

PLAN OF STUDIES

FACULTY OF MECHANICAL AND POWER ENGINEERING

MAIN FIELD OF STUDY: POWER ENGINEERING

EDUCATION LEVEL: 1st level, Engineer

FORM OF STUDIES: part-time

PROFILE: general academic

SPECIALIZATION: THERMAL POWER ENGINEERING

LANGUAGE OF STUDY: polish

Faculty Council Resolution of 30.09.2015
In effect since 01.10.2015

Plan of studies structure in point layout

30	informatics	informatics.				advanced design methods	humanities.	
28								
26							professional practice	
24							engineer individual student project	engineering thesis engineering
22								
20								
18								
16		humanities.						
14	chemistry	chemistry						
12	physics	physics	physics					
10								
8								
6	mathematics	mathematics	mathematics					
4								
2				sport. classes	humanities.	foreign language	foreign language	management
	sem.1	sem.2	sem.3	sem.4	sem.5	sem.6	sem.7	sem.8

Legend

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 ¹ classes			universit y-wide ⁴	practical ⁵	kind ⁶	type ⁷
1	ENN1455	Information Technologies	1,2					K1ENG_W06	18	60	2	1	T	Z	O		KO	Ob
2	MAP009027	Mathematic 1	1,2					K1ENG_W02 K1ENG_K01	18	120	4	2	T	E	O		PD	Ob
3	MAP009027	Mathematic 1		1,2				K1ENG_U08 K1ENG_K01	18	120	4	3	T	Z	O	P	PD	Ob
4	FZP009078	Physics 1	1,2					K1ENG_W03	18	120	4	2	T	E	O		PD	Ob
5	CHC003080	Chemistry	1,2					K1ENG_W04	18	60	2	1	T	Z	O		PD	Ob
6	ENN1375	Power Industry Machinery	1,2					K1ENG_W08	18	60	2	1	T	Z			K	Ob
7	ENN0215	Descriptive Geometry	1,2					K1ENG_W07	18	60	2	1	T	Z			K	Ob
8	ENN0215	Descriptive Geometry		0,6				K1ENG_U13	9	60	2	1,5	T	Z		P	K	Ob
9	ENN0785	Basics of Metrology and Experiment Techniques	1,2					K1ENG_W05	18	60	2	1	T	Z			K	Ob
10	ENN0785	Basics of Metrology and Experiment Techniques		0,6				K1ENG_U11 K1ENG_U12	9	60	2	1,5	T	Z		P	K	Ob
11	ENN0715	Fundamentals of Materials Science	1,2					K1ENG_W09	18	120	4	2	T	E			K	Ob
Total			9,6	2,4					180	900	30	17						

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				
9,6	2,4				180	900	30	17

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

Semester 2

Obligatory courses number of ECTS points 29

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 ¹ classes			universit y-wide ⁴	practical ⁵	kind ⁶	type ⁷
1	ENN0585	Application Packages			0,6			K1ENG_U02	9	30	1	0,75	T	Z	O	P	KO	Ob
2	MAP009028	Mathematic 2	1,2					K1ENG_W01 K1ENG_W02 K1ENG_K01	18	120	4	2	T	E	O		PD	Ob
3	MAP009028	Mathematic 2		1,2				K1ENG_U07 K1ENG_U08 K1ENG_K01	18	120	4	3	T	Z	O	P	PD	Ob
4	FZP009079	Physics 2	1,2					K1ENG_W03	18	120	4	2	T	E	O		PD	Ob
5	FZP009079	Physics 2		1,2				K1ENG_U09	18	60	2	1,5	T	Z	O	P	PD	Ob
6	CHC003080	Chemistry			0,6			K1ENG_U10	9	30	1	0,75	T	Z	O	P	PD	Ob
7	ENN0785	Basics of Metrology and Experiment Techniques			0,6			K1ENG_U11 K1ENG_U12	9	30	1	0,75	T	Z		P	K	Ob
8	ENN0945	Technical Drawing				1,2		K1ENG_U13	18	120	4	3	T	Z		P	K	Ob
9	ENN0805	Basics of Thermodynamics	1,2					K1ENG_W11	18	60	2	1	T	Z			K	Ob.
10	ENN0805	Basics of Thermodynamics		0,6				K1ENG_U16	9	60	2	1,5	T	Z		P	K	Ob
11	ENN0765	Fundamentals of Fluid Mechanics	1,2					K1ENG_W10	18	60	2	1	T	Z			K	Ob
12	ENN0765	Fundamentals of Fluid Mechanics		0,6				K1ENG_U14	9	60	2	1,5	T	Z		P	K	Ob
Total			4,8	3,6	1,8	1,2			171	870	29	18,75						

Optional courses (minimum 9 hours in semester) number of ECTS points 1

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 ¹ classes			universit y-wide ⁴	practical ⁵	kind ⁶	type ⁷
1	HNN100300BK	Humanities	0,6					K1ENG_W31 K1ENG_K02 K1ENG_K06	9	30	1	0,5	T	Z	O		KO	W
Total			0,6						9	30	1	0,5						

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

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

⁷Optional – enter W, obligatory – enter 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				
5,4	3,6	1,8	1,2		180	900	30	19,25

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	MAP009029	Mathematic 3	1,8					K1ENG_W01 K1ENG_W02 K1ENG_K01	27	150	5	2,5	T	E	O		PD	Ob
2	MAP009029	Mathematic 3		1,2				K1ENG_U07 K1ENG_U08 K1ENG_K01	18	120	4	3	T	Z	O	P	PD	Ob
3	FZP009080	Physics 3			1,2			K1ENG_U09	18	60	2	1,5	T	Z	O	P	PD	Ob
4	ENN0735	Fundamental Mechanics and Strength of Materials	0,6					K1ENG_W12	9	30	1	0,5	T	Z			K	Ob
5	ENN0735	Fundamental Mechanics and Strength of Materials		0,6				K1ENG_U18	9	60	2	1,5	T	Z		P	K	Ob
6	ENN0475	Fluid Mechanics	0,6					K1ENG_W10	9	90	3	1,5	T	E			K	Ob
7	ENN0475	Fluid Mechanics		0,6				K1ENG_U14	9	30	1	0,75	T	Z		P	K	Ob
8	ENN0475	Fluid Mechanics			1,2			K1ENG_U15	18	60	2	1,5	T	Z		P	K	Ob
9	ENN1045	Combustion and Fuels	1,2					K1ENG_W18	18	120	4	2	T	E			K	Ob
10	ENN1045	Combustion and Fuels		0,6				K1ENG_U25	9	30	1	0,75	T	Z		P	K	Ob
11	ENN0685	Electrical Engineering Fundamentals	1,2					K1ENG_W16	18	60	2	1	T	Z			K	Ob
12	ENN0685	Electrical Engineering Fundamentals		0,6				K1ENG_U22	9	60	2	1,5	T	Z		P	K	Ob
13	ENN0685	Electrical Engineering Fundamentals			0,6			K1ENG_U23	9	30	1	0,75	T	Z		P	K	Ob
Total			5,4	3,6	3				180	900	30	18,75						

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

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

⁷Optional – enter W, obligatory – enter 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				
5,4	3,6	3			180	900	30	18,75

Semester 4

Obligatory courses number of ECTS points 29

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	ENN0465	Mechanics and Strength of Materials	1,2					K1ENG_W12	18	60	2	1	T	Z			K	Ob
2	ENN0485	Mechanics and Strength of Materials		1,2				K1ENG_U18	18	60	2	1,5	T	Z		P	K	Ob
3	ENN1045	Combustion and Fuels			0,6			K1ENG_U26	9	30	1	0,75	T	Z		P	K	Ob
4	ENN0415	Turbomachinery	1,2					K1ENG_W30	18	120	4	2	T	E			K	Ob
5	ENN0415	Turbomachinery				0,6		K1ENG_U37 K1ENG_U29	9	60	2	1,5	T	Z		P	K	Ob
6	ENN1195	Thermodynamics	0,6					K1ENG_W11	9	90	3	1,5	T	E			K	Ob
7	ENN1195	Thermodynamics		0,6				K1ENG_U16	9	30	1	0,75	T	Z		P	K	Ob
8	ENN1195	Thermodynamics			1,2			K1ENG_U17 K1ENG_K04	18	60	2	1,5	T	Z		P	K	Ob
9	ENN0875	Heat Transfer	1,2					K1ENG_W21	18	60	2	1	T	Z			K	Ob
10	ENN0875	Heat Transfer		1,2				K1ENG_U28	18	90	3	2,25	T	Z		P	K	Ob
11	ENN0655	Fundamentals of Control Systems	1,2					K1ENG_W14	18	120	4	2	T	E			K	Ob
12	ENN0655	Fundamentals of Control Systems		0,6				K1ENG_U19	9	30	1	0,75	T	Z		P	K	Ob
13	ENN0665	Fundamentals of Electronics	0,6					K1ENG_W15	9	30	1	0,5	T	Z			K	Ob
14	ENN0665	Fundamentals of Electronics			0,6			K1ENG_U21	9	30	1	0,75	T	Z		P	K	Ob
Total			6	3,6	2,4	0,6			189	870	29	17,75						

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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 8 hours in semester) number of ECTS points 1

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	WFW02000BK	Sporting Classes		0,53				K1ENG_K03	8	8	1	1	T	Z	O	P	KO	W
		Total		0,53					8	8	1	1						

Altogether in semester 4

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				
6	4,13	2,4	0,6		197	878	30	18,75

Semester 5

Obligatory courses number of ECTS points 22

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	ENN0655	Fundamentals of Control Systems			1,2			K1ENG_U20 K1ENG_K04	18	60	2	1,5	T	Z		P	K	Ob
2	ENN0525	Power Engineering Metrology	1,2					K1ENG_W24	18	120	4	2	T	E			K	Ob
3	ENN0525	Power Engineering Metrology			1,2			K1ENG_U32	18	60	2	1,5	T	Z		P	K	Ob
4	ENN0335	Utility Boilers	1,2					K1ENG_W25	18	120	4	2	T	E			K	Ob
5	ENN0335	Utility Boilers				0,6		K1ENG_U33 K1ENG_U29	9	60	2	1,5	T	Z		P	K	Ob
6	ENN0625	Basics of Machine Design I	1,2					K1ENG_W22	18	60	2	1	T	Z			K	Ob
7	ENN0625	Basics of Machine Design I				0,6		K1ENG_U30	9	60	2	1,5	T	Z		P	K	Ob
8	ENN0045	CAD			1,2			K1ENG_U13	18	60	2	1,5	T	Z		P	K	Ob
9	ENN0425	Engineering Materials and Consumables	0,6					K1ENG_W17	9	30	1	0,5	T	Z			K	Ob
10	ENN0425	Engineering Materials and Consumables			0,6			K1ENG_U24	9	30	1	0,75	T	Z		P	K	Ob
		Total	4,2		4,2	1,2			144	660	22	13,75						

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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

Optional courses (minimum 45 hours in semester) 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 ¹ classes			universit y-wide ⁴	practical ⁵	kind ⁶	type ⁷
1	HNN100300BK	Humanities	1,2					K1ENG_W31 K1ENG_K02 K1ENG_K06	18	90	3	1,5	T	Z	O		KO	W
2	ENN0085	Refrigeration and Cryogenics	1,2					S1ENC_W03	18	120	4	2	T	E			S	W
3	ENN0085	Refrigeration and Cryogenics		0,6				S1ENC_U04	9	30	1	0,75	T	Z		P	S	W
Total			2,4	0,6					45	240	8	4,25						

Altogether in semester 5

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				
6,6	0,6	4,2	1,2		189	900	30	18

Semester 6

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 ¹ classes			universit y-wide ⁴	practical ⁵	kind ⁶	type ⁷
1	ENN0645	Basics of Machine Design II	1,2					K1ENG_W22	18	150	5	2,5	T	E			K	Ob
2	ENN0645	Basics of Machine Design II				0,6		K1ENG_U30	9	60	2	1,5	T	Z		P	K	Ob
3	ENN1095	Flue-gases Cleaning Techniques	1,2					K1ENG_W23	18	60	2	1	T	Z			K	Ob
4	ENN1095	Flue-gases Cleaning Techniques		0,6				K1ENG_U31	9	60	2	1,5	T	Z		P	K	Ob
5	ENN0405	Electrical Machines and Devices	1,2					K1ENG_W20	18	150	5	2,5	T	E			K	Ob
6	ENN0405	Electrical Machines and Devices			0,6			K1ENG_U27 K1ENG_K01 K1ENG_K04	9	30	1	0,75	T	Z		P	K	Ob
Total			3,6	0,6	0,6	0,6			81	510	17	9,75						

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

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

⁷Optional – enter W, obligatory – enter Ob

Optional courses (minimum 108 hours in semester) number of ECTS points 13

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	JZL100789C JZL100792C JZL100845C	Foreign Language B2.1		2,4				K1ENG_U06	36	60	2	1,5	T	Z	O	P	KO	W
2	ENN0835	Heat Pumps and Solar Collectors	0,6					S1ENC_W06	9	30	1	0,5	T	Z			S	W
3	ENN0835	Heat Pumps and Solar Collectors			0,6			S1ENC_U06	9	30	1	0,75	T	Z		P	S	W
4	ENN0835	Heat Pumps and Solar Collectors				0,6		S1ENC_U07	9	60	2	1,5	T	Z		P	S	W
5	ENN0325	Energy Conversion	1,2					S1ENC_W07	18	90	3	1,5	T	Z			S	W
6	ENN0325	Energy Conversion			0,6			S1ENC_U08	9	30	1	0,75	T	Z		P	S	W
7		Advanced Design Methods:			1,2				18	90	3	2,25	T	Z		P	K	W
	ENN0066	CATIA						K1ENG_U13										
	ENN1035	Solid Edge						K1ENG_U13										
	ENN0245	3D Graphic						K1ENG_U13 K1ENG_U05 K1ENG_K06										
Total			1,8	2,4	2,4	0,6			108	390	13	8,75	1,8					

Altogether in semester 6

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				
5,4	3	3	1,2		189	900	30	18,5

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

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

⁷Optional – enter W, obligatory – enter Ob

Semester 7

Obligatory courses

number of ECTS points 12

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 ¹ classes			universit ⁴ y-wide	practical ⁵	kind ⁶	type ⁷
1	PRZ0330W	Intellectual and Industrial Property Protection	1,2					K1ENG_W13	18	60	2	1	T	Z	O		KO	Ob
2	ENN0895	Power Distribution	1,2					K1ENG_W28	18	90	3	1,5	T	E			K	Ob
3	ENN0895	Power Distribution		0,6				K1ENG_U36	9	30	1	0,75	T	Z		P	K	Ob
4	ENN0123	Power and Heat Stations	1,2					K1ENG_W26	18	90	3	1,5	T	E			K	Ob
5	ENN0123	Power and Heat Stations			0,6			K1ENG_U34	9	30	1	0,75	T	Z		P	K	Ob
6	ENN0115	Ecology	1,2					K1ENG_W19 K1ENG_K02	18	60	2	1	T	Z			K	Ob
Total			4,8	0,6	0,6				90	360	12	6,5						

Optional courses (minimum 159 hours in semester)

number of ECTS points 18

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 ¹ classes			universit ⁴ y-wide	practical ⁵	kind ⁶	type ⁷
1	JZL100790C JZL100793C JZL100844C	Foreign Language B2.2		2,4				K1ENG_U06	36	90	3	2,25	T	Z	O	P	KO	W
2	ENN0695	Basics of Air-conditioning	0,6					SIENC_W04	9	30	1	0,5	T	Z			S	W
3	ENN0695	Basics of Air-conditioning			0,6			SIENC_U12	9	30	1	0,75	T	Z		P	S	W
4	ENN0855	Pumps and Pumping Systems	1,2					SIENC_W01	18	60	2	1	T	Z			S	W
5	ENN0855	Pumps and Pumping Systems		0,6				SIENC_U01	9	30	1	0,75	T	Z		P	S	W
6	ENN0345	Boilers and Small Power	0,6					SIENC_W09	9	30	1	0,5	T	Z			S	W
7	ENN0345	Boilers and Small Power			0,6			SIENC_U10	9	30	1	0,75	T	Z		P	S	W
8	ENN1355	Engineer Individual Student Project				4		K1ENG_U01 K1ENG_U03 K1ENG_U04 K1ENG_K01	60	120	4	1	T	Z		P	K	W
9	ENN1415	Professional Practice						K1ENG_U03 K1ENG_K04 K1ENG_K05		120	4	0				P	K	W
Total			2,4	3	1,2	4			159	540	18	7,5						

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

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

⁷Optional – enter W, obligatory – enter Ob

Altogether in semester 7

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				
7,2	3,6	1,8	4		249	900	30	14

Semester 8

Obligatory courses number of ECTS points 4

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	ENN0175	Power Engineering and Environmental	0,6					K1ENG_W29 K1ENG_K02	9	30	1	0,5	T	Z			K	Ob
2	ENN0035	Research and Testing of Machines and Devices	0,6					K1ENG_W27	9	30	1	0,5	T	Z			K	Ob
3	ENN0035	Research and Testing of Machines and Devices			0,6			K1ENG_U35	9	30	1	0,75	T	Z		P	K	Ob
4	ENN1373	Engineer Seminar					0,6	K1ENG_U01 K1ENG_U03 K1ENG_U05 K1ENG_K01 K1ENG_K04	9	30	1	0,75	T	Z		P	K	Ob
Total			1,2		0,6		0,6		36	120	4	2,5						

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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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Optional courses (minimum 117 hours in semester) number of ECTS points 26

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 ¹ classes			universit y-wide ⁴	practical ⁵	kind ⁶	type ⁷
1	ZNN100300BK	Management Science	0,6					K1ENG_W31 K1ENG_K05	9	30	1	0,5	T	Z	O		KO	W
2	ENN0015	Energy Audit	0,6					S1ENC_W11	9	30	1	0,5	T	Z			S	W
3	ENN0015	Energy Audit			0,6			S1ENC_U12	9	30	1	0,75	T	Z		P	S	W
4	ENN0205	Gas Technologies	0,6					S1ENC_W05	9	30	1	0,5	T	Z			S	W
5	ENN0205	Gas Technologies		0,6				S1ENC_U05	9	30	1	0,75	T	Z		P	S	W
6	ENN0235	Energy Management	1,2					S1ENC_W08	18	30	1	0,5	T	Z			S	W
7	ENN0235	Energy Management		0,6				S1ENC_U09	9	30	1	0,75	T	Z		P	S	W
8	ENN0165	Nuclear Power Engineering	1,2					S1ENC_W02	18	30	1	0,5	T	Z			S	W
9	ENN0165	Nuclear Power Engineering		0,6				S1ENC_U02	9	30	1	0,75	T	Z		P	S	W
10	ENN0975	Heat Distribution Networks	0,6					S1ENC_W10	9	30	1	0,5	T	Z			S	W
11	ENN0975	Heat Distribution Networks		0,6				S1ENC_U11	9	30	1	0,75	T	Z		P	S	W
12	ENN1425	Engineer Thesis						K1ENG_U01 K1ENG_U03 K1ENG_U04 K1ENG_U05 K1ENG_K01 K1ENG_K04 K1ENG_K06		450	15	2	T	Z		P	K	W
Total			4,8	2,4	0,6				117	780	26	8,75						

Altogether in semester 8

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				
6	2,4	1,2		0,6	153	900	30	11,25

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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

2. Set of examinations in semestral arrangement

Course code	Names of courses ending with examination	Semester
MAP009027 FZP009078 ENN0715	1. Mathematics 1 2. Physics 1 3. Fundamentals of Materials Science	1
MAP009028 FZP009079	1. Mathematics 2 2. Physics 2	2
MAP009029 ENN1045 ENN0475	1. Mathematics 3 2. Combustion and Fuels 3. Fluid Mechanics	3
ENN0655 ENN1195 ENN0415	1. Fundamentals of Control Systems 2. Thermodynamics 2. Turbomachinery	4
ENN0335 ENN0525 ENN0085	1. Utility Boilers 2. Power Engineering Metrology 3. Refrigeration and Cryogenics	5
ENN0645 ENN0405	1. Basics of Machine Design II 2. Electrical Machines and Devices	6
ENN0123 ENN0895	1. Power and Heat Stations 2. Power Distribution	7

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

Semester	Allowable deficit of ECTS points after semester
1	18
2	32
3	27
4	22
5	18
6	16
7	0