	22	15,4

## Semester 4

Optional courses			minimum					198	hours in semester,				26	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	ELR051199DP ELR052199DP ELR053199DP	Master's thesis					12					S2EEN_U14 K2ETK_K4 K2ETK_K6	132	540	18	12,6	T	Z		P	S	W
2	ELR052198S	Diploma seminar					2					S2EEN_U13 K2ETK_K6	22	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	FLH551622S	Ethics in bussiness					1					K2ETK_U7 K2ETK_K6	11	50	2	1,4	T	Z	O	P	KO	W
2	PKH550422S	Social communication					1					K2ETK_U7 K2ETK_K6	11	50	2	1,4	T	Z	O	P	KO	W
3	PKH55522S	The art of public speaking					1					K2ETK_U7 K2ETK_K6	11	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	ELR052175W	Logic design	2									S2EEN_W12	22	60	2	1,4	T	E			S	W
2	ELR052175L	Logic design			1							S2EEN_U11 K2ETK_K2 K2ETK_K6 K2ETK_K7	11	30	1	0,7	T	Z		P	S	W
3	ELR052176W	Artificial intelligence methods in power system protection and control	2									S2EEN_W12	22	60	2	1,4	T	E			S	W
4	ELR052176L	Artificial intelligence methods in power system protection and control			1							S2EEN_U11 K2ETK_K2 K2ETK_K6	11	30	1	0,7	T	Z		P	S	W
5	ELR052275W	PLC and Wireless Communication for Monitoring and Metering	2									S2EEN_W12 K2ETK_K6	22	60	2	1,4	T	E			S	W
6	ELR052275S	PLC and Wireless Communication for Monitoring and Metering					1					S2EEN_U11 K2ETK_K6	11	30	1	0,7	T	Z		P	S	W
7	ELR052578W	Automation of electric power systems	2									S2EEN_W12	22	60	2	1,4	T	E			S	W
8	ELR052578L	Automation of electric power systems			1							S2EEN_U11 K2ETK_K6	11	30	1	0,7	T	Z		P	S	W
9	ELR053274W	Power electronics converters in energetics	2									S2EEN_W12	22	60	2	1,4	T	E			S	W
10	ELR053274L	Power electronics converters in energetics			1							S2EEN_U11 K2ETK_K7	11	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				
2	0	1	12	3	198	770	26	18,2

## 2. Set of examinations in semestral arrangement

Course code	Names of courses ending with examination	Semester
ELR051371W	Selected problems of circuit theory	1
ELR053262W	Electromechanical drive systems	1
ELR052573W	Power Systems Operation and Control 1	2
ELR052171W	Fundamentals of digital power system protection and control	3
ELR052576W	Modern technologies in electric power transmission and distribution	3
one exam from optional courses block A		4

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

Semester	Allowable deficit of ECTS points after semester
1	5
2	5
3	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