PLAN OF STUDIES

FACULTY of Computer Science and Management

MAIN FIELD OF STUDY: Systems Engineering

EDUCATION LEVEL: 1st / ~~2nd~~ * level, ~~licencjat~~ / inżynier / ~~magister~~ / ~~magister inżynier~~*

FORM OF STUDIES: full-time / ~~part-time~~*

PROFILE: general academic /~~practical~~ *

SPECIALIZATION:..

LANGUAGE OF STUDY: język polski

Faculty Council Resolution of 23. 04. 2013

In effect since 01. 10. 2013

*delete as applicable

Plan of studies structure (optionally)

1) in point layout
(space for scheme of plan)

28	CNPS	ECTS	CNPS	ECTS	CNPS	ECTS	CNPS	ECTS	CNPS	ECTS	CNPS	ECTS	CNPS	ECTS	27
27	**900**	**30**	**900**	**30**	**900**	**30**	**900**	**30**	**900**	**30**	**900**	**30**	**900**	**30**	26
26					Sports activities						Praktyka				
25			Introduction to programming		**30**	**1**									25
24							English		English i		Information systems design				24
23			**120**	**4**	Elective courses block basic I										23
22							**60**	**2**	**90**	**3**	**90**	**3**			22
21	Information Technologies		Foundations of accounting for engineers		**240**	**8**									21
20	**60**	**2**							Elective courses block engineering I		Collective Engineering Project				20
19	Legal and economic environment of enterprises		**150**	**5**			Elective courses block basic II				**120**	**4**			19
18					Computer aided financial analysis				**180**	**6**					18
17	**120**	**4**					**240**	**8**							17
16	Learn about the enterprise		Dynamic Systems Models		**120**	**4**			Internet technologies						16
15											Elective courses block engineering II		Bachelor Thesis		15
14	**140**	**5**	**150**	**5**	Engineering Design		Database systems		**150**	**5**					14
13					**120**	**4**					**260**	**9**	**390**	**11**	13
12	Engineering drawing, graphics **120**		General Physics 1.1				**190**	**6**	Project management **60** **2**				Protecting intellectual property **30** **2**		12
11	**4**												Work safety and ergonomics **60 3**		11
10	Introduction to Systems Engineering		**150**	**5**	System optimization		Marketing and innovation		Systems Engineering i						10
9					**120**	**4**			**120**	**4**			Psychology		9
8	**100**	**3**	Discrete mathematics for engineers				**190**	**6**			Artificial intelligence		**90**	**3**	8
7	Algebra and Analytic Geometry								Computer simulation						7
6			**120**	**4**	General Physics **2.1**		Innovation and technology strategies **40** **2**		**120**	**4**	**120**	**4**	Collective Engineering Project		6
5	**120**	**4**									Foundations of Decision		**150**	**5**	5
4	Mathematical Analysis		Mathematical Analysis		**150**	**5**	System identification						Elective courses block		4

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

[2]Traditional – enter T, remote – enter Z

[3]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)

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

[5]Practical 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

3	1.1 A	2.1 A	Statistics and econometrics		Operational research	and Control Theory	engineering III	3
2				180　　6	180　　6	150　　5	180　　6	2
1	240　　8	210　　7	120　　4					1
	I	II	III	IV	V	VI	VII	Razem
	21 / 315	25 / 375	26 / 390	24 / 360	24 / 360	24 / 360	16 / 240	160/2400

2) in hourly layout
(space for scheme of plan)

28	CNPS　　ECTS	CNPS　　ECTS	CNPS　　ECTS	CNPS　　ECTS	CNPS　　ECTS	CNPS　　ECTS	CNPS　　ECTS	27
27	**900　　30**	**900　　30**	**900　　30**	**900　　30**	**900　　30**	**900　　30**	**900　　30**	26
26			Sports activities　**02000**			*Praktyka*		
25		Introduction to programming **20200**					Information systems design **10200**	25
24			Elective courses block basic I **6h**	English **04000**	English **04000**			24
23								23
22								22
21	Information Technologies 10100	Foundations of accounting for engineers **22000**				Collective Engineering Project **00211**		21
20				Elective courses block basic II	Elective courses block engineering I **4h**			20
19	Legal and economic environment of enterprises **21000**							19
18			Computer aided financial analysis **20110 E**					18
17		Dynamic Systems Models **22200 E**						17
16	Learn about the enterprise **22000 E**			**6h**	Internet technologies **10300**	Elective courses block engineering II **8h**	Bachelor Thesis **00040**	16
15								15
14			Engineering Design **31000**	Database systems **20200**				14
13								13
12	Engineering drawing, graphics 11000				Project management **20000**		Protecting intellectual property 30　2	12
11		General Physics					Work safety and	11

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[5]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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[7] Optional – enter W, obligatory – enter Ob

10	Introduction to Systems Engineering	1.1	System optimization	Marketing and innovation	*Systems Engineering*		ergonomics **10100**	10
9					**10002 E**	Artificial intelligence	Psychology	9
8	**20001**	Discrete mathematics for engineers	**20200 E**	**21001 E**			**20001**	8
7	Algebra and Analytic Geometry				Computer simulation	**20200 E**		7
6		**22000 E**	General Physics **2.1**	Innovation and technology strategies	**10200**		Collective Engineering Project	6
5	**21000 E**		**20100 E**	00002		Foundations of Decision and Control Theory	**00110**	5
4	Mathematical Analysis 1.1 A	Mathematical Analysis 2.1 A		System identification	Operational research			4
3			Statistics and econometrics				Elective courses block engineering III	3
2				**20200 E**	**22000 E**		**4h**	2
1	**22000 E**	**22000 E**	**20100 E**			**21200 E**		1
	I	**II**	**III**	**IV**	**V**	**VI**	**VII**	**Razem**
	21 / 315	**25 / 375**	**26 / 390**	**24 / 360**	**24 / 360**	**24 / 360**	**16 / 240**	**160/2400**

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

[2]Traditional – enter T, remote – enter Z

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

[5]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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[7] Optional – enter W, obligatory – enter Ob

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]			university-wide[4]	practical[5]	kind[6]	type[7]
1	MAP 1142W	Mathematical Analysis 1.1 A	2					K1_INS_W01	30	150	5	5	T	E	O		PD	Ob
2	MAP 1142C	Mathematical Analysis 1.1 A		2				K1_INS_W01	30	90	3	3	T	Z	O		PD	Ob
3	MAP001140W	Algebra and Analytic Geometry	2					K1_INS_W01	30	60	2	2	T	E	O		PD	Ob
4	MAP001140C	Algebra and Analytic Geometry		1				K1_INS_W01	15	60	2	2	T	Z	O		PD	Ob
5	INZ 3402W	Introduction to Systems Engineering	2					K1_INS_W17 K1_INS_U01	30	60	2	2	T	Z			K	Ob
6	INZ 3402S	Introduction to Systems Engineering					1	K1_INS_W17 K1_INS_U01	15	40	1	1	T	Z			K	Ob
7	INZ 3401W	Engineering drawing, graphics	1					K1_INS_W13 K1_INS_U20	15	60	2	2	T	Z			K	Ob
8	INZ 3401C	Engineering drawing, graphics		1				K1_INS_W13 K1_INS_U20	15	60	2	2	T	Z			K	Ob

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[4]University-wide course /group of courses – enter O
[5]Practical 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

No	Code	Name						Learning outcomes											
9	INZ 3418W	Information Technologies	1					K1_INS_U14	15	30	1	1	T	Z				KO	Ob
10	INZ 3418L	Information Technologies		1				K1_INS_U14	15	30	1	1	T	Z		P		KO	Ob
11	EKZ 1122W	Legal and economic environment of enterprises	2					K1_INS_W15 K1_INS_U22 K1_INS_K02 K1_INS_K06	30	80	3	3	T	Z				K	Ob
12	EKZ 1122C	Legal and economic environment of enterprises		1				K1_INS_W15 K1_INS_U22 K1_INS_K02 K1_INS_K06	15	40	1	1	T	Z				K	Ob
13	EKZ1121W	Learn about the enterprise	2					K1_INS_W15 K1_INS_U22	30	60	3	3	T	E				KO	Ob
14	EKZ1121C	Learn about the enterprise		2				K1_INS_W15 K1_INS_U22	30	80	2	2	T	Z				KO	Ob
		Total	12	7	1	0	1		315	900	30	30							

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[1]
lec	cl	lab	pr	sem				
12	7	1	0	1	315	900	30	30

[1]BK – number of ECTS points assigned to hours of classes requiring direct contact of teachers with students
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[3]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)
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[5]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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[7] Optional – enter W, obligatory – enter Ob

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	MAP 1156W	Mathematical Analysis 2.1 A	2					K1_INS_W01	30	120	4	3	T	**E**	O		PD	Ob
2	MAP 1156C	Mathematical Analysis 2.1 A		2				K1_INS_W01	30	90	3	2	T	**Z**	O		PD	Ob
3	INZ 3419W	Discrete mathematics for engineers	2					K1_INS_W01	30	60	2	3	T	**E**			PD	Ob
4	INZ 3419C	Discrete mathematics for engineers		2				K1_INS_W01	30	60	2	2	T	**Z**			PD	Ob
5	INZ 3420W	Dynamic Systems Models	2					K1_INS_W01 K1_INS_W03 K1_INS_U07 K1_INS_U09 K1_INS_U11	30	50	2	2	T	**E**			K	Ob
6	INZ 3420C	Dynamic Systems Models		2				K1_INS_W01 K1_INS_W03 K1_INS_U07	30	50	1	1	T	**Z**			K	Ob

[1]BK – number of ECTS points assigned to hours of classes requiring direct contact of teachers with students
[2]Traditional – enter T, remote – enter Z
[3]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)
[4]University-wide course /group of courses – enter O
[5]Practical 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

								K1_INS_U09									
								K1_INS_U11									
7	INZ 3420L	Dynamic Systems Models			2			K1_INS_W01 K1_INS_W03 K1_INS_U07 K1_INS_U09 K1_INS_U11	30	50	2	2	T	Z		P	K	Ob
8	INZ 3403W	Introduction to programming	2					K1_INS_W08 K1_INS_U14	30	50	1	1	T	Z			K	Ob
9	INZ 3403L	Introduction to programming			2			K1_INS_W08 K1_INS_U14	30	70	3	3	T	Z		P	K	Ob
10	FZP 1057W	General Physics 1.1	2					K1_INS_W02 K1_INS_U08	30	120	4	4	T	E	O		PD	Ob
11	FZP 1057C	General Physics 1.1		1				K1_INS_W02 K1_INS_U08	15	30	1	2	T	Z	O	P	PD	Ob
12	FBZ 1144W	Foundations of accounting for engineers	2					K1_INS_W16 K1_INS_U23	30	80	3	3	T	Z			K	Ob
13	FBZ 1144C	Foundations of accounting for engineers		2				K1_INS_W16 K1_INS_U23	30	70	2	2	T	Z			K	Ob
		Total	12	9	4	0	0		375	900	30	30						

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

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[3]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)

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

[5]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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[7] 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[1]
lec	cl	lab	pr	sem				
12	9	4	0	0	375	900	30	30

[1]BK – number of ECTS points assigned to hours of classes requiring direct contact of teachers with students
[2]Traditional – enter T, remote – enter Z
[3]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)
[4]University-wide course /group of courses – enter O
[5]Practical 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 21

No.	Course/group of courses code	Name of course/group of courses (denote group of courses with symbol **GK**)	lec	cl	lab	pr	sem	Field-of-study educational effect symbol	ZZU	CNPS	total	BK classes[1]	Form[2] of course/group of courses	Way[3] of crediting	university-wide[4]	practical[5]	kind[6]	type[7]
1	MAZ 1140W	Statistics and econometrics	2					K1_INS_W04 K1_INS_U10 K1_INS_U11	30	70	2	2	T	**E**			K	Ob
2	MAZ 1140L	Statistics and econometrics			1			K1_INS_W04 K1_INS_U10 K1_INS_U11	15	50	2	2	T	**Z**		P	K	Ob
3	INZ 3407W	System optimization	2					K1_INS_W06 K1_INS_W07 K1_INS_U07 K1_INS_U12	30	60	2	2	T	**E**			K	Ob
4	INZ 3407W	System optimization			2			K1_INS_W06 K1_INS_W07 K1_INS_U07 K1_INS_U12	30	60	2	2	T	**Z**		P	K	Ob
5	INZ 3406W	Engineering Design	3					K1_INS_W14	45	90	2	2	T	**Z**			K	Ob

[1]BK – number of ECTS points assigned to hours of classes requiring direct contact of teachers with students
[2]Traditional – enter T, remote – enter Z
[3]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)
[4]University-wide course /group of courses – enter O
[5]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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[7] Optional – enter W, obligatory – enter Ob

№	Code	Course name						Learning outcomes	Hours		BK		Traditional/remote	Exam/crediting	University-wide	Practical	Type	Optional/obligatory
								K1_INS_U18 K1_INS_U19										
6	INZ 3406C	Engineering Design		1				K1_INS_W14 K1_INS_U18 K1_INS_U19	15	30	2	2	T	**Z**			K	Ob
7	FZP 2072W	General Physics **2.1**	2					K1_INS_W02 K1_INS_U08	30	90	3	3	T	**E**	O		PD	Ob
8	FZP 2072L	General Physics **2.1**		1				K1_INS_W02 K1_INS_U08	15	60	2	2	T	**Z**	O	P	PD	Ob
9	EKZ 2109W	Computer aided financial analysis	2					K1_INS_W16 K1_INS_U23	30	40	1	1	T	**E**			K	Ob
10	EKZ 2109L	Computer aided financial analysis		1				K1_INS_W16 K1_INS_U23	15	40	1	1	T	**Z**		P	K	Ob
11	EKZ 2109P	Computer aided financial analysis			1			K1_INS_W16 K1_INS_U23	15	40	2	2	T	**Z**		P	K	Ob
		Total	11	1	5	1	0		270	630	21	21						

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

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[3]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)

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

[5]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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[7] Optional – enter W, obligatory – enter Ob

Optional courses (minimum 120 hours in semester, 9 ECTS points)

No.	Course/group of courses code	Name of course/group of courses (denote group of courses with symbol **GK**)	lec	cl	lab	pr	sem	Field-of-study educational effect symbol	ZZU	CNPS	total	BK classes[1]	Form[2] of course/group of courses	Way[3] of crediting	university-wide[4]	practical[5]	kind[6]	type[7]
KO		Zajęcia sportowe		2				K1_INS_K07	30	30	1	1	T	**Z**	O		KO	W
		Total		2					30	30	1	1						

Table header spanning note: *Weekly number of hours* spans lec/cl/lab/pr/sem; *Number of hours* spans ZZU/CNPS; *Number of ECTS points* spans total/BK classes; *Course/group of courses* spans university-wide/practical/kind/type.

Module SS I.1 – *training path "Control systems"* (min. 8 pkt ECTS):

No.	Course/group of courses code	Name of course/group of courses (denote group of courses with symbol **GK**)	lec	cl	lab	pr	sem	Field-of-study educational effect symbol	ZZU	CNPS	total	BK classes[1]	Form[2] of course/group of courses	Way[3] of crediting	university-wide[4]	practical[5]	kind[6]	type[7]
1	INZ003215W	Bases of electronics and Electrical Engineering	1					K1_INS_W11	15	40	1	1	T	**Z**			K	W
2	INZ003215C	Bases of electronics and Electrical Engineering		1				K1_INS_U05	15	40	1	1	T	**Z**			K	W
3	INZ003215L	Bases of electronics and Electrical Engineering			1			K1_INS_U06	15	40	2	2	T	**Z**		P	K	W
4	INZ003200W	Numerical methods	1					K1_INS_U19	15	40	2	2	T	**Z**			K	W
5	INZ003200L	Numerical methods			2				30	80	2	2	T	**Z**		P	K	W
		Total	2	1	3				90	240	8	8						

Module SSU I.1 – *training path "Service-based computer communication systems"* (min. 8 pkt ECTS):

No.	Course/group of courses code	Name of course/group of courses (denote group of courses	Weekly number of	Field-of-study	Number of	Number of ECTS	Form[2] of	Way[3] of	Course/group of courses

[1]BK – number of ECTS points assigned to hours of classes requiring direct contact of teachers with students
[2]Traditional – enter T, remote – enter Z
[3]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)
[4]University-wide course /group of courses – enter O
[5]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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[7] Optional – enter W, obligatory – enter Ob

No.	of courses code	with symbol **GK**)	lec	cl	lab	pr	sem	educational effect symbol	ZZU	CNPS	total	BK classes[1]	course/group of courses	crediting	university-wide[4]	practical[5]	kind[6]	type[7]
1		Methods of requirements analysis for service-based systems	2					K1_INS_W11	30	80	3	3	T	**Z**			K	W
2		Methods of requirements analysis for service-based systems		2				K1_INS_U05	30	80	2	2	T	**Z**			K	W
3		Metrology and measurement tools for sensor systems I	2					K1_INS_U06 K1_INS_U19	30	80	3	3	T	**Z**			K	W
		Total	4	2					90	240	8	8						

Module PB I.1 – *training path "Biotechnological processes"* (min. 8 pkt ECTS):

No..	Course/group of courses code	Name of course/group of courses (denote group of courses with symbol **GK**)	lec	cl	lab	pr	sem	Field-of-study educational effect symbol	ZZU	CNPS	total	BK classes[1]	Form[2] of course/group of courses	Way[3] of crediting	university-wide[4]	practical[5]	kind[6]	type[7]
															Course/group of courses			
1	CHC013002W	Principles of organic chemistry	2					K1_INS_W11	30	90	4	4	T	**Z**			K	W
2	CHC013002	Principles of organic chemistry			2			K1_INS_U05	30	60	2	2	T	**Z**		P	K	W
3		Biology I	2					K1_INS_U06 K1_INS_U19	30	90	2	2	T	**Z**			K	W
		Total	4		2				90	240	8	8						

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[4]University-wide course /group of courses – enter O
[5]Practical 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

Module SL I.1 – *training path "Logistics systems"* (min. 8 pkt ECTS):

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	**ZMZ1579W**	Operations Management	1					K1_INS_W11	15	40	2	2	T	**Z**			K	W
2	**ZMZ1579C**	Operations Management		1					15	40	1	1	T	**Z**			K	W
3	**ZMZ1578W**	The organization of logistics systems	1					K1_INS_U05	15	40	1	1	T	**Z**		P	K	W
4	**ZMZ1578P**	The organization of logistics systems				1		K1_INS_U06	15	40	2	2	T	**Z**		P	K	W
5	ZMZ1577W	Foundations of Logistic	1					K1_INS_U19	15	40	1	1	T	**Z**			K	W
6	ZMZ1577S	Foundations of Logistic					1		15	40	1	1	T	**Z**			K	W
		Total	3	1	0	1	1		90	240	8	8						

Module SE I.1 – *training path "Energy systems"* (min. 8 pkt ECTS):

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	ESN 0370W	Power engineering machinery	2					K1_INS_W11	30	90	3	3	T	**Z**			K	W
2	ESN 0660W	Fundamentals of Electronics	1					K1_INS_U05 / K1_INS_U06	15	30	1	1	T	**Z**			K	W
3	ESN 0660L	Fundamentals of Electronics			1			K1_INS_U19	15	30	1	1	T	**Z**		P	K	W

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

[2]Traditional – enter T, remote – enter Z

[3]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)

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

[5]Practical 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

| 4 | MSN 1010W | Combustion and fuels | 2 | | | | | 30 | 90 | 3 | 3 | T | **Z** | | | K | W |
| | | Total | 5 | | 1 | | | 90 | 240 | 8 | 8 | | | | | | |

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[1]
lec	cl	lab	pr	sem				
13	4	8	1	0	390	900	30	30

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

[2]Traditional – enter T, remote – enter Z

[3]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)

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

[5]Practical 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 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[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	ZMZ 2161W	Marketing and innovation	2					K1_INS_W12 K1_INS_W19 K1_INS_U25	30	90	3	3	T	**E**			K	Ob
2	ZMZ 2161S	Marketing and innovation					1	K1_INS_W12 K1_INS_W19 K1_INS_U25	15	50	1	1	T	**Z**			K	Ob
3	ZMZ 2161C	Marketing and innovation		1				K1_INS_W12 K1_INS_W19 K1_INS_U25	15	50	2	2	T	**Z**			K	Ob
4	INZ 3410W	System identification	2					K1_INS_W04 K1_INS_W05 K1_INS_U07 K1_INS_U08 K1_INS_U11	30	90	3	3	T	**E**			K	Ob
5	INZ 3410L	System identification			2			K1_INS_W04 K1_INS_W05	30	90	3	3	T	**Z**		P	K	Ob

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

[2]Traditional – enter T, remote – enter Z

[3]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)

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

[5]Practical 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

No.	Course/group of courses code	Name of course/group of courses	lec	cl	lab	pr	sem	Field-of-study educational effect symbol	ZZU	CNPS	total	BK classes	Form of course	Way of crediting	university-wide	practical	kind	type
								K1_INS_U07 K1_INS_U08 K1_INS_U11										
6	INZ 3409S	Innovation and technology strategies					2	K1_INS_W12 K1_INS_W14 K1_INS_U21	30	40	2	2	T	**Z**			K	Ob
7	INZ 3421W	Database systems	2					K1_INS_W08 K1_INS_U14	30	100	3	3	T	**Z**			K	Ob
8	INZ 3421L	Database systems			2			K1_INS_W08 K1_INS_U14	30	90	3	3	T	**Z**		P	K	Ob
		Total	6	1	4	0	3		210	570	20	20						

Optional courses (minimum 150 hours in semester, 10 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]			university-wide[4]	practical[5]	kind[6]	type[7]
		English		4				K1_INS_U03 K1_INS_U06	60	**60**	2	2	T	**Z**	O		KO	W
		Total		4					60	60	2	2						

Module SS I.2 – *training path "Control systems"* (min. 8 pkt ECTS):

[1]BK – number of ECTS points assigned to hours of classes requiring direct contact of teachers with students
[2]Traditional – enter T, remote – enter Z
[3]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)
[4]University-wide course /group of courses – enter O
[5]Practical 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

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	INZ003203W	Pattern recognition	1					K1_INS_W11	15	60	2	2	T	**Z**			K	W
2	INZ003203WL	Pattern recognition			2			K1_INS_U05	30	60	2	2	T	**Z**		P	K	W
3	INZ003204W	Learning Systems	1					K1_INS_U06	15	60	2	2	T	**Z**			K	W
4	INZ003204L	Learning Systems			2			K1_INS_U19	30	60	2	2	T	**Z**		P	K	W
		Total																

Module SSU I.2 – *training path "Service-based computer communication systems"* (min. 8 pkt ECTS):

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]
		Design of efficient algorithms of data processing in networked systems of services, things and media	2					K1_INS_W11	30	80	2	2	T	**Z**			K	W
		Design of efficient algorithms of data processing in networked systems of services, things and media			2			K1_INS_U05	30	80	3	3	T	**Z**		P	K	W
		Metrology and measurement tools for sensor systems II			2			K1_INS_U06	30	80	3	3	T	**Z**		P	K	W
		Total	4	0	2			K1_INS_U19	90	240	8	8						

[1]BK – number of ECTS points assigned to hours of classes requiring direct contact of teachers with students
[2]Traditional – enter T, remote – enter Z
[3]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)
[4]University-wide course /group of courses – enter O
[5]Practical 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

Module PB I.2 – *training path "Biotechnological processes"* (min. 8 pkt ECTS):

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	TCC 014001	Fundamentals of chemical technology	2					K1_INS_W11 K1_INS_U05	30	90	3	3	T	**Z**			K	W
2	BTC 014001	Biotechnological methods in environmental protection	2					K1_INS_U06	30	60	3	3	T	Z			K	W
3		Mathematical modeling of biotechnological processes			2			K1_INS_U19	30	90	2	2	T	Z			K	W
		Total	4		**2**				90	240	8	8						

Module SL I.2 – *training path "Logistics systems"* (min. 8 pkt ECTS):

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	ZMZ002165W	Logistics Management in Enterprise	2					K1_INS_W11	30	80	2	2	T	**Z**			K	W
2	ZMZ002165L	Logistics Management in Enterprise			1			K1_INS_U05	15	40	1	1	T	**Z**		P	K	W
3	ZMZ002165P	Logistics Management in Enterprise				1		K1_INS_U06	15	60	2	2	T	**Z**		P	K	W

[1]BK – number of ECTS points assigned to hours of classes requiring direct contact of teachers with students
[2]Traditional – enter T, remote – enter Z
[3]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)
[4]University-wide course /group of courses – enter O
[5]Practical 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

No.	Course/group of courses code	Name of course/group of courses	lec	cl	lab	pr	sem	Field-of-study educational effect symbol	ZZU	CNPS	total	BK classes	Form of course/group of courses	Way of crediting	university-wide	practical	kind	type
4	FBZ001186W	Logistics Base	1					K1_INS_U19	15	30	2	1	T	**Z**			K	W
5	FBZ001186C	Logistics Base		1					15	30	1	2	T	**Z**		P	K	W
		Total	3	1	1	1			90	240	8	8						

Module SE I.2 – *training path "Energy systems"* (min. 8 pkt ECTS):

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		Form² of course/group of courses	Way³ of crediting	Course/group of courses			
			lec	cl	lab	pr	sem		ZZU	CNPS	total	BK classes¹			university-wide⁴	practical⁵	kind⁶	type⁷
		Combustion and fuels			1				15	60	2	2	T	**Z**		P	K	W
	MSN0210	Ecology	2					K1_INS_W11 / K1_INS_U05	30	90	3	3	T	**Z**			K	W
	ESN0850	Pumps and pumping systems	2					K1_INS_U06 / K1_INS_U19	30	60	2	2	T	**Z**			K	W
	ESN0850	Pumps and pumping systems		1					15	30	1	1	T	**Z**		P	K	W
		Total	4	1	1				90	240	8	8						

Altogether in semester

Total number of hours	Total number of	Total number of CNPS	Total number of ECTS	Number of ECTS points for BK

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

					ZZU hours	hours	points	classes[1]
lec	cl	lab	pr	sem				
8	5	8	0	3	360	900	30	30

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

[2]Traditional – enter T, remote – enter Z

[3]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)

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

[5]Practical 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 5

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 **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	ZMZ 3198W	*Systems Engineering*	1					K1_INS_W17 K1_INS_U02 K1_INS_U18 K1_INS_K03 K1_INS_K04	15	50	1	1	T	**E**			K	Ob
2	ZMZ 3198S	*Systems Engineering*					2	K1_INS_W17 K1_INS_U02 K1_INS_U18 K1_INS_K03 K1_INS_K04	30	70	3	3	T	**Z**			K	Ob
3	ZMZ 3197W	Project management	2					K1_INS_W17	30	60	2	2	T	**Z**			K	Ob
4	MAZ 3101W	Operational research	2					K1_INS_W03 K1_INS_W07 K1_INS_U07 K1_INS_U09	30	90	3	3	T	**E**			K	Ob

[1]BK – number of ECTS points assigned to hours of classes requiring direct contact of teachers with students
[2]Traditional – enter T, remote – enter Z
[3]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)
[4]University-wide course /group of courses – enter O
[5]Practical 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

No	Code	Course					Learning outcomes	hours	BK	ECTS	BK	T/Z	E/Z	O	P	group	W/Ob
							K1_INS_U12										
							K1_INS_U13										
5	MAZ 3101C	Operational research		2			K1_INS_W03 K1_INS_W07 K1_INS_U07 K1_INS_U09 K1_INS_U12 K1_INS_U13	30	90	3	3	T	Z			K	Ob
6	INZ 3412W	Computer simulation	1				K1_INS_W04 K1_INS_U11	15	30	1	1	T	Z			K	Ob
7	INZ 3412L	Computer simulation		2			K1_INS_W04 K1_INS_U11	30	90	3	3	T	Z		P	K	Ob
8	INZ 3411W	Internet technologies	1				K1_INS_U15	15	50	2	2	T	Z			K	Ob
9	INZ 3411L	Internet technologies		3			K1_INS_U15	45	100	3	3	T	Z		P	K	Ob
		Total															

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

[2]Traditional – enter T, remote – enter Z

[3]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)

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

[5]Practical 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 120 hours in semester, 9 ECTS points)

No..	Course/group of courses code	Name of course/group of courses (denote group of courses with symbol **GK**)	lec	cl	lab	pr	sem	Field-of-study educational effect symbol	ZZU	CNPS	total	BK classes[1]	Form[2] of course/group of courses	Way[3] of crediting	university-wide[4]	practical[5]	kind[6]	type[7]
								Weekly number of hours		**Number of hours**		**Number of ECTS points**					**Course/group of courses**		
		English		4				K1_INS_U03 K1_INS_U06	60	90	3	3	T	**Z**	O		KO	W
		Total	4						60	90	3	3						

Module SS I.3 – *training path "Control systems"* (min. *6* pkt ECTS):

No..	Course/group of courses code	Name of course/group of courses (denote group of courses with symbol **GK**)	lec	cl	lab	pr	sem	Field-of-study educational effect symbol	ZZU	CNPS	total	BK classes[1]	Form[2] of course/group of courses	Way[3] of crediting	university-wide[4]	practical[5]	kind[6]	type[7]
								Weekly number of hours		**Number of hours**		**Number of ECTS points**					**Course/group of courses**		
	INZ003207W	Modeling and simulation of control systems	1					K1_INS_W11	15	60	2	2	T	**Z**			K	W
	INZ003207L	Modeling and simulation of control systems			3			K1_INS_U05 K1_INS_U06 K1_INS_U19	45	120	4	4	T	**Z**		P	K	W
		Total	1		3				60	180	6	6						

Module SSU I.3 – *training path "Service-based computer communication systems"* (min. *6* pkt ECTS):

[1]BK – number of ECTS points assigned to hours of classes requiring direct contact of teachers with students
[2]Traditional – enter T, remote – enter Z
[3]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)
[4]University-wide course /group of courses – enter O
[5]Practical 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

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		Design of networked systems of services, things and media	1					K1_INS_W11 K1_INS_U05	15	50	2	2	T	**Z**			K	W
2		Design of networked systems of services, things and media			2			K1_INS_U06 K1_INS_U19	30	80	3	3	T	**Z**		P	K	W
3		Services-based systems for e-economy	1						15	50	1	1	T	**Z**			K	W
		Total	2		2				60	180	6	6						

Module PB I.3 – *training path "Biotechnological processes"* (min. *6* pkt ECTS):

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		Bioinformatics			2			K1_INS_W11	30	90	3	3	T	Z			K	W
2		Biotechnology	2					K1_INS_U05 K1_INS_U06 K1_INS_U19	30	90	3	3	T	Z			K	W

[1]BK – number of ECTS points assigned to hours of classes requiring direct contact of teachers with students
[2]Traditional – enter T, remote – enter Z
[3]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)
[4]University-wide course /group of courses – enter O
[5]Practical 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

		Total	2		**2**				60	180	6	6					

Module SL I.3 – *training path "Logistics systems"* (min. *6* pkt ECTS):

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]
	ZMZ1580W	Supply Chain Management	1					K1_INS_W11 K1_INS_U05 K1_INS_U06 K1_INS_U19	15	40	2	1	T	**Z**			K	W
	ZMZ1580S	Supply Chain Management					1		15	40	1	2	T	**Z**		P	K	W
	IEZ1213W	Information systems in logistics	1						15	40	1	1	T	**Z**			K	W
	IEZ1213P	Information systems in logistics				1			15	60	2	2	T	**Z**			K	W
		Total	2	0	0	1	1		60	180	6	6						

Module SE I.3 – *training path "Energy systems"* (min. *6* pkt ECTS):

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

[2]Traditional – enter T, remote – enter Z

[3]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)

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

[5]Practical 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

No.	Course/group of courses code	Name of course/group of courses (denote group of courses with symbol **GK**)	Weekly number of hours lec	cl	lab	pr	sem	Field-of-study educational effect symbol	Number of hours ZZU	CNPS	Number of ECTS points total	BK classes[1]	Form[2] of course/group of courses	Way[3] of crediting	Course/group of courses university-wide[4]	practical[5]	kind[6]	type[7]
1	ESN 0171W	Power Engineering and Environmental	1					K1_INS_W11 K1_INS_U05 K1_INS_U06 K1_INS_U19	15	60	2	2	T	**Z**			K	W
2	ESN 1090W	Flue-Gas Cleaning Techniques	2						30	60	2	2	T	**Z**			K	W
3	ESN 1090C	Flue-Gas Cleaning Techniques		1					10	60	2	2	T	**Z**			K	W
		Total	3	1					60	180	6	6						

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[1]
lec	cl	lab	pr	sem				
8	6	8	0	2	360	900	30	30

[1]BK – number of ECTS points assigned to hours of classes requiring direct contact of teachers with students
[2]Traditional – enter T, remote – enter Z
[3]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)
[4]University-wide course /group of courses – enter O
[5]Practical 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 6

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**)	lec	cl	lab	pr	sem	Field-of-study educational effect symbol	ZZU	CNPS	total	BK classes[1]	Form[2] of course/group of courses	Way[3] of crediting	university-wide[4]	practical[5]	kind[6]	type[7]
1	INZ003422W	Information systems design	1					K1_INS_U06 K1_INS_U15	15	30	1	1	T	**Z**			K	Ob
2	INZ003422L	Information systems design			2			K1_INS_U06 K1_INS_U15	30	60	2	2	T	**Z**		P	K	Ob
3	INZ 4321W	Artificial intelligence	2					K1_INS_W10 K1_INS_U17	30	60	2	2	T	**E**			K	Ob
4	INZ 4321L	Artificial intelligence			2			K1_INS_W10 K1_INS_U17	30	60	2	2	T	**Z**		P	K	Ob
5	INZ 3423W	Foundations of Decision and Control Theory	2					K1_INS_W06 K1_INS_W07 K1_INS_W09 K1_INS_U07 K1_INS_U11 K1_INS_U13 K1_INS_U16	30	50	2	2	T	**E**			K	Ob

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

[2]Traditional – enter T, remote – enter Z

[3]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)

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

[5]Practical 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

#	Code	Course name				Learning outcomes			BK¹		²	³	⁴	⁵	⁶	⁷
6	INZ 3423C	Foundations of Decision and Control Theory	1			K1_INS_W06 K1_INS_W07 K1_INS_W09 K1_INS_U07 K1_INS_U11 K1_INS_U13 K1_INS_U16	15	40	1	1	T	Z			K	Ob
7	INZ 3423L	Foundations of Decision and Control Theory		2		K1_INS_W06 K1_INS_W07 K1_INS_W09 K1_INS_U07 K1_INS_U11 K1_INS_U13 K1_INS_U16	30	60	2	2	T	Z		P	K	Ob
		Total	5	1	6		180	360	12	12						

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 180 hours in semester, 18 ECTS points)
    Module *Team project engineering* (min. 4 pkt ECTS):

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]
	INZ 3424L	Collective Engineering Project			2			K1_INS_W12 K1_INS_U01 K1_INS_U02 K1_INS_U03 K1_INS_U04 K1_INS_U18 K1_INS_U19 K1_INS_K01 K1_INS_K02 K1_INS_K03 K1_INS_K04 K1_INS_K06	30	50	2	2	T	**Z**		P	K	W
	INZ 3424P	Collective Engineering Project				1		K1_INS_W12 K1_INS_U01 K1_INS_U02	15	40	1	1	T	**Z**		P	K	W

[1]BK – number of ECTS points assigned to hours of classes requiring direct contact of teachers with students
[2]Traditional – enter T, remote – enter Z
[3]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)
[4]University-wide course /group of courses – enter O
[5]Practical 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

							K1_INS_U03											
							K1_INS_U04											
							K1_INS_U18											
							K1_INS_U19											
							K1_INS_K01											
							K1_INS_K02											
							K1_INS_K03											
							K1_INS_K04											
							K1_INS_K06											
INZ 3424S	Collective Engineering Project				1	K1_INS_W12 K1_INS_U01 K1_INS_U02 K1_INS_U03 K1_INS_U04 K1_INS_U18 K1_INS_U19 K1_INS_K01 K1_INS_K02 K1_INS_K03 K1_INS_K04	15	30	1	1	T	**Z**			K	W

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

[2]Traditional – enter T, remote – enter Z

[3]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)

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

[5]Practical 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

No.	Course/group of courses code	Name of course/group of courses	lec	cl	lab	pr	sem	Field-of-study educational effect symbol	ZZU	CNPS	total	BK classes	Form of course/group of courses	Way of crediting	university-wide	practical	kind	type
								K1_INS_K06										
	Total		2	1	1				60	120	4	4						

Module SS I.4 – *training path "Control systems"* (min. *9* pkt ECTS):

No.	Course/group of courses code	Name of course/group of courses (denote group of courses with symbol **GK**)	lec	cl	lab	pr	sem	Field-of-study educational effect symbol	ZZU	CNPS	total	BK classes[1]	Form[2] of course/group of courses	Way[3] of crediting	university-wide[4]	practical[5]	kind[6]	type[7]
	INZ003425W	Advanced Decision Support Methods i	2					K1_INS_W11	30	50	2	2	T	**Z**			K	W
	INZ003425P	Advanced Decision Support Methods				2		K1_INS_U05	30	80	3	3	T	**Z**		P	K	W
	INZ003429W	Real-time systems	2					K1_INS_U06	30	40	1	1	T	**Z**			K	W
	INZ003429L	Real-time systems			2			K1_INS_U19	30	90	3	3	T	**Z**		P	K	W
		Total	4		2	2			120	260	9	9						

Module SSU I.4 – *training path "Service-based computer communication systems"* (min. *9* pkt ECTS):

No.	Course/group	Name of course/group of courses (denote group of courses	Weekly number of hours	Field-of-study educational	Number of hours	Number of ECTS points	Form[2] of course/group	Way[3] of crediting	Course/group of courses

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

[2]Traditional – enter T, remote – enter Z

[3]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)

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

[5]Practical 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

No.	of courses code	with symbol **GK**)	lec	cl	lab	pr	sem	effect symbol	ZZU	CNPS	total	BK classes[1]	of courses		university-wide[4]	practical[5]	kind[6]	type[7]
1		Design and implementation of Web systems	2					K1_INS_W11	30	50	2	2	T	**Z**			K	W
2		Design and implementation of Web systems				4		K1_INS_U05	60	160	5	5	T	**Z**		P	K	W
3		Quality service-based computer communication systems	2					K1_INS_U06 K1_INS_U19	30	50	2	2	T	**Z**			K	W
		Total	4			4			120	260	9	9						

Module PB I.4 – *training path "Biotechnological processes"* (min. 9 pkt ECTS):

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	BTC 010006	Bioprocess engineering	2					K1_INS_W11 K1_INS_U05	30	80	3	3	T	**Z**			K	W
2		Design of biologically active compounds	2					K1_INS_U06	30	60	2	2	T	Z			K	W
3	CHC010007W	Chemistry of natural products	2					K1_INS_U19	30	60	2	2	T	**Z**			K	W
4	BTC005009P	Design of biotechnological processes				2			30	60	2	2	T	**Z**			K	W
		Total																

[1]BK – number of ECTS points assigned to hours of classes requiring direct contact of teachers with students
[2]Traditional – enter T, remote – enter Z
[3]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)
[4]University-wide course /group of courses – enter O
[5]Practical 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

Module SL I.4 – *training path "Logistics systems"* (min. *9* pkt ECTS):

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	**IEZ1214W**	Simulation modeling in logistics	1						15	30	1	1	T	**Z**			K	W
2	**IEZ1214L**	Simulation modeling in logistics			1			K1_INS_W11	15	30	1	1	T	**Z**			K	W
3	ZMZ001489W	Quality Management Systems	1					K1_INS_U05	15	40	2	2	T	**Z**			K	W
4	ZMZ001489S	Quality Management Systems					1	K1_INS_U06	15	40	1	1	T	**Z**			K	W
5	**ZMZ1581W**	Quality management - basics	2					K1_INS_U19	30	60	2	2	T	**Z**			K	W
6	**ZMZ1581C**	Quality management - basics		2					30	60	2	2	T	**Z**			K	W
		Total																

Module SE I.4 – *training path "Energy systems"* (min. 9 pkt ECTS):

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		Cryogenics and Gas Technologies in Power Engineering	2					K1_INS_W11	30	60	3	3	T	**Z**			K	W
2		Cryogenics and Gas Technologies in Power Engineering		1				K1_INS_U05	15	30	1	1	T	**Z**			K	W
3		Cryogenics and Gas Technologies in Power Engineering				1		K1_INS_U06	15	30	1	1	T	**Z**		P	K	W
4		Power distribution	2					K1_INS_U19	30	60	2	2	T	**Z**			K	W

[1]BK – number of ECTS points assigned to hours of classes requiring direct contact of teachers with students
[2]Traditional – enter T, remote – enter Z
[3]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)
[4]University-wide course /group of courses – enter O
[5]Practical 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

5		Heat pumps and solar collectors	1					15	30	1	1	T	**Z**			K	W
6		Heat pumps and solar collectors		1				15	30	1	1	T	**Z**			K	W
		Total	5	1	2			120	260	9	9						

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[1]
lec	cl	lab	pr	sem				
9	1	10	3	1	360	900	30	30

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

[2]Traditional – enter T, remote – enter Z

[3]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)

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

[5]Practical 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 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 **GK**)	lec	cl	lab	pr	sem	Field-of-study educational effect symbol	ZZU	CNPS	total	BK classes[1]	Form[2] of course/group of courses	Way[3] of crediting	university-wide[4]	practical[5]	kind[6]	type[7]
1	PSZ 4104W	Psychology	2					K1_INS_W20 K1_INS_U26 K1_INS_K05	30	60	2	2	T	**Z**			KO	Ob
2	PSZ 4104S	Psychology					1	K1_INS_W20 K1_INS_U26 K1_INS_K05	15	30	1	1	T	**Z**			KO	Ob
3	PRZ 4125W	Protecting intellectual property	1					K1_INS_W15 K1_INS_U22	15	30	2	2	T	**Z**			K	Ob
4	ISZ 4101W	Work safety and ergonomics	1					K1_INS_W18 K1_INS_U24	15	20	1	1	T	**Z**			K	Ob
5	ISZ 4101L	Work safety and ergonomics			1			K1_INS_W18 K1_INS_U24	15	40	2	2	T	**Z**		P	K	Ob
		Total	4	0	1		1		90	180	8	8						

Optional courses (minimum 150 hours in semester, 22 ECTS points)

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

[2]Traditional – enter T, remote – enter Z

[3]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)

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

[5]Practical 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

Module *Team project engineering* *(min.* 5 *pkt ECTS):*

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	INZ 3428L	Collective Engineering Project			1			K1_INS_W12 K1_INS_U01 K1_INS_U02 K1_INS_U03 K1_INS_U04 K1_INS_U18 K1_INS_U19 K1_INS_K01 K1_INS_K02 K1_INS_K03 K1_INS_K04 K1_INS_K06	15	70	2	2	T	**Z**		P	K	W
2	INZ 3428P	Collective Engineering Project				1		K1_INS_W12 K1_INS_U01 K1_INS_U02	15	80	3	3	T	**Z**		P	K	W

[1]BK – number of ECTS points assigned to hours of classes requiring direct contact of teachers with students
[2]Traditional – enter T, remote – enter Z
[3]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)
[4]University-wide course /group of courses – enter O
[5]Practical 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

No..	Course/group of courses code	Name of course/group of courses (denote group of courses with symbol **GK**)	lec	cl	lab	pr	sem	Field-of-study educational effect symbol	ZZU	CNPS	total	BK classes						
								K1_INS_U03											
								K1_INS_U04											
								K1_INS_U18											
								K1_INS_U19											
								K1_INS_K01											
								K1_INS_K02											
								K1_INS_K03											
								K1_INS_K04											
								K1_INS_K06											
		Total			1	1			30	150	5	5							

Module *Bachelor Thesis* (min. 10 pkt ECTS):diploma

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	1 INZ003430D	Bachelor Thesis				4		K1_INS_U01 K1_INS_U19 K1_INS_K01 K1_INS_K04	60	390	11	11	T	**Z**		P	K	W

[1]BK – number of ECTS points assigned to hours of classes requiring direct contact of teachers with students
[2]Traditional – enter T, remote – enter Z
[3]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)
[4]University-wide course /group of courses – enter O
[5]Practical 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

							K1_INS_K06												
		Total			4				60	390	11		11						

Module SSU I.5 – *training path "Service-based computer communication systems"* (min. 6 pkt ECTS):

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]
		Design and implementation of advanced web systems	1					K1_INS_W11	15	30	1	1	T	**Z**			K	W
		Design and implementation of advanced web systems				2		K1_INS_U05	30	120	4	4	T	**Z**		P	K	W
		Internet of things, media and services	1					K1_INS_U06	15	30	1	1						
								K1_INS_U19										
		Total	2			2			60	180	6	6						

Module SS I.5 – *training path "Control systems"* (min. 6 pkt ECTS):

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]BK – number of ECTS points assigned to hours of classes requiring direct contact of teachers with students
[2]Traditional – enter T, remote – enter Z
[3]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)
[4]University-wide course /group of courses – enter O
[5]Practical 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

No.	Course/group of courses code	Name of course/group of courses	1				K1_INS_W11	15	60	2	2	T	**Z**				K	W
2		Embedded systems					K1_INS_U05											
							K1_INS_U06											
							K1_INS_U19											
	INZ003213p					3		45	120	4	4	T	**Z**			P	K	W
		Total	1			3		60	180	6	6							

Module PB I.5 – *training path "Biotechnological processes"* (min. *6* pkt ECTS):

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]
	BTC005012W	Bioorganic chemistry	2					K1_INS_W11	30	90	3	3	T	**Z**			K	W
		The ethical aspects of biotechnology	2					K1_INS_U05 K1_INS_U06 K1_INS_U19	30	90	3	3	T	Z			K	W
		Total	4		2				60	180	6	6						

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[2]Traditional – enter T, remote – enter Z
[3]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)
[4]University-wide course /group of courses – enter O
[5]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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[7] Optional – enter W, obligatory – enter Ob

Module SL I.5 – *training path "Logistics systems"* (min. **6** pkt ECTS):

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]
	ZMZ004132W	Quality management tools	2					K1_INS_W11	30	90	3	3	T	**Z**			K	W
	ZMZ004132C	Quality management tools		1				K1_INS_U05	15	50	2	2	T	**Z**			K	W
	ZMZ004132S	Quality management tools					1	K1_INS_U06 K1_INS_U19	15	40	1	1	T	**Z**			K	W
		Total	2	1			1		60	180	6	6						

Module SE I.5 – *training path "Energy systems"* (min. **6** pkt ECTS):

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		Energy management	2					K1_INS_W11 K1_INS_U05 K1_INS_U06 K1_INS_U19	30	90	3	3	T	**Z**			K	W
2		Thermal power stations	2						30	90	3	3	T	**Z**			K	W

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[6] KO – general education, PD – basic sciences, K – field-of-studies, S – specialization
[7] Optional – enter W, obligatory – enter Ob

		Total	4					60	180	6	6							

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[1]
lec	cl	lab	pr	sem				
5	0	1	8	2	240	900	30	30

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[2]Traditional –   enter T, remote – enter Z
[3]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)
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[6] KO – general education, PD – basic sciences, K – field-of-studies, S – specialization
[7] Optional – enter W, obligatory – enter Ob

2. Set of examinations in semestral arrangement

Course code	Names of courses ending with examination	Semester
	1. Mathematical Analysis 2. Algebra and Analytic Geometry 3. Learn about the enterprise	1
	1. Mathematical Analysis II 2. Discrete mathematics for engineers 3. General Physics I 4. Dynamic Systems Models	2
	1. Statistics and econometrics 2. General Physics II 3. System optimization 4. Computer aided financial analysis	3
	1. System identification 2. Marketing and innovation	4
	1. Operational research 2. Systems Engineering	5
	1. Foundations of Decision and Control Theory 2. Artificial intelligence	6

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

[2]Traditional – enter T, remote – enter Z

[3]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)

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

[5]Practical 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

		7

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

Semester	Allowable deficit of ECTS points after semester
1	12
2	16
3	10
4	10
5	6
6	5

[1]BK – number of ECTS points assigned to hours of classes requiring direct contact of teachers with students
[2]Traditional – enter T, remote – enter Z
[3]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)
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[6] KO – general education, PD – basic sciences, K – field-of-studies, S – specialization
[7] Optional – enter W, obligatory – enter Ob

Opinion of student government legislative body

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Date Name and surname, signature of student representative

....

Date Dean's signature

[1]BK – number of ECTS points assigned to hours of classes requiring direct contact of teachers with students
[2]Traditional – enter T, remote – enter Z
[3]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)
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