

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

| |
|--|
| 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 | MNN0165 | Information Technologies | 1,2 | | | | | K1MBM_W08 | 18 | 60 | 2 | 1 | T | Z | O | | KO | Ob |
| 2 | MAT1487 | Mathematic 1 | 1,2 | | | | | K1MBM_W02 K1MBM_K01 | 18 | 120 | 4 | 2 | T | E | O | | PD | Ob |
| 3 | MAT1487 | Mathematic 1 | | 1,2 | | | | K1MBM_U02 K1MBM_K01 | 18 | 120 | 4 | 3 | T | Z | O | P | PD | Ob |
| 4 | FZP009078 | Physics 1 | 1,2 | | | | | K1MBM_W03 | 18 | 120 | 4 | 2 | T | E | O | | PD | Ob |
| 5 | CHC003080 | Chemistry | 1,2 | | | | | K1MBM_W04 | 18 | 60 | 2 | 1 | T | Z | O | | PD | Ob |
| 6 | MNN0415 | Theory of Machines | 1,2 | | | | | K1MBM_W13 | 18 | 60 | 2 | 1 | T | Z | | | K | Ob |
| 7 | MNN0255 | Descriptive Geometry | 1,2 | | | | | K1MBM_W07 | 18 | 60 | 2 | 1 | T | Z | | | K | Ob |
| 8 | MNN0255 | Descriptive Geometry | | 0,6 | | | | K1MBM_U07 | 9 | 60 | 2 | 1,5 | T | Z | | P | K | Ob |
| 9 | MNN0826 | Basics of Metrology and Experiment Techniques | 1,2 | | | | | K1MBM_W10 | 18 | 60 | 2 | 1 | T | Z | | | K | Ob |
| 10 | MNN0826 | Basics of Metrology and Experiment Techniques | | 0,6 | | | | K1MBM_U10 | 9 | 60 | 2 | 1,5 | T | Z | | P | K | Ob |
| 11 | MNN0821 | Fundamentals of Materials Science | 1,2 | | | | | K1MBM_W06 | 18 | 120 | 4 | 2 | T | E | | | K | Ob |
| Total | | | 9,6 | 2,4 | | | | | 180 | 900 | 30 | 17 | | | | | | |

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 | | | | |
| 9,6 | 2,4 | | | | 180 | 900 | 30 | 17 |

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 2

Obligatory courses

number of ECTS points 29

| 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 | ENN0585 | Application Packages | | | 0,6 | | | K1MBM_U08 | 9 | 30 | 1 | 0,75 | T | Z | O | P | KO | Ob |
| 2 | MAT1489 | Mathematic 2 | 1,2 | | | | | K1MBM_W01 K1MBM_W02 K1MBM_K01 | 18 | 120 | 4 | 2 | T | E | O | | PD | Ob |
| 3 | MAT1489 | Mathematic 2 | | 1,2 | | | | K1MBM_U01 K1MBM_U02 K1MBM_K01 | 18 | 120 | 4 | 3 | T | Z | O | P | PD | Ob |
| 4 | FZP009079 | Physics 2 | 1,2 | | | | | K1MBM_W03 | 18 | 120 | 4 | 2 | T | E | O | | PD | Ob |
| 5 | FZP009079 | Physics 2 | | 1,2 | | | | K1MBM_W03 | 18 | 60 | 2 | 1,5 | T | Z | O | P | PD | Ob |
| 6 | CHC003080 | Chemistry | | | 0,6 | | | K1MBM_U04 | 9 | 30 | 1 | 0,75 | T | Z | O | P | PD | Ob |
| 7 | MNN0826 | Basics of Metrology and Experiment Techniques | | | 0,6 | | | K1MBM_U10 | 9 | 30 | 1 | 0,75 | T | Z | | P | K | Ob |
| 8 | MNN0515 | Mechanics 1 | 0,6 | | | | | K1MBM_W05 | 9 | 60 | 2 | 1 | T | Z | | | K | Ob |
| 9 | MNN0515 | Mechanics 1 | | 0,6 | | | | K1MBM_U05 | 9 | 60 | 2 | 1,5 | T | Z | | P | K | Ob |
| 10 | MNN0855 | Basics of Thermodynamics | 1,2 | | | | | K1MBM_W09 | 18 | 60 | 2 | 1 | T | Z | | | K | Ob. |
| 11 | MNN0855 | Basics of Thermodynamics | | 0,6 | | | | K1MBM_U09 | 9 | 60 | 2 | 1,5 | T | Z | | P | K | Ob |
| 12 | MNN0835 | Fundamentals of Fluid Mechanics | 1,2 | | | | | K1MBM_W09 | 18 | 60 | 2 | 1 | T | Z | | | K | Ob |
| 13 | MNN0835 | Fundamentals of Fluid Mechanics | | 0,6 | | | | K1MBM_U09 | 9 | 60 | 2 | 1,5 | T | Z | | P | K | Ob |
| Total | | | 5,4 | 4,2 | 1,8 | | | | 171 | 870 | 29 | 18,25 | | | | | | |

Optional courses (minimum 9 hours in semester)

number of ECTS points 1

| 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 | HNN100300BK | Humanities | 0,6 | | | | | K1MBM_W18 K1MBM_K06 K1MBM_K07 | 9 | 30 | 1 | 0,5 | T | Z | O | | KO | W |
| Total | | | 0,6 | | | | | | 9 | 30 | 1 | 0,5 | | | | | | |

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

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 | | | | |
| 6 | 4,2 | 1,8 | | | 180 | 900 | 30 | 18,75 |

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 | MAT1547 | Mathematic 3 | 1,8 | | | | | K1MBM_W01 K1MBM_W02 K1MBM_K01 | 27 | 150 | 5 | 2,5 | T | E | O | | PD | Ob |
| 2 | MAT1547 | Mathematic 3 | | 1,2 | | | | K1MBM_U01 K1MBM_U02 K1MBM_K01 | 18 | 120 | 4 | 3 | T | Z | O | P | PD | Ob |
| 3 | FZP009080 | Physics 3 | | | 1,2 | | | K1MBM_U03 | 18 | 60 | 2 | 1,5 | T | Z | O | P | PD | Ob |
| 4 | MNN0525 | Mechanics 2 | 1,2 | | | | | K1MBM_W05 | 18 | 120 | 4 | 2 | T | E | | | K | Ob |
| 5 | MNN0525 | Mechanics 2 | | 0,6 | | | | K1MBM_U05 | 9 | 30 | 1 | 0,75 | T | Z | | P | K | Ob |
| 6 | MNN0865 | Fundamental Strength of Materials | 1,2 | | | | | K1MBM_W05 | 18 | 60 | 2 | 1 | T | Z | | | K | Ob |
| 7 | MNN0865 | Fundamental Strength of Materials | | 0,6 | | | | K1MBM_U05 | 9 | 60 | 2 | 1,5 | T | Z | | P | K | Ob |
| 8 | MNN0465 | Materials Science | 0,6 | | | | | K1MBM_W06 | 9 | 30 | 1 | 0,5 | T | Z | | | K | Ob |
| 9 | MNN0465 | Materials Science | | | 0,6 | | | K1MBM_U06 K1MBM_K03 K1MBM_K06 | 9 | 30 | 1 | 0,75 | T | Z | | P | K | Ob |
| 10 | MNN1065 | Combustion and Fuels | 1,2 | | | | | K1MBM_W15 | 18 | 120 | 4 | 2 | T | E | | | K | Ob |
| 11 | MNN0815 | Electrical Engineering Fundamentals | 1,2 | | | | | K1MBM_W12 | 18 | 60 | 2 | 1 | T | Z | | | K | Ob |
| 12 | MNN0815 | Electrical Engineering Fundamentals | | 0,6 | | | | K1MBM_U12 | 9 | 60 | 2 | 1,5 | T | Z | | P | K | Ob |
| Total | | | 7,2 | 3 | 1,8 | | | | 180 | 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

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 | | | | |
| 7,2 | 3 | 1,8 | | | 180 | 900 | 30 | 18 |

Semester 4

Obligatory courses number of ECTS points 19

| 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 | MNN0815 | Electrical Engineering Fundamentals | | | 0,6 | | | K1MBM_U12 | 9 | 30 | 1 | 0,75 | T | Z | | P | K | Ob |
| 2 | MNN1065 | Combustion and Fuels | | | 0,6 | | | K1MBM_U14 | 9 | 30 | 1 | 0,75 | T | Z | | P | K | Ob |
| 3 | MNN0615 | Workshop Metrology | 0,6 | | | | | K1MBM_W11 K1MBM_K01 K1MBM_K03 | 9 | 30 | 1 | 0,5 | T | Z | | | K | Ob |
| 4 | MNN0615 | Workshop Metrology | | | 0,6 | | | K1MBM_U11 K1MBM_K01 K1MBM_K03 | 9 | 30 | 1 | 0,75 | T | Z | | P | K | Ob |
| 5 | MNN1145 | Production Technics | 1,8 | | | | | K1MBM_W11 | 27 | 90 | 3 | 1,5 | T | Z | | | K | Ob |
| 6 | MNN1005 | Technical Drawing | | | | 1,2 | | K1MBM_U07 | 18 | 120 | 4 | 3 | T | Z | | P | K | Ob |
| 7 | MNN0785 | Fundamentals of Control Systems | 1,2 | | | | | K1MBM_W12 | 18 | 120 | 4 | 2 | T | E | | | K | Ob |
| 8 | MNN0785 | Fundamentals of Control Systems | | 0,6 | | | | K1MBM_U12 | 9 | 30 | 1 | 0,75 | T | Z | | P | K | Ob |
| 9 | MNN0806 | Fundamentals of Electronics | 0,6 | | | | | K1MBM_W12 | 9 | 60 | 2 | 1 | T | Z | | | K | Ob |
| 10 | MNN0806 | Fundamentals of Electronics | | | 0,6 | | | K1MBM_U12 | 9 | 30 | 1 | 0,75 | T | Z | | P | K | Ob |
| Total | | | 4,2 | 0,6 | 2,4 | 1,2 | | | 126 | 570 | 19 | 11,75 | | | | | | |

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

Optional courses (minimum 62 hours in semester)
number of ECTS points 11

| 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 | MNN1125 | Technical Fluid Mechanics | 1,2 | | | | | S1INC_W03 | 18 | 120 | 4 | 2 | T | E | | | S | W |
| 2 | MNN1125 | Technical Fluid Mechanics | | 0,6 | | | | S1INC_U03 | 9 | 30 | 1 | 0,75 | T | Z | | P | S | W |
| 3 | MNN1455 | Strength of Materials | 1,2 | | | | | S1INC_W01 | 18 | 120 | 4 | 2 | T | E | | | S | W |
| 4 | MNN1455 | Strength of Materials | | 0,6 | | | | S1INC_U01 | 9 | 60 | 2 | 1,5 | T | Z | | P | S | W |
| Total | | | 2,4 | 1,2 | | | | | 54 | 330 | 11 | 6,25 | | | | | | |

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 | | | | |
| 6,6 | 1,8 | 2,4 | 1,2 | | 180 | 900 | 30 | 18 |

Semester 5
Obligatory courses
number of ECTS points 13

| No. | Course/group of courses code | Name of course/group of courses (denote group of courses with symbol GK) | Weekly number of hours | | | | | Field-of-study educational effect symbol | Number of hours | | Number of ECTS points | | Form ² of course/group of courses | Way ³ of crediting | Course/group of courses | | | |
|-------|------------------------------|--|------------------------|----|-----|-----|-----|--|-----------------|------|-----------------------|-------------------------|--|-------------------------------|-------------------------------|------------------------|-------------------|-------------------|
| | | | lec | cl | lab | pr | sem | | ZZU | CNPS | total | BK classes ¹ | | | universit y-wide ⁴ | practical ⁵ | kind ⁶ | type ⁷ |
| 1 | MNN1145 | Production Technics | | | 1,2 | | | K1MBM_U11 | 18 | 60 | 2 | 1,5 | T | Z | | P | K | Ob |
| 2 | MNN0785 | Fundamentals of Control Systems | | | 1,2 | | | K1MBM_U12 | 18 | 60 | 2 | 1,5 | T | Z | | P | K | Ob |
| 3 | MNN0745 | Basics of Machine Design I | 1,2 | | | | | K1MBM_W14 | 18 | 60 | 2 | 1 | T | Z | | | K | Ob |
| 4 | MNN0745 | Basics of Machine Design I | | | | 1,2 | | K1MBM_U13 | 18 | 120 | 4 | 3 | T | Z | | P | K | Ob |
| 5 | MNN0085 | CAD I | | | 1,2 | | | K1MBM_U07 | 18 | 90 | 3 | 1,5 | T | Z | | P | K | Ob |
| Total | | | 1,2 | | 3,6 | 1,2 | | | 90 | 390 | 13 | 8,5 | | | | | | |

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

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

⁷ Optional – enter W, obligatory – enter Ob

Optional courses (minimum 99 hours in semester) number of ECTS points 17

| 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 | HNN100300BK | Humanities | 1,2 | | | | | K1MBM_W18 K1MBM_K06 K1MBM_K07 | 18 | 90 | 3 | 1,5 | T | Z | O | | KO | W |
| 2 | MNN1405 | Heat transfer and heat exchangers | 1,2 | | | | | S1INC_W04 | 18 | 60 | 2 | 1 | T | Z | | | S | W |
| 3 | MNN1405 | Heat transfer and heat exchangers | | 0,6 | | | | S1INC_U04 | 9 | 30 | 1 | 0,75 | T | Z | | P | S | W |
| 4 | MNN0135 | Refrigeration and Cryogenics | 1,2 | | | | | S1INC_W05 | 18 | 120 | 4 | 2 | T | E | | | S | W |
| 5 | MNN0135 | Refrigeration and Cryogenics | | 0,6 | | | | S1INC_U06 | 9 | 30 | 1 | 0,75 | T | Z | | P | S | W |
| 6 | MNN1205 | Theory of Thermal Machines | 0,6 | | | | | S1INC_W02 | 9 | 90 | 3 | 1,5 | T | E | | | S | W |
| 7 | MNN1205 | Theory of Thermal Machines | | 1,2 | | | | S1INC_U02 | 18 | 90 | 3 | 2,25 | T | Z | | P | S | W |
| Total | | | 4,2 | 2,4 | | | | | 99 | 510 | 17 | 9,75 | | | | | | |

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 | | | | |
| 5,4 | 2,4 | 3,6 | 1,2 | | 189 | 900 | 30 | 18,25 |

Semester 6

Obligatory courses number of ECTS points 11

| 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 | MNN0755 | Basics of Machine Design II | 1,2 | | | | | K1MBM_W14 | 18 | 120 | 4 | 2 | T | E | | | K | Ob |
| 2 | MNN0755 | Basics of Machine Design II | | | | 1,2 | | K1MBM_U13 | 18 | 120 | 4 | 3 | T | Z | | P | K | Ob |
| 3 | MNN0105 | CAD II | | | 1,2 | | | K1MBM_U07 | 18 | 90 | 3 | 2,25 | T | Z | | P | K | Ob |
| Total | | | 1,2 | | 1,2 | 1,2 | | | 54 | 330 | 11 | 7,25 | | | | | | |

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

⁷ Optional – enter W, obligatory – enter Ob

Optional courses (minimum 135 hours in semester) number of ECTS points 19

| 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 | JZL100789C JZL100792C JZL100845C | Foreign Language B2.1 | | 2,4 | | | | K1MBM_U15 | 36 | 60 | 2 | 1,5 | T | Z | O | P | KO | W |
| 2 | MNN0305 | Process Engineering and Apparatus | 1,2 | | | | | S1INC_W08 | 18 | 120 | 4 | 2 | T | E | | | S | W |
| 3 | MNN0305 | Process Engineering and Apparatus | | 1,2 | | | | S1INC_U09 | 18 | 90 | 3 | 2,25 | T | Z | | P | S | W |
| 4 | MNN0155 | Thermal fluid–flow machinery | 1,2 | | | | | S1INC_W06 | 18 | 60 | 2 | 1 | T | Z | | | S | W |
| 5 | MNN0155 | Thermal fluid–flow machinery | | 0,6 | | | | S1INC_U07 | 9 | 60 | 2 | 1,5 | T | Z | | P | S | W |
| 6 | MNN0565 | Fluid Mechanics | | | 1,2 | | | S1INC_U03 | 18 | 90 | 3 | 2,25 | T | Z | | P | S | W |
| 7 | MNN1225 | Thermodynamics | | | 1,2 | | | S1INC_U05 K1MBM_K03 | 18 | 90 | 3 | 2,25 | T | Z | | P | S | W |
| Total | | | 2,4 | 4,2 | 2,4 | | | | 135 | 570 | 19 | 12,75 | | | | | | |

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 | | | | |
| 3,6 | 4,2 | 3,6 | 1,2 | | 189 | 900 | 30 | 20 |

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 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 | PRZ0330W | Intellectual and Industrial Property Protection | 1,2 | | | | | K1MBM_W16 | 18 | 60 | 2 | 1 | T | Z | O | | KO | Ob |
| 2 | MNN0115 | Ecology | 1,2 | | | | | K1MBM_W17 K1MBM_K02 | 18 | 60 | 2 | 1 | T | Z | | | K | Ob |
| Total | | | 2,4 | | | | | | 36 | 120 | 4 | 2 | | | | | | |

Optional courses (minimum 213 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 | JZL100790C JZL100793C JZL100844C | Foreign Language B2.2 | | 2,4 | | | | K1MBM_U15 | 36 | 90 | 3 | 2,25 | T | Z | O | P | KO | W |
| | | Advanced Design Methods: | | | 1,2 | | | | 18 | 90 | 3 | 2,25 | T | Z | | P | K | W |
| | MNN0112 | CATIA | | | | | | K1MBM_U07 | | | | | | | | | | |
| | MNN1046 | Solid Edge | | | | | | K1MBM_U07 | | | | | | | | | | |
| | MNN0267 | 3D Graphic | | | | | | K1MBM_U07 K1MBM_K06 | | | | | | | | | | |
| 3 | MNN0875 | Pumps | 1,2 | | | | | S1INC_W07 | 18 | 60 | 2 | 1 | T | Z | | | S | W |
| 4 | MNN0875 | Pumps | | 0,6 | | | | S1INC_U08 | 9 | 30 | 1 | 0,75 | T | Z | | P | S | W |
| 5 | MNN1355 | Boiler Devices | 1,2 | | | | | S1INC_W10 | 18 | 90 | 3 | 1,5 | T | E | | | S | W |
| 6 | MNN1355 | Boiler Devices | | | | 1,2 | | S1INC_U11 | 18 | 60 | 2 | 1,5 | T | Z | | P | S | W |
| 7 | MNN0045 | Research and Testing of Machines | 1,2 | | | | | S1INC_W12 | 18 | 90 | 3 | 1,5 | T | E | | | S | W |
| 8 | MNN0045 | Research and Testing of Machines | | | 1,2 | | | S1INC_U13 | 18 | 30 | 1 | 0,75 | T | Z | | P | S | W |
| 9 | MNN1481 | Engineer Individual Student Project | | | | 4 | | K1MBM_U17 K1MBM_K04 K1MBM_K05 | 60 | 120 | 4 | 1 | T | Z | | P | K | 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

| 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 |
| 10 | MNN1530 | Professional Practice | | | | | | K1MBM_K01 K1MBM_K03 K1MBM_K04 K1MBM_K05 | | 120 | 4 | 0 | | | | P | K | W |
| Total | | | 3,6 | 3 | 2,4 | 5,2 | | | 213 | 780 | 26 | 12,5 | | | | | | |

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 | | | | |
| 6 | 3 | 2,4 | 5,2 | | 249 | 900 | 30 | 14,5 |

Semester 8

Obligatory courses

number of ECTS points 2

| 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 | MNN1655 | Environmental Management | 1,2 | | | | | K1MBM_W17 K1MBM_K02 | 18 | 30 | 1 | 0,5 | T | Z | | | K | Ob |
| 4 | MNN1515 | Engineer Diploma Seminar | | | | | 0,6 | K1MBM_U16 K1MBM_U17 K1MBM_K01 K1MBM_K03 | 9 | 30 | 1 | 0,75 | T | Z | | P | K | Ob |
| Total | | | 1,2 | | | | 0,6 | | 27 | 60 | 2 | 1,25 | | | | | | |

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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 / group of courses / 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 135 hours in semester) number of ECTS points 28

| 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 | ZNN100300BK | Management Science | 0,6 | | | | | K1MBM_W18 K1MBM_K06 | 9 | 30 | 1 | 0,5 | T | Z | O | | KO | W |
| 2 | MNN1085 | Fans and Compressors | 0,6 | | | | | S1INC_W07 | 9 | 30 | 1 | 0,5 | T | Z | | | S | W |
| 3 | MNN1085 | Fans and Compressors | | 0,6 | | | | S1INC_U08 | 9 | 30 | 1 | 0,75 | T | Z | | P | S | W |
| 4 | MNN1375 | Air Protection Installations | 1,2 | | | | | S1INC_W11 | 18 | 60 | 2 | 1 | T | Z | | | S | W |
| 5 | MNN1375 | Air Protection Installations | | | | 0,6 | | S1INC_U12 K1MBM_K01 K1MBM_K02 | 9 | 30 | 1 | 0,75 | T | Z | | P | S | W |
| 6 | MNN1035 | Thermal Power Stations | 1,2 | | | | | S1INC_W13 | 18 | 30 | 1 | 0,5 | T | Z | | | S | W |
| 7 | MNN1035 | Thermal Power Stations | | | 0,6 | | | S1INC_U14 | 9 | 30 | 1 | 0,75 | T | Z | | P | S | W |
| 8 | MNN0455 | Volumetric Machines | 1,2 | | | | | S1INC_W07 | 18 | 30 | 1 | 0,5 | T | Z | | | S | W |
| 9 | MNN0455 | Volumetric Machines | | 0,6 | | | | S1INC_U08 | 9 | 30 | 1 | 0,75 | T | Z | | P | S | W |
| 10 | MNN0455 | Volumetric Machines | | | | 0,6 | | S1INC_U08 | 9 | 30 | 1 | 0,75 | T | Z | | P | S | W |
| 11 | MNN0985 | Nuclear Reactors | 0,6 | | | | | S1INC_W09 | 9 | 30 | 1 | 0,5 | T | Z | | | S | W |
| 12 | MNN0985 | Nuclear Reactors | | | 0,6 | | | S1INC_U10 | 9 | 30 | 1 | 0,75 | T | Z | | P | S | W |
| 13 | MNN1545 | Engineer Thesis | | | | | | K1MBM_U17 K1MBM_K04 K1MBM_K05 | | 450 | 15 | 2 | T | Z | | P | K | W |
| Total | | | 5,4 | 1,2 | 1,2 | 1,2 | | | 135 | 840 | 28 | 10 | | | | | | |

Altogether in semester 8

| Total number of hours | | | | | Total number of ZZUhours | Total number of CNPS hours | Total number of ECTS points | Number of ECTS points for BK classes ¹ |
|-----------------------|-----|-----|-----|-----|--------------------------|----------------------------|-----------------------------|---|
| lec | cl | lab | pr | sem | | | | |
| 6,6 | 1,2 | 1,2 | 1,2 | 0,6 | 162 | 900 | 30 | 11,25 |

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

2. Set of examinations in semestral arrangement

| Course code | Names of courses ending with examination | Semester |
|---------------------------------|--|----------|
| MAT1487 FZP009078 MNN0821 | 1. Mathematics 1 2. Physics 1 3. Fundamentals of Materials Science | 1 |
| MAT1489 FZP009079 | 1. Mathematics 2 2. Physics 2 | 2 |
| MAT1547 MNN1065 MNN0525 | 1. Mathematics 3 2. Combustion and Fuels 3. Mechanics 2 | 3 |
| MNN0785 MNN1455 MNN1125 | 1. Fundamentals of Control Systems 2. Strength of Materials 3. Technical Fluid Mechanics | 4 |
| MNN1205 MNN0135 | 1. Theory of Thermal Machines 2. Refrigeration and Cryogenics | 5 |
| MNN0755 MNN0305 | 1. Basics of Machine Design II 2. Process Engineering and Apparatus | 6 |
| MNN1355 MNN0045 | 1. Boiler Devices 2. Research and Testing of Machines | 7 |

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

| Semester | Allowable deficit of ECTS points after semester |
|----------|---|
| 1 | 18 |
| 2 | 32 |
| 3 | 27 |
| 4 | 22 |
| 5 | 18 |
| 6 | 16 |
| 7 | 0 |