

## **PLAN OF STUDIES**

**FACULTY:** MECHANICAL AND POWER ENGINEERING

**MAIN FIELD OF STUDY:** POWER ENGINEERING

**EDUCATION LEVEL:** 1st level, inżynier

**FORM OF STUDIES:** part-time

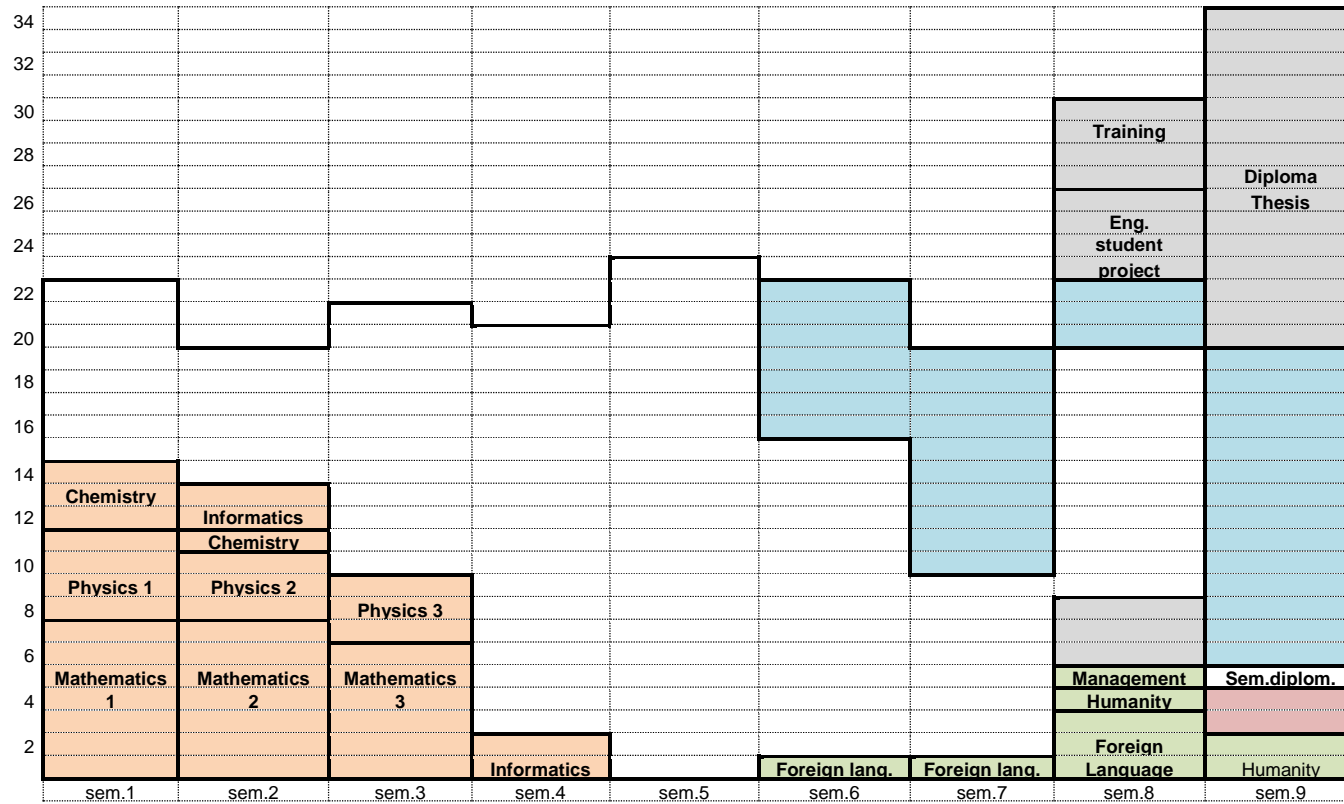
**PROFILE:** general academic

**SPECIALIZATION:** **THERMAL POWER ENGINEERING**

**LANGUAGE OF STUDY:** POLISH

Faculty Council Resolution of 26.09.2012  
In effect since 01.10.2012

## Plan of studies structure in point layout



### 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 22

No.	Course/group of courses code	Name of course/group of courses (denote group of courses with symbol <b>GK</b> )	Weekly number of hours					Field-of-study educational effect symbol	Number of hours		Number of ECTS points		Form <sup>2</sup> of course/group of courses	Way <sup>3</sup> of crediting	Course/group of courses			
			lec	cl	lab	pr	sem		ZZU	CNPS	total	BK classes <sup>1</sup>			university-wide <sup>4</sup>	practical <sup>5</sup>	kind <sup>6</sup>	type <sup>7</sup>
1	MAP1076	Mathematics 1	2,13					K1ENG_W02	32	120	4	2	T	E	O		PD	Ob
2	MAP1076	Mathematics 1		1,07				K1ENG_U08	16	90	3	2,25	T	Z	O	P	PD	Ob
3	FZP2109	Physics 1	2,13					K1ENG_W03	32	120	4	2	T	E	O		PD	Ob
4	CHC3078	Chemistry	1,60					K1ENG_W04	24	90	3	1,5	T	Z	O		PD	Ob
5	ENN0371	Power industry machinery	1,07					K1ENG_W08	16	60	2	1	T	Z			K	Ob
6	ENN0210	Descriptive geometry	1,07					K1ENG_W07	16	60	2	1	T	Z			K	Ob
7	ENN0210	Descriptive geometry		0,53				K1ENG_U13	8	30	1	0,75	T	Z		P	K	Ob
8	ENN0701	Fundamentals of Materials Science	1,07					K1ENG_W09	16	90	3	1,5	T	E			K	Ob
Total			9,07	1,60					160	660	22	12						

### 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 for BK classes <sup>1</sup>
lec	cl	lab	pr	sem				
9,07	1,60				160	660	22	12

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

<sup>2</sup>Traditional – enter T, remote – enter Z

<sup>3</sup>Exam – 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)

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

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

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

<sup>7</sup>Optional – enter W, obligatory – enter Ob

## Semester 2

### Obligatory courses number of ECTS points 19

No.	Course/group of courses code	Name of course/group of courses (denote group of courses with symbol <b>GK</b> )	Weekly number of hours					Field-of-study educational effect symbol	Number of hours		Number of ECTS points		Form <sup>2</sup> of course/group of courses	Way <sup>3</sup> of crediting	Course/group of courses			
			lec	cl	lab	pr	sem		ZZU	CNPS	total	BK classes <sup>1</sup>			university-wide <sup>4</sup>	practical <sup>5</sup>	kind <sup>6</sup>	type <sup>7</sup>
1	CHC3078	Chemistry			0,53			K1ENG_U10	8	30	1	0,75	T	Z	O	P	PD	Ob
2	MAP1069	Mathematics 2	2,13					K1ENG_W01	32	120	4	2	T	E	O		PD	Ob
3	MAP1069	Mathematics 2		1,07				K1ENG_U07	16	90	3	2,25	T	Z	O	P	PD	Ob
4	FZP2107	Physics 2	1,07					K1ENG_W03	16	60	2	1	T	E	O		PD	Ob
5	FZP2107	Physics 2		0,53				K1ENG_U09	8	30	1	0,75	T	Z	O	P	PD	Ob
6	ENN0801	Basics of thermodynamics	1,07					K1ENG_W11	16	60	2	1	T	Z			K	Ob
7	ENN0801	Basics of thermodynamics		1,07				K1ENG_U16	16	30	1	0,75	T	Z		P	K	Ob
8	ENN0761	Fundamentals of fluid mechanics	1,07					K1ENG_W10	16	60	2	1	T	Z			K	Ob
9	ENN0761	Fundamentals of fluid mechanics		1,07				K1ENG_U15 K1ENG_K04	16	30	1	0,75	T	Z		P	K	Ob
10	ENN1450	Information Technologies	1,07					K1ENG_W06	16	60	2	1	T	Z	O		KO	Ob
Total			6,41	3,74	0,53				160	570	19	11,25						

### 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 for BK classes <sup>1</sup>
lec	cl	lab	pr	sem				
6,41	3,74	0,53			160	570	19	11,25

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

<sup>2</sup>Traditional – enter T, remote – enter Z

<sup>3</sup>Exam – 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)

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

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

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

<sup>7</sup> Optional – enter W, obligatory – enter Ob

## Semester 3

### Obligatory courses number of ECTS points 21

No.	Course/group of courses code	Name of course/group of courses (denote group of courses with symbol <b>GK</b> )	Weekly number of hours					Field-of-study educational effect symbol	Number of hours		Number of ECTS points		Form <sup>2</sup> of course/group of courses	Way <sup>3</sup> of crediting	Course/group of courses			
			lec	cl	lab	pr	sem		ZZU	CNPS	total	BK classes <sup>1</sup>			university-wide <sup>4</sup>	practical <sup>5</sup>	kind <sup>6</sup>	type <sup>7</sup>
1	MAP1159	Mathematics 3	1,07					K1ENG_W02	16	120	4	2	T	E	O		PD	Ob
2	MAP1159	Mathematics 3		1,07				K1ENG_U08	16	60	2	1,5	T	Z	O	P	PD	Ob
3	FZP2114	Physics 3	0,53					K1ENG_W03	8	30	1	0,5	T	Z	O		PD	Ob
4	FZP2114	Physics 3			1,07			K1ENG_U09	16	60	2	1,5	T	Z	O	P	PD	Ob
5	ENN0730	Fundamental mechanics and strength of materials	1,07					K1ENG_W12	16	30	1	0,5	T	Z			K	Ob
6	ENN0730	Fundamental mechanics and strength of materials		0,53				K1ENG_U18	8	30	1	0,75	T	Z		P	K	Ob
7	ENN1190	Thermodynamics	1,07					K1ENG_W11	16	60	2	1	T	E			K	Ob
8	ENN1190	Thermodynamics		0,53				K1ENG_U16	8	30	1	0,75	T	Z		P	K	Ob
9	ENN0470	Fluid mechanics	1,07					K1ENG_W10	16	60	2	1	T	E			K	Ob
10	ENN0470	Fluid mechanics		0,53				K1ENG_U15 K1ENG_K04	8	30	1	0,75	T	Z		P	K	Ob
11	ENN0940	Technical drawing				1,07		K1ENG_U13	16	60	2	1,5	T	Z		P	K	Ob
12	ENN0420	Engineering Materials and Consumables	0,53					K1ENG_W09	8	30	1	0,5	T	Z			K	Ob
13	ENN0420	Engineering Materials and Consumables			0,53			K1ENG_U24	8	30	1	0,75	T	Z		P	K	Ob
Total			5,34	2,66	1,60	1,07			160	630	21	13						

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

<sup>2</sup>Traditional – enter T, remote – enter Z

<sup>3</sup>Exam – 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)

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

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

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

<sup>7</sup>Optional – enter W, obligatory – enter Ob

## 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 for BK classes <sup>1</sup>
lec	cl	lab	pr	sem				
5,34	2,66	1,60	1,07		160	630	21	13

## Semester 4

### Obligatory courses number of ECTS points 20

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 <sup>2</sup> of course/group of courses	Way <sup>3</sup> of crediting	Course/group of courses			
			lec	cl	lab	pr	sem		ZZU	CNPS	total	BK classes <sup>1</sup>			university-wide <sup>4</sup>	practical <sup>5</sup>	kind <sup>6</sup>	type <sup>7</sup>
1	ENN0680	Electrical Engineering Fundamentals	1,07					K1ENG_W16	16	60	2	1	T	Z			K	Ob
2	ENN0680	Electrical Engineering Fundamentals		0,53				K1ENG_U22	8	30	1	0,75	T	Z		P	K	Ob
3	ENN0680	Electrical Engineering Fundamentals			0,53			K1ENG_U23	8	30	1	0,75	T	Z		P	K	Ob
4	ENN0660	Fundamentals of Electronics	0,53					K1ENG_W15	8	30	1	0,5	T	Z			K	Ob
5	ENN0660	Fundamentals of Electronics			0,53			K1ENG_U21 K1ENG_K04	8	30	1	0,75	T	Z		P	K	Ob
6	ENN0460	Mechanics and strength of materials	1,07					K1ENG_W12	16	60	2	1	T	Z			K	Ob
7	ENN0460	Mechanics and strength of materials		1,07				K1ENG_U18	16	60	2	1,5	T	Z		P	K	Ob
8	ENN0872	Heat transfer	1,07					K1ENG_W21	16	60	2	1	T	Z			K	Ob
9	ENN0872	Heat transfer		1,07				K1ENG_U28	16	60	2	1,5	T	Z		P	K	Ob
10	ENN0781	Basics of metrology and experiment techniques	0,53					K1ENG_W05	8	60	2	1	T	Z			K	Ob
11	ENN0781	Basics of metrology and experiment techniques		0,53				K1ENG_U11	8	30	1	0,75	T	Z		P	K	Ob

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<sup>2</sup>Traditional – enter T, remote – enter Z

<sup>3</sup>Exam – 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)

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

<sup>5</sup>Practical 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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<sup>7</sup>Optional – enter W, obligatory – enter Ob

12	ENN0781	Basics of metrology and experiment techniques			1,07			KIENG_U12	16	30	1	0,75	T	Z		P	K	Ob
13	ENN0580	Application packages			1,07			KIENG_U02	16	60	2	1,5	T	Z	O	P	KO	Ob
Total			4,27	3,20	3,20				160	600	20	12,75						

### 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 for BK classes <sup>1</sup>
lec	cl	lab	pr	sem				
4,27	3,20	3,20			160	600	20	12,75

## Semester 5

### Obligatory courses number of ECTS points 23

No.	Course/group of courses code	Name of course/group of courses (denote group of courses with symbol <b>GK</b> )	Weekly number of hours					Field-of-study educational effect symbol	Number of hours		Number of ECTS points		Form <sup>2</sup> of course/group of courses	Way <sup>3</sup> of crediting	Course/group of courses			
			lec	cl	lab	pr	sem		ZZU	CNPS	total	BK classes <sup>1</sup>			university-wide <sup>4</sup>	practical <sup>5</sup>	kind <sup>6</sup>	type <sup>7</sup>
1	ENN0400	Electrical machines and devices	1,07					KIENG_W20	16	90	3	1,5	T	E			K	Ob
2	ENN0400	Electrical machines and devices			0,53			KIENG_U27 KIENG_K01 KIENG_K04	8	30	1	0,75	T	Z		P	K	Ob
3	ENN1040	Combustion and fuels	1,07					KIENG_W18 KIENG_K02	16	90	3	1,5	T	E			K	Ob
4	ENN1040	Combustion and fuels		0,53				KIENG_U25	8	30	1	0,75	T	Z		P	K	Ob
5	ENN1040	Combustion and fuels			0,53			KIENG_U26 KIENG_K04	8	30	1	0,75	T	Z		P	K	Ob
6	ENN1200	Thermodynamics - lab			1,07			KIENG_U17 KIENG_K04	16	60	2	1,5	T	Z		P	K	Ob
7	ENN0480	Fluid Mechanics - laboratory			1,07			KIENG_U15 KIENG_K04	16	60	2	1,5	T	Z		P	K	Ob
8	ENN0651	Fundamentals of Control Systems	1,07					KIENG_W14	16	90	3	1,5	T	E			K	Ob

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

<sup>2</sup>Traditional – enter T, remote – enter Z

<sup>3</sup>Exam – 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)

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

<sup>5</sup>Practical 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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<sup>7</sup> Optional – enter W, obligatory – enter Ob

9	ENN0651	Fundamentals of Control Systems			1,07				KIENG_U19	16	30	1	0,75	T	Z		P	K	Ob
10	ENN0101	Ecology			1,07				KIENG_W19 KIENG_K02	16	60	2	1	T	Z			K	Ob
11	ENN0621	Basics of Machine Design I			1,07				KIENG_W22	16	60	2	1	T	Z			K	Ob
12	ENN0621	Basics of Machine Design I					0,53		KIENG_U30 KIENG_K04	8	60	2	1,5	T	Z		P	K	Ob
Total					5,35	1,60	3,20	0,53		160	690	23	14						

### 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 for BK classes <sup>1</sup>
lec	cl	lab	pr	sem				
5,35	1,60	3,20	0,53		160	690	23	14

## Semester 6

### Obligatory courses number of ECTS points 14

No.	Course/group of courses code	Name of course/group of courses (denote group of courses with symbol <b>GK</b> )	Weekly number of hours					Field-of-study educational effect symbol	Number of hours		Number of ECTS points		Form <sup>2</sup> of course/group of courses	Way <sup>3</sup> of crediting	Course/group of courses			
			lec	cl	lab	pr	sem		ZZU	CNPS	total	BK classes <sup>1</sup>			university-wide <sup>4</sup>	practical <sup>5</sup>	kind <sup>6</sup>	type <sup>7</sup>
1	ENN0330	Energy boilers	1,07					KIENG_W25	16	90	3	1,5	T	E			K	Ob
2	ENN0330	Energy boilers				1,07		KIENG_U33	16	60	2	1,5	T	Z		P	K	Ob
3	ENN0651	Fundamentals of Control Systems			1,07			KIENG_U20 KIENG_K04	16	60	2	1,5	T	Z		P	K	Ob
4	ENN0041	CAD			1,07			KIENG_U13	16	60	2	1,5	T	Z		P	K	Ob
5	ENN0641	Basics of Machine Design II	1,07					KIENG_W22	16	90	3	1,5	T	E			K	Ob

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

<sup>2</sup>Traditional – enter T, remote – enter Z

<sup>3</sup>Exam – 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)

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

<sup>5</sup>Practical 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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<sup>7</sup>Optional – enter W, obligatory – enter Ob



6	ENN0641	Basics of Machine Design II				0,53	KIENG_U30 KIENG_K04	8	60	2	1,5	T	Z		P	K	Ob
Total			2,14		2,14	1,60		88	420	14	9						

### Optional courses (minimum 72 hours in semester, 8 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 <sup>2</sup> of course/group of courses	Way <sup>3</sup> of crediting	Course/group of courses			
			lec	cl	lab	pr	sem		ZZU	CNPS	total	BK classes <sup>1</sup>			university-wide <sup>4</sup>	practical <sup>5</sup>	kind <sup>6</sup>	type <sup>7</sup>
1	JZL100655BK	Foreign language B2.1.1			1,60			KIENG_U06	24	30	1	0,75	T	Z	O		KO	W
2	ENN0850	Pumps and pumping systems	1,07					S1EEN_W01	16	60	2	1	T	Z			S	W
3	ENN0850	Pumps and pumping systems			0,53			S1EEN_U01	8	30	1	0,75	T	Z		P	S	W
4	ENN0321	Energy Conversion	1,07					S1EEN_W07	16	60	2	1	T	Z			S	W
5	ENN0321	Energy Conversion			0,53			S1EEN_U08	8	30	1	0,75	T	Z		P	S	W
Total			2,14	2,13	0,53				72	210	7	4,25						

### 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 for BK classes <sup>1</sup>
lec	cl	lab	pr	sem				
4,28	2,13	2,67	1,60		160	630	21	13,25

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

<sup>2</sup>Traditional – enter T, remote – enter Z

<sup>3</sup>Exam – 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)

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

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

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

<sup>7</sup> Optional – enter W, obligatory – enter Ob

## Semester 7

### Obligatory courses number of ECTS points 8

No.	Course/group of courses code	Name of course/group of courses (denote group of courses with symbol <b>GK</b> )	Weekly number of hours					Field-of-study educational effect symbol	Number of hours		Number of ECTS points		Form <sup>2</sup> of course/group of courses	Way <sup>3</sup> of crediting	Course/group of courses			
			lec	cl	lab	pr	sem		ZZU	CNPS	total	BK classes <sup>1</sup>			university-wide <sup>4</sup>	practical <sup>5</sup>	kind <sup>6</sup>	type <sup>7</sup>
1	ENN1090	Flue-gases cleaning techniques	1,07					K1ENG_W23	16	60	2	1	T	Z			K	Ob
2	ENN1090	Flue-gases cleaning techniques		0,53				K1ENG_U31	8	30	1	0,75	T	Z		P	K	Ob
3	ENN0521	Power engineering metrology	1,07					K1ENG_W24	16	90	3	1,5	T	E			K	Ob
4	ENN0521	Power engineering metrology			1,60			K1ENG_U32	24	60	2	1,5	T	Z		P	K	Ob
Total			2,14	0,53	1,60				64	240	8	4,75						

### Optional courses (minimum 96 hours in semester, 11 ECTS points)

No.	Course/group of courses code	Name of course/group of courses (denote group of courses with symbol <b>GK</b> )	Weekly number of hours					Field-of-study educational effect symbol	Number of hours		Number of ECTS points		Form <sup>2</sup> of course/group of courses	Way <sup>3</sup> of crediting	Course/group of courses			
			lec	cl	lab	pr	sem		ZZU	CNPS	total	BK classes <sup>1</sup>			university-wide <sup>4</sup>	practical <sup>5</sup>	kind <sup>6</sup>	type <sup>7</sup>
1	JZL100655BK	Foreign language B2.1.2		1,60				K1ENG_U06	24	30	1	0,75	T	Z	O		KO	W
2	ENN0410	Turbomachinery	1,07					S1EEN_W02	16	90	3	1,5	T	E			S	W
3	ENN0410	Turbomachinery		1,07				S1EEN_U02	16	60	2	1,5	T	Z		P	S	W
4	ENN0410	Turbomachinery				0,53		S1EEN_U03	8	30	1	0,75	T	Z		P	S	W
5	ENN0082	Refrigeration and Cryogenics	1,07					S1EEN_W03	16	90	3	1,5	T	E			S	W
6	ENN0082	Refrigeration and Cryogenics			1,07			S1EEN_U04	16	60	2	1,5	T	Z		P	S	W
Total			2,14	2,67	1,07	0,53			96	330	12	7,5						

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

<sup>2</sup>Traditional – enter T, remote – enter Z

<sup>3</sup>Exam – 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)

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

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

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

<sup>7</sup> Optional – enter W, obligatory – enter Ob

## 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 for BK classes <sup>1</sup>
lec	cl	lab	pr	sem				
4,28	3,20	2,67	0,53		160	600	20	12,25

## Semester 8

### 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 <b>GK</b> )	Weekly number of hours					Field-of-study educational effect symbol	Number of hours		Number of ECTS points		Form <sup>2</sup> of course/group of courses	Way <sup>3</sup> of crediting	Course/group of courses			
			lec	cl	lab	pr	sem		ZZU	CNPS	total	BK classes <sup>1</sup>			university-wide <sup>4</sup>	practical <sup>5</sup>	kind <sup>6</sup>	type <sup>7</sup>
1	ENN0171	Power engineering and environmental	0,53					K1ENG_W29 K1ENG_K02	8	30	1	0,5	T	Z			K	Ob
2	ENN0893	Power Distribution	1,07					K1ENG_W28	16	90	3	1,5	T	E			K	Ob
3	ENN0893	Power Distribution		0,53				K1ENG_U36	8	30	1	0,75	T	Z		P	K	Ob
4	ENN0122	Power and heat stations	1,07					K1ENG_W26	16	90	3	1,5	T	E			K	Ob
5	ENN0122	Power and heat stations			0,53			K1ENG_U34	8	30	1	0,75	T	Z		P	K	Ob
6	ENN0033	Research and testing of machines and devices	0,53					K1ENG_W27	8	30	1	0,5	T	Z			K	Ob
7	ENN0033	Research and testing of machines and devices			1,07			K1ENG_U35	16	30	1	0,75	T	Z		P	K	Ob
Total			3,20	0,53	1,60				80	330	11	6,25						

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

<sup>2</sup>Traditional – enter T, remote – enter Z

<sup>3</sup>Exam – 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)

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

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

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

<sup>7</sup>Optional – enter W, obligatory – enter Ob

**Optional courses (minimum 140 hours in semester, 19 ECTS points)**

No.	Course/group of courses code	Name of course/group of courses (denote group of courses with symbol <b>GK</b> )	Weekly number of hours					Field-of-study educational effect symbol	Number of hours		Number of ECTS points		Form <sup>2</sup> of course/group of courses	Way <sup>3</sup> of crediting	Course/group of courses			
			lec	cl	lab	pr	sem		ZZU	CNPS	total	BK classes <sup>1</sup>			university-wide <sup>4</sup>	practical <sup>5</sup>	kind <sup>6</sup>	type <sup>7</sup>
1	JZL100655BK	Foreign language B2.2		1,60				KIENG_U06	24	90	3	2,25	T	Z	O		KO	W
2	HNN100100BK	Liberal subject	0,53					KIENG_W30 KIENG_K02 KIENG_K06	8	30	1	0,5	T	Z	O		KO	W
3	ZNN100100BK	Managerial since	0,53					KIENG_W30 KIENG_K05	8	30	1	0,5	T	Z	O		KO	W
4		Advanced Project methods:			1,07				16	90	3	2,25	T	Z		P	K	W
	ENN0065	CATIA						KIENG_U13										
	ENN1032	Solid Edge						KIENG_U13										
	ENN0242	Grafika 3D						KIENG_U13 KIENG_U05 KIENG_K06										
5	ENN0832	Heat pumps and solar collectors	0,53					S1EEN_W06	8	30	1	0,5	T	Z			S	W
6	ENN0832	Heat pumps and solar collectors			0,53			S1EEN_U06	8	30	1	0,75	T	Z		P	S	W
7	ENN0832	Heat pumps and solar collectors				0,53		S1EEN_U07	8	30	1	0,75	T	Z		P	S	W
8	ENN1351	Individual Engineering project				4,00		KIENG_U01 KIENG_U03 KIENG_U04 KIENG_K01	60	120	4	1	T	Z		P	K	W
9	ENN1410	Training						KIENG_U03 KIENG_K04 KIENG_K05			4					P	K	W
Total			1,59	1,60	1,60	4,53		KIENG_U01 KIENG_U03 KIENG_U04 KIENG_K01	140	450	19	8,5						

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<sup>3</sup>Exam – 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)

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

<sup>5</sup>Practical 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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<sup>7</sup> Optional – enter W, obligatory – enter Ob

## 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 for BK classes <sup>1</sup>
lec	cl	lab	pr	sem				
4,79	2,13	3,20	4,53		220	780	30	14,75

## Semester 9

### Obligatory courses number of ECTS points 3

No.	Course/group of courses code	Name of course/group of courses (denote group of courses with symbol <b>GK</b> )	Weekly number of hours					Field-of-study educational effect symbol	Number of hours		Number of ECTS points		Form <sup>2</sup> of course/group of courses	Way <sup>3</sup> of crediting	Course/group of courses			
			lec	cl	lab	pr	sem		ZZU	CNPS	total	BK classes <sup>1</sup>			university-wide <sup>4</sup>	practical <sup>5</sup>	kind <sup>6</sup>	type <sup>7</sup>
1	PRZ1153	Intellectual and Industrial Property Protection	1,07					KIENG_W13	16	60	2	1	T	Z	O		KO	Ob
2	ENN1370	Engineering diploma seminar					1,07	KIENG_U01 KIENG_U03 KIENG_U05 KIENG_K01 KIENG_K04	16	30	1	0,75	T	Z		P	K	Ob
Total			1,07				1,07		32	90	3	1,75						

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

<sup>5</sup>Practical 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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<sup>7</sup> Optional – enter W, obligatory – enter Ob

**Optional courses (minimum 128 hours in semester, 31 ECTS points)**

No.	Course/group of courses code	Name of course/group of courses (denote group of courses with symbol <b>GK</b> )	Weekly number of hours					Field-of-study educational effect symbol	Number of hours		Number of ECTS points		Form <sup>2</sup> of course/group of courses	Way <sup>3</sup> of crediting	Course/group of courses			
			lec	cl	lab	pr	sem		ZZU	CNPS	total	BK classes <sup>1</sup>			university-wide <sup>4</sup>	practical <sup>5</sup>	kind <sup>6</sup>	type <sup>7</sup>
1	HNN100100BK	Liberal subject	1,07					KIENG_W30 KIENG_K02 KIENG_K06	16	60	2	1	T	Z	O		KO	W
2	ENN0230	Energy management	1,07					S1EEN_W08	16	60	2	1	T	Z			S	W
3	ENN0230	Energy management		0,53				S1EEN_U09	8	30	1	0,75	T	Z		P	S	W
4	ENN0340	Boilers and Small Power	1,07					S1EEN_W09	16	60	2	1	T	Z			S	W
5	ENN0340	Boilers and Small Power		0,53				S1EEN_U10	8	30	1	0,75	T	Z		P	S	W
6	ENN0972	Heat distribution networks	0,53					S1EEN_W10	8	30	1	0,5	T	Z			S	W
7	ENN0972	Heat distribution networks		0,53				S1EEN_U11	8	30	1	0,75	T	Z		P	S	W
8	ENN0201	Gas technologies	0,53					S1EEN_W05	8	30	1	0,5	T	Z			S	W
9	ENN0201	Gas technologies		0,53				S1EEN_U05	8	30	1	0,75	T	Z		P	S	W
10	ENN0010	Energy audit	0,53					S1EEN_W11	8	30	1	0,5	T	Z			S	W
11	ENN0010	Energy audit			0,53			S1EEN_U12	8	30	1	0,75	T	Z		P	S	W
12	ENN0690	Basics of air-conditioning	1,07					S1EEN_W04	16	60	2	1	T	Z			S	W
13	ENN1420	Engineer diploma dissertatnion						KIENG_U01 KIENG_U03 KIENG_U04 KIENG_U05 KIENG_K01 KIENG_K04 KIENG_K06		450	15	2	T	Z		P		W
Total			5,87	2,12	0,53				128	930	31	11,25						

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

<sup>5</sup>Practical 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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<sup>7</sup> Optional – enter W, obligatory – enter Ob

## 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 for BK classes <sup>1</sup>
lec	cl	lab	pr	sem				
6,94	2,12	0,53		1,07	160	1020	34	13

## 2. Set of examinations in semestral arrangement

Course code	Names of courses ending with examination	Semester
ENN0701 FZP2109 MAP1076	1. Fundamentals of Materials Science 2. Physics 1 3. Mathematics 1	1
FZP2107 MAP1069	1. Physics 2 2. Mathematics 2	2
MAP1159 ENN0470 ENN1190	1. Mathematics 3 2. Fluid mechanics 3. Thermodynamics	3
ENN0651 ENN1040 ENN0400	1. Fundamentals of Control Systems 2. Combustion and fuels 3. Electrical machines and devices	5
ENN0641 ENN0330	1. Basics of Machine Design II 2. Energy boilers	6
ENN0521 ENN0410 ENN0082	1. Power engineering metrology 2. Turbomachinery 3. Refrigeration and Cryogenics	7
ENN0122 ENN0893	1. Power and heat stations 2. Power Distribution	8

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

Semester	Allowable deficit of ECTS points after semester
1	12
2	24
3	20
4	16
5	14
6	14
7	13
8	0

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