

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: full-time

PROFILE: general academic

SPECIALIZATION: **POWER ENGINEERING MACHINES AND DEVICES**

LANGUAGE OF STUDY: polish

Faculty Council Resolution of 30.09.2015
In effect since 01.10.2015

Plan of studies structure in point layout

| | | | |
|----|-----------------------------|--|--------------------------|
| 30 | | | |
| 28 | | Master Individual Student Project | |
| 26 | | | |
| 24 | | | |
| 22 | | | Master Thesis |
| 20 | | | |
| 18 | | | |
| 16 | | | |
| 14 | | | |
| 12 | | | |
| 10 | | Modelling and Optymalization | Technical Safety |
| 8 | | | |
| 6 | | Management Course | Master Seminar |
| 4 | | | |
| 2 | Mechanics Analytical | Sporting Classes | |
| | Foreign Language | Foreign Language | Humanities Course |
| | sem.1 | sem.2 | sem.3 |

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 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 | MSN0462 | Mechanics Analytical | 2 | | | | | K2MBM_W03 | 30 | 60 | 2 | 1 | T | Z | | | K | Ob |
| 2 | MSN1363 | Modern Engineering Materials | 1 | | | | | K2MBM_W02 | 15 | 30 | 1 | 0,5 | T | Z | | | K | Ob |
| 3 | MSN1363 | Modern Engineering Materials | | | 1 | | | K2MBM_U02 | 15 | 30 | 1 | 0,75 | T | Z | | P | K | Ob |
| 4 | MSN1363 | Modern Engineering Materials | | | | 1 | | K2MBM_U06 | 15 | 30 | 1 | 0,75 | T | Z | | P | K | Ob |
| 5 | MSN0530 | Mechatronics and Control Systems | 2 | | | | | K2MBM_W01 | 30 | 90 | 3 | 1,5 | T | E | | | K | Ob |
| 6 | MSN0530 | Mechatronics and Control Systems | | | 2 | | | K2MBM_U01 | 30 | 60 | 2 | 1,5 | T | Z | | P | K | Ob |
| Total | | | 5 | | 3 | | 1 | | 135 | 300 | 10 | 6 | | | | | | |

Optional courses (minimum 300 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 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 | JZL100655BK | Foreign Language (continuation), level B+ | | 1 | | | | K2MBM_U08 | 15 | 30 | 1 | 0,75 | T | Z | O | P | KO | W |
| 2 | MSN0300 | Boiler's Design and Equipment | 1 | | | | | S2MUE_W01 | 15 | 30 | 1 | 0,5 | T | E | | | S | W |
| 3 | MSN0300 | Boiler's Design and Equipment | | | | 2 | | S2MUE_U06 | 30 | 60 | 2 | 1,5 | T | Z | | P | S | W |
| 4 | MSN0670 | Burners and Furnaces | 1 | | | | | S2MUE_W02 | 15 | 30 | 1 | 0,5 | T | Z | | | S | W |
| 5 | MSN0670 | Burners and Furnaces | | | | 1 | | S2MUE_U07 | 15 | 30 | 1 | 0,75 | T | Z | | P | S | W |
| 6 | MSN0850 | Special Pumps | 2 | | | | | S2MUE_W03 | 30 | 60 | 2 | 1 | T | Z | | | S | W |
| 7 | MSN0950 | Pipelines and Armature | 2 | | | | | S2MUE_W04 | 30 | 60 | 2 | 1 | T | Z | | | S | W |
| 8 | MSN0981 | Thermal Engines | 1 | | | | | S2MUE_W05 | 15 | 30 | 1 | 0,5 | T | Z | | | S | W |
| 9 | MSN0981 | Thermal Engines | | | | 1 | | S2MUE_U08 K2MBM_K04 | 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

| 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 |
| 10 | MSN1320 | Turbines for Gas–steam Systems | 2 | | | | | S2MUE_W06 | 30 | 60 | 2 | 1 | T | E | | | S | W |
| 11 | MSN1320 | Turbines for Gas–steam Systems | | 1 | | | | S2MUE_U09 | 15 | 30 | 1 | 0,75 | T | Z | | P | S | W |
| 12 | MSN1310 | Turbines and Hydroelectric Power Plants | 2 | | | | | S2MUE_W07 | 30 | 60 | 2 | 1 | T | Z | | | S | W |
| 13 | MSN1310 | Turbines and Hydroelectric Power Plants | | 1 | | | | S2MUE_U10 | 15 | 30 | 1 | 0,75 | T | Z | | P | S | W |
| 14 | MSN1260 | Hydraulic Transport | 1 | | | | | S2MUE_W08 | 15 | 30 | 1 | 0,5 | T | Z | | | S | W |
| 15 | MSN1260 | Hydraulic Transport | | | 1 | | | S2MUE_U11 | 15 | 30 | 1 | 0,75 | T | Z | | P | S | W |
| Total | | | 12 | 3 | 1 | 3 | 1 | | 300 | 600 | 20 | 12 | | | | | | |

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 ¹ |
|-----------------------|----|-----|----|-----|---------------------------|----------------------------|-----------------------------|---|
| lec | cl | lab | pr | sem | | | | |
| 17 | 3 | 4 | 3 | 2 | 435 | 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 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 | MSN0613 | Modelling and Optimization | 1 | | | | | K2MBM_W04 | 15 | 60 | 2 | 1 | T | E | | | K | Ob |
| 2 | MSN0613 | Modelling and Optimization | | | 2 | | | K2MBM_U03 | 30 | 90 | 3 | 2,25 | T | Z | | P | K | Ob |
| Total | | | 1 | 2 | | | | | 45 | 120 | 4 | 2,5 | | | | | | |

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

Optional courses (minimum 390 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 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 | JZL100710BK | Foreign Language (second), any level | | 3 | | | | K2MBM_U09 | 45 | 60 | 2 | 1,5 | T | Z | O | P | KO | W |
| 2 | WFW010000BK | Sporting Classes | | 1 | | | | K2MBM_K06 | 15 | 15 | 1 | 1 | T | Z | O | P | KO | W |
| 3 | ZSN100400BK | Management Course | 2 | | | | | K2MBM_W08 K2MBM_K05 | 30 | 90 | 3 | 1,5 | T | Z | O | | KO | W |
| 4 | MSN0070 | Investigation of Hydraulic Machinery | 1 | | | | | S2MUE_W09 | 15 | 30 | 1 | 0,5 | T | Z | | | S | W |
| 5 | MSN0070 | Investigation of Hydraulic Machinery | | | 2 | | | S2MUE_U01 | 30 | 60 | 2 | 1,5 | | | | P | S | |
| 6 | MSN0220 | Utilization of Power Engineering Devices and Machines | 2 | | | | | S2MUE_W11 | 30 | 60 | 2 | 1 | T | E | | | S | W |
| 7 | MSN0220 | Utilization of Power Engineering Devices and Machines | | 1 | | | | S2MUE_U02 | 15 | 30 | 1 | 0,75 | T | Z | | P | S | W |
| 8 | MSN0290 | Constructions Types of the Special Turbines | 2 | | | | | S2MUE_W11 | 30 | 60 | 2 | 1 | T | Z | | | S | W |
| 9 | MSN0290 | Constructions Types of the Special Turbines | | 1 | | | | S2MUE_U03 | 15 | 30 | 1 | 0,75 | T | Z | | P | S | W |
| 10 | MSN0330 | Boilers and Small Power | 2 | | | | | S2MUE_W12 | 30 | 60 | 2 | 1 | T | Z | | | S | W |
| 11 | MSN0330 | Boilers and Small Power | | 1 | | | | S2MUE_U04 | 15 | 30 | 1 | 0,75 | T | Z | | P | S | W |
| 12 | MSN1270 | Mechanical and Pneumatically Transportation of Grainy Materials | 1 | | | | | S2MUE_W13 | 15 | 30 | 1 | 0,5 | T | Z | | | S | W |
| 13 | MSN1270 | Mechanical and Pneumatically Transportation of Grainy Materials | | 1 | | | | S2MUE_U05 K2MBM_K04 | 15 | 30 | 1 | 0,75 | T | Z | | P | S | W |
| 14 | MSN1534 | Master Indywidual Student Project | | | | 6 | | K2MBM_U07 K2MBM_K01 K2MBM_K04 K2MBM_K05 | 90 | 180 | 6 | 1 | T | Z | | P | K | W |
| Total | | | 10 | 8 | 2 | 6 | | | 390 | 765 | 26 | 13,5 | | | | | | |

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 ¹ |
|-----------------------|----|-----|----|-----|---------------------------|----------------------------|-----------------------------|---|
| lec | cl | lab | pr | sem | | | | |
| 11 | 10 | 2 | 6 | | 435 | 885 | 30 | 16 |

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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

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 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 | MSN1492 | Integrated Production Systems | 2 | | | | | K2MBM_W06 | 30 | 60 | 2 | 1 | T | Z | | | K | Ob |
| 2 | MSN1492 | Integrated Production Systems | | | 1 | | | K2MBM_U05 | 15 | 30 | 1 | 0,75 | T | Z | | P | K | Ob |
| 3 | MSN1560 | Diploma Seminar | | | | | 2 | K2MBM_U06 K2MBM_U07 K2MBM_K01 K2MBM_K03 K2MBM_K04 K2MBM_K05 | 30 | 60 | 2 | 1,5 | T | Z | | P | K | Ob |
| Total | | | 2 | | 1 | | 2 | | 75 | 150 | 5 | 3,25 | | | | | | |

Optional courses (minimum 60 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 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 | HSN100400BK | Humanities Course | 1 | | | | | K2MBM_W07 K2MBM_K02 | 15 | 60 | 2 | 1 | T | Z | O | | KO | W |
| 2 | | Technical Safety: | | | | | | | | | | | | | | | | |
| | MSN0033 | Failure Analysis of Machine and Devices | 2 | | | | | K2MBM_W05 | 30 | 60 | 2 | 1 | T | Z | | | K | W |
| | MSN0033 | Failure Analysis of Machine and Devices | | | 1 | | | K2MBM_U04 | 15 | 30 | 1 | 0,75 | T | Z | | P | K | W |
| | MSN0034 | Failure Analysis of Machines and Devices | 2 | | | | | K2MBM_W05 | 30 | 60 | 2 | 1 | T | Z | | | K | W |
| 3 | MSN1610 | Master Thesis | | | | | | K2MBM_U07 K2MBM_K01 K2MBM_K04 K2MBM_K05 | | 600 | 20 | 4 | T | Z | | P | K | W |
| | | | | | | | | | | | | | | | | | | |
| Total | | | 3 | | 1 | | | | 60 | 750 | 25 | 6,75 | | | | | | |

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 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 ¹ |
|-----------------------|----|-----|----|-----|---------------------------|----------------------------|-----------------------------|---|
| lec | cl | lab | pr | sem | | | | |
| 5 | | 2 | | 2 | 135 | 900 | 30 | 10 |

2. Set of examinations in semestral arrangement

| Course code | Names of courses ending with examination | Semester |
|-------------------------------|--|----------|
| MSN0530 MSN0300 MSN1320 | 1. Mechatronics and Control Systems 2. Boiler's Design and Equipment 3. Turbines for Gas-steam Systems | 1 |
| MSN0616 MSN0220 | 1. Modelling and Optimization 2. Utilization of Power Engineering Devices and Machines | 2 |

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

| Semester | Allowable deficit of ECTS points after semester |
|----------|---|
| 1 | 10 |
| 2 | 0 |