

Attachment no. 2 to Programme of Studies

PLAN OF STUDIES

FACULTY: OF MECHANICAL AND POWER ENGINEERING

MAIN FIELD OF STUDY: MECHANICAL ENGINEERING AND MACHINE BUILDING

EDUCATION LEVEL: 1st level, inzynier

FORM OF STUDIES: part-time

PROFILE: general academic

SPECIALIZATION: THERMAL ENGINEERING.

LANGUAGE OF STUDY: polish

**Faculty Council Resolution of 26.09.2012
In effect since 01.10.2012**

Edited adjustment 21.08.2015

Plan of studies structure in point layout

								professional practice	engineering thesis
								engineer individual student project	
chemistry	informatics								
	chemistry	informatics							
physics 1	physics 2	physics 3							
mathematics 1	mathematics 2	mathematics 3							
								management humanities	engineer sem.
								foreign language	humanities
sem.1	sem.2	sem.3	sem.4	sem.5	sem.6	sem.7	sem.8	sem.9	

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
Specialization and optional courses

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

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⁷Optional – 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 23

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 credi ng	Course/group of courses			
			lec	cl	lab	pr	sem		ZZU	CNPS	total	BK class ¹ es			univers ity- wide ⁴	practical ⁵	kind ⁶	type ⁷
1	MNN0820	Fundamentals of Materials Science	1,60					K1MBM_W06	24	120	4	2,00	T	E			K	Ob
2	MNN0411	Theory of machines	1,07					K1MBM_W13	16	60	2	1,00	T	Z			K	Ob
3	MNN0250	Descriptive geometry	1,07					K1MBM_W07	16	60	2	1,00	T	Z			K	Ob
4	MNN0250	Descriptive geometry		0,53				K1MBM_U07	8	30	1	0,75	T	Z		P	K	Ob
5	CHC3079	Chemistry	1,07					K1MBM_W04	16	90	3	1,50	T	Z	O		PD	Ob
6	FZP2109	Physics 1	2,13					K1MBM_W03	32	120	4	2,00	T	E	O		PD	Ob
7	MAP1076	Calculus 1	2,13					K1MBM_W01 K1MBM_K01	32	120	4	2,00	T	E	O		PD	Ob
8	MAP1076	Calculus 1		1,07				K1MBM_U01 K1MBM_K01	16	90	3	2,25	T	Z	O	P	PD	Ob
Total			9,07	1,60					160	690	23	12,50						

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				
9,07	1,60	0	0	0	160	690	23	12,50

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

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

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⁷Optional – enter W, obligatory – enter Ob

Semester 2

Obligatory courses number of ECTS points 22

No	Course/ group of courses code	Name of course/group of courses (denote group of courses with symbol GK)	Weekly number of hours					Field-of-study educational effect symbol	Number of hours		Number of ECTS points		Form ² of course/ group of courses	Way ³ of creditin g	Course/group of courses			
			lec	cl	lab	pr	sem		ZZU	CNPS	total	BK class ¹ es			univers ity- wide ⁴	practical ⁵	kind ⁶	type ⁷
1	MNN0163	Information Technologies	1,07					K1MBM_W08	16	60	2	1,00	T	Z	O		KO	Ob
2	MNN0820	Fundamentals of Materials Science			0,53			K1MBM_U06 K1MBM_K03 K1MBM_K06	8	30	1	0,75	T	Z		P	K	Ob
3	MNN1140	Production Technics	1,60					K1MBM_W11	24	90	3	1,50	T	Z			K	Ob
4	MNN1001	Technical drawing				1,07		K1MBM_U07	16	90	3	2,25	T	Z		P	K	Ob
5	MNN0510	Mechanics 1	0,53					K1MBM_W05	8	30	1	0,50	T	Z			K	Ob
6	MNN0510	Mechanics 1		0,53				K1MBM_U05	8	30	1	0,75	T	Z		P	K	Ob
7	CHC3079	Chemistry			0,53			K1MBM_U04	8	30	1	0,75	T	Z	O	P	PD	Ob
8	FZP2107	Physics 2	1,07					K1MBM_W03	16	60	2	1,00	T	E	O		PD	Ob
9	FZP2107	Physics 2		0,53				K1MBM_U03	8	30	1	0,75	T	Z	O	P	PD	Ob
10	MAP1069	Calculus 2	2,13					K1MBM_W01 K1MBM_W02 K1MBM_K01	32	120	4	2,00	T	E	O		PD	Ob
11	MAP1069	Calculus 2		1,07				K1MBM_U01 K1MBM_U02 K1MBM_K01	16	90	3	2,25	T	Z	O	P	PD	Ob
Total			6,40	2,13	1,06	1,07			160	660	22	13,5						

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

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

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

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

⁷ Optional – enter W, obligatory – enter Ob

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				
6,40	2,13	1,06	1,07	0	160	660	22	13,5

Semester 3

Obligatory courses number of ECTS points 24

No	Course/group of courses code	Name of course/group of courses (denote group of courses with symbol GK)	Weekly number of hours					Field-of-study educational effect symbol	Number of hours		Number of ECTS points		Form ² of course/group of courses	Way ³ of crediting	Course/group of courses			
			lec	cl	lab	pr	sem		ZZU	CNPS	total	BK classes ¹			university-wide ⁴	practical ⁵	kind ⁶	type ⁷
1	MNN0699	Application packages			1,07			K1MBM_U08	16	60	2	1,50	T	Z	O	P	KO	Ob
2	MNN0825	Basics of metrology and experiment techniques	0,53					K1MBM_W10	8	60	2	1,00	T	Z			K	Ob
3	MNN0825	Basics of metrology and experiment techniques		0,53				K1MBM_U10	8	30	1	0,75	T	Z		P	K	Ob
4	MNN0825	Basics of metrology and experiment techniques			0,53			K1MBM_U10	8	30	1	0,75	T	Z		P	K	Ob
5	MNN0610	Workshop metrology	0,53					K1MBM_W11 K1MBM_K01 K1MBM_K03	8	30	1	0,50	T	Z			K	Ob
6	MNN0610	Workshop metrology			0,53			K1MBM_U11 K1MBM_K01 K1MBM_K03	8	30	1	0,75	T	Z		P	K	Ob
7	MNN0860	Fundamental strength of materials	1,07					K1MBM_W05	16	60	2	1,00	T	Z			K	Ob
8	MNN0860	Fundamental strength of materials		0,53				K1MBM_U05	8	30	1	0,75	T	Z		P	K	Ob
9	MNN0520	Mechanics 2	1,07					K1MBM_W05	16	90	3	1,50	T	E			K	Ob
10	MNN0520	Mechanics 2		0,53				K1MBM_U05	8	30	1	0,75	T	Z		P	K	Ob

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

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11	FZP2114	Physics 3	0,53					K1MBM_W03	8	30	1	0,50	T	Z	O		PD	Ob
12	FZP2114	Physics 3			1,07			K1MBM_U03	16	60	2	1,50	T	Z	O	P	PD	Ob
13	MAP1159	Calculus 3	1,07					K1MBM_W02 K1MBM_K01	16	120	4	2,00	T	E	O		PD	Ob
14	MAP1159	Calculus 3		1,07				K1MBM_U02 K1MBM_K01	16	60	2	1,50	T	Z	O	P	PD	Ob
Total			4,80	2,66	3,20					160	720	24	14,75					

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 ¹
lec	cl	lab	pr	sem				
4,80	2,66	3,20			160	720	24	14,75

Semester 4

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 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	MNN1140	Production Technics			1,07			K1MBM_U11	16	60	2	1,50	T	Z		P	K	Ob
2	MNN0800	Fundamentals of Electronics	0,53					K1MBM_W12	8	30	1	0,50	T	Z			K	Ob
3	MNN0800	Fundamentals of Electronics			0,53			K1MBM_U12	8	30	1	0,75	T	Z		P	K	Ob
4	MNN0810	Electrical Engineering Fundamentals	1,07					K1MBM_W12	16	60	2	1,00	T	Z			K	Ob
5	MNN0810	Electrical Engineering Fundamentals		0,53				K1MBM_U12	8	30	1	0,75	T	Z		P	K	Ob

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

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

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6	MNN0810	Electrical Engineering Fundamentals			0,53			K1MBM_U12	8	30	1	0,75	T	Z		P	K	Ob
7	MNN0830	Fundamentals of fluid mechanics	1,07					K1MBM_W09	16	60	2	1,00	T	Z			K	Ob
8	MNN0830	Fundamentals of fluid mechanics		1,07				K1MBM_U09	16	30	1	0,75	T	Z		P	K	Ob
9	MNN0850	Basics of thermodynamics	1,07					K1MBM_W09	16	60	2	1,00	T	Z			K	Ob.
10	MNN0850	Basics of thermodynamics		1,07				K1MBM_U09	16	30	1	0,75	T	Z		P	K	Ob
Total			3,74	2,67	2,13				128	420	14	8,75						

Optional courses (minimum 32 hours in semester, 5 ECTS points)

No	Course/ group of courses code	Name of course/group of courses (denote group of courses with symbol GK)	Weekly number of hours					Field-of-study educational effect symbol	Number of hours		Number of ECTS points		Form ² of course/ group of courses	Way ³ of crediting	Course/group of courses			
			lec	cl	lab	pr	sem		ZZU	CNPS	total	BK class es ¹			univers ity- wide ⁴	practical ⁵	kind ⁶	type ⁷
1	MNN1451	Strength of materials	1,07					S1INC_W01	16	90	3	1,50	T	E			S	W
2	MNN1451	Strength of materials		1,07				S1INC_U01	16	60	2	1,50	T	Z		P	S	W
Total			1,07	1,07					32	150	5	3,00						

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				
4,81	3,74	2,13	0	0	160	570	19	11,75

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

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

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⁷Optional – enter W, obligatory – enter Ob

Semester 5

Obligatory courses number of ECTS points 10

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 creditin g	Course/group of courses			
			lec	cl	lab	pr	sem		ZZU	CNPS	total	BK class es ¹			univers ity- wide ⁴	practical ⁵	kind ⁶	type ⁷
1	MNN0740	Basics of Machine Design I	1,07					K1MBM_W14	16	60	2	1,00	T	Z			K	Ob
2	MNN0740	Basics of Machine Design I				1,07		K1MBM_U13	16	60	2	1,50	T	Z		P	K	Ob
3	MNN0091	CAD I			1,07			K1MBM_U07	16	60	2	1,50	T	Z		P	K	Ob
4	MNN0781	Fundamentals of Control Systems	1,07					K1MBM_W12	16	90	3	1,50	T	E			K	Ob
5	MNN0781	Fundamentals of Control Systems		1,07				K1MBM_U12	16	30	1	0,75	T	Z		P	K	Ob
Total			2,14	1,07	1,07	1,07			80	300	10	6,25						

Optional courses (minimum 80 hours in semester, 12 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 creditin g	Course/group of courses			
			lec	cl	lab	pr	sem		ZZU	CNPS	total	BK class es ¹			univers ity- wide ⁴	practical ⁵	kind ⁶	type ⁷
1	MNN0580	Fluid Mechanics - laboratory			1,07			S1INC_U03	16	60	2	1,50	T	Z		P	S	W
2	MNN1120	Technical Fluid Mechanics	1,07					S1INC_W03	16	90	3	1,50	T	E			S	W
3	MNN1120	Technical Fluid Mechanics		0,53				S1INC_U03	8	30	1	0,75	T	Z		P	S	W
4	MNN1250	Thermodynamics - lab			1,07			S1INC_U05 K1MBM_K03	16	60	2	1,50	T	Z		P	S	W
5	MNN1201	Theory of thermal machines	0,53					S1INC_W02	8	90	3	1,50	T	E			S	W

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

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

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6	MNN1201	Theory of thermal machines		1,07			S1INC_U02	16	30	1	0,75	T	Z		P	S	W
Total			1,60	1,60	2,14			80	360	12	7,50						

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				
3,74	2,67	3,21	1,07	0	160	660	22	13,75

Semester 6

Obligatory courses number of ECTS points 13

No	Course/group of courses code	Name of course/group of courses (denote group of courses with symbol GK)	Weekly number of hours					Field-of-study educational effect symbol	Number of hours		Number of ECTS points		Form ² of course/group of courses	Way ³ of crediting	Course/group of courses			
			lec	cl	lab	pr	sem		ZZU	CNPS	total	BK class ¹			university-wide ⁴	practical ⁵	kind ⁶	type ⁷
1	MNN0750	Basics of Machine Design II	1,07					K1MBM_W14	16	90	3	1,50	T	E			K	Ob
2	MNN0750	Basics of Machine Design II				1,07		K1MBM_U13	16	60	2	1,50	T	Z		P	K	Ob
3	MNN0100	CAD II			1,07			K1MBM_U07	16	60	2	1,50	T	Z		P	K	Ob
4	MNN0781	Fundamentals of Control Systems			1,07			K1MBM_U12	16	60	2	1,50	T	Z		P	K	Ob
5	MNN1060	Combustion and fuels	1,07					K1MBM_W15	16	90	3	1,50	T	E			K	Ob
6	MNN1060	Combustion and fuels			0,53			K1MBM_U14	8	30	1	0,75	T	Z		P	K	Ob
Total			2,14		2,67	1,07			88	390	13	8,25						

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

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

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⁷Optional – enter W, obligatory – enter Ob

Optional courses (minimum 56 hours in semester, 7 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 creditin g	Course/group of courses			
			lec	cl	lab	pr	sem		ZZU	CNPS	total	BK class ¹ es			univers ity- wide ⁴	practical ⁵	kind ⁶	type ⁷
1	MNN0881	Pumps	1,07					S1INC_W07	16	60	2	1,00	T	Z			S	W
2	MNN0881	Pumps		0,53				S1INC_U08	8	30	1	0,75	T	Z		P	S	W
3	MNN1400	Heat transfer and heat exchangers	1,07					S1INC_W04	16	60	2	1,00	T	Z			S	W
4	MNN1400	Heat transfer and heat exchangers		0,53				S1INC_U04	8	30	1	0,75	T	Z		P	S	W
5	JZL100655BK	Foreign language B2.1.1		1,60				K1MBM_U15	24	30	1	0,75	T	Z	O	P	KO	W
Total			2,14	2,66					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 ¹
lec	cl	lab	pr	sem				
4,28	2,66	2,67	1,07	0	160	600	20	12,50

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

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

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⁷ Optional – enter W, obligatory – enter Ob

Semester 7

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 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 creditin g	Course/group of courses			
			lec	cl	lab	pr	sem		ZZU	CNPS	total	BK class ¹ es			univers ity- wide ⁴	practical ⁵	kind ⁶	type ⁷
1	MNN0190	Ecology	1,07					K1MBM_W17 K1MBM_K02	16	90	3	1,50	T	Z			K	Ob
Total			2	0	0	0	1		16	90	3	1,50						

Optional courses (minimum 136 hours in semester, 18 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 creditin g	Course/group of courses			
			lec	cl	lab	pr	sem		ZZU	CNPS	total	BK class ¹ es			univers ity- wide ⁴	practical ⁵	kind ⁶	type ⁷
1	MNN0302	Process Engineering and Apparatus	1,07					S1INC_W08	16	90	3	1,50	T	E			S	W
2	MNN0302	Process Engineering and Apparatus		1,07				S1INC_U09	16	60	2	1,50	T	Z		P	S	W
3	MNN0130	Refrigeration and Cryogenics	1,07					S1INC_W05	16	90	3	1,50	T	E			S	W
4	MNN0130	Refrigeration and Cryogenics		0,53				S1INC_U06	8	30	1	0,75	T	Z		P	S	W
5	MNN0151	Thermal fluid–flow machinery	1,07					S1INC_W06	16	60	2	1,00	T	Z			S	W
6	MNN0151	Thermal fluid–flow machinery				1,07		S1INC_U07	16	30	1	0,75	T	Z		P	S	W
7	MNN1360	Boiler devices	1,07					S1INC_W10	16	90	3	1,50	T	E			S	W
8	MNN1360	Boiler devices				1,07		S1INC_U11	16	60	2	1,50	T	Z		P	S	W
9	JZL100655BK	Foreign language B2.1.2		1,60				K1MBM_U15	24	30	1	0,75	T	Z	O	P	KO	W
Total			4,28	3,2		2,14			144	540	18	10,75						

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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				
5,35	3,2	0	2,14	0	160	630	21	12,25

Semester 8

Optional courses (minimum 196 hours in semester, 27 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 creditin g	Course/group of courses			
			lec	cl	lab	pr	se m		ZZU	CNPS	total	BK class es ¹			univer sity- wide ⁴	practical ⁵	kind ⁶	type ⁷
1	MNN1530	Professional practice						K1MBM_K01 K1MBM_K03 K1MBM_K04 K1MBM_K05		120	4	0				P	K	W
2	MNN1481	Engineer Individual Student Project					4,00	K1MBM_U17 K1MBM_K04 K1MBM_K05	60	120	4	1,00	T	Z		P	K	W
3	MNN1082	Fans and compressors	1,07					S1INC_W07	16	60	2	1	T	Z			S	W
4	MNN1082	Fans and compressors		0,53				S1INC_U08	8	30	1	0,75	T	Z		P	S	W
5	MNN0042	Research and testing of machines	1,60					S1INC_W12	24	90	3	1,50	T	E			S	W
6	MNN0042	Research and testing of machines		0,53				S1INC_U13	8	30	1	0,75	T	Z		P	S	W
7	MNN0042	Research and testing of machines			1,07			S1INC_U13	16	60	2	1,50	T	Z		P	S	W
8	MNN1370	Air protection installations	1,07					S1INC_W11	16	60	2	1,00	T	Z			S	W
9	MNN1370	Air protection installations		0,53				S1INC_U12 K1MBM_K01 K1MBM_K02	8	30	1	0,75	T	Z		P	S	W

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10	ZNN100100BK	Management science	0,53					K1MBM_W18 K1MBM_K06	8	30	1	0,50	T	Z	O		KO	W
11	HNN100100BK	Humanities	0,53					K1MBM_W18 K1MBM_K06	8	30	1	0,50	T	Z	O		KO	W
12	JZL100655BK	Foreign language B2.2		1,60				K1MBM_U15	24	90	3	2,25	T	Z	O	P	KO	W
13		Advanced design methods:			1,07				16	90	3	2,25	T	Z		P	K	W
	MNN0111	CATIA						K1MBM_U08										
	MNN1045	Solid Edge						K1MBM_U07										
	MNN0266	3D graphic						K1MBM_U07 K1MBM_K06										
Total			4,8	3,19	2,14	4,00			212	840	28	13,75						

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 ¹
lec	cl	lab	pr	sem				
4,8	3,19	2,14	4,00	0	212	840	28	13,75

Semester 9

Obligatory courses number of ECTS points 6

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	MNN1510	Engineering diploma seminar					1,07	K1MBM_U16 K1MBM_U17 K1MBM_K01 K1MBM_K03	16	30	1	0,75	T	Z		P	K	Ob

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2	MNN1650	Environmental management	1,07						K1MBM_W17 K1MBM_K02	16	90	3	1,50	T	Z			K	Ob
3	PRZ1153	Intellectual and Industrial Property Protection	1,07						K1MBM_W16	16	60	2	1,00	T	Z	O		KO	Ob
Total			2,14					1,07		48	180	6	3,25						

Optional courses (minimum 112 hours in semester, 26 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 creditin g	Course/group of courses				
			lec	cl	lab	pr	se m		ZZU	CNPS	total	BK class es ¹			univers ity- wide ⁴	practical ⁵	kind ⁶	type ⁷	
1	MNN1540	Engineer thesis						K1MBM_U17 K1MBM_K04 K1MBM_K05		450	15	2,00	T	Z			P	K	W
2	MNN1044	Heat power stations	1,07					S1INC_W13	16	60	2	1,00	T	Z			S	W	
3	MNN1044	Heat power stations		0,53				S1INC_U14	8	30	1	0,75	T	Z			P	S	W
4	MNN0452	Volumetric machines	1,07					S1INC_W07	16	60	2	1,00	T	Z			S	W	
5	MNN0452	Volumetric machines		1,07				S1INC_U08	16	30	1	0,75	T	Z			P	S	W
6	MNN0452	Volumetric machines				0,53		S1INC_U08	8	30	1	0,75	T	Z			P	S	W
7	MNN0982	Nuclear reactors	1,07					S1INC_W09	16	30	1	0,50	T	Z			S	W	
8	MNN0982	Nuclear reactors			1,07			S1INC_U10	16	30	1	0,75	T	Z			P	S	W
9	HNN100100BK	Humanities	1,07					K1MBM_W18 K1MBM_K06	16	60	2	1,00	T	Z	O		KO	W	
Total			4,28	1,6	1,07	0,53			112	780	26	8,50							

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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				
6,42	1,6	1,07	0,53	1,07	160	960	32	11,75

2. Set of examinations in semestral arrangement

Course code	Names of courses ending with examination	Semester
MNN0820 FZP2109 MAP1076	1. Fundamentals of Materials Science 2. Physics 1 3. Calculus 1	1
FZP2107 MAP1069	1. Physics 2 2. Calculus 2	2
MNN0520 MAP1159	1. Mechanics 2 2. Calculus 3	3
MNN1451	1. Strength of materials	4
MNN0781 MNN1120 MNN1201	1. Fundamentals of Control Systems 2. Technical Fluid Mechanics 3. Theory of thermal machines	5
MNN0750 MNN1060	1. Basics of Machine Design II 2. Combustion and fuels	6
MNN0302 MNN0130 MNN1360	1. Process Engineering and Apparatus 2. Refrigeration and Cryogenics 3. Boiler devices	7
MNN0042	1. Research and testing of machines	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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