

PLAN OF STUDIES

FACULTY OF MECHANICAL AND POWER ENGINEERING

MAIN FIELD OF STUDY: POWER ENGINEERING

EDUCATION LEVEL: 1st level, Engineer

FORM OF STUDIES: full-time

PROFILE: general academic

SPECIALIZATION: THERMAL POWER ENGINEERING

LANGUAGE OF STUDY: polish

Faculty Council Resolution of 20.09.2017
In effect since 01.10.2017

Plan of studies structure in point layout

30	informatics	humanities			advanced design		
29					methods	professional practice	
28		informatics					
27							
26						engineer individual	
25						student project	engineering thesis
24							
23							
22							
21							
20							
19	chemistry						
18							
17							
16							
15	physics						
14		chemistry					
13							
12							
11		physics					
10							
9							
8							
7	mathematics						
6							
5		mathematics				humanities	
4							
3						foreign language	
2			humanities	foreign language			diploma seminar
1							management
	sem. 1	sem. 2	sem. 3	sem. 4	sem. 5	sem. 6	sem. 7

basic and obligatory courses
general and obligatory courses
general and optional courses
obligatory main-field-of-study courses
optional main-field-of-study courses
optional/specialization courses

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

Semester 1

Obligatory courses number of ECTS points 30

No.	Course/group of courses code	Name of course/group of courses (denote group of courses with symbol GK)	Weekly number of hours					Field-of-study educational effect symbol	Number of hours		Number of ECTS points		Form ² of course/group of courses	Way ³ of crediting	Course/group of courses			
			lec	cl	lab	pr	sem		ZZU	CNPS	total	BK classes ¹			universit y-wide ⁴	practical ⁵	kind ⁶	type ⁷
1	MAT1415	Mathematical Analysis 1A	2					K1ENG_W02 K1ENG_K01	30	150	5	2,5	T	E	O		PD	Ob
2	MAT1415	Mathematical Analysis 1A		2				K1ENG_U08 K1ENG_K01	30	90	3	2,25	T	Z	O	P	PD	Ob
3	MAT1408	Algebra and Analytic Geometry	2					K1ENG_W01 K1ENG_K01	30	60	2	1	T	E	O		PD	Ob
4	MAT1408	Algebra and Analytic Geometry		1				K1ENG_U07 K1ENG_K01	15	60	2	1,5	T	Z	O	P	PD	Ob
5	FZP1065	Physics 1.6	2					K1ENG_W03 K1ENG_K02 K1ENG_K03 K1ENG_K04	30	90	3	1,5	T	E	O		PD	Ob
6	FZP1065	Physics 1.6		2				K1ENG_W03 K1ENG_K01 K1ENG_K02 K1ENG_K03 K1ENG_K04	30	60	2	1,5	T	Z	O	P	PD	Ob
7	CHC1101	Chemistry	2					K1ENG_W04	30	90	3	1,5	T	Z	O		PD	Ob
8	ESN0371	Power Industry Machinery	2					K1ENG_W08	30	60	2	1	T	Z			K	Ob
9	ESN0220	Descriptive Geometry	2					K1ENG_W07	30	60	2	1	T	Z			K	Ob
10	ESN0220	Descriptive Geometry		1				K1ENG_U13	15	30	1	0,75	T	Z		P	K	Ob
11	ESN0780	Basics of Metrology and Experiment Techniques	2					K1ENG_W05	30	60	2	1	T	Z			K	Ob
12	ESN0780	Basics of Metrology and Experiment Techniques		1				K1ENG_U11	15	30	1	0,75	T	Z		P	K	Ob
13	INN1004	Information Technologies	2					K1ENG_W06	30	60	2	1	T	Z	O		KO	Ob
Total			16	7					345	900	30	17,25						

¹BK – number of ECTS points assigned to hours of classes requiring direct contact of teachers with students

²Traditional – enter T, remote – enter Z

³Exam – enter E, crediting – enter Z. For the group of courses – after the letter E or Z - enter in brackets the final course form (lec, cl, lab, pr, sem)

⁴University-wide course /group of courses – enter O

⁵Practical course / group of courses – enter P. For the group of courses – in brackets enter the number of ECTS points assigned to practical courses

⁶ KO – general education, PD – basic sciences, K – field-of-studies, S – specialization

⁷ Optional – enter W, obligatory – enter Ob

Altogether in semester 1

Total number of hours					Total number of ZZU hours	Total number of CNPS hours	Total number of ECTS points	Number of ECTS points for BK classes ¹
lec	cl	lab	pr	sem				
16	7				345	900	30	17,25

Semester 2

Obligatory courses number of ECTS points 30

No.	Course/group of courses code	Name of course/group of courses (denote group of courses with symbol GK)	Weekly number of hours					Field-of-study educational effect symbol	Number of hours		Number of ECTS points		Form ² of course/group of courses	Way ³ of crediting	Course/group of courses			
			lec	cl	lab	pr	sem		ZZU	CNPS	total	BK classes ¹			university-wide ⁴	practical ⁵	kind ⁶	type ⁷
1	MAT1425	Mathematical Analysis 2.2A	3					K1ENG_W02 K1ENG_K01	45	150	5	2,5	T	E	O		PD	Ob
2	MAT1425	Mathematical Analysis 2.2A		2				K1ENG_U08 K1ENG_K01	30	90	3	2,25	T	Z	O	P	PD	Ob
3	FZP1066	Physics 2.11	2					K1ENG_W03 K1ENG_K01 K1ENG_K02 K1ENG_K03 K1ENG_K04	30	90	3	1,5	T	E	O		PD	Ob
4	FZP1066	Physics 2.11			2			K1ENG_W03 K1ENG_K01 K1ENG_K02 K1ENG_K03 K1ENG_K04	30	60	2	1,5	T	Z	O	P	PD	Ob
5	CHC1101	Chemistry			1			K1ENG_U10	15	30	1	0,75	T	Z	O	P	PD	Ob
6	ESN0710	Fundamentals of Materials Science	2					K1ENG_W09	30	90	3	1,5	T	E			K	Ob
7	ESN0760	Fundamentals of Fluid Mechanics	2					K1ENG_W10	30	60	2	1	T	Z			K	Ob
8	ESN0760	Fundamentals of Fluid Mechanics		1				K1ENG_U14 K1ENG_K04	15	30	1	0,75	T	Z		P	K	Ob
9	ESN0800	Basics of Thermodynamics	2					K1ENG_W11	30	60	2	1	T	Z			K	Ob
10	ESN0800	Basics of Thermodynamics		1				K1ENG_U16	15	30	1	0,75	T	Z		P	K	Ob
11	ESN0730	Fundamental Mechanics and Strength of Materials	1					K1ENG_W12	15	30	1	0,5	T	Z			K	Ob
12	ESN0730	Fundamental Mechanics and Strength of Materials		1				K1ENG_U18	15	30	1	0,75	T	Z		P	K	Ob

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³Exam – enter E, crediting – enter Z. For the group of courses – after the letter E or Z - enter in brackets the final course form (lec, cl, lab, pr, sem)

⁴University-wide course /group of courses – enter O

⁵Practical course / group of courses – enter P. For the group of courses – in brackets enter the number of ECTS points assigned to practical courses

⁶KO – general education, PD – basic sciences, K – field-of-studies, S – specialization

⁷Optional – enter W, obligatory – enter Ob

No.	Course/group of courses code	Name of course/group of courses (denote group of courses with symbol GK)	Weekly number of hours					Field-of-study educational effect symbol	Number of hours		Number of ECTS points		Form ² of course/group of courses	Way ³ of crediting	Course/group of courses			
			lec	cl	lab	pr	sem		ZZU	CNPS	total	BK classes ¹			universit y-wide ⁴	practical ⁵	kind ⁶	type ⁷
13	ESN0780	Basics of Metrology and Experiment Techniques			1			K1ENG_U12	15	30	1	0,75	T	Z		P	K	Ob
14	INN1003	Application Packages			2			K1ENG_U02	30	60	2	1,5	T	Z	O	P	KO	Ob
15	PRZ1152	Intellectual and Industrial Property Protection	2					K1ENG_W13	30	60	2	1	T	Z	O		KO	Ob
Total			14	5	6				375	900	30	18						

Obligatory courses (optionally in English) number of ECTS points 8

No.	Course/group of courses code	Name of course/group of courses (denote group of courses with symbol GK)	Weekly number of hours					Field-of-study educational effect symbol	Number of hours		Number of ECTS points		Form ² of course/group of courses	Way ³ of crediting	Course/group of courses			
			lec	cl	lab	pr	sem		ZZU	CNPS	total	BK classes ¹			universit y-wide ⁴	practical ⁵	kind ⁶	type ⁷
1	ESN0731	Fundamental Mechanics and Strength of Materials	1					K1ENG_W12	15	30	1	0,5	T	Z			K	Ob
2	ESN0731	Fundamental Mechanics and Strength of Materials		1				K1ENG_U18	15	30	1	0,75	T	Z		P	K	Ob
3	ESN0801	Basics of Thermodynamics	2					K1ENG_W11	30	60	2	1	T	Z			K	Ob
4	ESN0801	Basics of Thermodynamics		1				K1ENG_U16	15	30	1	0,75	T	Z		P	K	Ob
5	ESN0761	Fundamentals of Fluid Mechanics	2					K1ENG_W10	30	60	2	1	T	Z			K	Ob
6	ESN0761	Fundamentals of Fluid Mechanics		1				K1ENG_U14	15	30	1	0,75	T	Z		P	K	Ob

Altogether in semester 2

Total number of hours					Total number of ZZU hours	Total number of CNPS hours	Total number of ECTS points	Number of ECTS points for BK classes ¹
lec	cl	lab	pr	sem				
14	5	6			375	900	30	18

¹BK – number of ECTS points assigned to hours of classes requiring direct contact of teachers with students

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³Exam – enter E, crediting – enter Z. For the group of courses – after the letter E or Z - enter in brackets the final course form (lec, cl, lab, pr, sem)

⁴University-wide course /group of courses – enter O

⁵Practical course / group of courses – enter P. For the group of courses – in brackets enter the number of ECTS points assigned to practical courses

⁶ KO – general education, PD – basic sciences, K – field-of-studies, S – specialization

⁷ Optional – enter W, obligatory – enter Ob

Semester 3

Obligatory courses number of ECTS points 30

No.	Course/group of courses code	Name of course/group of courses (denote group of courses with symbol GK)	Weekly number of hours					Field-of-study educational effect symbol	Number of hours		Number of ECTS points		Form ² of course/group of courses	Way ³ of crediting	Course/group of courses			
			lec	cl	lab	pr	sem		ZZU	CNPS	total	BK classes ¹			universit y-wide ⁴	practical ⁵	kind ⁶	type ⁷
1	ESN0650	Fundamentals of Control Systems	2					K1ENG_W14	30	90	3	1,5	T	E			K	Ob
2	ESN0650	Fundamentals of Control Systems		1				K1ENG_U19	15	30	1	0,75	T	Z		P	K	Ob
3	ESN0660	Fundamentals of Electronics	1					K1ENG_W15	15	30	1	0,5	T	Z			K	Ob
4	ESN0660	Fundamentals of Electronics			1			K1ENG_U21	15	30	1	0,75	T	Z		P	K	Ob
5	ESN0680	Electrical Engineering Fundamentals	2					K1ENG_W16	30	60	2	1	T	Z			K	Ob
6	ESN0680	Electrical Engineering Fundamentals		1				K1ENG_U22	15	30	1	0,75	T	Z		P	K	Ob
7	ESN0940	Technical Drawing				2		K1ENG_U13	30	60	2	1,5	T	Z		P	K	Ob
8	ESN0420	Engineering Materials and Consumables	1					K1ENG_W09	15	30	1	0,5	T	Z			K	Ob
9	ESN0420	Engineering Materials and Consumables			1			K1ENG_U24	15	30	1	0,75	T	Z		P	K	Ob
10	ESN0470	Fluid Mechanics	1					K1ENG_W10	15	60	2	1	T	E			K	Ob
11	ESN0470	Fluid Mechanics		1				K1ENG_U14 K1ENG_K04	15	30	1	0,75	T	Z		P	K	Ob
12	ESN1190	Thermodynamic	1					K1ENG_W11	15	60	2	1	T	E			K	Ob
13	ESN1190	Thermodynamic		1				K1ENG_U16	15	30	1	0,75	T	Z		P	K	Ob
14	ESN1040	Combustion and Fuels	2					K1ENG_W18	30	90	3	1,5	T	E			K	Ob
15	ESN1040	Combustion and Fuels		1				K1ENG_U25 K1ENG_U26	15	30	1	0,75	T	Z		P	K	Ob
16	ESN1040	Combustion and Fuels			1			K1ENG_U25 K1ENG_U26	15	30	1	0,75	T	Z		P	K	Ob
17	ESN0460	Mechanics and Strength of Materials	2					K1ENG_W12	30	60	2	1	T	Z			K	Ob
18	ESN0460	Mechanics and Strength of Materials		2				K1ENG_U18	30	60	2	1,5	T	Z		P	K	Ob
19	ESN0111	Ecology	2					K1ENG_W19 K1ENG_K02	30	60	2	1	T	Z			K	Ob
Total			14	7	3	2			390	900	30	18						

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⁵Practical course / group of courses – enter P. For the group of courses – in brackets enter the number of ECTS points assigned to practical courses

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⁷ Optional – enter W, obligatory – enter Ob

Obligatory courses (optionally in English) number of ECTS points 24

No.	Course/group of courses code	Name of course/group of courses (denote group of courses with symbol GK)	Weekly number of hours					Field-of-study educational effect symbol	Number of hours		Number of ECTS points		Form ² of course/group of courses	Way ³ of crediting	Course/group of courses			
			lec	cl	lab	pr	sem		ZZU	CNPS	total	BK classes ¹			universit y-wide ⁴	practical ⁵	kind ⁶	type ⁷
1	ESN0461	Mechanics and Strength of Materials	2					K1ENG_W12	30	90	2	1	T	Z			K	Ob
2	ESN0461	Mechanics and Strength of Materials		2				K1ENG_U18	30	90	2	1,5	T	Z		P	K	Ob
3	ESN1043	Combustion and Fuels	2					K1ENG_W18	30	90	3	1,5	T	E			K	Ob
4	ESN1043	Combustion and Fuels		1				K1ENG_U25 K1ENG_U26	15	30	1	0,75	T	Z		P	K	Ob
5	ESN1043	Combustion and Fuels			1			K1ENG_U25 K1ENG_U26	15	30	1	0,75	T	Z		P	K	Ob
6	ESN1191	Thermodynamic	1					K1ENG_W11	15	60	2	1	T	E			K	Ob
7	ESN1191	Thermodynamic		1				K1ENG_U16	15	30	1	0,75	T	Z		P	K	Ob
8	ESN0471	Fluid Mechanics	1					K1ENG_W10	15	60	2	1	T	E			K	Ob
9	ESN0471	Fluid Mechanics		1				K1ENG_U14	15	30	1	0,75	T	Z		P	K	Ob
10	ESN0681	Fundamentals of Electrical Engineering	2					K1ENG_W16	30	60	2	1	T	Z			K	Ob
11	ESN0681	Fundamentals of Electrical Engineering		1				K1ENG_U22	15	30	1	0,75	T	Z		P	K	Ob
12	ESN0661	Fundamentals of Electronics	1					K1ENG_W15	15	30	1	0,5	T	Z			K	Ob
13	ESN0661	Fundamentals of Electronics			1			K1ENG_U21	15	30	1	0,75	T	Z		P	K	Ob
14	ESN0652	Fundamentals of Control Systems	2					K1ENG_W14	30	90	3	1,5	T	E			K	Ob
15	ESN0652	Fundamentals of Control Systems		1				K1ENG_U19	15	30	1	0,75	T	Z		P	K	Ob

Altogether in semester 3

Total number of hours					Total number of ZZU hours	Total number of CNPS hours	Total number of ECTS points	Number of ECTS points for BK classes ¹
lec	cl	lab	pr	sem				
14	7	3	2		390	900	30	18

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⁴University-wide course /group of courses – enter O

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⁷Optional – enter W, obligatory – enter Ob

Semester 4

Obligatory courses number of ECTS points 25

No.	Course/group of courses code	Name of course/group of courses (denote group of courses with symbol GK)	Weekly number of hours					Field-of-study educational effect symbol	Number of hours		Number of ECTS points		Form ² of course/group of courses	Way ³ of crediting	Course/group of courses			
			lec	cl	lab	pr	sem		ZZU	CNPS	total	BK classes ¹			universit y-wide ⁴	practical ⁵	kind ⁶	type ⁷
1	ESN0650	Fundamentals of Control Systems			2			K1ENG_U20	30	60	2	1,5	T	Z		P	K	Ob
2	ESN0065	CAD			2			K1ENG_U13	30	60	2	1,5	T	Z		P	K	Ob
3	ESN0622	Basics of Machine Design I	2					K1ENG_W22	30	60	2	1	T	Z			K	Ob
4	ESN0622	Basics of Machine Design I				1		K1ENG_U30	15	60	2	1,5	T	Z		P	K	Ob
5	ESN0680	Electrical Engineering Fundamentals			1			K1ENG_U23	15	30	1	0,75	T	Z		P	K	Ob
6	ESN0480	Fluid Mechanics - lab			2			K1ENG_U15	30	60	2	1,5	T	Z		P	K	Ob
7	ESN1200	Thermodynamics - lab			2			K1ENG_U17 K1ENG_K04	30	60	2	1,5	T	Z		P	K	Ob
8	ESN0875	Heat Transfer	2					K1ENG_W21	30	60	2	1	T	Z			K	Ob
9	ESN0875	Heat Transfer		2				K1ENG_U28	30	60	2	1,5	T	Z		P	K	Ob
10	ESN0400	Electrical Machines and Devices	2					K1ENG_W20	30	90	3	1,5	T	E			K	Ob
11	ESN0400	Electrical Machines and Devices			1			K1ENG_U27 K1ENG_K01 K1ENG_K04	15	30	1	0,75	T	Z		P	K	Ob
12	ESN0412	Turbomachinery	2					K1ENG_W30	30	90	3	1,5	T	E			S	W
13	ESN0412	Turbomachinery				1		K1ENG_U37 K1ENG_U29	15	30	1	0,75	T	Z		P	S	W
Total			8	2	10	2			330	750	25	16,25						

Obligatory courses (optionally in English) number of ECTS points 8

No.	Course/group of courses code	Name of course/group of courses (denote group of courses with symbol GK)	Weekly number of hours					Field-of-study educational effect symbol	Number of hours		Number of ECTS points		Form ² of course/group of courses	Way ³ of crediting	Course/group of courses			
			lec	cl	lab	pr	sem		ZZU	CNPS	total	BK classes ¹			universit y-wide ⁴	practical ⁵	kind ⁶	type ⁷
1	ESN0876	Heat Transfer	2					K1ENG_W21	30	60	2	1	T	Z			K	Ob
2	ESN0876	Heat Transfer		2				K1ENG_U28	30	60	2	1,5	T	Z		P	K	Ob
3	ESN0623	Basics of Machine Design I	2					K1ENG_W22	30	60	2	1	T	Z			K	Ob
4	ESN0623	Basics of Machine Design I				1		K1ENG_U30	15	60	2	1,5	T	Z		P	K	Ob

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⁴University-wide course /group of courses – enter O

⁵Practical course / group of courses – enter P. For the group of courses – in brackets enter the number of ECTS points assigned to practical courses

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⁷Optional – enter W, obligatory – enter Ob

Optional courses (minimum 60 hours in semester, 5 ECTS points)

No.	Course/group of courses code	Name of course/group of courses (denote group of courses with symbol GK)	Weekly number of hours					Field-of-study educational effect symbol	Number of hours		Number of ECTS points		Form ² of course/group of courses	Way ³ of crediting	Course/group of courses			
			lec	cl	lab	pr	sem		ZZU	CNPS	total	BK classes ¹			universit y-wide ⁴	practical ⁵	kind ⁶	type ⁷
1	ESN0850	Pumps and Pumping Systems	2					S1ENC_W01	30	60	2	1	T	Z			S	W
2	ESN0850	Pumps and Pumping Systems		1				S1ENC_U01	15	30	1	0,75	T	Z		P	S	W
3	HSN10030 0BK	Humanities	1					K1ENG_W31 K1ENG_K02 K1ENG_K03 K1ENG_K06	15	60	2	1	T	Z	O		KO	W
Total			3	1					60	150	5	2,75						

Altogether in semester 4

Total number of hours					Total number of ZZUhours	Total number of CNPS hours	Total number of ECTS points	Number of ECTS points for BK classes ¹
lec	cl	lab	pr	sem				
11	3	10	2		390	900	30	19

Semester 5

Obligatory courses number of ECTS points 17

No.	Course/group of courses code	Name of course/group of courses (denote group of courses with symbol GK)	Weekly number of hours					Field-of-study educational effect symbol	Number of hours		Number of ECTS points		Form ² of course/group of courses	Way ³ of crediting	Course/group of courses			
			lec	cl	lab	pr	sem		ZZU	CNPS	total	BK classes ¹			universit y-wide ⁴	practical ⁵	kind ⁶	type ⁷
1	ESN1190	Flue-gases Cleaning Techniques	2					K1ENG_W23	30	60	2	1	T	Z			K	Ob
2	ESN1190	Flue-gases Cleaning Techniques		1				K1ENG_U31	15	30	1	0,75	T	Z		P	K	Ob
3	ESN0642	Basics of Machine Design II	2					K1ENG_W22	30	90	3	1,5	T	E			K	Ob
4	ESN0642	Basics of Machine Design II				1		K1ENG_U30	15	60	2	1,5	T	Z		P	K	Ob
5	ESN0523	Power Engineering Metrology	2					K1ENG_W24	30	90	3	1,5	T	E			K	Ob
6	ESN0523	Power Engineering Metrology			2			K1ENG_U32	30	60	2	1,5	T	Z		P	K	Ob
7	ESN0331	Utility Boilers	2					K1ENG_W25	30	90	3	1,5	T	E			K	Ob
8	ESN0331	Utility Boilers				1		K1ENG_U33 K1ENG_U29	15	30	1	0,75	T	Z		P	K	Ob
Total			8	1	2	2			195	510	17	10						

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³Exam – enter E, crediting – enter Z. For the group of courses – after the letter E or Z - enter in brackets the final course form (lec, cl, lab, pr, sem)

⁴University-wide course /group of courses – enter O

⁵Practical course / group of courses – enter P. For the group of courses – in brackets enter the number of ECTS points assigned to practical courses

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⁷ Optional – enter W, obligatory – enter Ob

Obligatory courses (optionally in English) number of ECTS points 5

No.	Course/group of courses code	Name of course/group of courses (denote group of courses with symbol GK)	Weekly number of hours					Field-of-study educational effect symbol	Number of hours		Number of ECTS points		Form ² of course/group of courses	Way ³ of crediting	Course/group of courses			
			lec	cl	lab	pr	sem		ZZU	CNPS	total	BK classes ¹			universit y-wide ⁴	practical ⁵	kind ⁶	type ⁷
1	ESN0643	Basics of Machine Design II	2					K1ENG_W22	30	90	3	1,5	T	E			K	Ob
2	ESN0643	Basics of Machine Design II				1		K1ENG_U30	15	60	2	1,5	T	Z		P	K	Ob

Optional courses (minimum 195 hours in semester, 13 ECTS points)

No.	Course/group of courses code	Name of course/group of courses (denote group of courses with symbol GK)	Weekly number of hours					Field-of-study educational effect symbol	Number of hours		Number of ECTS points		Form ² of course/group of courses	Way ³ of crediting	Course/group of courses			
			lec	cl	lab	pr	sem		ZZU	CNPS	total	BK classes ¹			universit y-wide ⁴	practical ⁵	kind ⁶	type ⁷
		Advanced Design Methods:			2				30	90	3	2,25	T	Z		P	K	W
	ESN0064	CATIA					K1ENG_U13											
	ESN1022	Solid Edge					K1ENG_U13											
	ESN0246	3D Graphic					K1ENG_U13 K1ENG_U05 K1ENG_K06											
2	ESN0075	Refrigeration and Cryogenics	2				S1ENC_W03	30	90	3	1,5	T	E				S	W
3	ESN0075	Refrigeration and Cryogenics			2		S1ENC_U04	30	60	2	1,5	T	Z		P		S	W
4	ESN0310	Energy Conversion	2				S1ENC_W07	30	60	2	1	T	Z				S	W
5	ESN0310	Energy Conversion			1		S1ENC_U08	15	30	1	0,75	T	Z		P		S	W
6	JZL100707	Foreign Language B2.1		4			K1ENG_U06	60	60	2	1,5	T	Z		O	P	KO	W
Total			4	4	5			195	390	13	8,5							

Optional courses (optionally in English) number of ECTS points 8

Lp	Kod kursu/grupy kursów	Nazwa kursu/grupy kursów (grupę kursów oznaczyć symbolem GK)	Tygodniowa liczba godzin					Symbol kierunku efektu kształcenia	Liczba godzin		Liczba pkt. ECTS		Forma ² kursu/grupy kursów	Sposób ³ zaliczenia	Kurs/grupa kursów			
			w	ć	l	p	s		ZZU	CNPS	łącz-na	zajęć BK ¹			ogólno-uczel-niany ⁴	o charakt. prakty-cznym ⁵	rodzaj ⁶	typ ⁷
1	ESN0311	Energy Conversion	2				S1ENC_W07	30	60	2	1	T	Z				S	W
2	ESN0311	Energy Conversion			1		S1ENC_U08	15	30	1	0,75	T	Z		P		S	W
3	ESN0078	Refrigeration and Cryogenics	2				S1ENC_W03	30	90	3	1,5	T	E				S	W
4	ESN0078	Refrigeration and Cryogenics			2		S1ENC_U04	30	60	2	1,5	T	Z		P		S	W

¹BK – number of ECTS points assigned to hours of classes requiring direct contact of teachers with students

²Traditional – enter T, remote – enter Z

³Exam – enter E, crediting – enter Z. For the group of courses – after the letter E or Z - enter in brackets the final course form (lec, cl, lab, pr, sem)

⁴University-wide course /group of courses – enter O

⁵Practical course / group of courses – enter P. For the group of courses – in brackets enter the number of ECTS points assigned to practical courses

⁶ KO – general education, PD – basic sciences, K – field-of-studies, S – specialization

⁷ Optional – enter W, obligatory – enter Ob

Altogether in semester 5

Total number of hours					Total number of ZZUhours	Total number of CNPS hours	Total number of ECTS points	Number of ECTS points for BK classes ¹
lec	cl	lab	pr	sem				
12	5	7	2		390	900	30	18,5

Semester 6

Obligatory courses number of ECTS points 11

No.	Course/group of courses code	Name of course/group of courses (denote group of courses with symbol GK)	Weekly number of hours					Field-of-study educational effect symbol	Number of hours		Number of ECTS points		Form ² of course/group of courses	Way ³ of crediting	Course/group of courses			
			lec	cl	lab	pr	sem		ZZU	CNPS	total	BK classes ¹			universit y-wide ⁴	practical ⁵	kind ⁶	type ⁷
1	ESN0136	Power and Heat Stations	2					K1ENG_W26	30	90	3	1,5	T	E			K	Ob
2	ESN0136	Power and Heat Stations			1			K1ENG_U34	15	30	1	0,75	T	Z		P	K	Ob
3	ESN0891	Power Distribution	2					K1ENG_W28	30	90	3	1,5	T	E			K	Ob
4	ESN0891	Power Distribution		1				K1ENG_U36	15	30	1	0,75	T	Z		P	K	Ob
5	ESN0042	Research and Testing of Machines and Devices	1					K1ENG_W27	15	60	2	1	T	Z			K	Ob
6	ESN0042	Research and Testing of Machines and Devices			1			K1ENG_U35	15	30	1	0,75	T	Z		P	K	Ob
Razem			5	1	2				120	330	11	6,25						

Optional courses (minimum 285 hours in semester, 19 ECTS points)

No.	Course/group of courses code	Name of course/group of courses (denote group of courses with symbol GK)	Weekly number of hours					Field-of-study educational effect symbol	Number of hours		Number of ECTS points		Form ² of course/group of courses	Way ³ of crediting	Course/group of courses			
			lec	cl	lab	pr	sem		ZZU	CNPS	total	BK classes ¹			universit y-wide ⁴	practical ⁵	kind ⁶	type ⁷
1	ESN0211	Gas Technologies	1					S1ENC_W05	15	30	1	0,5	T	Z			S	W
2	ESN0211	Gas Technologies		1				S1ENC_U05	15	30	1	0,75	T	Z		P	S	W
3	ESN0834	Heat Pumps and Solar Collectors	1					S1ENC_W06	15	30	1	0,5	T	Z			S	W
4	ESN0834	Heat Pumps and Solar Collectors			1			S1ENC_U06	15	30	1	0,75	T	Z		P	S	W
5	ESN0834	Heat Pumps and Solar Collectors				1		S1ENC_U07	15	30	1	0,75	T	Z		P	S	W
6	ESN0686	Basics of Air-conditioning	1					S1ENC_W04	15	30	1	0,5	T	Z			S	W
7	ESN0686	Basics of Air-conditioning			1			S1ENC_U12	15	30	1	0,75	T	Z		P	S	W

¹BK – number of ECTS points assigned to hours of classes requiring direct contact of teachers with students

²Traditional – enter T, remote – enter Z

³Exam – enter E, crediting – enter Z. For the group of courses – after the letter E or Z - enter in brackets the final course form (lec, cl, lab, pr, sem)

⁴University-wide course / group of courses – enter O

⁵Practical course / group of courses – enter P. For the group of courses – in brackets enter the number of ECTS points assigned to practical courses

⁶ KO – general education, PD – basic sciences, K – field-of-studies, S – specialization

⁷ Optional – enter W, obligatory – enter Ob

8	ESN1351	Engineer Individual Student Project				4		K1ENG_U01 K1ENG_U03 K1ENG_U04 K1ENG_K01	60	90	3	1	T	Z		P	K	W
9	HSN100300BK	Humanities	2					K1ENG_W31 K1ENG_K02 K1ENG_K03 K1ENG_K06	30	60	2	1	T	Z	O		KO	W
10	JZL100708	Foreign Language B2.2		4				K1ENG_U06	60	90	3	2,25	T	Z	O	P	KO	W
11	WFW000000BK	Sporting Classes		2				K1ENG_K03	30	0	0	0	T	Z	O	P	KO	W
12	ESN1410	Professional Practice						K1ENG_U03 K1ENG_K04 K1ENG_K05		120	4	0	T	Z		P	K	W
Total			5	7	2	5			285	570	19	8,75						

Altogether in semester 6

Total number of hours					Total number of ZZUhours	Total number of CNPS hours	Total number of ECTS points	Number of ECTS points for BK classes ¹
lec	cl	lab	pr	sem				
10	8	4	5		405	900	30	15

Semester 7

Obligatory courses number of ECTS points 2

No.	Course/group of courses code	Name of course/group of courses (denote group of courses with symbol GK)	Weekly number of hours					Field-of-study educational effect symbol	Number of hours		Number of ECTS points		Form ² of course/group of courses	Way ³ of crediting	Course/group of courses			
			lec	cl	lab	pr	sem		ZZU	CNPS	total	BK classes ¹			universit y-wide ⁴	practical ⁵	kind ⁶	type ⁷
1	ESN1370	Engineer Seminar					1	K1ENG_U01 K1ENG_U03 K1ENG_U05 K1ENG_K01 K1ENG_K04	15	30	1	0,75	T	Z		P	K	Ob
2	ESN0171	Power Engineering and Environmental	1					K1ENG_W29 K1ENG_K02	15	30	1	0,5	T	Z			K	Ob
Total			1				1		30	60	2	1,25						

¹BK – number of ECTS points assigned to hours of classes requiring direct contact of teachers with students

²Traditional – enter T, remote – enter Z

³Exam – enter E, crediting – enter Z. For the group of courses – after the letter E or Z - enter in brackets the final course form (lec, cl, lab, pr, sem)

⁴University-wide course /group of courses – enter O

⁵Practical course / group of courses – enter P. For the group of courses – in brackets enter the number of ECTS points assigned to practical courses

⁶ KO – general education, PD – basic sciences, K – field-of-studies, S – specialization

⁷ Optional – enter W, obligatory – enter Ob

Optional courses (minimum 195 hours in semester, 28 ECTS points)

No.	Course/group of courses code	Name of course/group of courses (denote group of courses with symbol GK)	Weekly number of hours					Field-of-study educational effect symbol	Number of hours		Number of ECTS points		Form ² of course/group of courses	Way ³ of crediting	Course/group of courses			
			lec	cj	lab	pr	sem		ZZU	CNPS	total	BK classes ¹			universit y-wide ⁴	practical ⁵	kind ⁶	type ⁷
1	ESN0170	Nuclear Power Engineering	2					SIENC_W02	30	60	2	1	T	Z			S	W
2	ESN0170	Nuclear Power Engineering			1			SIENC_U02	15	30	1	0,75	T	Z		P	S	W
3	ESN0011	Energy Audit	1					SIENC_W11	15	30	1	0,5	T	Z			S	W
4	ESN0011	Energy Audit			1			SIENC_U12	15	30	1	0,75	T	Z		P	S	W
5	ESN0971	Heat Distribution Networks	1					SIENC_W10	15	30	1	0,5	T	Z			S	W
6	ESN0971	Heat Distribution Networks		1				SIENC_U11	15	30	1	0,75	T	Z		P	S	W
7	ESN0341	Boilers and Small Power	1					SIENC_W09	15	30	1	0,5	T	Z			S	W
8	ESN0341	Boilers and Small Power		1				SIENC_U10	15	30	1	0,75	T	Z		P	S	W
9	ESN0240	Energy Management	2					SIENC_W08	30	60	2	1	T	Z			S	W
10	ESN0240	Energy Management		1				SIENC_U09	15	30	1	0,75	T	Z		P	S	W
11	ZSN100300BK	Management Science	1					K1ENG_W31 K1ENG_K05	15	30	1	0,5	T	Z	O		KO	W
12	ESN1420	Engineer Thesis						K1ENG_U01 K1ENG_U03 K1ENG_U04 K1ENG_U05 K1ENG_K01 K1ENG_K04 K1ENG_K06		450	15	2	T	Z		P		W
Total			8	3	2				195	840	28	9,75						

Optional courses (optionally in English) number of ECTS points 3

Lp	Kod kursu/ grupy kursów	Nazwa kursu/grupy kursów (grupę kursów oznaczyć symbolem GK)	Tygodniowa liczba godzin					Symbol kierunku. efektu kształcenia	Liczba godzin		Liczba pkt. ECTS		Forma ² kursu/ grupy kursów	Sposób ³ zaliczenia	Kurs/grupa kursów			
			w	ć	l	p	s		ZZU	CNPS	łącz- na	zajęć BK ¹			ogólno-uczel- niany ⁴	o charakt. prakty- cznym ⁵	rodzaj ⁶	typ ⁷
1	ESN0169	Nuclear power engineering	2					K1ENG_W40	30	60	2	1	T	Z			S	W
2	ESN0169	Nuclear power engineering			1			K1ENG_U49	15	30	1	0,75	T	Z		P	S	W

¹BK –liczba punktów ECTS przypisanych godzinom zajęć wymagających bezpośredniego kontaktu nauczycieli i studentów

²Tradycyjna – T, zdalna – Z

³Egzamin – E, zaliczenie na ocenę – Z. W grupie kursów po literze E lub Z wpisać w nawiasie formę kursu końcowego (w, c, l, s, p)

⁴Kurs/ grupa kursów Ogólnouczelniany – O

⁵Kurs/ grupa kursów Praktyczny – P. W grupie kursów w nawiasie wpisać liczbę punktów ECTS dla kursów o charakterze praktycznym

⁶KO - kształcenia ogólnego, PD – podstawowy, K – kierunkowy, S – specjalnościowy

⁷W – wybieralny, Ob – obowiązkowy

Altogether in semester 7

Total number of hours					Total number of ZZUhours	Total number of CNPS hours	Total number of ECTS points	Number of ECTS points for BK classes ¹
lec	cl	lab	pr	sem				
9	3	2		1	225	900	30	11

2. Set of examinations in semestral arrangement

Course code	Names of courses ending with examination	Semester
MAT1415 MAT1408 FZP1065	1. Mathematical Analysis 1.1A 2. Algebra and Analytic Geometry A 3. Physics 1.6	1
MAT1425 FZP1066 ESN0710	1. Mathematical Analysis 2.2A 2. Physics 2.11 3. Fundamentals of Materials Science	2
ESN0650 (ESN0652) ESN0470 (ESN0471) ESN1190 (ESN0191) ESN1040 (ESN1043)	1. Fundamentals of Control Systems 2. Fluid Mechanics 3. Thermodynamics 4. Combustion and Fuels	3
ESN0400 ESN0412	1. Electrical Machines and Devices 2. Turbomachinery	4
ESN0642 (ESN0643) ESN0523 ESN0331 ESN0075 (ESN0078)	1. Basics of Machine Design II 2. Power Engineering Metrology 3. Utility Boilers 4. Refrigeration and Cryogenics	5
ESN0136 ESN0891	1. Power and Heat Stations 2. Power Distribution	6

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

Semester	Allowable deficit of ECTS points after semester
1	15
2	17
3	14
4	12
5	12
6	0