

PLAN OF STUDIES

FACULTY OF MECHANICAL AND POWER ENGINEERING

MAIN FIELD OF STUDY: MECHANICAL ENGINEERING AND MACHINE BUILDING

EDUCATION LEVEL: 1st level, Engineer

FORM OF STUDIES: full-time

PROFILE: general academic

SPECIALIZATION: THERMAL ENGINEERING

LANGUAGE OF STUDY: polish

Faculty Council Resolution of 20.09.2017
In effect since 01.10.2017

Plan of studies structure in point layout

| | | | | | | | |
|----|-------------|-------------|--------|--------|------------|-----------------|-----------------|
| 30 | informatics | humanities | | | | | |
| 29 | | | | | | professional | |
| 28 | | informatics | | | | practice | |
| 27 | | | | | | | |
| 26 | | | | | | engineer | |
| 25 | | | | | | individual | |
| 24 | | | | | | student project | engineering |
| 23 | | | | | | advanced | thesis |
| 22 | | | | | | design | |
| 21 | | | | | | methods | |
| 20 | | | | | | | |
| 19 | chemistry | | | | | | |
| 18 | | | | | | | |
| 17 | | | | | | | |
| 16 | | | | | | | |
| 15 | physics | | | | | | |
| 14 | | chemistry | | | | | |
| 13 | | | | | | | |
| 12 | | | | | | | |
| 11 | | physics | | | | | |
| 10 | | | | | | | |
| 9 | | | | | | | |
| 8 | | | | | | | |
| 7 | mathematics | | | | | | |
| 6 | | | | | | | |
| 5 | | mathematics | | | | | |
| 4 | | | | | | | diploma seminar |
| 3 | | | | | humanities | foreign | humanities |
| 2 | | | | | foreign | language | |
| 1 | | | | | language | | management |
| | sem. 1 | sem. 2 | sem. 3 | sem. 4 | sem. 5 | sem. 6 | sem. 7 |

| |
|--|
| 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 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 | INN1004 | Information Technologies | 2 | | | | | K1MBM_W08 | 30 | 60 | 2 | 1 | T | Z | O | | KO | Ob |
| 2 | MSN0815 | Basics of Metrology and Experiment Techniques | 2 | | | | | K1MBM_W10 | 30 | 60 | 2 | 1 | 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 | 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 | T | Z | | | K | Ob |
| 7 | CHC1101 | Chemistry | 2 | | | | | K1MBM_W04 | 30 | 90 | 3 | 1,5 | T | Z | O | | PD | Ob |
| 8 | FZP1065 | Physics 1.6 | 2 | | | | | K1MBM_W03 K1MBM_K01 K1MBM_K02 K1MBM_K03 K1MBM_K04 | 30 | 90 | 3 | 1,5 | T | E | O | | PD | Ob |
| 9 | FZP1065 | Physics 1.6 | | 2 | | | | K1MBM_U03 K1MBM_K01 K1MBM_K02 K1MBM_K03 K1MBM_K04 | 30 | 60 | 2 | 1,5 | T | Z | O | P | PD | Ob |
| 10 | MAT1408 | Algebra and Analytic Geometry | 2 | | | | | K1MBM_W01 K1MBM_K01 | 30 | 60 | 2 | 1 | T | E | O | | PD | Ob |
| 11 | MAT1408 | Algebra and Analytic Geometry | | 1 | | | | K1MBM_U01 K1MBM_K01 | 15 | 60 | 2 | 1,5 | T | Z | O | P | PD | Ob |
| 12 | MAT1415 | Mathematical Analysis 1A | 2 | | | | | K1MBM_W02 K1MBM_K01 | 30 | 150 | 5 | 2,5 | T | E | O | | PD | Ob |
| 13 | MAT1415 | 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 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 | | | | |
| 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 | | | universit y-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 | 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 | 0,5 | 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 | 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 | 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 | 1,5 | 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 K1MBM_K01 K1MBM_K02 K1MBM_K03 K1MBM_K04 | 30 | 90 | 3 | 1,5 | T | E | O | | PD | Ob |
| 13 | FZP1066 | Physics 2.11 | | | 2 | | | K1MBM_W03 K1MBM_K01 K1MBM_K02 K1MBM_K03 K1MBM_K04 | 30 | 60 | 2 | 1,5 | T | Z | O | P | PD | Ob |
| 14 | MAT1425 | Mathematical Analysis 2.2A | 3 | | | | | K1MBM_W02 K1MBM_K01 | 45 | 150 | 5 | 2,5 | T | E | O | | PD | Ob |
| 15 | MAT1425 | 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 | | | | | | |

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

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 | | | universit y-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 |

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 | | | | |
| 14 | 5 | 6 | | | 375 | 900 | 30 | 18 |

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 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 | 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 |

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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

| No. | Course/gr oup 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 |
| 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 | 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 | 0,5 | 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 12

| No. | Course/gr oup 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 | MSN0751 | Fundamentals of Electrical Engineering | 2 | | | | | K1MBM_W12 | 30 | 60 | 2 | 1 | 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 | 0,5 | 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 | MSN0712 | Fundamentals of Control Systems | 2 | | | | | K1MBM_W12 | 30 | 90 | 3 | 1,5 | T | E | | | K | Ob |
| 7 | MSN0712 | Fundamentals of Control Systems | | 1 | | | | K1MBM_U12 | 15 | 30 | 1 | 0,75 | T | Z | | P | K | 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 | | | | |
| 15 | 4 | 5 | 2 | | 390 | 900 | 30 | 18 |

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

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 | | | universit y-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 | 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 | MSN1080 | 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

| 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 | 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 |

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

²Traditional – enter T, remote – enter Z

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

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

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

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

⁷ Optional – enter W, obligatory – enter Ob

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

| 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 | MSN1460 | Strength of Materials | 2 | | | | | S1INC_W01 K1MBM_K02 K1MBM_K04 | 30 | 90 | 3 | 1,5 | 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 | T | E | | | S | W |
| 5 | MSN1170 | Theory of Thermal Machines | | 2 | | | | S1INC_U02 | 30 | 60 | 2 | 1,5 | T | Z | | P | S | W |
| 6 | MSN1070 | Technical Fluid Mechanics | 2 | | | | | S1INC_W03 | 30 | 90 | 3 | 1,5 | 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 | 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 | | | | 195 | 480 | 16 | 9,5 | | | | | | |

Optional courses (optionally in English) 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 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 | 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 |
| 3 | MSN1401 | Heat Transfer and Heat Exchangers | 2 | | | | | S1INC_W04 | 30 | 60 | 2 | 1 | T | Z | | | S | W |
| 4 | MSN1401 | Heat Transfer and Heat Exchangers | | 1 | | | | S1INC_U04 | 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

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

⁷ 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 ¹ |
|-----------------------|----|-----|----|-----|---------------------------|----------------------------|-----------------------------|---|
| lec | cl | lab | pr | sem | | | | |
| 12 | 5 | 7 | 2 | | 390 | 900 | 30 | 18,5 |

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 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 | 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

| 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 | 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 |

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

²Traditional – enter T, remote – enter Z

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

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

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

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

⁷ Optional – enter W, obligatory – enter Ob

Optional courses (minimum 330 hours in semester) 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 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 | JZL100707 | Foreign language B2.1 | | 4 | | | | K1MBM_U15 | 60 | 60 | 2 | 1,5 | T | Z | O | P | KO | W |
| 2 | HSN100300BK | Humanities | 1 | | | | | K1MBM_W18 K1MBM_K06 K1MBM_K07 | 15 | 60 | 2 | 1 | T | Z | O | | KO | W |
| 3 | MSN1210 | Thermodynamics - lab | | | 2 | | | S1INC_U05 | 30 | 60 | 2 | 1,5 | T | Z | | P | S | W |
| 4 | MSN0500 | Fluid Mechanics - lab | | | 2 | | | S1INC_U03 | 30 | 60 | 2 | 1,5 | T | Z | | P | S | W |
| 5 | MSN0140 | Refrigeration and Cryogenics | 2 | | | | | S1INC_W05 | 30 | 90 | 3 | 1,5 | 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 | 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 | 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 | 1,5 | T | E | | | S | W |
| 12 | MSN0262 | Process Engineering and Apparatus | | 2 | | | | S1INC_U09 | 30 | 60 | 2 | 1,5 | T | Z | | P | S | W |
| Total | | | 9 | 9 | 4 | | | | 330 | 690 | 23 | 14,25 | | | | | | |

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

Altogether in semester 5

| 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 | | 420 | 900 | 30 | 18,75 |

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

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

⁷ Optional – enter W, obligatory – enter Ob

Semester 6

Optional courses (minimum 375 hours in semester) 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 | | | universit y-wide ⁴ | practical ⁵ | kind ⁶ | type ⁷ |
| 1 | JZL100708 | Foreign Language B2.2 | | 4 | | | | K1MBM_U15 | 60 | 90 | 3 | 2,25 | T | Z | O | P | KO | W |
| 2 | MSN1590 | Professional Practice | | | | | | K1MBM_K01 K1MBM_K03 K1MBM_K04 K1MBM_K05 | | 120 | 4 | 0 | | Z | | P | K | W |
| 3 | MSN1521 | Engineer Individual Student Project | | | | 4 | | K1MBM_U17 K1MBM_K04 K1MBM_K05 | 60 | 90 | 3 | 1 | T | Z | | P | K | W |
| 4 | MSN1030 | Fans and Compressors | 1 | | | | | S1INC_W07 | 15 | 30 | 1 | 0,5 | 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 | 0,5 | 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 | 1,5 | T | E | | | S | W |
| 9 | MSN1340 | Boiler Devices | | | | 2 | | S1INC_U11 | 30 | 60 | 2 | 1,5 | T | Z | | P | S | W |
| 10 | MSN1350 | Air Protection Installations | 2 | | | | | S1INC_W11 | 30 | 60 | 2 | 1 | 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 | 1,5 | T | E | | | S | W |
| 13 | MSN0060 | Research and Testing of Machines | | | 2 | | | S1INC_U13 | 30 | 60 | 2 | 1,5 | T | Z | | P | S | W |
| | | 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 | | | 375 | 900 | 30 | 15,75 | | | | | | |

Altogether in semester 6

| 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 | | 375 | 900 | 30 | 15,75 |

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

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 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 | MSN1500 | Environmental Management | 2 | | | | | K1MBM_W17 K1MBM_K02 | 30 | 90 | 3 | 1,5 | T | Z | | | K | Ob |
| 2 | MSN1551 | Engineer Diploma Seminar | | | | | 1 | K1MBM_U16 K1MBM_U17 K1MBM_K01 K1MBM_K03 | 15 | 30 | 1 | 0,75 | T | Z | | P | K | Ob |
| Total | | | 2 | | | | 1 | | 45 | 120 | 4 | 2,25 | | | | | | |

Optional courses (minimum 180 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 | MSN1600 | Engineer Thesis | | | | | | K1MBM_U17 K1MBM_K04 K1MBM_K05 | | 450 | 15 | 2 | T | Z | | P | K | W |
| 2 | WFW00000BK | Sporting Classes | | 2 | | | | K1MBM_K07 | 30 | 0 | 0 | 0 | T | Z | O | P | KO | W |
| 3 | ZSN100300BK | Management Science | 1 | | | | | K1MBM_W18 K1MBM_K06 | 15 | 30 | 1 | 0,5 | T | Z | O | | KO | W |
| 4 | HSN100300BK | Humanities | 2 | | | | | K1MBM_W18 K1MBM_K06 | 30 | 60 | 2 | 1 | T | Z | O | | KO | W |
| 5 | MSN0392 | Volumetric Machines | 2 | | | | | S1INC_W07 | 30 | 60 | 2 | 1 | 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 | MSN0999 | Thermal Power Stations | 2 | | | | | S1INC_W13 | 30 | 90 | 3 | 1,5 | T | Z | | | S | W |
| 9 | MSN0999 | Thermal Power Stations | | | 1 | | | S1INC_U14 | 15 | 30 | 1 | 0,75 | T | Z | | P | S | W |
| Total | | | 7 | 3 | 1 | 1 | | | 180 | 780 | 26 | 8,25 | | | | | | |

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

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

⁷Optional – enter W, obligatory – enter Ob

Altogether in semester 7

| 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 | 10,5 |

2. Set of examinations in semestral arrangement

| Course code | Names of courses ending with examination | Semester |
|---|---|----------|
| MAT1415 MAT1408 FZP1065 | 1. Mathematical Analysis 1.1A 2. Algebra and Analytic Geometry A 3. Physics 1.6 | 1 |
| MAT1425 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 |