

PLAN OF STUDIES

FACULTY:	Electrical Engineering
MAIN FIELD OF STUDY:	Electrical Engineering
EDUCATION LEVEL:	2nd level, 2nd level studies
FORM OF STUDIES:	full-time
PROFILE:	general academic
SPECIALIZATION:	Control in Electrical Power Engineering
LANGUAGE OF STUDY:	english

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 creditin g	Course			
			lec	cl	lab	pr	sem		ZZU	CNPS	total	BK classes			universit y-wide	practical	kind	type
1	ELR041330W	Numerical and Optimization Methods	1					K2ETK_W02	15	60	2	1,4	T	Z			PD	OB
2	ELR041330L	Numerical and Optimization Methods			1			K2ETK_U02 K2ETK_K06	15	30	1	0,7	T	Z		P	PD	OB
3	ELR041331W	Power Quality Assessment	2					S2CPE_W13 K2ETK_K01 K2ETK_K02	30	90	3	2,1	T	Z			S	OB
4	ELR041331L	Power Quality Assessment			1			S2CPE_U11 K2ETK_K01 K2ETK_K02	15	30	1	0,7	T	Z		P	S	OB
5	ELR041332W	Circuits and Systems	2					K2ETK_W01	30	90	3	2,1	T	E			K	OB
6	ELR041332C	Circuits and Systems		1				K2ETK_U01 K2ETK_K01	15	30	1	0,7	T	Z		P	K	OB
7	ELR042131W	Power System Faults	2					K2ETK_W03 K2ETK_K01	30	120	4	2,8	T	E			K	OB
8	ELR042139P	Fault Calculations				2		S2CPE_U12 K2ETK_K02	30	60	2	1,4	T	Z		P	S	OB
9	ELR043225W	Dynamics and Control of AC and DC Drives	2					K2ETK_W04	30	120	4	2,8	T	E			K	OB
10	ELR043225L	Dynamics and Control of AC and DC Drives			1			K2ETK_U03 K2ETK_K02 K2ETK_K06	15	30	1	0,7	T	Z		P	K	OB
11	ELR043225P	Dynamics and Control of AC and DC Drives				1		K2ETK_U03 K2ETK_K02 K2ETK_K06	15	30	1	0,7	T	Z		P	K	OB
12	ESN001501W	Advanced Technology in Electrical Power Generation	2					S2CPE_W14	30	90	3	2,1	T	Z			S	OB
13	ESN001501C	Advanced Technology in Electrical Power Generation		1				S2CPE_U13 K2ETK_K03	15	30	1	0,7	T	Z		P	S	OB
Total			11	2	3	3			285	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 creditin g	Course			
			lec	cl	lab	pr	sem		ZZU	CNPS	total	BK classes			universit y-wide	practical	kind	type
Optional courses block: Foreign Language								ECTS		hours								
1	JZL100709BKC	Foreign language B2+ or C1+		1				K2ETK_U05 K2ETK_K01	15	30	1	0,7	T	Z	O	P	KO	W
2	JZL100710BKC	Foreign language A1 or A2		3				K2ETK_U06 K2ETK_K01	45	60	2	1,4	T	Z	O	P	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	6	3	3	0	345	900	30	21

Semester 2

Obligatory courses

number of ECTS points: 24

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	ELR042132W	Digital Control Techniques	2					S2CPE_W12 K2ETK_K02 K2ETK_K06 K2ETK_K07	30	60	2	1,4	T	Z			S	OB
2	ELR042132L	Digital Control Techniques			1			S2CPE_U01 K2ETK_K02 K2ETK_K06 K2ETK_K07	15	30	1	0,7	T	Z		P	S	OB
3	ELR042133W	Simulation and Analysis of Power System Transients	1					S2CPE_W01	15	30	1	0,7	T	Z			S	OB
4	ELR042133L	Simulation and Analysis of Power System Transients			2			S2CPE_U02 K2ETK_K06 K2ETK_K07	30	60	2	1,4	T	Z		P	S	OB
5	ELR042134W	Digital Signal Processing for Protection and Control	2					S2CPE_W02	30	60	2	1,4	T	E			S	OB
6	ELR042134P	Digital Signal Processing for Protection and Control				2		S2CPE_U03 K2ETK_K02	30	60	2	1,4	T	Z		P	S	OB
7	ELR042231W	Power System Protection	2					S2CPE_W03 K2ETK_K06	30	90	3	2,1	T	E			S	OB
8	ELR042231L	Power System Protection			2			S2CPE_U04 K2ETK_K06	30	60	2	1,4	T	Z		P	S	OB
9	ELR042232W	Fiber Optics Communications and Sensors	2					S2CPE_W04 K2ETK_K06	30	60	2	1,4	T	Z			S	OB
10	ELR042232L	Fiber Optics Communications and Sensors			2			S2CPE_U05 K2ETK_K06	30	30	1	0,7	T	Z		P	S	OB
11	ELR042331W	Renewable Energy Sources	2					S2CPE_W05 K2ETK_K06	30	60	2	1,4	T	Z			S	OB
12	ELR042331S	Renewable Energy Sources				1		S2CPE_U06 K2ETK_K06	15	30	1	0,7	T	Z		P	S	OB
13	ELR042531W	Electric Power System Operation and Control	2					S2CPE_W06	30	60	2	1,4	T	Z			S	OB
14	ELR042531S	Electric Power System Operation and Control				1		S2CPE_U07 K2ETK_K07	15	30	1	0,7	T	Z		P	S	OB
Total			13		7	2	2		360	720	24	16,8						

Optional courses

minimum

175

hours in semester,

6

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	ELR045105Q	Diploma placement 4 weeks				40		S2CPE_U16 K2ETK_K06	160	120	4	2,8	T	Z		P	S	W
Optional courses block: Management								ECTS	2	hours	1							
1	ZMR042538W	Market Mechanisms in Power Systems with Distributed Energy	1					K2ETK_W06 K2ETK_K03 K2ETK_K06	15	60	2	1,4	T	Z	O		KO	W
2	ZMZ001499W	Fundamentals of Management	1					K2ETK_W06 K2ETK_K03 K2ETK_K06	15	60	2	1,4	T	Z	O		KO	W

Altogether in semester

Diploma placement 4 weeks

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	2	2	375	780	26	18,2
0	0	0	40	0	160	120	4	2,8

Semester 3

Obligatory courses

number of ECTS points: 21

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			universit y-wide	practical	kind	type
1	ELR041120W	Advanced High Voltage Technology	2					S2CPE_U07 K2ETK_K07	30	90	3	2,1	T	E			S	OB
2	ELR041120L	Advanced High Voltage Technology			2			S2CPE_U08 K2ETK_K07	30	60	2	1,4	T	Z		P	S	OB
3	ELR042135W	Artificial Intelligence Techniques	2					S2CPE_U08	30	60	2	1,4	T	Z			S	OB
4	ELR042135P	Artificial Intelligence Techniques				1		S2CPE_U09 K2ETK_K02 K2ETK_K06	15	30	1	0,7	T	Z		P	S	OB
5	ELR042233W	Power System Automation and Security	2					S2CPE_U09 K2ETK_K06	30	90	3	2,1	T	E			S	OB
6	ELR042233S	Power System Automation and Security				1		S2CPE_U04 K2ETK_K06	15	30	1	0,7	T	Z		P	S	OB
7	ELR042532W	Electrical Power Systems Management	1					S2CPE_U10 K2ETK_K07	15	30	1	0,7	T	Z			S	OB
8	ELR042532S	Electrical Power Systems Management				1		S2CPE_U07 K2ETK_K07	15	30	1	0,7	T	Z		P	S	OB
9	ELR043311W	Electromagnetic Compatibility	2					S2CPE_W11 K2ETK_K07	30	60	2	1,4	T	Z			S	OB
10	ELR043311L	Electromagnetic Compatibility			1			S2CPE_U10 K2ETK_K07	15	30	1	0,7	T	Z		P	S	OB
11	ELR043312W	Measurement methods and techniques	2					K2ETK_W05 K2ETK_K07	30	60	2	1,4	T	Z			PD	OB
12	ELR043312L	Measurement methods and techniques			2			K2ETK_U04 K2ETK_K07	30	60	2	1,4	T	Z		P	PD	OB
Total			11		5	1	2		285	630	21	14,7						

Optional courses

minimum

135

hours in semester,

9

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 creditin g	Course			
			lec	cl	lab	pr	sem		ZZU	CNPS	total	BK classes			universit y-wide	practical	kind	type
1	ELR045117P ELR045127P ELR045137P	Diploma Project				8		S2CPE_U17 K2ETK_K06	120	240	8	5,6	T	Z		P	S	W
Optional courses block: Law										ECTS	1	hours	1					
1	PRR041231W	Intellectual property rights in the world	1					K2ETK_W07 K2ETK_K03 K2ETK_K05	15	30	1	0,7	T	Z	O		KO	W
2	PRR041232W	Inventions and patents	1					K2ETK_W07 K2ETK_K03 K2ETK_K05	15	30	1	0,7	T	Z	O		KO	W
3	PRR041233W	Industrial property and copyright for engineers	1					K2ETK_W07 K2ETK_K03 K2ETK_K05	15	30	1	0,7	T	Z	O		KO	W
4	PRZ001007W	Protection of Intellectual Property	1					K2ETK_W07 K2ETK_K03 K2ETK_K05	15	30	1	0,7	T	Z	O		KO	W
5	PRZ001008W	International Law	1					K2ETK_W07 K2ETK_K03 K2ETK_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				
12	0	5	9	2	420	900	30	21

Semester 4

Optional courses

No.	Course code	Name of course	Weekly number of hours					Field-of-study educational effect symbol	minimum 300 hours in semester,				Form of course	Way of crediting	30 ECTS points			
			lec	cl	lab	pr	sem		Number of hours		Number of ECTS points				Course			
									ZZU	CNPS	total	BK classes			university-wide	practical	kind	type
1	ELR045108S	Diploma seminar					2	S2CPE_U18 K2ETK_K06	30	90	3	2,1	T	Z		P	S	W
2	ELR045119DP ELR045129DP ELR045139DP	Master's thesis					12	S2CPE_U19 K2ETK_K04 K2ETK_K06	180	540	18	12,6	T	Z		P	S	W
Optional courses block: Social Sciences and Ethics										ECTS	2		hours	1				
1	FLH051721S	Ethics in bussiness					1	K2ETK_U07 K2ETK_K06	15	60	2	1,4	T	Z	O	P	KO	W
2	PKH053721S	The art of public speaking					1	K2ETK_U07 K2ETK_K06	15	60	2	1,4	T	Z	O	P	KO	W
3	PKH053821S	Social communication					1	K2ETK_U07 K2ETK_K06	15	60	2	1,4	T	Z	O	P	KO	W
Optional courses block: A										ECTS	4		hours	3				
1	ELR041230W	Visual Engineering Environments and Graphical Languages	1					S2CPE_W15	15	30	1	0,7	T	E			S	W
2	ELR041230L	Visual Engineering Environments and Graphical Languages			2			S2CPE_U14 K2ETK_K02	30	90	3	2,1	T	Z		P	S	W
3	ELR041334W	Signal and Systems	2					S2CPE_W15	30	90	3	2,1	T	E			S	W
4	ELR041334C	Signal and Systems		1				S2CPE_U14 K2ETK_K01	15	30	1	0,7	T	Z		P	S	W
5	ELR041335W	Advanced Signal Processing Methods	2					S2CPE_W15	30	90	3	2,1	T	E			S	W
6	ELR041335C	Advanced Signal Processing Methods		1				S2CPE_U14 K2ETK_K06	15	30	1	0,7	T	Z		P	S	W
7	ELR042234W	PLC and Wireless Communications for Monitoring and Metering	2					S2CPE_W15 K2ETK_K06	30	90	3	2,1	T	E			S	W
8	ELR042234S	PLC and Wireless Communications for Monitoring and Metering					1	S2CPE_U14 K2ETK_K06	15	30	1	0,7	T	Z		P	S	W
9	ELR042335W	Advanced Substations and Electrical Equipment	2					S2CPE_W15	30	90	3	2,1	T	E			S	W
10	ELR042335P	Advanced Substations and Electrical Equipment					1	S2CPE_U14 K2ETK_K06	15	30	1	0,7	T	Z		P	S	W
11	ELR042534W	Power System Modelling	2					S2CPE_W15	30	90	3	2,1	T	E			S	W
12	ELR042534P	Power System Modelling					1	S2CPE_U14 K2ETK_K06	15	30	1	0,7	T	Z		P	S	W
13	ELR042535W	Computer Control of Power System	2					S2CPE_W15	30	90	3	2,1	T	E			S	W
14	ELR042535S	Computer Control of Power System					1	S2CPE_U14 K2ETK_K06	15	30	1	0,7	T	Z		P	S	W
Optional courses block: B										ECTS	3		hours	2				
1	ELR042136W	Design of logic circuits	1					S2CPE_W16	15	60	2	1,4	T	Z			S	W
2	ELR042136L	Design of logic circuits			1			S2CPE_U15 K2ETK_K01 K2ETK_K02 K2ETK_K07	15	30	1	0,7	T	Z		P	S	W
3	ELR042138W	Electrical Power Engineering – excursionary activities	1						15	60	2	1,4	T	Z			S	W
4	ELR042138S	Electrical Power Engineering – excursionary activities					1		15	30	1	0,7	T	Z		P	S	W
5	ELR043226W	Fuzzy Logic Control	1					S2CPE_W16	15	60	2	1,4	T	Z			S	W
6	ELR043226L	Fuzzy Logic Control			1			S2CPE_U15 K2ETK_K06	15	30	1	0,7	T	Z		P	S	W
7	ELR043227W	Control of Power Electronic Converters	1					S2CPE_W16 K2ETK_K06	15	60	2	1,4	T	Z			S	W
8	ELR043227L	Control of Power Electronic Converters			1			S2CPE_U15 K2ETK_K06	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				
3	1	1	12	3	300	900	30	21

2. Set of examinations in semestral arrangement

Course code	Names of courses ending with examination	Semester
ELR041332W	Circuits and Systems	1
ELR042131W	Power System Faults	1
ELR043225W	Dynamics and Control of AC and DC Drives	1
ELR042134W	Digital Signal Processing for Protection and Control	2
ELR042231W	Power System Protection	2
ELR041120W	Advanced High Voltage Technology	3
ELR042233W	Power System Automation and Security	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	4
2	4
3	4
4	0

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