INFORMATION OF THE STUDY PROGRAMME MECHANICAL ENGINEERING - RESEARCH AND DEVELOPMENT PROGRAMME

Basic information

Programme name	**Mechanical Engineering - Research and Development Programme**
Programme properties	
Type	Master's
Level	Level 2
KLASIUS-SRV	Master's programme (2nd Bologna cycle)/Master' s degree (2nd Bologna cycle (17003)
ISCED	• technique (52)
KLASIUS-P	• Mechanical engineering and metalworking (not specified in detail) (5210)
KLASIUS-P-16	• Mechanics and metal trades (0715)
Frascati	• Natural and mathematical sciences (1) • Technical studies (2) • Social Sciences (5)
Level SQF	Level SQF 8
Level EQF	Level EQF 7
Level QF-EHEA	QF-EHEA Second cycle
Areas/modules/fields of study	• No breakdown (study programme) • Energy engineering (field of study) • Process engineering (field of study) • Engineering design (field of study) • Mechanics (field of study) • Production engineering (field of study) • Mechatronics and laser technology (field of study)
Members of the University of Ljubljana	• Faculty of Mechanical Engineering, Aškerčeva 6, 1000 Ljubljana, Slovenia
Duration (years)	2 full academic years
Number of ECTS per year	60 ECTS credits
Mode of study	full-time

Primary objectives of the programme

In an effort to create the conditions for increased competitiveness of the Slovenian economy on globalized world markets, based primarily on the ability to constantly design and develop new products, process technologies and technological processes, taking into account the criteria of sustainable development and environmental protection, is the primary objective of the

2nd Cycle Master's Study Programme in MECHANICAL ENGINEERING – Research and Development Programme, to educate Masters of Mechanical Engineering, trained for independent research and development and project application work and the creation of new knowledge in the field of mechanical sciences and in areas requiring interdisciplinary integration. Accordingly, we define as a key factor of the programme to follow the needs and desires of the national economy, and thus the desires of the student to acquire the necessary skills and competencies that should

provide direct employability after graduation. The emphasis is on:

- the student is enabled to acquire in-depth fundamental and orienting professional engineering knowledge, especially in the field of mechanical engineering; this enables students to assume professional responsibility in solving difficult professional problems in practice, the solution of which is often associated with new added value to 2nd Cycle Master's Study Programme in MECHANICAL ENGINEERING – Research and Development Programme, thus becoming indispensable for the prosperity of the national economy;
- in a student who acquires a broader base of fundamental knowledge and with the acquired knowledge covers and masters the basic professional fields of mechanical engineering, scientific thinking is developed in the research work, which is supported by the acquired methodological approaches; in this way, students are trained to solve development tasks, the solutions to which usually ensure the existence of companies on the international market;
- the student learns the importance of interdisciplinary integration in the acquisition of new products and technologies. With a broad outlook, with the ability to think analytically, with the knowledge of methods and an approach to research as well as development work in various professional fields of mechanical engineering, a Master's degree in

Mechanical Engineering is given both the knowledge and the ability to interdisciplinary integration of the various fields. This also fulfils the basic requirements for successful continuation of studies at the doctoral level III.

We follow the principles of the Bologna Declaration, the European Universities Association EUR, and the European Federation
of National Engineering Associations FEANI as well as the German accreditation agency ASIIN and thus to impart European-comparable knowledge and employability skills to our Master engineers through a high degree of choice, which is expressed in the number of professional fields in the course of study as well as in elective subjects, and mobility. Accordingly:

- the student acquires an education comparable to similar study in Central and Western Europe;
- the student with a credited record of course work is able to transfer to another related postgraduate study at home or abroad.

The above-mentioned features enable Master Engineers - graduates of the 2nd Cycle Master's Study Programme in MECHANICAL ENGINEERING – Research and Development Programme to master specialized fields within technical sciences, which enables them to become employable and successfully work in technical research and development departments of companies, in research laboratories of research institutes, in educational institutions, etc.

The primary goals that the study programme pursues with the Engineering Pedagogy field of study are:

- Independent work in education;
- Evaluation of one's own practice on the basis of modern professional didactic theories;
- Recognition and definition of problems of one's own practice;
- Ability to plan solution strategies and ability to solve these problems in a team;
- Training for development innovation work in education;
- Scientific research, evaluation, planning and development of new solutions in school practice;
- Organization and management in education;
- Lifelong learning;
- Independence of various social activities and liberal professions.

General competences (learning outcomes)

General competencies as well as Master of Engineering qualifications upon completion of the 2nd Cycle Master's Study Programme in MECHANICAL ENGINEERING – Research and Development Programme include:

- Ability to define, understand basic scientific problems and creatively solve professional challenges;
- Enhancement of the ability to think critically, analytically and synthetically; Development of new knowledge and understanding of the field; Development of higher cognitive skills related to the creation of new knowledge;
- Ability to take responsibility for one's own professional development and learning through evaluation and reflection on one's own work (experiential learning, supervision);
- Independence of various social activities and liberal professions;
- Ability to communicate professionally in writing, including in an international context;
- Ability to use information and communication technologies;
- Ability to apply acquired knowledge to independently solve technical problems in mechanical engineering;
- Ability to search for resources, to critically evaluate information, to independently expand acquired knowledge and to deepen knowledge in individual fields of mechanical engineering;
- Ability to work in groups and to network across disciplines. Establish partnership with users and other groups. Leadership and organizational skills;
- Ability to apply modern research methods and procedures. Ability to conduct research and transfer knowledge into practice.

Subject-specific competences (learning outcomes)

Subject-specific competencies and qualifications of the Master of Engineering upon completion of the 2nd Cycle Master's Study Programme in MECHANICAL ENGINEERING – Research and Development Programme, specifically:

- Ability to expand and apply basic mechanical skills and their developmental implementation;
- Mastery of basic theoretical as well as applied knowledge indispensable for mastering the field of mechanical engineering;

- Broad qualification in the field of mechanical engineering enabling continuation of studies in the doctoral programme;
- Ability of physical, mathematical in numerical modelling of problems with developed critical ability of analysis of results;
- Ability to independently acquire new knowledge and skills;
- Ability to independently perform demanding research, development, engineering and professional organizational works and the ability to creatively solve individual tasks in the field of mechanical engineering;
- based on analysis and synthesis developed the ability to find more optimal solutions.

Subject-specific competences and qualifications acquired by a master professor in the field of Engineering Pedagogy are:

- Recognition and solution of professional problems in education;
- Application of specific research approaches in education;
- In-depth knowledge of other professional fields of teaching;
- Critical observation of the latest developments in theory and practise in the field of teaching;
- Assumption of responsibility for the management of the educational process;
- Ability for interdisciplinary and “cross-curricular" integration and a comprehensive view of the educational process;
- Ability to critically (self-)reflect and (self-)evaluate educational and research work;
- Ability to develop new ideas (creativity) in the educational field;
- Ability to work independently in the educational field;
- Ability to act based on ethical judgement.

Specific competences in the narrower sense are listed in the curricula of the individual subjects.

Conditions for enrolment

Anyone who has completed the following may enrol in the 2nd Cycle Master's Study Programme in MECHANICAL ENGINEERING – Research and Development Programme:

a) Studies of at least the first level, evaluated with at least 180 ECTS in the field of mechanical engineering from research and development contents, or equivalent studies acquired in accordance with the applicable regulations in the Republic of Slovenia or abroad;

b) Studies of at least Level I, evaluated with at least 180 ECTS in the field of mechanical engineering from project application contents, or equivalent studies acquired in accordance with the applicable regulations in the Republic of Slovenia or abroad, if they have completed, prior to enrolment, study obligations essential for the continuation of studies, amounting to 10 to 15 ECTS credits;

c) A study programme of at least the first level, assessed with at least 180 credit points, from other subject areas, or an equivalent study programme completed in accordance with the regulations in force in the Republic of Slovenia or abroad, if he/she has completed, prior to enrolment, study obligations essential for the continuation of studies. These obligations are set by the Enrolment Commission and range from 10 to a maximum of 60 ECTS, depending on the diversity of the field of expertise.

Selection criteria in the case of restricted enrolment

In the case of restricted enrolment, the success of the undergraduate degree (average grade of the thesis) is taken into account in the selection of candidates for enrolment in the program. If the undergraduate studies of Level I do not include a diploma thesis, only the average grade is taken into account.

Criteria for recognition of knowledge and skills acquired prior to enrolment in the program

Knowledge and skills acquired prior to enrolment in the degree program, which correspond in content and scope to the course content of the subjects of 2nd Cycle Master's Study Programme in MECHANICAL ENGINEERING – Research and Development Programme are recognized as completed study obligations. The UL FME Master's Study Committee decides on the recognition of knowledge and skills acquired prior to enrolment on the basis of a written application by the student, attached written certificates or other documents proving successfully acquired knowledge and knowledge content, and in accordance with the Rules of Procedure and the Criteria for recognition of informally acquired knowledge and skills.

The number of ECTS credits earned outside this programme is not fixed or limited. Candidates are, upon enrolment in the 2nd Cycle Master's Study Programme in MECHANICAL ENGINEERING – Research and Development Programme, evaluated the scope and content of comparable knowledge and skills according to the ECTS system, and, at the discretion of the Master's Committee,

some study obligations are recognised as completed in the programme. This ensures that the amount of professional study content of the
program, which is absolutely necessary to achieve the established goals and competencies, is not cut.

Assessment methods

Assessment methods are in accordance with UL Statute and are specified in the syllabi.

Conditions for advancement through the programme

The condition for advancement from the 1st to the 2nd year is the fulfilment of study obligations amounting to at least 48 ECTS credits. Exceptionally, a student may enrol in the 2nd. year even if he/she has not fulfilled all the obligations set out in the study programme for enrolment in the senior year, if he/she has justified reasons according to Article 153 of the UL Statute (maternity, long illness, exceptional family and social circumstances, recognized status of a person with special needs, active participation in high-profile professional, cultural and sporting events, active participation in
university committees) or reasons of obligation arising from parallel studies, transfer from one university to another, language problems (foreign student), additional burdens due to international exchanges or increased workload in additional research and development work. Pursuant to Article 240 of the UL Constitution, a student has the right to use suspension of student status during maternity, paternity, or sick leave for more than one year.

A student who has not fulfilled all the obligations set out in the study programme for enrolment in a final year shall repeat the year if he/she has obtained at least 24 ECTS credits. During the course of study, a student may repeat a year only once.

Conditions for switching between programmes

Transfer between programs is considered to be the completion of the student's studies in the programme in which he/she has enrolled and the continuation of studies in 2nd Cycle Master's Study Programme in MECHANICAL ENGINEERING – Research and Development Programme in which part of the study obligations or all the study obligations already completed by the student in the first study programme are recognized as completed. It should be noted that co-transitions are only possible
for degree programs that ensure the acquisition of comparable competencies upon completion. The applications of candidates for transition to 2nd Cycle Master's Study Programme in MECHANICAL ENGINEERING – Research and Development Programme and the extent of recognized study obligations in the programme were individually reviewed by the Master's Committee.

In accordance with the criteria for transition between study programmes, the candidate may enrol in the study for 2nd Cycle Master's Study Programme in MECHANICAL ENGINEERING – Research and Development Programme, provided that at least half of the ECTS obligations
from the first cycle are recognized, which relate to the compulsory subjects of
2nd Cycle Master's Study Programme in MECHANICAL ENGINEERING – Research and Development Programme. If, in the process of recognition due to transition, the candidate has recognized at least as many and those credits that are a condition of enrolment in the second year of 2nd Cycle Master's Study Programme in MECHANICAL ENGINEERING – Research and Development Programme, the candidate is eligible to enrol in the second year 2nd Cycle Master's Study Programme in MECHANICAL ENGINEERING – Research and Development Programme.

Conditions for completion of studies

The condition for the completion of studies is that the candidate successfully completes all study obligations set by the programme, amounting to 120 ECTS credits, and successfully defends the Master's thesis.

Conditions for completion of individual parts of the study program, if the programme includes them

There is no possibility to complete individual parts of the Master's study programme. The programme is carried out and treated as
a whole.

Professional or scientific or artistic title in original language (male)

- magister inženir strojništva

Professional or scientific or artistic title in original language (female)

- magistrica inženirka strojništva

Professional or scientific or artistic title in original language (abbreviation)

- mag. inž. str.

CURRICULUM OF THE STUDY PROGRAMME WITH THE DESIGNATED LECTURERS AND HEADS OF

No breakdown (study programme)

The breakdown has no subjects.

Energy engineering (field of study)

1. year

				Contact hours									
	Code	Title	Heads of subject	Lectures	Seminars	Practical work	Clinical work	Other forms of study	Independent work	Hours Total	ECTS	Semesters	Elective
1.	6001-M	Experimental modeling in energy and process engineering	Marko Hočevar	30		30			65	125	5	Winter	no
2.	6002-M	Advanced combustion processes	Andrej Senegačnik, Tomaž Katrašnik	30		30			65	125	5	Winter	no
3.	6003-M	Energy conversion systems	Mihael Sekavčnik	30		30			65	125	5	Winter	no
4.	-	Professional elective subject S01		30		30			65	125	5	Winter	yes
5.	-	Professional elective subject S02		30		30			65	125	5	Winter	yes
6.	-	General elective subject 1		30		30			65	125	5	Winter	yes
7.	6004-M	Turbomachinery	Marko Hočevar	30		30			65	125	5	Summer	no
8.	6005-M	Processes in heat engines	Tomaž Katrašnik	30		30			65	125	5	Summer	no
9.	6006-M	Chemical energy carriers	Andrej Senegačnik	30		30			65	125	5	Summer	no
10.	-	Professional elective subject S03		30		30			65	125	5	Summer	yes
11.	-	Professional elective subject S04		30		30			65	125	5	Summer	yes
12.	-	General elective subject 2		30		30			65	125	5	Summer	yes
		Total		360	0	360	0	0	780	1500	60		

The student chooses a professional elective subject S01, S02, S03 and S04 in the amount of 20 ECTS at his/her own choice from the set of all compulsory subjects in other fields of study of 2nd Cycle Master's Study Programme in MECHANICAL ENGINEERING – Research and Development Programme, with the exception of Energy engineering.

General electives 1 and 2 amounting to 10 ECTS are chosen by the student at his/her own choice from the set of all compulsory subjects in other fields of 2nd Cycle Master's Study Programme in MECHANICAL ENGINEERING – Research and Development Programme with the exception of Energy engineering or according to his/her choice in any program, faculty or university.

2. year

				Contact hours									
	Code	Title	Heads of subject	Lectures	Seminars	Practical work	Clinical work	Other forms of study	Independent work	Hours Total	ECTS	Semesters	Elective
1.	6007-M	Technical acoustics	Jurij Prezelj	30		30			65	125	5	Winter	no
2.	6008-M	Electromobility	Tomaž Katrašnik	30		30			65	125	5	Winter	no
3.	6009-M	Energy supply in circular economy	Mihael Sekavčnik, Tomaž Katrašnik	30		30			65	125	5	Winter	no
4.	6010-M	Sustainable sources of electric energy	Marko Hočevar	30		30			65	125	5	Winter	no
5.	-	Professional elective subject S05		30		30			65	125	5	Winter	yes
6.	-	Professional elective subject S06		30		30			65	125	5	Winter	yes
7.	6011-M	Research in mechanical engineering	Andrej Bombač, Andrej Kitanovski, Andrej Senegačnik, Boris Jerman, Božidar Šarler, Damjan Klobčar, Davorin Kramar, Drago Bračun, Edvard Govekar, Franc Majdič, Franci Pušavec, Iztok Golobič, Janez Diaci, Janez Kušar, Janez Žerovnik, Janko Slavič, Jernej Klemenc, Joško Valentinčič, Jože Kutin, Jurij Prezelj, Lidija Slemenik Perše , Marko Hočevar, Marko Nagode, Matija Jezeršek, Miha Boltežar, Miha Brojan, Mihael Sekavčnik, Miroslav Halilovič, Mitjan Kalin,	90		90			195	375	15	Summer	no

			Niko Herakovič, Nikolaj Mole, Primož Podržaj, Robert Kunc, Rok Petkovšek, Rok Vrabič, Roman Šturm, Sašo Medved, Tadej Kosel, Tomaž Katrašnik, Tomaž Pepelnjak, Uroš Stritih										
8.	6012-M	Project practicum - MAG	All heads in the program		15			80	30	125	5	Summer	no
9.	6013-M	Master thesis	All heads in the program		35			70	145	250	10	Summer	no
		Total		270	50	270	0	150	760	1500	60		

The student chooses professional elective course S05 and S06 for ECTS at his own discretion from the set of all compulsory courses in other subjects of 2nd Cycle Master's Study Programme in MECHANICAL ENGINEERING – Research and Development Programme, with the exception of Energy engineering.

Process engineering (field of study)

1. year

				Contact hours									
	Code	Title	Heads of subject	Lectures	Seminars	Practical work	Clinical work	Other forms of study	Independent work	Hours Total	ECTS	Semesters	Elective
1.	6014-M	Transport phenomena	Andrej Kitanovski	30		30			65	125	5	Winter	no
2.	6015-M	Thermodynamics of mixtures	Iztok Golobič	30		30			65	125	5	Winter	no
3.	6016-M	Solar utility technologies	Sašo Medved	30		30			65	125	5	Winter	no
4.	-	Professional elective subject S01		30		30			65	125	5	Winter	yes
5.	-	Professional elective subject S02		30		30			65	125	5	Winter	yes
6.	-	General elective subject 1		30		30			65	125	5	Winter	yes
7.	6017-M	Air-conditioning, heating, refrigeration, ventilation	Uroš Stritih	30		30			65	125	5	Summer	no
8.	6018-M	Computational fluid dynamics	Božidar Šarler	30		30			65	125	5	Summer	no
9.	6019-M	Refrigeration and heat pumps - MAG	Andrej Kitanovski	30		30			65	125	5	Summer	no
10.	-	Professional elective subject S03		30		30			65	125	5	Summer	yes
11.	-	Professional elective subject S04		30		30			65	125	5	Summer	yes
12.	-	General elective subject 2		30		30			65	125	5	Summer	yes
		Total		360	0	360	0	0	780	1500	60		

The student chooses a professional elective subject S01, S02, S03 and S04 in the amount of 20 ECTS at his/her own choice from the set of all compulsory subjects in other fields of study of 2nd Cycle Master's Study Programme in MECHANICAL ENGINEERING – Research and Development Programme, with the exception of Process Engineering.

General electives 1 and 2 amounting to 10 ECTS are chosen by the student at his/her own choice from the set of all compulsory subjects in other fields of the 2nd Cycle Master's Study Programme in MECHANICAL ENGINEERING – Research and Development Programme with the exception of Process Engineering or according to his/her choice in any program, faculty or university.

2. year

				Contact hours									
	Code	Title	Heads of subject	Lectures	Seminars	Practical work	Clinical work	Other forms of study	Independent work	Hours Total	ECTS	Semesters	Elective
1.	6020-M	Heat exchangers	Andrej Kitanovski, Iztok Golobič, Jože Kutin	30		30			65	125	5	Winter	no
2.	6021-M	Process engineering	Iztok Golobič	30		30			65	125	5	Winter	no
3.	6022-M	Smart cities	Andrej Kitanovski, Sašo Medved	30		30			65	125	5	Winter	no
4.	6023-M	Multiphase Systems	Andrej Bombač, Božidar Šarler	30		30			65	125	5	Winter	no
5.	-	Professional elective subject S05		30		30			65	125	5	Winter	yes
6.	-	Professional elective subject S06		30		30			65	125	5	Winter	yes
7.	6011-M	Research in mechanical engineering	Andrej Bombač, Andrej Kitanovski, Andrej Senegačnik, Boris Jerman, Božidar Šarler, Damjan Klobčar, Davorin Kramar, Drago Bračun, Edvard Govekar, Franc Majdič, Franci Pušavec, Iztok Golobič, Janez Diaci, Janez Kušar, Janez Žerovnik, Janko Slavič, Jernej Klemenc, Joško Valentinčič, Jože Kutin, Jurij Prezelj, Lidija Slemenik Perše , Marko Hočevar, Marko Nagode, Matija Jezeršek, Miha Boltežar, Miha Brojan, Mihael Sekavčnik, Miroslav Halilovič, Mitjan Kalin, Niko Herakovič, Nikolaj Mole, Primož Podržaj, Robert Kunc,	90		90			195	375	15	Summer	no

			Rok Petkovšek, Rok Vrabič, Roman Šturm, Sašo Medved, Tadej Kosel, Tomaž Katrašnik, Tomaž Pepelnjak, Uroš Stritih										
8.	6012-M	Project practicum - MAG	All heads in the program		15			80	30	125	5	Summer	no
9.	6013-M	Master thesis	All heads in the program		35			70	145	250	10	Summer	no
		Total		270	50	270	0	150	760	1500	60		

The student chooses professional elective course S05 and S06 for ECTS at his own discretion from the set of all compulsory courses in other subjects of 2nd Cycle Master's Study Programme in MECHANICAL ENGINEERING – Research and Development Programme, with the exception of Process Engineering.

Engineering design (field of study)

1. year

				Contact hours									
	Code	Title	Heads of subject	Lectures	Seminars	Practical work	Clinical work	Other forms of study	Independent work	Hours Total	ECTS	Semesters	Elective
1.	6024-M	Engineering design techniques	Leon Kos, Nikola Vukašinović	30		30			65	125	5	Winter	no
2.	6025-M	Surface and contact engineering	Mitjan Kalin	30		30			65	125	5	Winter	no
3.	6026-M	Design of advanced systems	Jernej Klemenc, Marko Nagode	30		30			65	125	5	Winter	no
4.	-	Professional elective subject S01		30		30			65	125	5	Winter	yes
5.	-	Professional elective subject S02		30		30			65	125	5	Winter	yes
6.	-	General elective subject 1		30		30			65	125	5	Winter	yes
7.	6027-M	Operational strength	Domen Šeruga, Jernej Klemenc, Marko Nagode	30		30			65	125	5	Summer	no
8.	6028-M	Nanotechnologies	Mitjan Kalin	30		30			65	125	5	Summer	no
9.	6029-M	Geometric Product Specifications	Robert Kunc, Samo Zupan	30		30			65	125	5	Summer	no
10.	-	Professional elective subject S03		30		30			65	125	5	Summer	yes
11.	-	Professional elective subject S04		30		30			65	125	5	Summer	yes
12.	-	General elective subject 2		30		30			65	125	5	Summer	yes
		Total		360	0	360	0	0	780	1500	60		

The student chooses a professional elective subject S01, S02, S03 and S04 in the amount of 20 ECTS at his/her own choice from the set of all compulsory subjects in other fields of study of 2nd Cycle Master's Study Programme in MECHANICAL ENGINEERING – Research and Development Programme, with the exception of Engineering design.

General electives 1 and 2 amounting to 10 ECTS are chosen by the student at his/her own choice from the set of all compulsory subjects in other fields of the 2nd Cycle Master's Study Programme in MECHANICAL ENGINEERING – Research and Development Programme with the exception of Engineering design or according to his/her choice in any program, faculty or university.

2. year

				Contact hours									
	Code	Title	Heads of subject	Lectures	Seminars	Practical work	Clinical work	Other forms of study	Independent work	Hours Total	ECTS	Semesters	Elective
1.	6030-M	Hydraulic components and systems	Franc Majdič	30		30			65	125	5	Winter	no
2.	6031-M	Complex powertrains in mobile machinery	Jernej Klemenc, Marko Nagode, Simon Oman	30		30			65	125	5	Winter	no
3.	6032-M	Lightweight structures	Boris Jerman	30		30			65	125	5	Winter	no
4.	6033-M	Reliability evaluation and demonstration	Jernej Klemenc, Marko Nagode	30		30			65	125	5	Winter	no
5.	-	Professional elective subject S05		30		30			65	125	5	Winter	yes
6.	-	Professional elective subject S06		30		30			65	125	5	Winter	yes
7.	6011-M	Research in mechanical engineering	Andrej Bombač, Andrej Kitanovski, Andrej Senegačnik, Boris Jerman, Božidar Šarler, Damjan Klobčar, Davorin Kramar, Drago Bračun, Edvard Govekar, Franc Majdič, Franci Pušavec, Iztok Golobič, Janez Diaci, Janez Kušar, Janez Žerovnik, Janko Slavič, Jernej Klemenc, Joško Valentinčič, Jože Kutin, Jurij Prezelj, Lidija Slemenik Perše , Marko Hočevar, Marko Nagode, Matija Jezeršek, Miha Boltežar, Miha Brojan, Mihael Sekavčnik, Miroslav Halilovič, Mitjan Kalin, Niko Herakovič, Nikolaj Mole, Primož Podržaj, Robert Kunc, Rok Petkovšek,	90		90			195	375	15	Summer	no

			Rok Vrabič, Roman Šturm, Sašo Medved, Tadej Kosel, Tomaž Katrašnik, Tomaž Pepelnjak, Uroš Stritih										
8.	6012- M	Project practicum - MAG	All heads in the program		15			80	30	125	5	Summer	no
9.	6013- M	Master thesis	All heads in the program		35			70	145	250	10	Summer	no
		Total		270	50	270	0	150	760	1500	60		

The student chooses professional elective course S05 and S06 for ECTS at his own discretion from the set of all compulsory courses in other subjects of 2nd Cycle Master's Study Programme in MECHANICAL ENGINEERING – Research and Development Programme, with the exception of Engineering design.

Mechanics (field of study)

1. year

				Contact hours									
	Code	Title	Heads of subject	Lectures	Seminars	Practical work	Clinical work	Other forms of study	Independent work	Hours Total	ECTS	Semesters	Elective
1.	6034-M	Advanced strength of materials	Miha Brojan	30		30			65	125	5	Winter	no
2.	6035-M	Advanced Dynamics	Miha Boltežar, Gregor Čepon	30		30			65	125	5	Winter	no
3.	6036-M	Mechanics of structural elements	Miroslav Halilovič	30		30			65	125	5	Winter	no
4.	-	Professional elective subject S01		30		30			65	125	5	Winter	yes
5.	-	Professional elective subject S02		30		30			65	125	5	Winter	yes
6.	-	General elective subject 1		30		30			65	125	5	Winter	yes
7.	6037-M	FEM structural analysis	Miroslav Halilovič, Nikolaj Mole	30		30			65	125	5	Summer	no
8.	6038-M	Dynamics of machines and structures	Janko Slavič, Miha Boltežar, Gregor Čepon	30		30			65	125	5	Summer	no
9.	6039-M	Signal processing	Janko Slavič	30		30			65	125	5	Summer	no
10.	-	Professional elective subject S03		30		30			65	125	5	Summer	yes
11.	-	Professional elective subject S04		30		30			65	125	5	Summer	yes
12.	-	General elective subject 2		30		30			65	125	5	Summer	yes
		Total		360	0	360	0	0	780	1500	60		

The student chooses a professional elective subject S01, S02, S03 and S04 in the amount of 20 ECTS at his/her own choice from the set of all compulsory subjects in other fields of study of 2nd Cycle Master's Study Programme in MECHANICAL ENGINEERING – Research and Development Programme, with the exception of Mechanics.

General electives 1 and 2 amounting to 10 ECTS are chosen by the student at his/her own choice from the set of all compulsory subjects in other fields of 2nd Cycle Master's Study Programme in MECHANICAL ENGINEERING – Research and Development Programme with the exception of Mechanics or according to his/her choice in any program, faculty or university.

2. year

				Contact hours									
	Code	Title	Heads of subject	Lectures	Seminars	Practical work	Clinical work	Other forms of study	Independent work	Hours Total	ECTS	Semesters	Elective
1.	6040-M	Mechanics of light-weight structures	Miha Brojan	30		30			65	125	5	Winter	no
2.	6041-M	Experimental modal analysis	Janko Slavič	30		30			65	125	5	Winter	no
3.	6042-M	Rheology of polymers	Lidija Slemenik Perše	30		30			65	125	5	Winter	no
4.	6043-M	Numerical modelling of technological processes	Miroslav Halilovič, Nikolaj Mole	30		30			65	125	5	Winter	no
5.	-	Professional elective subject S05		30		30			65	125	5	Winter	yes
6.	-	Professional elective subject S06		30		30			65	125	5	Winter	yes
7.	6011-M	Research in mechanical engineering	Andrej Bombač, Andrej Kitanovski, Andrej Senegačnik, Boris Jerman, Božidar Šarler, Damjan Klobčar, Davorin Kramar, Drago Bračun, Edvard Govekar, Franc Majdič, Franci Pušavec, Iztok Golobič, Janez Diaci, Janez Kušar, Janez Žerovnik, Janko Slavič, Jernej Klemenc, Joško Valentinčič, Jože Kutin, Jurij Prezelj, Lidija Slemenik Perše , Marko Hočevar, Marko Nagode, Matija Jezeršek, Miha Boltežar, Miha Brojan, Mihael Sekavčnik, Miroslav Halilovič, Mitjan Kalin, Niko Herakovič, Nikolaj Mole, Primož Podržaj, Robert Kunc, Rok Petkovšek, Rok	90		90			195	375	15	Summer	no

			Vrabič, Roman Šturm, Sašo Medved, Tadej Kosel, Tomaž Katrašnik, Tomaž Pepelnjak, Uroš Stritih										
8.	6012-M	Project practicum - MAG	All heads in the program		15			80	30	125	5	Summer	no
9.	6013-M	Master thesis	All heads in the program		35			70	145	250	10	Summer	no
		Total		270	50	270	0	150	760	1500	60		

The student chooses professional elective course S05 and S06 for ECTS at his own discretion from the set of all compulsory courses in other subjects of 2nd Cycle Master's Study Programme in MECHANICAL ENGINEERING – Research and Development Programme, with the exception of Mechanics.

Production engineering (field of study)

1. year

				Contact hours									
	Code	Title	Heads of subject	Lectures	Seminars	Practical work	Clinical work	Other forms of study	Independent work	Hours Total	ECTS	Semesters	Elective
1.	6044-M	Micromanufacturing technologies	Joško Valentinčič	30		30			65	125	5	Winter	no
2.	6045-M	Advanced machining processes	Franci Pušavec	30		30			65	125	5	Winter	no
3.	6046-M	Heat treatment	Roman Šturm	30		30			65	125	5	Winter	no
4.	-	Professional elective subject S01		30		30			65	125	5	Winter	yes
5.	-	Professional elective subject S02		30		30			65	125	5	Winter	yes
6.	-	General elective subject 1		30		30			65	125	5	Winter	yes
7.	6047-M	Advanced forming processes	Tomaž Pepelnjak	30		30			65	125	5	Summer	no
8.	6048-M	Assembly and Handling Systems	Marko Šimic, Niko Herakovič	30		30			65	125	5	Summer	no
9.	6049-M	Production planning and organization	Janez Kušar, Tomaž Berlec	30		30			65	125	5	Summer	no
10.	-	Professional elective subject S03		30		30			65	125	5	Summer	yes
11.	-	Professional elective subject S04		30		30			65	125	5	Summer	yes
12.	-	General elective subject 2		30		30			65	125	5	Summer	yes
		Total		360	0	360	0	0	780	1500	60		

The student chooses a professional elective subject S01, S02, S03 and S04 in the amount of 20 ECTS at his/her own choice from the set of all compulsory subjects in other fields of study of 2nd Cycle Master's Study Programme in MECHANICAL ENGINEERING – Research and Development Programme, with the exception of Production Engineering.

General electives 1 and 2 amounting to 10 ECTS are chosen by the student at his/her own choice from the set of all compulsory subjects in other fields of the 2nd Cycle Master's Study Programme in MECHANICAL ENGINEERING – Research and Development Programme with the exception of Production Engineering or according to his/her choice in any program, faculty or university.

2. year

				Contact hours									
	Code	Title	Heads of subject	Lectures	Seminars	Practical work	Clinical work	Other forms of study	Independent work	Hours Total	ECTS	Semesters	Elective
1.	6050-M	Quality engineering	Davorin Kramar	30		30			65	125	5	Winter	no
2.	6051-M	CAM systems	Franci Pušavec	30		30			65	125	5	Winter	no
3.	6052-M	Additive technologies	Damjan Klobčar, Edvard Govekar	30		30			65	125	5	Winter	no
4.	6053-M	Smart factories	Marko Šimic, Niko Herakovič	30		30			65	125	5	Winter	no
5.	-	Professional elective subject S05		30		30			65	125	5	Winter	yes
6.	-	Professional elective subject S06		30		30			65	125	5	Winter	yes
7.	6011-M	Research in mechanical engineering	Andrej Bombač, Andrej Kitanovski, Andrej Senegačnik, Boris Jerman, Božidar Šarler, Damjan Klobčar, Davorin Kramar, Drago Bračun, Edvard Govekar, Franc Majdič, Franci Pušavec, Iztok Golobič, Janez Diaci, Janez Kušar, Janez Žerovnik, Janko Slavič, Jernej Klemenc, Joško Valentinčič, Jože Kutin, Jurij Prezelj, Lidija Slemenik Perše , Marko Hočevar, Marko Nagode, Matija Jezeršek, Miha Boltežar, Miha Brojan, Mihael Sekavčnik, Miroslav Halilovič, Mitjan Kalin, Niko Herakovič, Nikolaj Mole, Primož Podržaj, Robert Kunc, Rok Petkovšek, Rok Vrabič, Roman Šturm, Sašo Medved, Tadej Kosel, Tomaž Katrašnik, Tomaž Pepelnjak, Uroš Stritih	90		90			195	375	15	Summer	no

8.	6012-M	Project practicum - MAG	All heads in the program		15			80	30	125	5	Summer	no
9.	6013-M	Master thesis	All heads in the program		35			70	145	250	10	Summer	no
		Total		270	50	270	0	150	760	1500	60		

The student chooses professional elective course S05 and S06 in the amount of 10 ECTS at his own discretion from the set of all compulsory courses in other subjects of 2nd Cycle Master's Study Programme in MECHANICAL ENGINEERING – Research and Development Programme, with the exception of Production Engineering.

Mechatronics and laser technology (field of study)

1. year

				Contact hours									
	Code	Title	Heads of subject	Lectures	Seminars	Practical work	Clinical work	Other forms of study	Independent work	Hours Total	ECTS	Semesters	Elective
1.	6054-M	Microprocessor control	Janez Diaci, Primož Podržaj	30		30			65	125	5	Winter	no
2.	6055-M	Robotic systems - MAG	Rok Vrabič	30		30			65	125	5	Winter	no
3.	6056-M	Algorithms and protocols	Rok Vrabič	30		30			65	125	5	Winter	no
4.	-	Professional elective subject S01		30		30			65	125	5	Winter	yes
5.	-	Professional elective subject S02		30		30			65	125	5	Winter	yes
6.	-	General elective subject 1		30		30			65	125	5	Winter	yes
7.	6057-M	Discrete control systems	Janez Diaci, Primož Podržaj	30		30			65	125	5	Summer	no
8.	6058-M	Laser systems	Matija Jezeršek	30		30			65	125	5	Summer	no
9.	6059-M	Photonics and laser sources	Rok Petkovšek, Vid Agrež	30		30			65	125	5	Summer	no
10.	-	Professional elective subject S03		30		30			65	125	5	Summer	yes
11.	-	Professional elective subject S04		30		30			65	125	5	Summer	yes
12.	-	General elective subject 2		30		30			65	125	5	Summer	yes
		Total		360	0	360	0	0	780	1500	60		

The student chooses a professional elective subject S01, S02, S03 and S04 in the amount of 20 ECTS at his/her own choice from the set of all compulsory subjects in other fields of study of 2nd Cycle Master's Study Programme in MECHANICAL ENGINEERING – Research and Development Programme, with the exception of Mechatronics and Laser Technology.

General electives 1 and 2 amounting to 10 ECTS are chosen by the student at his/her own choice from the set of all compulsory subjects in other fields of 2nd Cycle Master's Study Programme in MECHANICAL ENGINEERING – Research and Development Programme with the exception of Mechatronics and Laser Technology or according to his/her choice in any program, faculty or university.

2. year

				Contact hours									
	Code	Title	Heads of subject	Lectures	Seminars	Practical work	Clinical work	Other forms of study	Independent work	Hours Total	ECTS	Semesters	Elective
1.	6060-M	Laser measurement systems	Matija Jezeršek	30		30			65	125	5	Winter	no
2.	6061-M	Laser processing technology	Matija Jezeršek, Peter Gregorčič	30		30			65	125	5	Winter	no
3.	6062-M	Advanced sensory systems and networks	Primož Podržaj	30		30			65	125	5	Winter	no
4.	6063-M	Manufacturing automation	Drago Bračun	30		30			65	125	5	Winter	no
5.	-	Professional elective subject S05		30		30			65	125	5	Winter	yes
6.	-	Professional elective subject S06		30		30			65	125	5	Winter	yes
7.	6011-M	Research in mechanical engineering	Andrej Bombač, Andrej Kitanovski, Andrej Senegačnik, Boris Jerman, Božidar Šarler, Damjan Klobčar, Davorin Kramar, Drago Bračun, Edvard Govekar, Franc Majdič, Franci Pušavec, Iztok Golobič, Janez Diaci, Janez Kušar, Janez Žerovnik, Janko Slavič, Jernej Klemenc, Joško Valentinčič, Jože Kutin, Jurij Prezelj, Lidija Slemenik Perše , Marko Hočevar, Marko Nagode, Matija Jezeršek, Miha Boltežar, Miha Brojan, Mihael Sekavčnik, Miroslav Halilovič, Mitjan Kalin, Niko Herakovič, Nikolaj Mole,	90		90			195	375	15	Summer	no

			Primož Podržaj, Robert Kunc, Rok Petkovšek, Rok Vrabič, Roman Šturm, Sašo Medved, Tadej Kosel, Tomaž Katrašnik, Tomaž Pepelnjak, Uroš Stritih										
8.	6012-M	Project practicum - MAG	All heads in the program		15			80	30	125	5	Summer	no
9.	6013-M	Master thesis	All heads in the program		35			70	145	250	10	Summer	no
		Total		270	50	270	0	150	760	1500	60		

The student chooses professional elective course S05 and S06 for ECTS at his own discretion from the set of all compulsory courses in other subjects of 2nd Cycle Master's Study Programme in MECHANICAL ENGINEERING – Research and Development Programme, with the exception of Mechatronics and Laser Technology.