# THE "MECHANICAL ENGINEERING – RESEARCH AND DEVELOPMENT PROGRAMME" INFORMATION

### Basic information

Programme title	Mechanical Engineering – Research and Development
-	Programme
Programme features	
Туре	Master's degree
Study level (cycle)	Second cycle
KLASIUS-SRV	Master's education (second Bologna cycle)/Master's degree (second
	Bologna cycle) (17003)
ISCED	• Technics (52)
KLASIUS-P	<ul> <li>Mechanical engineering and metalworking (not further defined) (5210)</li> </ul>
M KLASIUS-P-16	• Metallurgy, mechanical engineering and metalwork (0715)
Frascati	• Natural sciences (1)
	• Technical sciences (2)
	• Social sciences (5)
SOK level	SOK level 8
EOK level	EOK level 7
EOVK level	Second cycle
Fields/modules/courses of study	• Energy engineering (course of study)
	Process engineering (course of study)
	• Engineering design (course of study)
	Mechanics (course of study)
	<ul> <li>Process engineering (course of study)</li> </ul>
	Mechatronics and laser technology (course of study)
Member of the University of	• Faculty of Mechanical Engineering, Aškerčeva 6, 1000 Ljubljana,
Ljubljana	Slovenia
Duration (years)	2
Number of ECTS credits per year	60
Modes of study	Full-time

## Key objectives of the programme

In an effort to create the conditions for increased global competitiveness of the Slovenian economy, which is primarily based on the ability to constantly design and develop new products, process technologies and technological procedures, while taking into account the criteria of sustainable development and environmental protection, the primary objective of the second-cycle master's degree programme "MECHANICAL ENGINEERING – Research and Development Programme" is to educate future mechanical engineers who will be qualified for independent R&D and project-oriented work and generating new knowledge both in the field of mechanical sciences as well as areas that require interdisciplinary integration. Accordingly, the key factor of the programme is to address the needs and preferences of the national economy and, therefore, the students' needs to acquire the necessary competencies that will ensure immediate employability upon completion of the study programme. The main emphasis is on the following aspects:

- Students are allowed to acquire in-depth fundamental and specific technical engineering expertise, especially in the field of mechanical engineering; in this way, students are trained to assume professional responsibility in resolving challenging technical issues in practice, which often leads to new added value. Master's graduates in mechanical engineering graduates of the second-cycle master's degree programme "MECHANICAL ENGINEERING Research and Development Programme", therefore become indispensable for the flourishing of the national economy.
- Students get a broader underpinning of knowledge and use the acquired skills to cover and master the core professional areas of mechanical engineering, while developing scientific thinking in their research work,

which is supported by the acquired methodological approaches. In this way, students are trained to handle R&D tasks; and finding solutions to these problems enables the enterprises to survive in international markets.

• Students are made aware of the importance of interdisciplinary integration by mastering new products and technologies. Through a wide range of knowledge, the ability to think analytically, the knowledge of methodologies, and by approaching research and development work in various professional areas of mechanical engineering, the master's graduates in mechanical engineering will be provided with both the expertise and the ability to connect different fields through interdisciplinary integration. This also fulfils the basic requirements for the successful continuation of their studies in a doctoral degree programme (third-cycle studies).

We strive to uphold the principles of the Bologna Declaration, the European University Association (EUA), the European Federation of National Engineering Associations (FEANI) and the German accreditation agency ASIIN. By providing a wide range of courses to choose from, which is expressed both in the number of professional courses in the study programme and in elective courses, as well as mobility, the programme enables our master's graduates in engineering to acquire skills and employment qualifications that are comparable across Europe. Accordingly:

- Students receive an education that is comparable to similar study programmes in Central and Western Europe.
- Students can transfer to another similar undergraduate study at home or abroad using a transfer credit statement of completed coursework.

The above-mentioned features enable our master's graduates in engineering – graduates of the second-cycle master's degree programme "MECHANICAL ENGINEERING – Research and Development Programme" to master specialized areas of expertise within the technical science field, which enables them to be employed and work successfully in the technical research and development departments of companies, in research laboratories of research institutes, in educational institutions, etc.

## General competencies (learning outcomes)

The general competencies as well as qualifications of a master's graduate in engineering after completing the second-cycle master's degree programme "MECHANICAL ENGINEERING – Research and Development Programme" include:

- the ability to define and understand fundamental scientific problems and creatively solve professional challenges;
- expanding the ability to think critically, analytically and synthetically; developing new knowledge and comprehension of his field of expertise; developing higher cognitive skills related to the generation of new knowledge;
- the ability to take responsibility for one's professional development and learning by evaluating and reflecting on one's work (experiential learning, supervision);
- independent participation in various social activities and freelance work;
- proficiency in professional communication and writing, including in the international arena;
- the ability to make use of information and communication technology;
- the ability to make use of the acquired knowledge to independently solve technical problems in the field of mechanical engineering;
- the ability to search for sources, critically assess information, independently expand the acquired knowledge and to broaden the skills in specific specialized areas of mechanical engineering;
- the ability to work in a group and take part in interdisciplinary networking; establishing partnerships with users and other groups; leadership and organisational skills;
- the ability to use modern research methods and procedures; the ability to do research and transfer the findings into practice.

## Course-specific competencies (learning outcomes)

The course-specific competencies of a master's graduate in engineering upon completing the second-cycle master's degree programme "MECHANICAL ENGINEERING – Research and Development Programme" are:

- the ability to upgrade and use basic mechanical engineering expertise and its development and technical implementation;
- proficiency in basic theoretical and applied knowledge, which is essential for mastering the technical field of mechanical engineering;
- great proficiency in the field of mechanical engineering, which enables the continuation of studies in a doctoral degree programme.
- proficiency in physical, mathematical and numerical problem modelling with a well-developed ability to critically analyse the results;
- the ability to independently acquire new expertise and skills;
- the ability to carry out independent research, development, engineering and technical organizational work and the ability to handle specific tasks in the field of mechanical engineering in a creative manner;
- a well-developed ability to find optimal solutions based on analysis and synthesis.

The specific competencies (more narrowly defined) are listed in the syllabi of individual courses.

## Entry requirements

The second-cycle master's degree programme "Mechanical Engineering – Research and Development Programme" can be entered by anyone who has completed at least:

a) a first-cycle study programme, comprising of at least 180 credits, in the field of mechanical engineering with research and development content or an equivalent study programme pursuant to the current regulations in the Republic of Slovenia or abroad;

b) a first-cycle study programme, comprising at least 180 credits, in the field of mechanical engineering with project-oriented content or an equivalent study programme pursuant to the current regulations in the Republic of Slovenia or abroad, if prior to enrolment, he has completed the requirements essential for continuing his studies ranging from 10 to 15 credits;

c) a first-cycle study programme, comprising at least 180 credits, from other technical fields or an equivalent study programme pursuant to the current regulations in the Republic of Slovenia or abroad, if prior to enrolment, he has completed the requirements essential for continuing his studies. The fulfilment of these requirements-related conditions shall be determined by the Admissions Committee. Depending on the different areas of expertise, the credited requirements range from 10 to a maximum of 60 credits.

### Selection criteria in the event of admission quotas

In the event of admission quotas, the selection of candidates for enrolment in the study programme will take into account their academic performance in first-cycle studies (average grade and the diploma thesis grade). Where a diploma thesis is not part of the first-cycle study programme, only the average grade shall be taken into account.

# Criteria for the recognition of knowledge and skills acquired before enrolment in the programme

Before enrolling in the second-cycle master's degree programme "MECHANICAL ENGINEERING – Research and Development Programme", the students' previously acquired skills can be recognized as completed requirements if the content and scope of these skills correspond to the educational content of the subjects in this programme. The decision on whether or not to acknowledge the expertise and skills acquired by a particular student prior to enrolment is made by the UL FME Master's Studies Committee, based on the written application of the student, the attached written certificates and other documents proving the successfully acquired skills and the content of these skills, and in accordance with the Rules on the Procedure and Criteria for the Acknowledgement of Informally Acquired Knowledge and Skills.

The number of ECTS credits acquired outside of this study programme is not capped or limited. Upon enrolment in the second-cycle master's degree programme "MECHANICAL ENGINEERING – Research and Development Programme", the scope and content of comparable knowledge and skills are evaluated according to the ECTS system and, after the assessment of the Master's Studies Committee, recognized as completed requirements of the programme. This ensures that the range of professional content within the study programme, which is necessary for achieving the set objectives and competencies, is not reduced.

### Methods of assessment

The methods of assessment are compliant with the UL Statute and are listed in the course syllabi.

## Requirements for the progression through the programme

The prerequisite for progressing from 1st to 2nd year is the completion of the study requirements amounting to a minimum of 48 ECTS credits. Exceptionally, a student may enrol in the 2nd year of study even if he has not completed all the requirements required for enrolment in a higher year (as stipulated in the study programme), when there are justifiable grounds for doing so, as defined in Article 153 of the UL Statute (maternity, prolonged illness, extenuating family and social circumstances, disability status, active participation in top professional, cultural and sporting events and active participation in the bodies of the university) or reasons of study commitments to do with parallel studies, transferring from one university to another, language difficulties (foreign students), additional burdens due to international exchange or increased workload to do with additional research and development work. Pursuant to Article 240 of the UL Statute, students are entitled to suspend their student status during maternity, paternity or sick leave lasting over one year.

A student who has not fulfilled all the requirements set by the study programme for enrolment into a higher year may repeat a year if he has earned at least 24 ECTS credits. A year can only be repeated once during the studies.

## Conditions for transferring between programmes

The transfer between programmes shall mean the termination of the student's education in the study programme in which he initially enrolled and the continuation of education in the second-cycle master's degree programme "MECHANICAL ENGINEERING – Research and Development Programme", whereby part of the requirements or all of the requirements that the student has already passed as part of the initial study programme shall be deemed to have been completed. It should be noted, however, that transferring is only possible between study programmes that provide comparable competencies upon completion. Applications for transferring to the second-cycle master's degree programme "MECHANICAL ENGINEERING – Research and Development Programme" and the scope of satisfied requirements within the study programme will be reviewed by the Master's Studies Committee.

In accordance with the Criteria for Transfers Between Study Programmes, the candidate can enrol in the secondcycle master's degree programme "MECHANICAL ENGINEERING – Research and Development Programme", provided that he is entitled to at least half of the ECTS credits from the initial study programme pertaining to the compulsory subjects of the second-cycle master's degree programme "MECHANICAL ENGINEERING – Research and Development Programme". If, during the recognition procedure, the candidate is found to be entitled to at least as many (and specifically those) credit points that are the prerequisite for enrolment in the second year of the second-cycle master's degree programme "MECHANICAL ENGINEERING – Research and Development Programme", the candidate shall be allowed to enrol in the second year of the second-cycle master's degree programme "MECHANICAL ENGINEERING – Research and Development Programme", the candidate shall be allowed to enrol in the second year of the second-cycle master's degree programme "MECHANICAL ENGINEERING – Research and Development Programme".

## Requirements for the completion of studies

The prerequisite for completing the studies is that the candidate successfully completes all of the programmespecific study requirements amounting to 120 ECTS credits and successfully defends his master's thesis.

Requirements for completing individual parts of the programme, if any exist: There are no options to complete individual parts of the study programme. The programme is implemented and treated as a whole.

Professional or scientific or artistic title (male)

MSc in Mechanical Engineering

Professional or scientific or artistic title (female)

MSc in Mechanical Engineering

Professional or scientific or artistic title (abbreviation)

• MSc, Mech. Eng.

Professional or scientific or artistic title in English including abbreviation

• Master of Science (MSc, Mech. Eng.)

## STUDY PROGRAMME CURRICULUM MECHANICAL ENGINEERING - RESEARCH AND DEVELOPMENT PROGRAMME

Name of study programme	Mechanical engineering - research and development programme
Programme characteristics	
Туре	master's
Cycle	master
University of Ljubljana	• Faculty of Mechanical Engineering, Aškerčeva 6, 1000 Ljubljana,
members	Slovenija

## Energy engineering (field of study)

				Conta	ct hour	s							
	Unive rsity Cours e Code	Course title	Lectur ers	Lect ures	Semi nar	Tuto rials	Clini cal tuto rials	Ot her for ms of stu	Indivi dual stude nt work	To tal ho urs	EC TS	Semest ers	Elec tive
1.	05668 50	EXPERIM ENTAL MODELI NG IN ENERGY AND PROCESS ENGINEE RING	Marko Hočev ar, Matev ž Dular	30		30		dy	65	12 5	5	1st sem ester	no
2.	05668 51	ADVANC ED COMBUS TION PROCESS ES	Andrej Senega čnik, Tine Seljak, Tomaž Katraš nik	30		30			65	12 5	5	1st sem ester	no
3.	05668 52	ENERGY CONVERS ION SYSTEMS	Mihael Sekavč nik	30		30			65	12 5	5	1st sem ester	no
4.	05483 92	Professiona l elective course S01		30		30			65	12 5	5	1st sem ester	yes
5.	05483 93	Professiona l elective course S02		30		30			65	12 5	5	1st sem ester	yes
6.	05483 94	General elective course 1		30		30			65	12 5	5	1st sem ester	yes
7.	05668 56	Turbomach inery	Lovre nc Novak , Marko	30		30			65	12 5	5	2nd se mester	no

			Hočev										
			ar										
8.	05668	Processes	Tomaž	30		30			65	12	5	2nd se	no
	57	in heat	Katraš							5		mester	
		engines	nik										
9.	05668	CHEMICA	Andrej	30		30			65	12	5	2nd se	no
	58	L	Senega							5		mester	
		ENERGY	čnik										
		CARRIER											
		S											
1	05484	Professiona		30		30			65	12	5	2nd se	yes
0.	01	l elective								5		mester	
		course S03											
1	05484	Professiona		30		30			65	12	5	2nd se	yes
1.	02	l elective								5		mester	
		course S04											
1	05484	General		30		30			65	12	5	2nd se	yes
2.	03	elective								5		mester	
		course 2											
		Total		360	0	360	0	0	780	15	60		
										00			

The professional elective courses S01, S02, S03 and S04 in the amount of 20 ECTS are selected by the student of his/her own choice from the set of all compulsory courses of other fields of study of the Master's study programme Mechanical Engineering – Research and Development Programme with the exception of the Energy Mechanical Engineering field of study.

The General elective courses 1 and 2 in the amount of 10 ECTS are chosen by the student at his/her own choice from the set of all compulsory courses of other fields of study of the Master's study programme Mechanical Engineering – Research and Development Programme with the exception of the Energy Engineering field of study, or at their own choice at any programme, faculty or university.

Year	2
I Car	_

				Conta	ct hours	3							
	Unive rsity Cours e Code	Course title	Lecture rs	Lect ures	Semi nar	Tuto rials	Clini cal tutor ials	Ot her for ms of stu dy	Indivi dual stude nt work	To tal ho urs	EC TS	Semest ers	Elec tive
1	05668 62	TECHNI CAL ACOUSTI CS	Jurij Prezelj	30		30			65	12 5	5	1st sem ester	no
2	05668 63	Electromo bility	Tomaž Katrašn ik	30		30			65	12 5	5	1st sem ester	no
3.	05668 64	Energy supply in circular economy	Mihael Sekavč nik, Tine Seljak, Tomaž Katrašn ik	30		30			65	12 5	5	1st sem ester	no
4	05668 65	Sustainable sources of	Marko Hočeva r,	30		30			65	12 5	5	1st sem ester	no

		electric	Martin								
		energy	Petkov								
		0,	šek								
5	05484	Profession		30	30		65	12	5	1st sem	ves
	11	al elective		50	50		05	5	5	ester	yes
•	11							5		CSICI	
	05404	Course 505		20	 20		<	10	-		
6	05484	Profession		30	30		65	12	5	1st sem	yes
	12	al elective						5		ester	
		course S06			 						
7	05668	RESEARC	Andrej	90	90		195	37	15	2nd se	no
	26	H IN	Bomba					5		mester	
		MECHAN	č,								
		ICAL	Andrei								
		ENGINE	Kitano								
		ERING	vski								
			Andrei								
			Senema								
			čnik								
			Dorio								
			DOMS								
			Jerman,								
			Božidar								
			Sarler,								
			Damja								
			n								
			Klobča								
			r,								
			Davori								
			n								
			Kramar								
			Drago								
			Bračun								
			Edward								
			Carrela								
			Болека								
			r, Franc								
			Majdıć,								
			Franci								
			Pušave								
			c, Iztok								
			Golobi								
			č, Janez								
			Žerovn								
			ik,								
			Janko								
			Slavič.								
			Jernei								
			Kleme								
			nc								
			Ločke								
			JUSKO Walawi								
			valenti								
			ncić,								
			Joże								
			Kutin,								
			Jurij								
			Prezelj,								
			Lidija								
			Slemeni								
			k								
			Perše .								

			Marko								
			Hočeva								
			r,								
			Marko								
			Nagode								
			, Matija								
			Jezerše								
			k, Miha								
			Bolteža								
			r, Miha								
			Brojan,								
			Mihael								
			Sekavč								
			nik,								
			Mirosla								
			v								
			Halilov								
			ič,								
			Mitjan								
			Kalin,								
			Niko								
			Herako								
			vič,								
			Nikola								
			Vukaši								
			nović,								
			Nikolaj								
			Mole,								
			Primož								
			Podržaj								
			,								
			Robert								
			Kunc,								
			Rok								
			Petkov								
			šek.								
			Rok								
			Vrabič,								
			Roman								
			Šturm,								
			Sašo								
			Medve								
			d,								
			Tomaž								
			Berlec.								
			Tomaž								
			Katrašn								
			ik,								
			Tomaž								
			Pepelni								
			ak,								
			Uroš								
			Stritih								
8	05628	PROJECT	All	15		80	30	12	5	2nd se	no
	03	PRACTIC	course			-		5		mester	-
		UM -	holders								
		MAG	in the								

			progra mme										
9.	05628 04	MASTER THESIS	All course holders in the progra mme		35			70	145	25 0	10	2nd se mester	no
		Total		270	50	270	0	150	760	15 00	60		

The Professional elective courses S05 and S06 in the amount of 10 ECTS are selected by the student of his/her own choice from the set of all compulsory courses of other fields of study of the Master's study programme Mechanical Engineering – Research and Development Programme with the exception of the Energy Engineering field of study.

## Process engineering (field of study)

				Conta	ct hour	S							
	Unive rsity Cours e Code	Course title	Lectur ers	Lect ures	Sem inar	Tuto rials	Clini cal tuto rials	Ot her for ms of stu dy	Indivi dual stude nt work	To tal ho urs	EC TS	Semest ers	Elec tive
1.	05669 13	TRANSPO RT PHENOM ENA	Andre j Kitan ovski, Katja Klinar	30		30			65	12 5	5	1st sem ester	no
2.	05669 14	Thermodyn amics of mixtures	Iztok Golob ič, Matic Može	30		30			65	12 5	5	1st sem ester	no
3.	05669 15	SOLAR UTILITY TECHNOL OGIES	Sašo Medve d	30		30			65	12 5	5	1st sem ester	no
4.	05483 92	Professional elective course S01		30		30			65	12 5	5	1st sem ester	yes
5.	05483 93	Professional elective course S02		30		30			65	12 5	5	1st sem ester	yes
6.	05483 94	General elective course 1		30		30			65	12 5	5	1st sem ester	yes
7.	05669 19	AIR- CONDITI ONING, HEATING, REFRIGER ATION, VENTILAT ION	Uroš Stritih	30		30			65	12 5	5	2nd se mester	no
8.	05669 20	Computatio nal fluid dynamics	Boštja n Mavri č, Božid ar Šarler	30		30			65	12 5	5	2nd se mester	no
9.	05669 21	Refrigeratio n and heat pumps - MAG	Andre j Kitan ovski	30		30			65	12 5	5	2nd se mester	no
1 0.	05484 01	Professional elective course S03		30		30			65	12 5	5	2nd se mester	yes

1	05484	Professional	30		30			65	12	5	2nd se	yes
1.	02	elective							5		mester	
		course S04										
1	05484	General	30		30			65	12	5	2nd se	yes
2.	03	elective							5		mester	
		course 2										
		Total	360	0	360	0	0	780	15	60		
									00			

The professional elective courses S01, S02, S03 and S04 in the amount of 20 ECTS are selected by the student of his/her own choice from the set of all compulsory courses of other fields of study of the Master's study programme Mechanical Engineering – Research and Development Programme with the exception of the Process Engineering field of study.

The General elective courses 1 and 2 in the amount of 10 ECTS are chosen by the student at his/her own choice from the set of all compulsory courses of other fields of study of the Master's study programme Mechanical Engineering – Research and Development Programme with the exception of the Process Engineering field of study, or at their own choice at any programme, faculty or university.

				Conta	ct hours	3							
	Unive rsity Cours e Code	Course title	Lecture rs	Lect ures	Semi nar	Tuto rials	Clini cal tutor ials	Ot her for ms of stu dy	Indivi dual stude nt work	To tal ho urs	EC TS	Semest ers	Elec tive
1	05669 25	Heat exchangers	Andrej Kitano vski, Iztok Golobi č, Jaka Tušek, Jože Kutin	30		30			65	12 5	5	1st sem ester	no
2	05669 26	Process engineerin g	Iztok Golobi č, Matevž Zupanč ič	30		30			65	12 5	5	1st sem ester	no
3.	05669 27	SMART CITIES	Andrej Kitano vski, Sašo Medve d	30		30			65	12 5	5	1st sem ester	no
4	05669 28	Multiphase Systems	Andrej Bomba č, Božidar Šarler	30		30			65	12 5	5	1st sem ester	no
5.	05484 11	Profession al elective course S05		30		30			65	12 5	5	1st sem ester	yes
6	05484 12	Profession al elective course S06		30		30			65	12 5	5	1st sem ester	yes

7	05668	RESEARC	Andrej	90	90		195	37	15	2nd se	no
	26	H IN	Bomba					5		mester	
		MECHAN	č.								
		ICAL	Andrei								
		ENGINE	Kitano								
		FRING	veki								
			Andrei								
			Senega								
			čnik								
			Domin								
			Lormon								
			Jerman, D - ≚: J								
			bozidar								
			Sarler,								
			Damja								
			n IZI I X								
			Klobca								
			r, David ni								
			Davon								
			11 Varana an								
			Diaman								
			, Drago								
			Edward								
			Cavala								
			Govека в Еконо								
			r, Franc								
			Empaire,								
			Dužano								
			r usave								
			Colobi								
			č Japoz								
			Č, Janez								
			1K, Lambo								
			Slavič								
			Slavic,								
			Vlama								
			Kleine								
			lic,								
			JOSKO Walanti								
			valenti								
			Joze								
			Kuun,								
			Jurij Decreti								
			rrezelj,								
			Lidija								
			Siemeni								
			Merler								
			Iviarko								
			noceva								
			r, Marleo								
			Iviarko								
			Matila								
			Lozoržo								
			b Miha								
			Rolteža								
1			Doneza								

			r, Miha Brojan, Mihael Sekavč nik, Mirosla v Halilov ič, Mitjan Kalin, Niko Herako vič, Nikola Vukaši nović, Nikolaj Mole, Primož Podržaj , Robert Kunc, Rok Petkov šek, Rok Vrabič, Robert Kunc, Rok Petkov šek, Rok Vrabič, Roman Šturm, Sašo Medve d, Tomaž Berlec, Tomaž Berlec, Tomaž Katrašn ik, Tomaž Pepelnj ak, Uroš Stritih										
8	05628 03	PROJECT PRACTIC UM - MAG	All course holders in the progra mme		15			80	30	12 5	5	2nd se mester	no
9	05629 09	MASTER THESIS	All course holders in the progra mme		35			70	145	25 0	10	2nd se mester	no
		Total		270	50	270	0	150	760	15 00	60		

The Professional elective courses S05 and S06 in the amount of 10 ECTS are selected by the student of his/her own choice from the set of all compulsory courses of other fields of study of the Master's study programme Mechanical Engineering – Research and Development Programme with the exception of the Process Engineering field of study.

Engineering design (field of study)

				Conta	ct hours	5							
	Unive rsity Cours e Code	Course title	Lectur ers	Lect ures	Semi nar	Tuto rials	Clini cal tutor ials	Ot her for ms of stu dy	Indivi dual stude nt work	To tal ho urs	EC TS	Semest ers	Elec tive
1.	05668 71	Engineerin g design techniques	Leon Kos, Nikola Vukaši nović	30		30			65	12 5	5	1st sem ester	no
2.	05668 72	Surface and contact engineerin g	Mitjan Kalin	30		30			65	12 5	5	1st sem ester	no
3.	05668 73	DESIGN OF ADVANC ED SYSTEMS	Jernej Kleme nc, Marko Nagod e	30		30			65	12 5	5	1st sem ester	no
4.	05483 92	Profession al elective course S01		30		30			65	12 5	5	1st sem ester	yes
5.	05483 93	Profession al elective course S02		30		30			65	12 5	5	1st sem ester	yes
6.	05483 94	General elective course 1		30		30			65	12 5	5	1st sem ester	yes
7.	05668 77	OPERATI ONAL STRENG TH	Dome n Šeruga, Jernej Kleme nc, Marko Nagod e	30		30			65	12 5	5	2nd se mester	no
8.	05668 78	Nanotech nologies	Mitjan Kalin	30		30			65	12 5	5	2nd se mester	no
9.	05668 79	Geometric Product Specificati ons	Robert Kunc, Samo Zupan	30		30			65	12 5	5	2nd se mester	no

1	05484	Profession	30		30			65	12	5	2nd se	yes
0.	01	al elective							5		mester	
		course S03										
1	05484	Profession	30		30			65	12	5	2nd se	yes
1.	02	al elective							5		mester	
		course S04										
1	05484	General	30		30			65	12	5	2nd se	yes
2.	03	elective							5		mester	
		course 2										
		Total	360	0	360	0	0	780	15	60		
									00			

The professional elective courses S01, S02, S03 and S04 in the amount of 20 ECTS are selected by the student of his/her own choice from the set of all compulsory courses of other fields of study of the Master's study programme Mechanical Engineering – Research and Development Programme with the exception of the Engineering design field of study.

The General elective courses 1 and 2 in the amount of 10 ECTS are chosen by the student at his/her own choice from the set of all compulsory courses of other fields of study of the Master's study programme Mechanical Engineering – Research and Development Programme with the exception of the Engineering design field of study, or at their own choice at any programme, faculty or university.

				Conta	ct hour	s							
	Unive rsity Cours e Code	Course title	Lecture rs	Lect ures	Sem inar	Tuto rials	Clini cal tuto rials	Ot her for ms of stu dy	Indivi dual stude nt work	To tal ho urs	EC TS	Semest ers	Elec tive
1.	05668 83	Hydraulic components and systems	Franc Majdič	30		30			65	12 5	5	1st sem ester	no
2	05668 84	COMPLEX POWERTR AINS IN MOBILE MACHINE RY	Jernej Kleme nc, Marko Nagod e, Simon Oman	30		30			65	12 5	5	1st sem ester	no
3.	05668 85	LIGHTWEI GHT STRUCTUR ES	Boris Jerman	30		30			65	12 5	5	1st sem ester	no
4	05668 86	RELIABILI TY EVALUATI ON AND DEMONST RATION	Jernej Kleme nc, Marko Nagod e	30		30			65	12 5	5	1st sem ester	no
5	05484 11	Professional elective course S05		30		30			65	12 5	5	1st sem ester	yes
6	05484 12	Professional elective course S06		30		30			65	12 5	5	1st sem ester	yes
7	05668 26	RESEARCH IN	Andrej Bomba	90		90			195	37 5	15	2nd se mester	no

	1	1		1			
MECHANI	č,						
CAL	Andrei						
CAL	Andrej						
ENGINEE	Kitano						
PINC	malri						
KING	VSKI,						
	Andrej						
	Senem						
	Schega						
	ċnık,						
	Boris						
	DOIIS						
	Jerman						
	, D V 1						
	Bozida						
	r						
	Šanlan						
	Salici,						
	Damja						
	n						
	1/1-1-1-						
	Kiobca						
	r,						
	Davori						
	Lavon						
	n						
	Krama						
	r						
	1, D						
	Drago						
	Bračun						
	Diadan						
	,						
	Edvard						
	Govek						
	GOVER						
	ar,						
	Franc						
	Maidia						
	Majdić,						
	Franci						
	Pušave						
	c, Iztok						
	Golobi						
	č						
	<i>c</i> ,						
	Janez						
	Žerovn						
	il.						
	IK,						
	Janko						
	Slavič						
	Lorra						
	Jernej						
	Kleme						
	nc						
	I_Y1						
	Josko						
	Valenti						
	nčič						
	Joże						
	Kutin.						
	Interio						
	Juiij						
	Prezelj,						
	Lidiia						
	Slame						
	Siemen						
	ik						
	Perše						
	M. 1						
	Iviarko						
	Hočev						
	ar						
	M 1						
	Marko						
	Nagod						

					1						
8.	05628 03	PROJECT PRACTICU M - MAG	e, Matija Jezerše k, Miha Bolteža r, Miha Brojan, Mihael Sekavč nik, Mirosla v Halilov ič, Mitjan Kalin, Niko Herako vič, Nikola Herako vič, Nikola Vukaši nović, Nikola Vukaši Nole, Primož Podrža j, Robert Kunc, Rok Vrabič, Roman Šturm, Sašo Medve d, Tomaž Berlec, Tomaž Katraš nik, Tomaž Pepelnj ak, Uroš Stritih All course holders in the Progra	15		80	30	12 5	5	2nd se mester	no
			in the								
			progra								
0	05/00	MACTER	mme	25		70	1 4 5	25	10	0 1	
9	05628	MASTER	All	35		70	145	25	10	2nd se	no
•	0/	1 HE212	course holders					U		mester	

		in the									
		progra									
		mme									
	Total		270	50	270	0	15	760	15	60	
							0		00		

The Professional elective courses S05 and S06 in the amount of 10 ECTS are selected by the student of his/her own choice from the set of all compulsory courses of other fields of study of the Master's study programme Mechanical Engineering – Research and Development Programme with the exception of the Engineering design field of study.

# Mechanics (field of study)

				Contac	ct hours								
	Unive rsity Cours e Code	Course title	Lectu rers	Lect ures	Semi nar	Tutor ials	Clini cal tutor ials	Ot her for ms of stu dy	Indivi dual stude nt work	Tot al ho urs	EC TS	Semeste rs	Elect
1.	05668 92	Advanc ed strengt h of material s	Miha Broja n	30		30			65	125	5	1st seme ster	no
2.	05668 93	Advanc ed Dynami cs	Greg or Čepo n, Janko Slavič , Miha Bolte žar	30		30			65	125	5	1st seme ster	no
3.	05668 94	Mechan ics of structur al element s	Miros lav Halilo vič	30		30			65	125	5	1st seme ster	no
4.	05483 92	Professi onal elective course S01		30		30			65	125	5	1st seme ster	yes
5.	05483 93	Professi onal elective course S02		30		30			65	125	5	1st seme ster	yes
6.	05483 94	General elective course 1		30		30			65	125	5	1st seme ster	yes
7.	05668 98	FEM structur al analysis	Miros lav Halilo vič, Nikol aj Mole	30		30			65	125	5	2nd sem ester	no
8.	05668 99	Dynami cs of machin es and	Greg or Čepo n,	30		30			65	125	5	2nd sem ester	no

		structur es	Miha Bolte žar										
9.	05669 00	Signal process ing	Janko Slavič	30		30			65	125	5	2nd sem ester	no
1 0.	05484 01	Professi onal elective course S03		30		30			65	125	5	2nd sem ester	yes
1 1.	05484 02	Professi onal elective course S04		30		30			65	125	5	2nd sem ester	yes
1 2.	05484 03	General elective course 2		30		30			65	125	5	2nd sem ester	yes
	-	Total		360	0	360	0	0	780	150 0	60		

The professional elective courses S01, S02, S03 and S04 in the amount of 20 ECTS are selected by the student of his/her own choice from the set of all compulsory courses of other fields of study of the Master's study programme Mechanical Engineering – Research and Development Programme with the exception of the Mechanics field of study.

The General elective courses 1 and 2 in the amount of 10 ECTS are chosen by the student at his/her own choice from the set of all compulsory courses of other fields of study of the Master's study programme Mechanical Engineering – Research and Development Programme with the exception of the Mechanics field of study, or at their own choice at any programme, faculty or university.

				Conta	ct hours	3							
	Unive	Course	Lecture	Lect	Semi	Tuto	Clini	Ot	Indivi	То	EC	Semest	Elec
	rsity	title	rs	ures	nar	rials	cal	her	dual	tal	TS	ers	tive
	Cours						tutor	for	stude	ho			
	e						ials	ms	nt	urs			
	Code							of	work				
								stu					
								dy					
1	05669	Mechanics	Miha	30		30			65	12	5	1st sem	no
	04	of light-	Brojan							5		ester	
		weight											
		structures											
2	05669	Experimen	Gregor	30		30			65	12	5	1st sem	no
	05	tal modal	Ċepon,							5		ester	
		analysis	Janko										
			Slavič										
3	05669	Rheology	Lidija	30		30			65	12	5	1st sem	no
	06	of	Slemeni							5		ester	
		polymers	k Perše										
4	05669	Numerical	Bojan	30		30			65	12	5	1st sem	no
	07	modelling	Starma							5		ester	
		of	n,										
		technologi	Mirosla										
		cal	v										
		processes	Halilov										
			ič,										

			Nikolaj								
_	0 = 10 1		Mole	•	 •	 			_		
5	05484	Protession		30	30		65	12	5	1st sem	yes
•	11	al elective						З		ester	
6	05484	Profession		30	 30		65	12	5	1st sem	VAS
0	12	al elective		50	50		05	5	5	ester	yes
	12	course S06								Cotter	
7	05668	RESEARC	Andrej	90	90		195	37	15	2nd se	no
	26	H IN	Bomba					5		mester	
		MECHAN	č,								
		ICAL	Andrej								
		ENGINE	Kitano								
		EKING	VSK1,								
			Senega								
			čnik.								
			Boris								
			Jerman,								
			Božidar								
			Sarler,								
			Damja								
			II Klobča								
			r.								
			Davori								
			n								
			Kramar								
			, Drago								
			Bracun, Edward								
			Goveka								
			r, Franc								
			Majdič,								
			Franci								
			Pušave								
			c, Iztok								
			č Janez								
			Žerovn								
			ik,								
			Janko								
			Slavič,								
			Jernej								
			Kieme								
			loško								
			Valenti								
			nčič,								
			Jože								
			Kutin,								
			Jurij								
			Lidiia								
			Slemeni								
			k								
			Perše,								
			Marko								

			Hočeva								
			r,								
			Marko								
			Nagode								
			, Matija								
			Jezerse								
			к, Mina Bolteža								
			r Miha								
			Brojan,								
			Mihael								
			Sekavč								
			nik,								
			Mirosla								
			V L Lalilorr								
			Hamov								
			ic, Mitian								
			Kalin,								
			Niko								
			Herako								
			vič,								
			Nikola								
			V UKASI								
			Nikolai								
			Mole,								
			Primož								
			Podržaj								
			, D 1								
			Kobert Varia								
			Kunc, Rok								
			Petkov								
			šek,								
			Rok								
			Vrabič,								
			Roman								
			Sturm,								
			Saso Meduo								
			d.								
			, Tomaž								
			Berlec,								
			Tomaž								
			Katrašn								
			1k, Torreč								
			Tomaz Pepelai								
			ak.								
			Uroš								
			Stritih		 						
8	05628	PROJECT	All	15		80	30	12	5	2nd se	no
•	03	PRACTIC	course					5		mester	
		UM -	holders								
		MAG	in the								
			mme								

9	05628	MASTER	All		35			70	145	25	10	2nd se	no
.	04	THESIS	course							0		mester	
			holders										
			in the										
			progra										
			mme										
		Total		270	50	270	0	150	760	15	60		
										00			

The Professional elective courses S05 and S06 in the amount of 10 ECTS are selected by the student of his/her own choice from the set of all compulsory courses of other fields of study of the Master's study programme Mechanical Engineering – Research and Development Programme with the exception of the Mechanics field of study.

# Production engineering (field of study)

				Conta	ct hours	5							
	Unive rsity Cours e Code	Course title	Lectur ers	Lect ures	Semi nar	Tuto rials	Clini cal tuto rials	Ot her for ms of stu dy	Indivi dual stude nt work	To tal ho urs	EC TS	Semest ers	Elec tive
1.	05668 29	Micromanu facturing technologie s	Joško Valent inčič	30		30		-	65	12 5	5	1st sem ester	no
2.	05668 30	Advanced machining processes	Davor in Kram ar, Franci Pušav ec	30		30			65	12 5	5	1st sem ester	no
3.	05668 31	HEAT TREATME NT	Roma n Šturm, Sebast jan Žagar	30		30			65	12 5	5	1st sem ester	no
4.	05483 92	Professional elective course S01		30		30			65	12 5	5	1st sem ester	yes
5.	05483 93	Professional elective course S02		30		30			65	12 5	5	1st sem ester	yes
6.	05483 94	General elective course 1		30		30			65	12 5	5	1st sem ester	yes
7.	05668 35	ADVANC ED FORMING PROCESS ES	Toma ž Pepel njak	30		30			65	12 5	5	2nd se mester	no
8.	05668 36	Assembly and Handling Systems	Marko Šimic, Mihael Debev ec, Niko Herak ovič	30		30			65	12 5	5	2nd se mester	no
9.	05668 37	PRODUCT ION PLANNIN G AND ORGANIZ ATION	Toma ž Berlec	30		30			65	12 5	5	2nd se mester	no

1	05484	Professional	30		30			65	12	5	2nd se	yes
0.	01	elective							5		mester	
		course S03										
1	05484	Professional	30		30			65	12	5	2nd se	yes
1.	02	elective							5		mester	
		course S04										
1	05484	General	30		30			65	12	5	2nd se	yes
2.	03	elective							5		mester	
		course 2										
		Total	360	0	360	0	0	780	15	60		
									00			

The professional elective courses S01, S02, S03 and S04 in the amount of 20 ECTS are selected by the student of his/her own choice from the set of all compulsory courses of other fields of study of the Master's study programme Mechanical Engineering – Research and Development Programme with the exception of the Production Engineering field of study.

The General elective courses 1 and 2 in the amount of 10 ECTS are chosen by the student at his/her own choice from the set of all compulsory courses of other fields of study of the Master's study programme Mechanical Engineering – Research and Development Programme with the exception of the Production Engineering field of study, or at their own choice at any programme, faculty or university.

				Conta	ct hours	5							
	Unive rsity Cours e Code	Course title	Lecture rs	Lect ures	Semi nar	Tuto rials	Clini cal tuto rials	Ot her for ms of stu dy	Indivi dual stude nt work	To tal ho urs	EC TS	Semest ers	Elec tive
1.	05668 41	QUALITY ENGINEE RING	Davori n Kramar	30		30			65	12 5	5	1st sem ester	no
2	05668 42	CAM systems	Franci Pušave c, Peter Krajnik	30		30			65	12 5	5	1st sem ester	no
3.	05668 43	ADDITIV E TECHNO LOGIES	Damja n Klobča r, Edvard Govek ar	30		30			65	12 5	5	1st sem ester	no
4	05668 44	Smart factories	Marko Šimic, Miha Pipan, Niko Herako vič	30		30			65	12 5	5	1st sem ester	no
5	05484 11	Professiona l elective course S05		30		30			65	12 5	5	1st sem ester	yes
6	05484 12	Professiona l elective course S06		30		30			65	12 5	5	1st sem ester	yes
7	05668 26	RESEARC H IN	Andrej Bomba	90		90			195	37 5	15	2nd se mester	no

	MECHANI	č,					
	CAL	Andrej					
	ENGINEE	Kitano					
	RING	vski,					
		Andrej					
		Senega					
		čnik,					
		Boris					
		Jerman,					
		Božida					
		r Sarler,					
		Damja					
		n					
		Klobća					
		r,					
		Davori					
		11 Kramar					
		Drago					
		Bračun					
		Edvard					
		Govek					
		ar,					
		Franc					
		Majdič,					
		Franci					
		Pušave					
		c, Iztok					
		Golobi					
		c, Janez					
		1K, Lanko					
		Slavič					
		Jernei					
		Kleme					
		nc,					
		Joško					
		Valenti					
		nčič,					
		Jože					
		Kutin,					
		Jurij					
		Prezelj,					
		Lidija					
		Perče					
		Marko					
		Hočeva					
		r,					
		Marko					
		Nagod					
		e,					
		Matija					
		Jezerše					
		k, Miha					
		Bolteża					

			r, Miha Brojan, Mihael Sekavč nik, Mirosla v Halilov ič, Mitjan Kalin, Niko Herako vič, Nikola Vukaši nović, Nikola Vukaši nović, Nikolaj Mole, Primož Podržaj , Robert Kunc, Rok Petkov šek, Rok Vrabič, Roman Šturm, Sašo Medve d, Tomaž Berlec, Tomaž Katraš nik, Tomaž Pepelnj ak, Uroš Strith										
8	05628 24	PROJECT PRACTIC UM - MAG	All course holders in the progra mme		15			80	30	12 5	5	2nd se mester	no
9	05628 04	MASTER THESIS	All course holders in the progra mme		35			70	145	25 0	10	2nd se mester	no
		Total		270	50	270	0	150	760	15 00	60		

The Professional elective courses S05 and S06 in the amount of 10 ECTS are selected by the student of his/her own choice from the set of all compulsory courses of other fields of study of the Master's study programme Mechanical Engineering – Research and Development Programme with the exception of the Production Engineering field of study.

## Mechatronics and laser technology (field of study)

				Conta	ct hour	s							
	Unive rsity Cours e Code	Course title	Lectu rers	Lect ures	Sem inar	Tuto rials	Clini cal tuto rials	Ot her for ms of stu dy	Indivi dual stude nt work	To tal ho urs	EC TS	Semest ers	Elec tive
1	05668 08	MICROPRO CESSOR CONTROL	Domi nik Kozje k	30		30			65	12 5	5	1st sem ester	no
2	05668 09	ROBOTIC SYSTEMS - MAG	Rok Vrabi č	30		30			65	12 5	5	1st sem ester	no
3.	05668 10	ALGORITH MS AND PROTOCO LS	Domi nik Kozje k	30		30			65	12 5	5	1st sem ester	no
4	05483 92	Professional elective course S01		30		30			65	12 5	5	1st sem ester	yes
5	05483 93	Professional elective course S02		30		30			65	12 5	5	1st sem ester	yes
6	05483 94	General elective course 1		30		30			65	12 5	5	1st sem ester	yes
7	05668 14	DISCRETE CONTROL SYSTEMS	Primo ž Podrž aj	30		30			65	12 5	5	2nd se mester	no
8	05668 15	LASER SYSTEMS	Matija Jezerš ek	30		30			65	12 5	5	2nd se mester	no
9	05668 16	PHOTONIC S AND LASER SOURCES	Rok Petko všek, Vid Agrež	30		30			65	12 5	5	2nd se mester	no
1 0	05484 01	Professional elective course S03		30		30			65	12 5	5	2nd se mester	yes
1 1	05484 02	Professional elective course S04		30		30			65	12 5	5	2nd se mester	yes
1 2	05484 03	General elective course 2		30		30			65	12 5	5	2nd se mester	yes
		Total		360	0	360	0	0	780	15 00	60		

The professional elective courses S01, S02, S03 and S04 in the amount of 20 ECTS are selected by the student of his/her own choice from the set of all compulsory courses of other fields of study of the Master's study programme Mechanical Engineering – Research and Development Programme with the exception of the Mechatronics and laser technology field of study.

The General elective courses 1 and 2 in the amount of 10 ECTS are chosen by the student at his/her own choice from the set of all compulsory courses of other fields of study of the Master's study programme Mechanical Engineering – Research and Development Programme with the exception of the Mechatronics and laser technology field of study, or at their own choice at any programme, faculty or university.

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Image: Series of the series					Conta	ct hour	s							
rsity c Code       rsity c Code       rs       ures       inar       rials raik       cal raik       ref rois       dref studie       dral hos rois       rs       rs       res       tive         1       200       MESSUR       Matija       30       20       30       566       5		Unive	Course title	Lecture	Lect	Sem	Tuto	Clini	Ot	Indivi	То	EC	Semest	Elec
Cours c CodeLASER MEASURE MENT SYSTEMSMatia lezeric k30303050501251st sem csterno cster20568 21LASER MENT SYSTEMSMatija lezeric k303050501251st sem csterno cster30568 21ADVANCE PROCESSI NG CGYMatija lezeric k303050501251st sem csterno cster30568 		rsity		rs	ures	inar	rials	cal	her	dual	tal	TS	ers	tive
e Codee CodeLASER MEASURE MEASURE MENTMatija lezerie k3030106512 s501st sem esterno205668 MENCE VSTEMSLASER MENC PROCESST TECHNOL SOGMatija lezerie k303010106512 s501st sem esterno305668 MAUVANCE SUSTEMS NG NG SUSTEMS SUSTEMS SUSTEMS SUSTEMS NETWORK30303010		Cours						tuto	for	stude	ho			
CodeCodeLASERMatija (exerce)303030651251st sem (ester)no22005668LASERMatija (ezerce)303030651251st sem (ester)no221PROCESSIMatija (ezerce)303030651251st sem (ester)no305668ADVANCE (FECHNOL)Pimož (podrža)303030651251st sem (ester)no222DDPodrža (str30303030551st sem (ester)no405668ADVANCE (SSTENS AND NETWORK SDrago (FROCESSI)303030651251st sem (ester)no505484Professional (elective course S0530303030651251st sem (ester)podrža70568RIESEARCH N (CAL RINGAndrej senega riak, Bornia, Jerman, Neterna, rese303030151st sem (ester)podrža70568RIESEARCH N N CAL RINGAndrej senega cink, Bornia, Jerman, Neterna, N903010515152nd se nesterno605484Professional (cAL N N CAL NAndrej senega cink, Andrej Senega cink, Bornia, Jerman, Bornia,30 <t< td=""><td></td><td>e</td><td></td><td></td><td></td><td></td><td></td><td>rials</td><td>ms</td><td>nt</td><td>urs</td><td></td><td></td><td></td></t<>		e						rials	ms	nt	urs			
Image: Normal StateImage: Normal		Code							of	work				
III									stu					
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The Professional elective courses S05 and S06 in the amount of 10 ECTS are selected by the student of his/her own choice from the set of all compulsory courses of other fields of study of the Master's study programme Mechanical Engineering – Research and Development Programme with the exception of the Mechatronics and laser technology field of study.