

## **PLAN OF STUDY**

FACULTY: MECHANICAL AND POWER ENGINEERING

MAIN FIELD OF STUDY: MECHANICAL ENGINEERING AND MACHINE BUILDING

EDUCATION LEVEL: 2nd level, Master of Science

FORM OF STUDIES: part-time

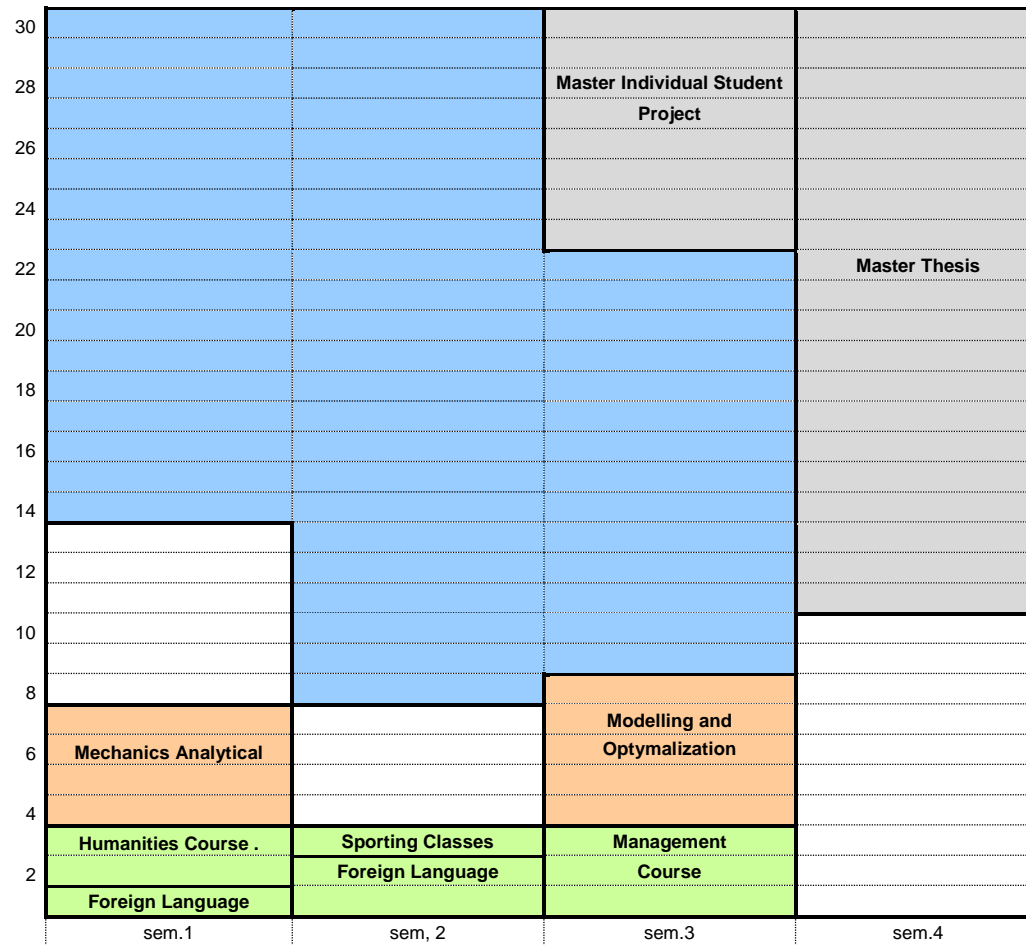
PROFILE: general academic

SPECIALIZATION: **ENGINEERING OF AVIATION**

LANGUAGE OF STUDY: polish

Faculty Council Resolution of 30.09.2015  
In effect since 01.10.2015

## Plan of studies structure in point layout



### Legend

Basic and obligatory courses
General and optional courses
Fielf-of-studies and obligatory courses
Fielf-of-studies and optional courses
Specialization and optional courses

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

## Semester 1

### 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 <sup>2</sup> of course/group of courses	Way <sup>3</sup> of crediting	Course/group of courses			
			lec	cl	lab	pr	sem		ZZU	CNPS	total	BK classes <sup>1</sup>			university-wide <sup>4</sup>	practical <sup>5</sup>	kind <sup>6</sup>	type <sup>7</sup>
1	MNN0533	Mechanics Analytical	1,8					K2MBM_W03	27	120	4	2	T	Z			PD	Ob
2	MNN0591	Mechatronics and Control Systems	1,2					K2MBM_W01	18	120	4	2	T	E			K	Ob
3	MNN0591	Mechatronics and Control Systems			1,2			K2MBM_U01	18	60	2	1,5	T	Z		P	K	Ob
Total			3		1,2				63	300	10	6						

### Optional courses (minimum 108 hours in semester) number of ECTS points 20

No.	Course/group of courses code	Name of course/group of courses (denote group of courses with symbol GK)	Weekly number of hours					Field-of-study educational effect symbol	Number of hours		Number of ECTS points		Form <sup>2</sup> of course/group of courses	Way <sup>3</sup> of crediting	Course/group of courses			
			lec	cl	lab	pr	sem		ZZU	CNPS	total	BK classes <sup>1</sup>			university-wide <sup>4</sup>	practical <sup>5</sup>	kind <sup>6</sup>	type <sup>7</sup>
1	JZL100589C JZL100846C JZL100847C	Foreign Language (continuation), level B+		0,6				K2MBM_U08	9	30	1	0,75	T	Z	O	P	KO	W
2	HNN100400BK	Humanities Course	0,6					K2MBM_W07 K2MBM_K02	9	60	2	1	T	Z	O		KO	W
3	MNN0842	Bases of the Theory of Oscillation	1,2					S2ILO_W03	18	120	4	2	T	E			S	W
4	MNN0842	Bases of the Theory of Oscillation		0,6				S2ILO_U05	9	30	1	0,75	T	Z		P	S	W
5	MNN0061	Structure of Aircrafts	1,2					S2ILO_W02	18	60	2	1	T	Z			S	W
6	MNN0061	Structure of Aircrafts		0,6				S2ILO_U03	9	30	1	0,75	T	Z		P	S	W
7	MNN0952	Design of Propulsion Units	1,2					S2ILO_W01	18	120	4	2	T	E			S	W
8	MNN0952	Design of Propulsion Units		0,6				S2ILO_U01	9	30	1	0,75	T	Z		P	S	W
9	MNN0952	Design of Propulsion Units				0,6		S2ILO_U02	9	120	4	3	T	Z		P	S	W
Total			4,2	2,4		0,6			108	600	20	12						

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

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

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

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

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

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

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

## Altogether in semester 1

Total number of hours					Total number of ZZU hours	Total number of CNPS hours	Total number of ECTS points	Number of ECTS points for BK classes <sup>1</sup>
lec	cl	lab	pr	sem				
7,2	2,4	1,2	0,6		171	900	30	18

## Semester 2

### 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 <b>GK</b> )	Weekly number of hours					Field-of-study educational effect symbol	Number of hours		Number of ECTS points		Form <sup>2</sup> of course/group of courses	Way <sup>3</sup> of crediting	Course/group of courses			
			lec	cl	lab	pr	sem		ZZU	CNPS	total	BK classes <sup>1</sup>			universit y-wide <sup>4</sup>	practical <sup>5</sup>	kind <sup>6</sup>	type <sup>7</sup>
1	MNN1383	Modern Engineering Materials	0,6					K2MBM_W02	9	30	1	0,5	T	Z			K	Ob
2	MNN1383	Modern Engineering Materials			1,2			K2MBM_U02	18	60	2	1,5	T	Z		P	K	Ob
3	MNN1383	Modern Engineering Materials					0,6	K2MBM_U06	9	30	1	0,75	T	Z		P	K	Ob
Total			0,6		1,2		0,6		36	120	4	2,75						

### Optional courses (minimum 125 hours in semester) number of ECTS points 26

No.	Course/group of courses code	Name of course/group of courses (denote group of courses with symbol <b>GK</b> )	Weekly number of hours					Field-of-study educational effect symbol	Number of hours		Number of ECTS points		Form <sup>2</sup> of course/group of courses	Way <sup>3</sup> of crediting	Course/group of courses			
			lec	cl	lab	pr	sem		ZZU	CNPS	total	BK classes <sup>1</sup>			universit y-wide <sup>4</sup>	practical <sup>5</sup>	kind <sup>6</sup>	type <sup>7</sup>
1	JZL100586C JZL100591C JZL100597C	Foreign Language (second), any level		1,8				K2MBM_U09	27	60	2	1,5	T	Z	O	P	KO	W
2	WFW020000BK	Sporting Classes		0,53				K2MBM_K06	8	8	1	1	T	Z	O	P	KO	W
3	MNN0602	Numerical Methods in Design of Constructions	0,6					S2ILO_W11	9	30	1	0,5	T	Z			S	W
4	MNN0602	Numerical Methods in Design of Constructions				1,2		S2ILO_U09	18	240	8	6	T	Z		P	S	W

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

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

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

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

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

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

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

No.	Course/group of courses code	Name of course/group of courses (denote group of courses with symbol GK)	Weekly number of hours					Field-of-study educational effect symbol	Number of hours		Number of ECTS points		Form <sup>2</sup> of course/group of courses	Way <sup>3</sup> of crediting	Course/group of courses			
			lec	cl	lab	pr	sem		ZZU	CNPS	total	BK classes <sup>1</sup>			universit y-wide <sup>4</sup>	practical <sup>5</sup>	kind <sup>6</sup>	type <sup>7</sup>
5	MNN0182	Flight Dynamics and Aeroelasticity of Aircrafts	1,2					S2ILO_W05	18	120	4	2	T	E			S	W
6	MNN0182	Flight Dynamics and Aeroelasticity of Aircrafts				1,2		S2ILO_U08	18	210	7	5,25	T	Z		P	S	W
7	MNN1392	Selected Problems on Fluid Mechanics	0,6					S2ILO_W04	9	30	1	0,5	T	Z			S	W
8	MNN1392	Selected Problems on Fluid Mechanics		0,6				S2ILO_U06	9	30	1	0,75	T	Z		P	S	W
9	MNN1392	Selected Problems on Fluid Mechanics			0,6			S2ILO_U07	9	30	1	0,75	T	Z		P	S	W
Total			2,4	2,93	0,6	2,4			125	758	26	18,25						

### Altogether in semester 2

Total number of hours					Total number of ZZU hours	Total number of CNPS hours	Total number of ECTS points	Number of ECTS points for BK classes <sup>1</sup>
lec	cl	lab	pr	sem				
3	93	1,8	2,4	0,6	161	878	30	21

### Semester 3

#### Obligatory courses 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 <sup>2</sup> of course/group of courses	Way <sup>3</sup> of crediting	Course/group of courses			
			lec	cl	lab	pr	sem		ZZU	CNPS	total	BK classes <sup>1</sup>			universit y-wide <sup>4</sup>	practical <sup>5</sup>	kind <sup>6</sup>	type <sup>7</sup>
1	MNN0673	Modelling and Optimization	0,6					K2MBM_W04	9	60	2	1	T	E			PD	Ob
2	MNN0673	Modelling and Optimization		1,8				K2MBM_U03	27	90	3	2,25	T	Z		P	PD	Ob
Total			0,6	1,8					36	150	5	3,25						

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

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

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

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

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

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

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

### Optional courses (minimum 206 hours in semester) number of ECTS points 25

No.	Course/group of courses code	Name of course/group of courses (denote group of courses with symbol GK)	Weekly number of hours					Field-of-study educational effect symbol	Number of hours		Number of ECTS points		Form <sup>2</sup> of course/group of courses	Way <sup>3</sup> of crediting	Course/group of courses			
			lec	cl	lab	pr	sem		ZZU	CNPS	total	BK classes <sup>1</sup>			university-wide <sup>4</sup>	practical <sup>5</sup>	kind <sup>6</sup>	type <sup>7</sup>
1	ZNN100400BK	Management Course	1,2					K2MBM_W08 K2MBM_K05	18	90	3	1,5	T	Z	O		KO	W
2	MNN1461	Safety Management in Aviation	1,2					S2ILO_W10	18	60	2	1	T	Z			S	W
3	MNN0552	Helicopter Flight Mechanics	1,2					S2ILO_W09	18	60	2	1	T	Z			S	W
4	MNN0552	Helicopter Flight Mechanics		0,6				S2ILO_U11	9	30	1	0,75	T	Z		P	S	W
5	MNN0552	Helicopter Flight Mechanics				0,6		S2ILO_U12	9	60	2	1,5	T	Z		P	S	W
6	MNN1661	Aircraft Power Systems	0,6					S2ILO_W08	9	30	1	0,5	T	Z			S	W
7	MNN1661	Aircraft Power Systems				0,6		S2ILO_U04	9	60	2	1,5	T	Z		P	S	W
8	MNN1302	Durability and Reliability of Aircraft	1,2					S2ILO_W07	18	60	2	1	T	Z			S	W
9	MNN0912	Aviation Law	0,6					S2ILO_W06	9	30	1	0,5	T	Z			S	W
10	MNN0912	Aviation Law				0,6		S2ILO_U10	9	30	1	0,75	T	Z		P	S	W
11	MNN1492	Master Individual Student Project				5,33		K2MBM_U07 K2MBM_K01 K2MBM_K04 K2MBM_K05	80	240	8	1	T	Z		P	K	W
Total			6	0,6		6,53	0,6		206	750	25	11						

### Altogether in semester 3

Total number of hours					Total number of ZZU hours	Total number of CNPS hours	Total number of ECTS points	Number of ECTS points for BK classes <sup>1</sup>
lec	cl	lab	pr	sem				
6,6	2,4		6,53	0,6	242	900	30	14,25

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

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

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

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

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

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

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

## Semester 4

### 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 <b>GK</b> )	Weekly number of hours					Field-of-study educational effect symbol	Number of hours		Number of ECTS points		Form <sup>2</sup> of course/group of courses	Way <sup>3</sup> of crediting	Course/group of courses			
			lec	cl	lab	pr	sem		ZZU	CNPS	total	BK classes <sup>1</sup>			universit y-wide <sup>4</sup>	practical <sup>5</sup>	kind <sup>6</sup>	type <sup>7</sup>
1	MNN1474	Integrated Production Systems	1,2					K2MBM_W06	18	60	2	1	T	Z			K	Ob
2	MNN1474	Integrated Production Systems			1,2			K2MBM_U05	18	60	2	1,5	T	Z		P	K	Ob
3	MNN0023	Failure Analysis of Machines and Devices	1,2					K2MBM_W05	18	60	2	1	T	Z			K	Ob
4	MNN0023	Failure Analysis of Machines and Devices			0,6			K2MBM_U04	9	60	2	1,5	T	Z		P	K	Ob
5	MNN1551	Diploma Seminar						K2MBM_U06 K2MBM_U07 K2MBM_K01 K2MBM_K03 K2MBM_K04 K2MBM_K05	18	60	2	1,5	T	Z		P	K	Ob
Total			2,4		1,8				81	300	10	6,5						

### Optional courses number of ECTS points 20

No.	Course/group of courses code	Name of course/group of courses (denote group of courses with symbol <b>GK</b> )	Weekly number of hours					Field-of-study educational effect symbol	Number of hours		Number of ECTS points		Form <sup>2</sup> of course/group of courses	Way <sup>3</sup> of crediting	Course/group of courses			
			lec	cl	lab	pr	sem		ZZU	CNPS	total	BK classes <sup>1</sup>			universit y-wide <sup>4</sup>	practical <sup>5</sup>	kind <sup>6</sup>	type <sup>7</sup>
1	MNN1551	Master Thesis						K2MBM_U07 K2MBM_K01 K2MBM_K04 K2MBM_K05		600	20	4	T	Z		P	K	W
Total										600	20	4						

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

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

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

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

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

## Altogether in semester 4

Total number of hours					Total number of ZZU hours	Total number of CNPS hours	Total number of ECTS points	Number of ECTS points for BK classes <sup>1</sup>
lec	cl	lab	pr	sem				
2,4		1,8		1,2	81	900	30	10,5

## 2. Set of examinations in semestral arrangement

Course code	Names of courses ending with examination	Semester
MNN0591 MNN0842 MNN0952	1. Mechatronics and Control Systems 2. Bases of the Theory of Oscillation 3. Design of Propulsion Units	1
MNN0182	1. Flight Dynamics and Aeroelasticity of Aircrafts	2
MNN0673	1. Modelling and Optimization	3

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

Semester	Allowable deficit of ECTS points after semester
1	14
2	19
3	0