



**Presentation of the study programme**  
2<sup>nd</sup> cycle master study programme  
**BUILDINGS (MA)**

Valid from study year 2021/2022 | Valid study programme from 20/01/2021

University of Ljubljana, Faculty of Civil and Geodetic Engineering

## INFORMATION ABOUT THE STUDY PROGRAMME

### 1. Basic data

Programme name	Buildings
Programme characteristics	
Type	master
Cycle	second cycle
KLASIUS-SRV	Master higher education (second cycle Bologna)/Master higher education (second cycle Bologna) (17003)
ISCED	<ul style="list-style-type: none"> <li>architecture, urbanism and civil engineering (58)</li> </ul>
KLASIUS-P	<ul style="list-style-type: none"> <li>building and civil engineering (broad programmes) (5820)</li> </ul>
KLASIUS-P-16	<ul style="list-style-type: none"> <li>architecture, spatial planning and urbanism (0731)</li> </ul>
Frascati	<ul style="list-style-type: none"> <li>Technical sciences (2)</li> </ul>
Level SOK	Level SOK 8
Level EOK	Level EOK 7
Level EOVK	second cycle
Areas/modules/orientations	<ul style="list-style-type: none"> <li>No subdivision (study programme)</li> </ul>
Member of University of Ljubljana	<ul style="list-style-type: none"> <li>Faculty of Civil and Geodetic Engineering, Jamova 2, 1000 Ljubljana, Slovenia</li> </ul>
Duration (years)	2
Number of ECTS per year	60
Implementation of study	full-time, part-time

### 2. Basic goals of the programme

The primary goal of the 2<sup>nd</sup> cycle master study programme Buildings is a new designer and planner profile of living and working environment, who will be capable of independent design and execution of simple and less demanding constructions and will be able to cooperate in the design and execution of demanding constructions according to the relevant legislation of Republic of Slovenia and EU (organically connected planning + execution + removal). The goal of the new designer and planner profile of living and working environment activity is:

- improved built environment quality,
- improved functioning of this environment with the aim to reduce adverse impacts on the environment,
- orientation into the design of such buildings that take into account the principles of sustainable development by creative and responsible behaviour with healthy built environment based on efficient use of sources and ecological principles,
- acquisition of knowledge, technical skills and innovative abilities to raise the quality of projects for planning, execution, distribution, use and removal and for the assessment of physical feasibility, economic justification and financial possibilities,
- realisation of the most important skills for civil engineers according to the opinion from practice:
  1. Ability to use knowledge in practice.
  2. Ability to adapt to new situations.
  3. Decision-making.
  4. Basic mastering of the relevant field of science.
  5. Ability to create new ideas.
  6. Basic knowledge from the area of civil engineering.
- creating a study environment that will allow rational and efficient transfer of knowledge among individual universities and between university and civil engineering practice,
- organisation of the study in the way that follows the requirements of the Bologna two-tier system.

Several years ago it has become clear that there exists a considerable gap between the civil engineering education process and the practice, which can no longer be bridged by the existing study programmes. From the first energy crisis in the 1970's until today the structure of constructional complexes has changed more than in the whole history of built environment before that. After more than thirty years most players in the area of architecture and civil engineering are still not aware of that. The principle of learning on tested ("traditional") recipes by heart can simply no longer follow the technological development on the level of materials, or on the level of information technologies

that have quickly been making their way into built environment. In a large part of civil engineering – and this is the target area of the study programme Buildings – investments are spread to smaller projects, where instead of synergetic actions there appear to be constant conflicts, mainly due to lack of knowledge of all players, i.e. investors, designers and contractors, including the administrative services. Successful projects within large systems, e.g. the highway program, are exception, because the investors have (must have!) a good organisation and knowledge for managing relatively standard projects.

### 3. General competences (learning outcomes)

General competences acquired by the graduate of the master's study programme Buildings are:

- mastering of basic knowledge from the areas of mathematics and physics, mechanics, methodology of engineering design,
- ability to use foreign expert language in written and spoken communication (beside literature reading) is developed by offering lectures of foreign visiting professors, field trips abroad, work on projects related to foreign partners. Unfortunately, the legislation does not allow larger scope of teaching activities/courses in English,
- knowledge and understanding of these areas related to adequate engineering knowledge.

Engineering analysis:

- ability to solve problems by considering impacts from complementary areas according to the students' level of knowledge and understanding,
- ability to identify problems and their structure, ability to consider various methods and their selection,
- ability to use and select the available instruments at the theoretical level, use of computer software and experiments,
- ability to identify cultural, ecological and economical frameworks related to health, social and safety issues.

Engineering design:

- ability of independent implementation of project design and project for the protection of construction and load-carrying structures,
- ability to cooperate with engineers and other professionals,
- ability to solve problems in accordance with the methodology of engineering design,
- ability to connect research and development results of the related areas of architecture, machinery and electrotechnics with the design and implementation of buildings and their use.

Studies and evaluations:

- ability to use adequate methods for learning, design, calculation, analysis and processing as well as presentation of data such as literature use, planning and implementation of study projects and investigations, interpretation of data and computer simulations,
- ability to follow legislation,
- ability to follow the development of technical regulations and standards,

Engineering practice:

- readiness to cooperate in the transfer of theoretical knowledge into construction designs on the level of execution, their physical feasibility, economic value and financial feasibility,
- development of social competences including mainly the area of communications is the aim and integral part of the study programme, while their assurance and assessment are not.

### 4. Course-related competences (learning outcomes)

With the master's study programme Buildings, the graduate acquires mainly the following subject-specific competences:

Knowledge and understanding:

- students master the basic knowledge in the areas of mathematics and physics,
- they master specific knowledge in the areas represented by specific basics for the field of civil engineering, building materials, building physics, building mechanics, system analysis, building- architectural informatics,
- mastering of professional areas covering the design, execution, maintenance and removal of buildings: design of living and working space, load-bearing structure, envelope structures, project management and the related information-communication technologies,
- ability to use basic, specific and expert knowledge to solve engineering problems of demanding buildings in the areas of building physics, efficient energy use, acoustics and noise as well as fire protection,
- ability to use and select analytical methods and tools from the area of building physics,
- ability to carry out critical, comparative analysis of problems emerging at design, execution and use of load-bearing and envelope structures of buildings,
- ability to use and understand relevant and current scientific bases from the area of civil engineering, at the national as well as international level,
- ability to follow the development of new procedures, materials and technologies in the area of civil engineering and at other complementary areas,
- understanding the necessity to follow the development and to be informed about national and international research achievements in the areas of building physics, providing quality living environment, efficient energy use and renewable energy sources,
- ability to use basic, specific and expert knowledge to solve engineering problems of demanding buildings in the area of building physics, efficient energy use, acoustics and noise as well as fire protection,
- ability to use and select special analytical methods and tools from the area of building physics,
- ability to perform critical comparative analysis of problems appearing in the design, implementation and use as well as mutual impact of load-carrying and protective structures of buildings, installations and control systems.

#### Engineering analysis:

- ability to analyse component elements of buildings: load-bearing structure, thermal, hydro, sound, psychophysical and fire protection on the level of the building and to upgrade it mainly within dynamic systems,
- ability to conceptualise problems and to select and use adequate methodological and program tools for their solving,
- ability to solve problems of protective and control systems in buildings according to the methodology of engineering design,
- ability to cooperate in the development of methods for the analysis of energy efficiency, acoustics and noise control, quality of living environment and control systems,
- ability of independent and critical study of current scientific-research achievements and their transfer to solving specific engineering issues from the area of building physics,
- ability to transfer knowledge to co-workers.

#### Engineering design:

- ability of independent elaboration of designs according to the competences of the Construction Act,
- ability to manage development,
- ability to use methods for the conceptual design on the level of protective structures,
- ability to connect with other professional areas, mainly to those dealing with architecture, installations and control systems and design of their implementation.

#### Studies and evaluations:

- ability to join in the manufacturing-consumer socio-ecological circle by using methodological instruments (system analysis) acquired in the area of engineering analysis and engineering design,
- knowledge about the basic research methods,
- ability of complete identification of problem areas by considering sustainable, environment-friendly, ecological and economical aspects,
- ability to find adequate sources in current professional and scientific publications,
- knowledge about the philosophy of engineering design,

Engineering practice:

- student acquires overview and some experience about the processes/projects within the design in an engineering firm and field work,
- acquires the ability to use different methods for decision making process,
- knows important scientific treaties from the area of building physics,
- has skills and knowledge for independent organisation, management and evaluation.

Social competences:

- skills to manage groups consisting of members from different areas and qualifications related to design, construction and management of buildings in practice,
- ability to take over responsibility to lead and manage projects.

## 5. Conditions for enrolment

The second cycle master study programme Buildings is available to the following candidates:

- 1<sup>st</sup> cycle study programme from the area of buildings.
- 1<sup>st</sup> cycle study programme from other expert areas, if before the enrolment the candidate completes other study obligations which are essential for the continuation of the study, totalling 10-60 ECTS; these obligations shall be defined according to the nature of expert area, and the candidates may complete them during the first cycle study, in programmes for additional education and by passing exams before the enrolment to the master study.
- Higher education professional study programme of civil engineering before the introduction of the Bologna programmes.
- Higher education expert study programme according to the old study programme of other expert areas or; before the enrolment the candidate completes study obligations which are essential for the continuation of the study, totalling 10-60 ECTS, and the candidates may complete them during the first cycle study, in programmes for additional education and by passing exams before the enrolment to the master study.

Obligations of individual transfer programme are defined by the Study Board of the Department of Civil Engineering of UL FGG according to the missing knowledge that the candidate did not acquire within prior education. The same is also valid for the enrolment from other higher education institutions in Slovenia, EU and elsewhere.

## 6. Selection criteria when enrolment is restricted

In case of restricted enrolment the following conditions shall be considered: grade obtained in the 1<sup>st</sup> cycle study.

## 7. Criteria for recognising knowledge and skills acquired before enrolment in the programme

The student can be acknowledged the knowledge that matches the contents and scope of the study in master's study programme Buildings. The Study Board of the Department of Civil Engineering UL FGG takes decisions regarding the acknowledgement of knowledge and skills acquired before the enrolment, based on the student's written application, the enclosed certificates and other documents evidencing the successfully acquired knowledge and contents of this knowledge, and in accordance with the Rules on the procedure and criteria for the acknowledgement of informally acquired knowledge and skills, adopted on 29 May, 2007, at the 15<sup>th</sup> meeting of the Senate of UL.

For the acknowledgement of knowledge and skills the following shall be considered:

- certificates and other documents evidencing finished courses and other forms of education,
- evaluation of finished products, services, publications and other original works of the student,
- evaluation of knowledge acquired by the student based on self-education or learning from experiences (possibility of completing study obligations without participation at lectures, practical work, seminars).

Shall the Study Board of the Department of Civil Engineering UL FGG establish that the acquired knowledge may be acknowledged, this shall be evaluated with the same number of points according to ECTS as the number of points in the subject.

## 8. Methods of assessment

The assessment methods are in accordance with the [Statute of University of Ljubljana](#) and listed in the Course Syllabi.

## 9. Conditions for progression through the programme

The student may enrol to subsequent year, if they complete by the end of the study year all the obligations foreseen by the study plan, amounting to at least 45 ECTS.

Exceptionally students may enrol to subsequent year with at least 40 ECTS points collected if they have completed the mandatory contents in accordance with the study programme and they have justifiable reasons as defined by the UL Statute. The Study Board of the Department of Civil Engineering of UL FGG adopts the decisions about the enrolment as defined in this paragraph.

Failing to meet all the obligations defined by the study program for the advancement in the subsequent year, students may enrol in the first year for the second time, provided that they have obtained at least 30 credit points according to ECTS.

## 10. Transfers between study programmes

Transfer between programmes shall mean termination of education in the student's original study programme (first programme) and continuation of education in the 2<sup>nd</sup> cycle master study programme of Buildings (second programme), in which a part of the completed study requirements from the first study programme are recognised as completed.

Transfers are possible from the second cycle study programmes, and until their expiration also from the undergraduate academic study programmes adopted before June 11 2004, where the competences of the finished studies are comparable and according to the acknowledgement criteria at least half of the obligations according to ECTS from the first study programme related to compulsory courses of the second study programme can be acknowledged. Considering the scope of acknowledged obligations from the first study programme in the Republic of Slovenia or abroad student may enrol to the same or higher year in the second study programme. Transferring students shall fulfil the conditions for the enrolment to the second study programme.

Applications of candidates for the transfer to the 2<sup>nd</sup> cycle master study programme Buildings and the scope of acknowledged obligations in the study programme will be examined individually by the Study Board of the Department of Civil Engineering UL FGG. If in the procedure of acknowledging obligations for the purpose of transfer the candidate is approved at least the amount of credit points and those point that are required for the enrolment to the second year of the 2<sup>nd</sup> cycle master study programme Buildings, the candidate may enrol to the second year of the 2<sup>nd</sup> cycle master study programme Buildings.

## 11. Conditions for completion of the study

Students finish the study by accomplishing the foreseen obligations totalling 180 credit points according to ECTS.

## 12. Conditions for completion of individual parts of the programme

The Study is uniform.

## 13. Qualification, professional or academic title (male)

Magister inženir stavbarstva (second cycle graduate in buildings).

## 14. Qualification, professional or academic title (female)

Magistrica inženirka stavbarstva (second cycle graduate in buildings).

## 15. Qualification, professional or academic title (abbreviation)

mag. inž. stavb.

## SYLLABUS OF STUDY PROGRAMME WITH FORESEEN COURSE COORDINATORS

### 16. No subdivision (study programme)

#### 1<sup>st</sup> year, mandatory

	Code	Course title	Lecturers	Contact hours					Independent work	Total hours	ECTS	Semester	Elective
				Lectures	Seminar	Tutorials	Clinical tutorials	Other study forms					
1.	1737	Differential Equations and Geometry	Ganna Kudryavtseva	60	0	0	30	0	90	180	6	Winter	no
2.	1259	Daylight	Mitja Košir	30	0	0	60	0	90	180	6	Winter	no
3.	1776	Design of Building Structures I	Boštjan Pulko, Matjaž Dolšek, Sebastjan Bratina	50	0	50	50	0	150	300	10	Winter	no
4.	1470	Fire	Tomaž Hozjan	30	0	0	60	0	90	180	6	Winter	no
5.	1262	Practical Training	Andreja Istenič Starčič	6	0	0	0	80	34	120	4	Winter	no
6.	1777	Design of Building Structures II	Drago Saje, Primož Može	30	0	30	30	0	90	180	6	Summer	no
7.	1258	Structural Building Physics	Zvonko Jagličič	60	0	60	60	0	180	360	12	Summer	no
8.	1260	Building Information Modelling	Tomo Cerovšek	30	0	0	30	0	60	120	4	Summer	no
9.	1574	Elective course		45	0	45	0	0	90	180	6	Summer	yes
		Total		341	0	185	320	80	874	1800	60		

**2<sup>nd</sup> year, mandatory**

	Code	Course title	Lecturers	Contact hours					Independent work	Total hours	ECTS	Semester	Elective
				Lectures	Seminar	Tutorials	Clinical tutorials	Other study forms					
1.	1469	Advanced Materials	Mateja Dovjak	30	0	0	60	0	90	180	6	Summer	no
2.	1471	Efficient Energy Use	Mitja Košir	45	0	0	90	0	135	270	9	Winter	no
3.	1345	Living Environment	Mateja Dovjak	45	0	0	90	0	135	270	9	Winter	no
4.	1574	Elective course		45	0	45	0	0	90	180	6	Winter	yes
5.	1346	Automatic Management of Systems	Igor Škrjanc, Vito Logar	45	0	0	45	0	90	180	6	Winter	no
6.	1760	Building Sustainability Assessment	Mitja Košir	30	0	0	30	0	60	120	4	Summer	no
7.	1347	Smart House	Mitja Košir	30	0	0	30	0	60	120	4	Summer	no
8.	1761	Master Seminar	Mateja Dovjak	0	30	0	0	60	90	180	6	Summer	no
9.	1348	Master Thesis		0	0	0	0	150	150	300	10	Summer	no
		Total		270	30	45	345	210	900	1800	60		



**Elective courses**

	Code	Course title	Lecturers	Contact hours					Independent work	Total hours	ECTS	Semester	Elective
				Lectures	Seminar	Tutorials	Clinical tutorials	Other study forms					
1.	1263	Technology of Installations	Uroš Stritih	30	0	30	30	0	90	180	6	Summer, Winter	yes
2.	1738	Information and Communication Technologies in Built Environment	Žiga Turk	45	0	45	0	0	90	180	6	Summer, Winter	yes
3.	1256	Physical Education	Branko Škof	5	0	40	0	0	45	90	3	Summer, Winter	yes
4.	1778	Closing Material Cycles in Buildings and Agglomerations	Nataša Atanasova	30	15	0	45	0	90	180	6	Summer, Winter	yes
Total				110	15	115	75	0	315	630	21		

## **17. Possibilities of elective courses and mobility**

The master study programme Buildings foresees elective courses: in the 2<sup>nd</sup> semester of the 1<sup>st</sup> year, UL FGG and other (6 ECTS), in the 1<sup>st</sup> semester of the 2<sup>nd</sup> year, UL FGG and other (6 ECTS). External elective courses are foreseen in the 1<sup>st</sup> semester of the 2<sup>nd</sup> year (6 ECTS). Beside other courses the study programme also proposes two elective courses from this field of science. Among elective courses from other members of UL, students are recommended to select mainly contents from the areas of architecture, mechanical engineering and electrotechnical engineering (control systems). Students can freely select contents, subject to the approval of the Study Board of the Department of Civil Engineering of UL FGG.