

FACULTY OF MECHANICAL AND POWER ENGINEERING

main field of study: **MECHANICAL ENGINEERING AND MACHINE BUILDING**

full-time studies 1st level

PLANS of STUDIES

Thermal Engineering.....	2
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Edited adjustment_April 2014

PLAN OF STUDIES

FACULTY: OF MECHANICAL AND POWER ENGINEERING

MAIN FIELD OF STUDY: MECHANICAL ENGINEERING AND MACHINE BUILDING

EDUCATION LEVEL: 1st level, inżynier

FORM OF STUDIES: full-time

PROFILE: general academic

SPECIALIZATION: **THERMAL ENGINEERING.**

LANGUAGE OF STUDY: polish

Faculty Council Resolution of 26.09.2012
In effect since 01.10.2012

Plan of studies structure in point layout

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

Legend

Basic and obligatory courses
General and obligatory courses
General and optional courses
Obligatory main-field-of-study courses
Optional main-field-of-study courses
Optional /specialization courses

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

Semester 1

Obligatory courses number of ECTS points 30

No	Course/ group of courses code	Name of course/group of courses (denote group of courses with symbol GK)	Weekly number of hours					Field-of-study educational effect symbol	Number of hours		Number of ECTS points		Form ² of course/ group of courses	Way ³ of credi ting	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	INN1004	Information Technologies	2					K1MBM_W08	30	60	2	1,00	T	Z	O		KO	Ob
2	MSN0815	Basics of metrology and experiment techniques	2					K1MBM_W10	30	60	2	1,00	T	Z			K	Ob
3	MSN0815	Basics of metrology and experiment techniques		1				K1MBM_U10	15	30	1	0,75	T	Z		P	K	Ob
4	MSN0230	Descriptive geometry	2					K1MBM_W07	30	60	2	1,00	T	Z			K	Ob
5	MSN0230	Descriptive geometry		1				K1MBM_U07	15	30	1	0,75	T	Z		P	K	Ob
6	MSN0371	Theory of machines	2					K1MBM_W13	30	60	2	1,00	T	Z			K	Ob
7	CHC1101	Chemistry	2					K1MBM_W04	30	90	3	1,50	T	Z	O		PD	Ob
8	FZP1065	Physics 1.6	2					K1MBM_W03 K1MBM_K01 K1MBM_K02 K1MBM_K03 K1MBM_K04	30	90	3	1,50	T	E	O		PD	Ob
9	FZP1065	Physics 1.6		2				K1MBM_U03 K1MBM_K01 K1MBM_K02 K1MBM_K03 K1MBM_K04	30	60	2	1,50	T	Z	O	P	PD	Ob
10	MAP1140	Algebra and Analytic Geometry	2					K1MBM_W01 K1MBM_K01	30	60	2	1,00	T	E	O		PD	Ob
11	MAP1140	Algebra and Analytic Geometry		1				K1MBM_U01 K1MBM_K01	15	60	2	1,50	T	Z	O	P	PD	Ob
12	MAP1142	Mathematical Analysis 1A	2					K1MBM_W02 K1MBM_K01	30	150	5	2,50	T	E	O		PD	Ob
13	MAP1142	Mathematical Analysis 1A		2				K1MBM_U02 K1MBM_K01	30	90	3	2,25	T	Z	O	P	PD	Ob
Total			16	7					345	900	30	17,25						

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

²Traditional – enter T, remote – enter Z

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

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

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

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

⁷ Optional – enter W, obligatory – enter Ob

Altogether in semester

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

Semester 2

Obligatory courses (number of ECTS points 30)

No	Course/group of courses code	Name of course/group of courses (denote group of courses with symbol GK)	Weekly number of hours					Field-of-study educational effect symbol	Number of hours		Number of ECTS points		Form ² of course/group of courses	Way ³ of crediting	Course/group of courses			
			lec	cl	lab	pr	sem		ZZU	CNPS	total	BK classes ¹			university-wide ⁴	practical ⁵	kind ⁶	type ⁷
1	PRZ1152	Intellectual and Industrial Property Protection	2					K1MBM_W16	30	60	2	1,00	T	Z	O		KO	Ob
2	INN1003	Application Packages			2			K1MBM_U08	30	60	2	1,50	T	Z	O	P	KO	Ob
3	MSN0815	Basics of Metrology and Experiment Techniques			1			K1MBM_U10	15	30	1	0,75	T	Z		P	K	Ob
4	MSN0430	Mechanics 1	1					K1MBM_W05	15	30	1	0,50	T	Z			K	Ob
5	MSN0430	Mechanics 1		1				K1MBM_U05	15	30	1	0,75	T	Z		P	K	Ob
6	MSN0810	Basics of Thermodynamics	2					K1MBM_W09	30	60	2	1,00	T	Z			K	Ob
7	MSN0810	Basics of Thermodynamics		1				K1MBM_U09	15	30	1	0,75	T	Z		P	K	Ob
8	MSN0780	Fundamentals of Fluid Mechanics	2					K1MBM_W09	30	60	2	1,00	T	Z			K	Ob
9	MSN0780	Fundamentals of Fluid Mechanics		1				K1MBM_U09	15	30	1	0,75	T	Z		P	K	Ob
10	MSN0770	Fundamentals of Materials Science	2					K1MBM_W06	30	90	3	1,50	T	E			K	Ob
11	CHC1101	Chemistry			1			K1MBM_U04	15	30	1	0,75	T	Z	O	P	PD	Ob
12	FZP1066	Physics 2.11	2					K1MBM_W03	30	90	3	1,50	T	E	O		PD	Ob
13	FZP1066	Physics 2.11			2			K1MBM_U03	30	60	2	1,50	T	Z	O	P	PD	Ob
14	MAP1144	Mathematical Analysis 2.2A	3					K1MBM_W02 K1MBM_K01	45	150	5	2,50	T	E	O		PD	Ob
15	MAP1144	Mathematical Analysis 2.2A		2				K1MBM_U02 K1MBM_K01	30	90	3	2,25	T	Z	O	P	PD	Ob
Total			14	5	6				375	900	30	18,00						

Obligatory courses (optionally in English) (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	MSN0811	Basics of Thermodynamics	2					K1MBM_W09	30	60	2	1,00	T	Z			K	Ob
2	MSN0811	Basics of Thermodynamics		1				K1MBM_U09	15	30	1	0,75	T	Z		P	K	Ob
3	MSN0781	Fundamentals of Fluid Mechanics	2					K1MBM_W09	30	60	2	1,00	T	Z			K	Ob
4	MSN0781	Fundamentals of Fluid Mechanics		1				K1MBM_U09	15	30	1	0,75	T	Z		P	K	Ob

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

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

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

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

⁷Optional – enter W, obligatory – enter Ob

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				
14	5	6			375	900	30	18,00

Semester 3

Obligatory courses (number of ECTS points 30)

No	Course/ group of courses code	Name of course/group of courses (denote group of courses with symbol GK)	Weekly number of hours					Field-of-study educational effect symbol	Number of hours		Number of ECTS points		Form ² of course/ group of courses	Way ³ of 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	MSN0820	Fundamental strength of materials	2					K1MBM_W05 K1MBM_K02 K1MBM_K04	30	60	2	1,00	T	Z			K	Ob
2	MSN0820	Fundamental strength of materials		1				K1MBM_U05 K1MBM_K02 K1MBM_K04	15	30	1	0,75	T	Z		P	K	Ob
3	MSN0450	Mechanics 2	2					K1MBM_W05	30	90	3	1,50	T	E			K	Ob
4	MSN0450	Mechanics 2		1				K1MBM_U05	15	30	1	0,75	T	Z		P	K	Ob
5	MSN1100	Production Technics	3					K1MBM_W11	45	90	3	1,50	T	Z			K	Ob
6	MSN0400	Materials Science	1					K1MBM_W06	15	30	1	0,50	T	Z			K	Ob
7	MSN0400	Materials Science			1			K1MBM_U06 K1MBM_K03 K1MBM_K06	15	30	1	0,75	T	Z		P	K	Ob
8	MSN0971	Technical drawing				2		K1MBM_U07	30	90	3	2,25	T	Z		P	K	Ob
9	MSN0750	Fundamentals of Electrical Engineering	2					K1MBM_W12	30	60	2	1,00	T	Z			K	Ob
10	MSN0750	Fundamentals of Electrical Engineering		1				K1MBM_U12	15	30	1	0,75	T	Z		P	K	Ob
11	MSN0750	Fundamentals of Electrical Engineering			1			K1MBM_U12	15	30	1	0,75	T	Z		P	K	Ob
12	MSN0740	Fundamentals of Electronics	1					K1MBM_W12	15	30	1	0,50	T	Z			K	Ob
13	MSN0740	Fundamentals of Electronics			1			K1MBM_U12	15	30	1	0,75	T	Z		P	K	Ob
14	MSN1010	Combustion and Fuels	2					K1MBM_W15	30	90	3	1,50	T	E			K	Ob

15	MSN0710	Fundamentals of Control Systems	2					K1MBM_W12	30	90	3	1,50	T	E			K	Ob
16	MSN0710	Fundamentals of Control Systems		1				K1MBM_U12	15	30	1	0,75	T	Z		P	K	Ob
17	MSN0710	Fundamentals of Control Systems			2			K1MBM_U12	30	60	2	1,50	T	Z		P	K	Ob
Total:			15	4	5	2			390	900	30	18,00						

Obligatory courses (optionally in English) (number of ECTS points 12)

No	Course/ group of courses code	Name of course/group of courses (denote group of courses with symbol GK)	Weekly number of hours					Field-of-study educational effect symbol	Number of hours		Number of ECTS points		Form ² of course/ group of courses	Way ³ of 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	MSN0751	Fundamentals of Electrical Engineering	2					K1MBM_W12	30	60	2	1,00	T	Z			K	Ob
2	MSN0751	Fundamentals of Electrical Engineering		1				K1MBM_U12	15	30	1	0,75	T	Z		P	K	Ob
3	MSN0741	Fundamentals of Electronics	1					K1MBM_W12	15	30	1	0,50	T	Z			K	Ob
4	MSN0741	Fundamentals of Electronics			1			K1MBM_U12	15	30	1	0,75	T	Z		P	K	Ob
5	MSN1011	Combustion and Fuels	2					K1MBM_W15	30	90	3	1,50	T	E			K	Ob
6	MSN0712	Fundamentals of Control Systems	2					K1MBM_W12	30	90	3	1,50	T	E			K	Ob
7	MSN0712	Fundamentals of Control Systems		1				K1MBM_U12	15	30	1	0,75	T	Z		P	K	Ob

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

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

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

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

⁷Optional – enter W, obligatory – enter Ob

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				
15	4	5	2		390	900	30	18,00

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 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	MSN0210	Ecology	2					K1MBM_W17 K1MBM_K02	30	90	3	1,50	T	Z			K	Ob
2	MSN0570	Workshop Metrology	1					K1MBM_W11	15	30	1	0,50	T	Z			K	Ob
3	MSN0570	Workshop Metrology			1			K1MBM_U11 K1MBM_K01 K1MBM_K03	15	30	1	0,75	T	Z		P	K	Ob
4	MSN1080	Production Technics			2			K1MBM_U11	30	60	2	1,50	T	Z		P	K	Ob
5	MSN1010	Combustion and Fuels			1			K1MBM_U14	15	30	1	0,75	T	Z		P	K	Ob
6	MSN0680	Basics of Machine Design I	2					K1MBM_W14	30	60	2	1,00	T	Z			K	Ob
7	MSN0680	Basics of Machine Design I				2		K1MBM_U13	30	60	2	1,50	T	Z		P	K	Ob
8	MSN0091	CAD I			2			K1MBM_U07	30	60	2	1,50	T	Z		P	K	Ob
Total			5	0	6	2	0		195	420	14	9,00						

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

No	Course/ group of courses code	Name of course/group of courses (denote group of courses with symbol GK)	Weekly number of hours					Field-of-study educational effect symbol	Number of hours		Number of ECTS points		Form ² of course/ group of courses	Way ³ of 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
5	MSN1011	Combustion and Fuels			1			K1MBM_U14	15	30	1	0,75	T	Z		P	K	Ob
6	MSN0681	Basics of Machine Design I	2					K1MBM_W14	30	60	2	1,00	T	Z			K	Ob
7	MSN0681	Basics of Machine Design I				2		K1MBM_U13	30	60	2	1,50	T	Z		P	K	Ob

Optional courses (minimum 195 hours in semester, 16 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	MSN1460	Strength of Materials	2					S1INC_W01 K1MBM_K02 K1MBM_K04	30	90	3	1,50	T	E			S	W
2	MSN1460	Strength of Materials		1				S1INC_U01 K1MBM_K02 K1MBM_K04	15	30	1	0,75	T	Z		P	S	W

3	MSN1460	Strength of materials			1			S1INC_U01 K1MBM_K02 K1MBM_K04	15	30	1	0,75	T	Z		P	S	W
4	MSN1170	Theory of Thermal Machines	1					S1INC_W02	15	60	2	1,00	T	E			S	W
5	MSN1170	Theory of Thermal Machines		2				S1INC_U02	30	60	2	1,50	T	Z		P	S	W
6	MSN1070	Technical Fluid Mechanics	2					S1INC_W03	30	90	3	1,50	T	E			S	W
7	MSN1070	Technical Fluid Mechanics		1				S1INC_U03	15	30	1	0,75	T	Z		P	S	W
8	MSN1400	Heat transfer and heat exchangers	2					S1INC_W04	30	60	2	1,00	T	Z			S	W
9	MSN1400	Heat transfer and heat exchangers		1				S1INC_U04	15	30	1	0,75	T	Z		P	S	W
Total			7	5	1	0	0		195	480	16	9,50						

Optional/specialization courses (optionally in English) 4 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	MSN1071	Technical Fluid Mechanics	2					S1INC_W03	30	90	3	1,50	T	E			S	W
2	MSN1071	Technical Fluid Mechanics		1				S1INC_U03	15	30	1	0,75	T	Z		P	S	W

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²Traditional – enter T, remote – enter Z

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

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

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

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

⁷Optional – 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	5	7	2	0	390	900	30	18,50

Semester 5

Obligatory courses number of ECTS points 7

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	MSN0690	Basics of Machine Design II	2					K1MBM_W14	30	90	3	1,50	T	E			K	Ob
2	MSN0690	Basics of Machine Design II				2		K1MBM_U13	30	60	2	1,50	T	Z		P	K	Ob
3	MSN0100	CAD II			2			K1MBM_U07	30	60	2	1,50	T	Z		P	K	Ob
Total			2	0	2	2	0		90	210	7	4,50						

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

No	Course/ group of courses code	Name of course/group of courses (denote group of courses with symbol GK)	Weekly number of hours					Field-of-study educational effect symbol	Number of hours		Number of ECTS points		Form ² of course/ group of courses	Way ³ of 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	MSN0691	Basics of Machine Design II	2					K1MBM_W14	30	90	3	1,50	T	E			K	Ob
2	MSN0691	Basics of Machine Design II				2		K1MBM_U13	30	60	2	1,50	T	Z		P	K	Ob

Optional courses (minimum 330 hours in semester, 22 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	JZL100655BK	Foreign language B2.1		4				K1MBM_U15	60	60	2	1,50	T	Z	O	P	KO	W
2	HSN100100BK	Humanities	1					K1MBM_W18 K1MBM_K06	15	30	1	0,50	T	Z	O		KO	W
3	MSN1210	Thermodynamics - lab			2			S1INC_U05	30	60	2	1,50	T	Z		P	S	W
4	MSN0500	Fluid Mechanics - laboratory			2			S1INC_U03	30	60	2	1,50	T	Z		P	S	W
5	MSN0140	Refrigeration and Cryogenics	2					S1INC_W05	30	90	3	1,50	T	E			S	W
6	MSN0140	Refrigeration and Cryogenics		1				S1INC_U06	15	30	1	0,75	T	Z		P	S	W
7	MSN0170	Thermal fluid-flow machinery	2					S1INC_W06	30	60	2	1,00	T	Z			S	W
8	MSN0170	Thermal fluid-flow machinery		1				S1INC_U07	15	30	1	0,75	T	Z		P	S	W
9	MSN0841	Pumps	2					S1INC_W07	30	60	2	1,00	T	Z			S	W
10	MSN0841	Pumps		1				S1INC_U08	15	30	1	0,75	T	Z		P	S	W
11	MSN0262	Process Engineering and Apparatus	2					S1INC_W08	30	90	3	1,50	T	E			S	W
12	MSN0262	Process Engineering and Apparatus		2				S1INC_U09	30	60	2	1,50	T	Z		P	S	W
Total			9	9	4	0	0		330	660	22	13,75						

Optional/specialization courses (optionally in English) (4 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			univer sity- wide ⁴	practical ⁵	kind ⁶	type ⁷
1	MSN0141	Refrigeration and Cryogenics	2					S1INC_W05	30	90	3	1,50	T	E			S	W
2	MSN0141	Refrigeration and Cryogenics		1				S1INC_U06	15	30	1	0,75	T	Z		P	S	W

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

²Traditional – enter T, remote – enter Z

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

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

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

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

⁷Optional – 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				
11	9	6	2	0	420	870	29	18,25

Semester 6

Optional courses (minimum 375 hours in semester, 31 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			univer sity- wide ⁴	practical ⁵	kind ⁶	type ⁷
1	JZL100655BK	Foreign language B2.2		4				K1MBM_U15	60	90	3	2,25	T	Z	O	P	KO	W
2	MSN1590	Proffecional practise						K1MBM_K01 K1MBM_K03 K1MBM_K04 K1MBM_K05		120	4	0,00		Z		P	K	W
3	MSN1520	Engineer Individual Student Project				4		K1MBM_U17 K1MBM_K04 K1MBM_K05	60	120	4	1,00	T	Z		P	K	W
4	MSN1030	Fans and Compressors	1					S1INC_W07	15	30	1	0,50	T	Z			S	W
5	MSN1030	Fans and Compressors		1				S1INC_U08	15	30	1	0,75	T	Z		P	S	W

6	MSN0931	Nuclear Reactors	1					S1INC_W09	15	30	1	0,50	T	Z			S	W
7	MSN0931	Nuclear Reactors			1			S1INC_U10	15	30	1	0,75	T	Z		P	S	W
8	MSN1340	Boiler Devices	2					S1INC_W10	30	90	3	1,50	T	E			S	W
9	MSN1340	Boiler Devices				2		S1INC_U11	30	60	2	1,50	T	Z		P	S	W
10	MSN1350	Air Protection Installations	2					S1INC_W11	30	60	2	1,00	T	Z			S	W
11	MSN1350	Air Protection Installations				1		S1INC_U12 K1MBM_K01 K1MBM_K03	15	30	1	0,75	T	Z		P	S	W
12	MSN0060	Research and Testing of Machines	2					S1INC_W12	30	90	3	1,50	T	E			S	W
13	MSN0060	Research and Testing of Machines			2			S1INC_U13	30	60	2	1,50	T	Z		P	S	W
14		Advanced Design Methods			2				30	90	3	2,25	T	Z		P	K	W
	MSN0111	CATIA						K1MBM_U08										
	MSN1001	Solid Edge						K1MBM_U07										
	MSN0236	3D Graphic						K1MBM_U07 K1MBM_K06										
Total			8	5	5	7	0		375	930	31	15,75						

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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

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				
8	5	5	7	0	375	930	31	15,75

Semester 7

Obligatory courses number of ECTS points 4

No	Course/ group of courses code	Name of course/group of courses (denote group of courses with symbol GK)	Weekly number of hours					Field-of-study educational effect symbol	Number of hours		Number of ECTS points		Form ² of course/ group of courses	Way ³ of 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
	MSN1500	Environmental Management	2					K1MBM_W17 K1MBM_K02	30	90	3	1,50	T	Z			K	Ob

2	MSN1551	Engineer Seminar					1	K1MBM_U16 K1MBM_U17 K1MBM_K01 K1MBM_K03	15	30	1	0,75	T	Z		P	K	Ob
Total			2	0	0	0	1		45	120	4	2,25						

Optional courses (minimum 180 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 crediti ng	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	MSN1600	Engineer Thesis						K1MBM_U17 K1MBM_K04 K1MBM_K05		450	15	2,00	T	Z		P	K	W
2	WFW00000BK	Sporting classes		2				K1MBM_K07	30	30	1	1,00	T	Z	O	P	KO	W
3	ZSN100100BK	Management science	1					K1MBM_W18 K1MBM_K06	15	30	1	0,50	T	Z	O		KO	W
4	HSN100100BK	Humanities	2					K1MBM_W18 K1MBM_K06	30	60	2	1,00	T	Z	O		KO	W
5	MSN0392	Volumetric Machines	2					S1INC_W07	30	60	2	1,00	T	Z			S	W
6	MSN0392	Volumetric Machines		1				S1INC_U08	15	30	1	0,75	T	Z		P	S	W
7	MSN0392	Volumetric Machines				1		S1INC_U08	15	30	1	0,75	T	Z		P	S	W
8	MSN1000	Thermal Engines	2					S1INC_W13	30	60	2	1,00	T	Z			S	W
9	MSN1000	Thermal Engines			1			S1INC_U14	15	30	1	0,75	T	Z		P	S	W
Total			7	3	1	1	0		180	780	26	8,75						

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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

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

⁷Optional – 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				
9	3	1	1	1	225	900	30	11,00

2. Set of examinations in semestral arrangement

Course code	Names of courses ending with examination	Semester
MAP1142 MAP1140 FZP1065	1. Mathematical Analysis 1A 2. Algebra and Analytic Geometry 3. Physics 1.6	1
MAP1144 FZP1066 MSN0770	1. Mathematical Analysis 2.2A 2. Physics 2.11 3. Fundamentals of Materials Science	2
MSN0710 (MSN0712) MSN1010 (MSN1011) MSN0450	1. Fundamentals of Control Systems 2. Combustion and Fuels 3. Mechanics 2	3
MSN1070 (MSN1071) MSN1170 MSN1460	1. Technical Fluid Mechanics 2. Theory of Thermal Machines 3. Strength of Materials	4
MSN0690 (MSN0691) MSN0262 MSN0140 (MSN0141)	1. Basics of Machine Design II 2. Process Engineering and Apparatus 3. Refrigeration and Cryogenics	5
MSN0060 MSN1340	1. Research and Testing of Machines 2. Boiler devices	6

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

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

PLAN OF STUDIES

FACULTY OF MECHANICAL AND POWER ENGINEERING

MAIN FIELD OF STUDY: Mechanical Engineering and Machine Building

EDUCATION LEVEL: 1st level / inżynier

FORM OF STUDIES: full-time

PROFILE: general academic

SPECIALIZATION: ENGINEERING OF AVIATION

LANGUAGE OF STUDY: polish

Faculty Council Resolution on September 26, 2012

In effect since October 1, 2012

Plan of studies structure in point layout

30	informatics	humanities				professional training	
28		informatics					
26						engineering individual project	engineering thesis
24							
22							
20	chemistry						
18							
16	physics						diploma semin.
14		chemistry					
12		physics					
10							
8	mathematics						
6		mathematics				computer - aided design	
4						humanities	humanities
2				foreign language	foreign language		management sporting class.
	sem.1	sem.2	sem.3	sem.4	sem.5	sem.6	sem.7

Legenda

obligatory basics courses
obligatory general courses
optional general courses
obligatory main-field-of study courses
optional main-field-of study courses
optional specialization courses

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

Semestr 1

Obligatory courses number of ECTS points 30

N o.	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	INN1004	Information Technologies	2					K1MBM_W08	30	60	2	1	T	Z	O		KO	Ob
2	CHC1101	Chemistry	2					K1MBM_W04	30	90	3	1,5	T	Z	O		PD	Ob
3	FZP1065	Physics 1.6	2					K1MBM_W03	30	90	3	1,5	T	E	O		PD	Ob
4	FZP1065	Physics 1.6		2				K1MBM_U03	30	60	2	1,5	T	Z	O	P	PD	Ob
5	MAP1140	Algebra and Analytic Geometry	2					K1MBM_W01	30	60	2	1	T	E	O		PD	Ob
6	MAP1140	Algebra and Analytic Geometry		1				K1MBM_U01	15	60	2	1,5	T	Z	O	P	PD	Ob
7	MAP1142	Mathematical analysis 1.1A	2					K1MBM_W02	30	150	5	2,5	T	E	O		PD	Ob
8	MAP1142	Mathematical analysis 1.1A		2				K1MBM_U02	30	90	3	2,25	T	Z	O	P	PD	Ob
9	MSN0815	Basics of metrology and experiment techniques	2					K1MBM_W10	30	60	2	1	T	Z			K	Ob
10	MSN0815	Basics of metrology and experiment techniques		1				K1MBM_U10	15	30	1	0,75	T	Z		P	K	Ob
11	MSN0230	Descriptive geometry	2					K1MBM_W07	30	60	2	1	T	Z			K	Ob
12	MSN0230	Descriptive geometry		1				K1MBM_U07	15	30	1	0,75	T	Z		P	K	Ob
13	MSN0371	Theory of machines	2					K1MBM_W13	30	60	2	1	T	Z			K	Ob
Total			16	7					345	900	30	17,25						

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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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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				
16	7				345	900	30	17,25

Semestr 2

Obligatory courses number of ECTS points 30

N o.	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	PRZ1152	Intellectual and Industrial Property Protection	2					K1MBM_W16	30	60	2	1	T	Z	O		KO	Ob
2	INN1003	Application packages			2			K1MBM_U08	30	60	2	1,5	T	Z	O	P	KO	Ob
3	CHC1101	Chemistry			1			K1MBM_U04	15	30	1	0,75	T	Z	O	P	PD	Ob
4	FZP1066	Physics 2.11	2					K1MBM_W03	30	90	3	1,5	T	E	O		PD	Ob
5	FZP1066	Physics 2.11			2			K1MBM_U03	30	60	2	1,5	T	Z	O	P	PD	Ob
6	MAP1144	Mathematical analysis 2.2A	3					K1MBM_W02	45	150	5	2,5	T	E	O		PD	Ob
7	MAP1144	Mathematical analysis 2.2A		2				K1MBM_U02	30	90	3	2,25	T	Z	O	P	PD	Ob
8	MSN0815	Basics of metrology and experiment techniques			1			K1MBM_U10	15	30	1	0,75	T	Z		P	K	Ob
9	MSN0430	Mechanics 1	1					K1MBM_W05	15	30	1	0,5	T	Z			K	Ob
10	MSN0430	Mechanics 1		1				K1MBM_U05	15	30	1	0,75	T	Z		P	K	Ob
11	MSN0810	Basics of thermodynamics	2					K1MBM_W09	30	60	2	1	T	Z			K	Ob
12	MSN0810	Basics of thermodynamics		1				K1MBM_U09	15	30	1	0,75	T	Z		P	K	Ob
13	MSN0780	Fundamentals of Fluid Mechanics	2					K1MBM_W09	30	60	2	1	T	Z			K	Ob
14	MSN0780	Fundamentals of Fluid Mechanics		1				K1MBM_U09	15	30	1	0,75	T	Z		P	K	Ob
15	MSN0770	Fundamentals of Materials Science	2					K1MBM_W06	30	90	3	1,5	T	E			K	Ob
Total			14	5	6				375	900	30	18						

Obligatory courses (optionally in English) number of ECTS points 6

N o.	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	MSN0811	Basics of thermodynamics	2					K1MBM_W09	30	60	2	1	T	Z			K	Ob
2	MSN0811	Basics of thermodynamics		1				K1MBM_U09	15	30	1	0,75	T	Z		P	K	Ob
3	MSN0781	Fundamentals of Fluid Mechanics	2					K1MBM_W09	30	60	2	1	T	Z			K	Ob
4	MSN0781	Fundamentals of Fluid Mechanics		1				K1MBM_U09	15	30	1	0,75	T	Z		P	K	Ob
Total			14	5	6				375	900	30	18						

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

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

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

⁶KO – general education, PD – basic sciences, K – field-of-studies, S – specialization 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				
14	5	6			375	900	30	18

Semestr 3

Obligatory courses number of ECTS points 30

N o.	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	MSN0820	Fundamental strength of materials	2					K1MBM_W05 K1MBM_K02 K1MBM_K04	30	60	2	1	T	Z			K	Ob
2	MSN0820	Fundamental strength of materials		1				K1MBM_U05 K1MBM_K02 K1MBM_K04	15	30	1	0,75	T	Z		P	K	Ob
3	MSN0450	Mechanics 2	2					K1MBM_W05	30	90	3	1,5	T	E			K	Ob
4	MSN0450	Mechanics 2		1				K1MBM_U05	15	30	1	0,75	T	Z		P	K	Ob
5	MSN1100	Production Technics	3					K1MBM_W11	45	90	3	1,5	T	Z			K	Ob
6	MSN0400	Materials Science	1					K1MBM_W06	15	30	1	0,5	T	Z			K	Ob
7	MSN0400	Materials Science			1			K1MBM_U06 K1MBM_K03 K1MBM_K06	15	30	1	0,75	T	Z		P	K	Ob
8	MSN0971	Technical Drawing				2		K1MBM_U07	30	90	3	2,25	T	Z		P	K	Ob
9	MSN0750	Electrical Engineering Fundamentals	2					K1MBM_W12	30	60	2	1	T	Z			K	Ob
10	MSN0750	Electrical Engineering Fundamentals		1				K1MBM_U12	15	30	1	0,75	T	Z		P	K	Ob
11	MSN0750	Electrical Engineering Fundamentals			1			K1MBM_U12	15	30	1	0,75	T	Z		P	K	Ob
12	MSN0740	Fundamentals of Electronics	1					K1MBM_W12	15	30	1	0,5	T	Z			K	Ob
13	MSN0740	Fundamentals of Electronics			1			K1MBM_U12	15	30	1	0,75	T	Z		P	K	Ob
14	MSN1010	Combustion and Fuels	2					K1MBM_W15	30	90	3	1,5	T	E			K	Ob
15	MSN0710	Fundamentals of Control Systems	2					K1MBM_W12	30	90	3	1,5	T	E			K	Ob
16	MSN0710	Fundamentals of Control Systems		1				K1MBM_U12	15	30	1	0,75	T	Z		P	K	Ob
17	MSN0710	Fundamentals of Control Systems			2			K1MBM_U12	30	60	2	1,5	T	Z		P	K	Ob
Total			15	4	5	2			390	900	30	18						

Obligatory courses (optionally in English) number of ECTS points 14

N o.	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	MSN0751	Electrical Engineering Fundamentals	2					K1MBM_W12	30	60	2	1	T	Z			K	Ob
2	MSN0751	Electrical Engineering Fundamentals		1				K1MBM_U12	15	30	1	0,75	T	Z		P	K	Ob
3	MSN0741	Fundamentals of Electronics	1					K1MBM_W12	15	30	1	0,5	T	Z			K	Ob
4	MSN0741	Fundamentals of Electronics			1			K1MBM_U12	15	30	1	0,75	T	Z		P	K	Ob
5	MSN1011	Combustion and Fuels	2					K1MBM_W15	30	90	3	1,5	T	E			K	Ob
6	MSN0711	Fundamentals of Control Systems	2					K1MBM_W12	30	90	3	1,5	T	E			K	Ob
7	MSN0711	Fundamentals of Control Systems		1				K1MBM_U12	15	30	1	0,75	T	Z		P	K	Ob
8	MSN0711	Fundamentals of Control Systems			2			K1MBM_U12	30	60	2	1,5	T	Z		P	K	Ob

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

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

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

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⁷Optional – 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				
15	4	5	2		390	900	30	18

Semestr 4

Obligatory courses number of ECTS points 14

N o.	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	MSN0210	Ecology	2					K1MBM_W17 K1MBM_K02	30	90	3	1,5	T	Z			K	Ob
2	MSN0570	Workshop Metrology	1					K1MBM_W11 K1MBM_K01 K1MBM_K03	15	30	1	0,5	T	Z			K	Ob

3	MSN0570	Workshop metrology			1			K1MBM_U11 K1MBM_K01 K1MBM_K03	15	30	1	0,75	T	Z		P	K	Ob
4	MSN1100	Production Technics			2			K1MBM_U11	30	60	2	1,5	T	Z		P	K	Ob
5	MSN1010	Combustion and Fuels			1			K1MBM_U14	15	30	1	0,75	T	Z		P	K	Ob
6	MSN0680	Basics of Machine Design I	2					K1MBM_W14	30	60	2	1	T	Z			K	Ob
7	MSN0680	Basics of Machine Design I				2		K1MBM_U13	30	60	2	1,5	T	Z		P	K	Ob
8	MSN0091	CAD I			2			K1MBM_U07	30	60	2	1,5	T	Z		P	K	Ob
Total			5		6	2			195	420	14	9						

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

N o.	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	MSN1011	Combustion and Fuels			1			K1MBM_U14	15	30	1	0,75	T	Z		P	K	Ob
2	MSN0681	Basics of Machine Design I	2					K1MBM_W14	30	60	2	1	T	Z			K	Ob
3	MSN0681	Basics of Machine Design I				2		K1MBM_U13	30	60	2	1,5	T	Z		P	K	Ob

Optional courses (minimum 195 hours in semester, 16 ECTS points)

N o.	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	MSN1430	Strength of Aircraft Structures	2					S1ILO_W01	30	90	3	1,5	T	E			S	W
2	MSN1430	Strength of Aircraft Structures		2				S1ILO_U01	30	60	2	1,5	T	Z		P	S	W
3	MSN1190	Theory of Aircraft Propulsion	2					S1ILO_W02	30	90	3	1,5	T	E			S	W
4	MSN1190	Theory of Aircraft Propulsion		1				S1ILO_U02	15	30	1	0,75	T	Z		P	S	W
5	MSN0020	Aerodynamics	2					S1ILO_W03	30	90	3	1,5	T	E			S	W
6	MSN0020	Aerodynamics		1				S1ILO_U03	15	30	1	0,75	T	Z		P	S	W
7	MSN0020	Aerodynamics			1			S1ILO_U04	15	30	1	0,75	T	Z		P	S	W
8	MSN0360	Aviation Machines and Electric Devices	2					S1ILO_W04	30	60	2	1	T	Z			S	W
Total			8	4	1				195	480	16	9,25						

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²Traditional – enter T, remote – enter Z

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

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

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

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

⁷Optional – 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				
13	4	7	2		390	900	30	18,25

Semestr 5

Obligatory courses number of ECTS points 7

N o.	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	MSN0690	Basics of Machine Design II	2					K1MBM_W14	30	90	3	1,5	T	E			K	Ob
2	MSN0690	Basics of Machine Design II				2		K1MBM_U13	30	60	2	1,5	T	Z		P	K	Ob
3	MSN0100	CAD II			2			K1MBM_U07	30	60	2	1,5	T	Z		P	K	Ob
Total			2		2	2			90	210	7	4,5						

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

N o.	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	MSN0691	Basics of Machine Design II	2					K1MBM_W14	30	90	3	1,5	T	E			K	Ob
2	MSN0691	Basics of Machine Design II				2		K1MBM_U13	30	60	2	1,5	T	Z		P	K	Ob

Optional courses (minimum 330 hours in semester, 22 ECTS points)

N o.	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	JZL100707BK	Foreign language B2.1		4				K1MBM_U15	60	60	2	1,5	T	Z	O	P	KO	W
2	MSN0900	Designing of Aeroplanes	2					S1ILO_W05	30	60	2	1	T	Z			S	W
3	MSN0900	Designing of Aeroplanes				2		S1ILO_U05	30	60	2	1,5	T	Z		P	S	W

4	MSN1250	Aero-piston Engines	2					SIILO_W06	30	90	3	1,5	T	E			S	W
5	MSN1250	Aero-piston Engines		1				SIILO_U06	15	30	1	0,75	T	Z		P	S	W
6	MSN0051	Avionics and Control of Aircrafts	1					SIILO_W07	15	30	1	0,5	T	Z			S	W
7	MSN0051	Avionics and Control of Aircrafts			1			SIILO_U08	15	30	1	0,75	T	Z		P	S	W
8	MSN0051	Avionics and Control of Aircrafts				2		SIILO_U07	30	60	2	1,5	T	Z		P	S	W
9	MSN0481	Flight Mechanics	1					SIILO_W08	15	60	2	1	T	E			S	W
10	MSN0481	Flight Mechanics		1				SIILO_U09	15	30	1	0,75	T	Z		P	S	W
11	MSN0481	Flight Mechanics				1		SIILO_U10	15	30	1	0,75	T	Z		P	S	W
12	MSN1420	Equipment of Aircrafts	2					SIILO_W09	30	60	2	1	T	Z			S	W
13	MSN1420	Equipment of Aircrafts			2			SIILO_U11	30	60	2	1,5	T	Z		P	S	W
Total			8	6	3	5			330	660	22	14						

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²Traditional – enter T, remote – enter Z

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

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

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

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

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				
10	6	5	7		420	870	29	18,5

Semestr 6

Optional courses (minimum 375 hours in semester, 31 ECTS points)

N o.	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			univers-ity-wide ⁴	practical ⁵	kind ⁶	type ⁷
1	JZL100708BK	Foreign language B2.2		4				K1MBM_U15	60	90	3	2,25	T	Z	O	P	KO	W
2	HSN100100BK	Humanities course	1					K1MBM_W18 K1MBM_K06	15	30	1	0,5	T	Z	O		KO	W
3	MSN1590	Professional training						K1MBM_K01 K1MBM_K03 K1MBM_K04 K1MBM_K05	0	120	4	0	T	Z		P	K	W
4	MSN1520	Engineering individual project				4		K1MBM_U17	60	120	4	1	T	Z		P	K	W

								K1MBM_K04 K1MBM_K05										
5	MSN0321	Constructing of Aeroplanes	1					S1ILO_W10	15	60	2	1	T	E			S	W
6	MSN0321	Constructing of Aeroplanes		1				S1ILO_U12	15	30	1	0,75	T	Z		P	S	W
7	MSN0321	Constructing of Aeroplanes				2		S1ILO_U13	30	60	2	1,5	T	Z		P	S	W
8	MSN1300	Gas turbine Engines	2					S1ILO_W11	30	90	3	1,5	T	E			S	W
9	MSN1300	Gas turbine Engines		1				S1ILO_U14	15	30	1	0,75	T	Z		P	S	W
10	MSN0190	Diagnostics of Aviation Equipment	2					S1ILO_W12	30	60	2	1	T	Z			S	W
11	MSN0190	Diagnostics of Aviation Equipment				2		S1ILO_U15	30	60	2	1,5	T	Z		P	S	W
12	MSN1131	Technology of Development and Repair	1					S1ILO_W13	15	30	1	0,5	T	Z			S	W
13	MSN1131	Technology of Development and Repair				1		S1ILO_U16	15	30	1	0,75	T	Z		P	S	W
14	MSN1061	Helicopters	1					S1ILO_W14	15	30	1	0,5	T	Z			S	W
15		Advanced Design Methods:				2			30	90	3	2,25	T	Z		P	K	W
	MSN0111	CATIA						K1MBM_U07										
	MSN1001	Solid Edge						K1MBM_U07										
	MSN0236	3D graphic						K1MBM_U07 K1MBM_K06										
Total			8	6	5	6			375	930	31	15,75						

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

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

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

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

⁷Optional – 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				
8	6	5	6		375	930	31	15,75

Semestr 7

Obligatory courses number of ECTS points 4

N o.	Course/group of courses code	Name of course/group of courses (denote group of courses with symbol GK)	Weekly number of hours					Field-of-study educational effect symbol	Number of hours		Number of ECTS points		Form ² of course/group of courses	Way ³ of crediting	Course/group of courses			
			lec	cl	lab	pr	sem		ZZU	CNPS	total	BK classes ¹			universit y-wide ⁴	practical ⁵	kind ⁶	type ⁷
1	MSN1551	Diploma seminar					1	K1MBM_U16 K1MBM_U17 K1MBM_K01 K1MBM_K03	15	30	1	0,75	T	Z		P	K	Ob
2	MSN1500	Environmental management	2					K1MBM_W17 K1MBM_K02	30	90	3	1,5	T	Z			K	Ob
Total			2				1		45	120	4	2,25						

Optional courses (minimum 180 hours in semester, 26 ECTS points)

N o.	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			
			l e c	cl	lab	pr	sem		ZZU	CNPS	total	BK classes ¹			universit y-wide ⁴	practical ⁵	kind ⁶	type ⁷
1	WFW000000BK	Sporting classes		2				K1MBM_K07	30	30	1	1	T	Z	O	P	KO	W
2	ZSN100100BK	Management course	1					K1MBM_W18	15	30	1	0,5	T	Z	O		KO	W
3	HSN100100BK	Humanities course	2					K1MBM_W18 K1MBM_K06	30	60	2	1	T	Z	O		KO	W
4	MSN1600	Diploma disseration						K1MBM_U17 K1MBM_K01 K1MBM_K04 K1MBM_K05	0	450	15	2	T	Z		P	K	W
5	MSN0732	Bases of Aircraft Operation	2					S1ILO_W15	30	60	2	1	T	Z			S	W
6	MSN0732	Bases of Aircraft Operation			1			S1ILO_U17	15	30	1	0,75	T	Z		P	S	W
7	MSN0732	Bases of Aircraft Operation					1	S1ILO_U18	15	30	1	0,75	T	Z		P	S	W
8	MSN0188	Human Factors in Aircraft Maintenance	1					S1ILO_W16	15	30	1	0,5	T	Z			S	W
9	MSN0188	Human Factors in Aircraft Maintenance					2	S1ILO_U19	30	60	2	1,5	T	Z		P	S	W
Total			6	2	1		3		180	780	26	9						

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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

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				
8	2	1		3	225	900	30	11,25

2. Set of examinations in semestral arrangement:

Course code	Names of courses ending with examination	Semester
MAP1142 MAP1140 FZP1065	1. Mathematical Analysis 1.1A 2. Algebra and Analytic Geometry 3. Physics 1.6	1
MAP1144 FZP1066 MSN0770	1. Mathematical Analysis 2.2A 2. Physics 2.11 3. Fundamentals of Materials Science	2
MSN0710 (MSN0711) MSN1010 (MSN1010) MSN0450	1. Fundamentals of Control Systems 2. Combustion and Fuels 3. Mechanics 2	3
MSN0020 MSN1190 MSN1430	1. Aerodynamics 2. Theory of Aircraft Propulsion 3. Strength of Aircraft Structures	4
MSN0690 (MSN069) MSN0481 MSN1250	1. Basics of Machine Design II 2. Flight Mechanics 3. Aero-piston Engines	5
MSN1300 MSN0321	1. Gas Turbine Engines 2. Constructing of Aeroplanes	6

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

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