

University *of Ljubljana*
Faculty *of Computer and Information Science*
Faculty *of Electrical Engineering*



**SECOND-CYCLE INTERDISCIPLINARY MASTER'S STUDY
PROGRAMME
MULTIMEDIA**

HANDBOOK

for students enrolled for the first time in the first year in the 2019/2020 academic year

Ljubljana, 2019

INFORMATION ABOUT THE MULTIMEDIA STUDY PROGRAMME

Main objectives of the programme

To offer the technical and non-technical aspects of the field of multimedia and their mutual synergy, specifically:

- provide systemic knowledge in the fields of telecommunications and computer science,
- train students to analyse problems, search relevant sources and critically assess information obtained,
- train students to plan and implement multimedia solutions, both in technical and user aspects,
- provide knowledge in the area of software development,
- provide knowledge in the areas of analysing, discovering and visualising data and information,
- provide knowledge in the area of analysing and processing multimedia content,
- train students for teamwork with experts in technical and non-technical fields, including the capacity for active communication in written or verbal form.

General competences

- ability to define, understand and creatively address problems in the broader field of multimedia,
- ability to think critically on the basis of analysis and synthesis,
- systemic knowledge, ability to undertake research and planning,
- show professional, environmental and social responsibility,
- ability to engage in active technical communication in written and oral form,
- ability to make optimal use of information and communication technologies and develop them,
- ability to autonomously keep abreast of the latest achievements and acquire new knowledge,
- ability to search sources, critically assess information and communicate knowledge,
- capacity for teamwork with experts in technical and non-technical fields.

Subject-specific competences

- master basic and specialised knowledge in the field of telecommunications and information systems,
- ability to generate technical plans and implement multimedia systems and services,
- ability to plan and implement multimedia systems from the user standpoint, including user experience,
- familiarisation with modern methods of software development in multimedia systems,
- familiarisation with the basic properties of designing information and visual communication,
- ability to understand data and extract knowledge from data,
- ability to analyse various types of multimedia content,
- ability to acquire knowledge from complementary technical fields and the business sector and understand it.

Admission requirements

Enrolment in the master's programme is open to candidates who have:

- a) completed a first-cycle or post-secondary professional study programme, adopted under the legal provisions in force prior to 11 June 2004, in the specialist fields of multimedia, computer science or information technology, electrical engineering or studies in other fields of natural science and

technology (mathematics, physics, chemistry and chemical technology, mechanical engineering, civil engineering),

b) completed a first-cycle programme in the field or post-secondary professional study programme, adopted under the legal provisions in force prior to 11 June 2004, not covered under point a) and who prior to enrolment have passed the following examinations from the first-cycle Multimedia programme: Programming 1, Programming 2, Introduction to Multimedia Systems and Communication Systems, or who during their first-cycle studies mastered the material covered in the stated courses, regarding which the Committee for Study Affairs of FRI and the Study Committee of FE will decide,

c) completed education equivalent to that set out in points a) and b) abroad.

Selection criteria for limited enrolment

In the event of a decision limiting enrolment, candidates will be selected depending on:

- first-cycle studies GPA (20% of points),
- selection exam results (80% of points).

The selection exam will cover the fields of mathematics, programming, algorithms, communication systems, internet protocols and the properties of multimedia content, and will be held in the first half of September, after the deadline to register for the study programme.

Criteria for recognising knowledge and skills acquired prior to enrolment

Knowledge which is suitable in content and scope to the educational content of courses in the second-cycle master's study programme in Multimedia can be recognised in the education process. Recognition of knowledge and skills acquired prior to enrolment is decided upon by the Committee for Study Affairs of FRI and the Study Committee of FE, on the basis of a written application from the student, enclosing certificates and other documents demonstrating successfully acquired knowledge and the substance of such knowledge, and in accordance with the Rules on the procedure and criteria for recognising non-formally acquired knowledge and skills, adopted by the UL Senate on 29 May 2007.

Assessment methods

The methods of assessment comply with the [UL Statutes](#) and are set out in the curriculums.

Requirements for progression through the course

In order to enrol in the second year, students must have completed first-year course units in the amount of 54 ECTS credits.

In accordance with Article 153 of the Statutes of the University of Ljubljana, in exceptions students may enrol in the next year even if they have not completed all the requirements for progress, if they have justified reasons for so doing, such as: maternity, lengthy illness, exceptional family and welfare circumstances, recognised status of person with special needs, active participation in top-level professional, cultural and sports events and active participation in university bodies. Possible exceptional enrolment based on a student's application is decided on by the FRI Committee for Study Affairs.

For repeat enrolment in the same year students must have completed at least half the programme requirements of that year (i.e. 30 credits).

Students may in exceptions repeat a year even if they have not completed all the requirements for repeating, if they have justified reasons for so doing as set out in Article 153 of the Statutes of the University of Ljubljana, such as: maternity, lengthy illness, exceptional family and welfare circumstances, recognised status of person with special needs, active participation in top-level professional, cultural and sports events and active participation in university bodies. Possible exceptional repeat enrolment based on a student's application is decided on by the FRI Committee for Study Affairs.

Requirements for transferring between programmes

In accordance with Article 6 of the Criteria for Transferring between Programmes, it is possible to transfer between study programmes that: (1) upon completion of studies ensure the acquisition of comparable competences and (2) for which it is possible to recognise at least half the course units under the European Credit Transfer System (ECTS) from the first study programme relating to compulsory subjects of the second study programme. The conditions for transfer to the second-cycle interdisciplinary master's study programme in Multimedia from other programmes (master's programmes) are as follows:

- conditions fulfilled for enrolment in the second-cycle interdisciplinary master's study programme in Multimedia,
- conditions fulfilled for enrolment in the second year of the study specialisation in which the student is currently enrolled, with the added condition that they have completed the requirements in all mandatory courses of the first year or equivalent courses at other higher education institutions whose appropriateness is assessed by the Committee for Study Affairs of FRI and the Study Committee of FE.

Students can be granted consent for parallel enrolment in another study programme on the basis of an individual application and their study performance.

Requirements for completing the study programme

To complete the study programme, students must complete all prescribed course units, for a total of 120 credits, including their master's thesis.

Requirements for completing individual parts of the programme if the programme contains them

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Professional or academic title (male)

- magister inženir multimedije

Professional or academic title (female)

- magistrica inženirka multimedije.

Professional or academic title (abbreviated)

- mag. inž. mm.

CURRICULUM OF THE STUDY PROGRAMME WITH EXPECTED SUBJECT LECTURERS

No specified direction (Study programme)

YEAR 1

No.	Course code	Study unit	Lecturer	Contact hours					Individ. work	Total	ECTS	Semester	Elective
				Lectures	Seminar	Tutorial	Laboratory work	Field work					
1.	64M21	Transmission of Multimedia Signals	Anton Umek	45		30			105	180	6	Fall	No
2.	64M22	User-adapted Communication	Andrej Košir	45		30			105	180	6	Fall	No
3.	63527	Interaction and Information Design	Franc Solina	45	20	10			105	180	6	Fall	No
4.	6301	Specialist elective course FRI 1		45		30			105	180	6	Fall	No
5.	6401	Specialist elective course FE 1		45		30			105	180	6	Fall	Yes
6.	64M23	Multimedia Content Transfer	Anton Kos	45		30			105	180	6	Spring	No
7.	63551	Web Information	Marko Bajec	45	10	20			105	180	6	Spring	No

		Extraction and Retrieval											
8.	63515	Advanced Software Development Methods	Damjan Vavpotič	45	10	20			105	180	6	Spring	No
9.	6302	Specialist elective course FRI 2		45		30			105	180	6	Spring	Yes
10.	6402	Specialist elective course FE 2		45		30			105	180	6	Spring	Yes
Total				450	40	260	0	0	1050	1800	60		

Year 1, Specialist elective course FRI 1 (students choose 1 out of 3 offered)

No.	Course code	Study unit	Lecturer	Contact hours					Individ. work	Total	ECTS	Semester	Elective
				Lectures	Seminar	Tutorial	Laboratory work	Field work					
1.	63251	Introduction to Data Mining	Blaž Zupan	45	20	10			105	180	6	Fall	Yes
2.	63521	Information Security and Privacy	Denis Trček	45		30			105	180	6	Fall	Yes
3.	63559	Digital Marketing	Vesna Žabkar	45		30			105	180	6	Fall	Yes
Total				135	20	70	0	0	315	540	18		

Year 1, Specialist elective course FE 1 (students choose 1 out of 2 offered)

				Contact hours									
No.	Course code	Study unit	Lecturer	Lectures	Seminar	Tutorial	Laboratory work	Field work	Individ. work	Total	ECTS	Semester	Elective
1.	64M24	Sensor Systems and Multimedia	Sara Stančin	45		30			75	150	6	Fall	Yes
2.	64M25	Visual Communication Design	Boštjan Botas Kenda	45		30			105	180	6	Fall	Yes
Total				90	0	60	0	0	180	330	12		

Year 1 Specialist elective course FRI 2 (students choose 1 out of 2 offered)

				Contact hours									
No.	Course code	Study unit	Lecturer	Lectures	Seminar	Tutorial	Laboratory work	Field work	Individ. work	Total	ECTS	Semester	Elective
1.	63522	Numerical Mathematics	Bojan Orel	45		30			105	180	6	Fall, Spring	Yes
2.	63525	Data mining	Blaž Zupan	45	20	10			105	180	6	Spring	Yes
Total				90	20	40	0	0	210	360	12		

Year 1, Specialist elective course FE 2 (students choose 1 out of 2 offered)

				Contact hours									
No.	Course code	Study unit	Lecturer	Lectures	Seminar	Tutorial	Laboratory work	Field work	Individ. work	Total	ECTS	Semester	Elective
1.	64M26	Ambient Intelligence	Matej Zajc	45		30			105	180	6	Spring	Yes

2.	64M27	Multimedia Content Processing	Marko Meža, Urban Burnik	45		30			75	150	6	Spring	Yes
Total				90	0	60	0	0	180	330	12		

YEAR 2

				Contact hours									
No.	Course code	Study unit	Lecturer	Lectures	Seminar	Tutorial	Laboratory work	Field work	Individ. work	Total	ECTS	Semester	Elective
1.	6403	Module FE - course 1 (student selects Module FE A or Module FE B)		45		30			105	180	6	Fall	Yes
2.	6404	Module FE - course 2 (student selects Module FE A or Module FE B)		45		30			105	180	6	Fall	Yes
3.	6303	Thematic set FRI – course 1 (student selects a course from the same Thematic set FRI A/B/C/D)		45		30			105	180	6	Fall	Yes
4.	6304	Thematic set FRI – course 2		45		30			105	180	6	Fall	Yes

		(student selects a course from the same Thematic set FRI A/B/C/D)											
5.	0008	General elective course		45		30			105	180	6	Fall	Yes
6.	0002	General elective course		45		30			105	180	6	Spring	Yes
7.	6305	Master's thesis							720	720	24	Fall, Spring	No
Total				270	0	180	0	0	1350	1800	60		

Year 2, Module FE A User-oriented (Students choose 2 courses from one of the 2 modules offered)

				Contact hours									
No.	Course code	Study unit	Lecturer	Lectures	Seminar	Tutorial	Laboratory work	Field work	Individ. work	Total	ECTS	Semester	Elective
1.	64M28	Multimedia Terminals	Marko Meža, Matej Zajc	45		30			105	180	6	Fall	Yes
2.	64M29	User Experience and User Interfaces Design	Matevž Pogačnik	45		30			105	180	6	Fall	Yes
Skupno				90	0	60	0	0	210	360	12		

Year 2, Module FE B System-oriented (Students choose 2 courses from one of the 2 modules offered)

				Contact hours									
No.	Course code	Study unit	Lecturer	Lectures	Seminar	Tutorial	Laboratory work	Field work	Individ. work	Total	ECTS	Semester	Elective
1.	64M30	3D Sound in Multimedia	Jaka Sodnik	45		30			105	180	6	Fall	Yes
2.	64M31	Embedded Systems in Multimedia	Iztok Fajfar	45		30			105	180	6	Fall	Yes
		Skupno		90	0	60	0	0	210	360	12		

Year 2, Thematic set FRI A Designing Multimedia Services (students choose 2 courses from the set offered; precondition: selection of Module FE A)

				Contact hours									
No.	Course code	Study unit	Lecturer	Lectures	Seminar	Tutorial	Laboratory work	Field work	Individ. work	Total	ECTS	Semester	Elective
1.	63550	Human-Computer Interaction	Franc Jager	45		30			105	180	6	Fall	Yes
2.	63507	Functional Programming	Zoran Bosnić	45	10	20			105	180	6	Fall	Yes
3.	63522	Numerical Mathematics	Bojan Orel	45		30			105	180	6	Fall, Spring	Yes
4.	63541	Cloud Computing	Branko Matjaž Jurič	45	20	10			105	180	6	Fall	Yes
		Total		180	30	90	0	0	420	720	24		

Year 2, Thematic set FRI B Users and User Experiences (students choose 2 courses from the set offered; precondition: selection of Module FE A)

No.	Course code	Study unit	Lecturer	Contact hours					Individ. work	Total	ECTS	Semester	Elective
				Lectures	Seminar	Tutorial	Laboratory work	Field work					
1.	63550	Human-Computer Interaction	Franc Jager	45		30			105	180	6	Fall	Yes
2.	63521	Information Security and Privacy	Denis Trček	45		30			105	180	6	Fall	Yes
3.	63555	Natural Language Processing	Marko Robnik Šikonja	45	10	20			105	180	6	Fall	Yes
4.	63554	Image Based Biometry	Peter Peer	45	10	20			105	180	6	Fall	Yes
Total				180	20	100	0	0	420	720	24		

Year 2, Thematic set FRI C Processing and Analysing Multimedia Content (students choose 2 courses from the set offered; precondition: selection of Module FE B)

No.	Course code	Study unit	Lecturer	Contact hours					Individ. work	Total	ECTS	Semester	Elective
				Lectures	Seminar	Tutorial	Laboratory work	Field work					
1.	63523	Computer Based Sound Production	Denis Trček	45		30			105	180	6	Fall	Yes

2.	63552	Advanced Topics in Computer Vision	Matej Kristan	45	10	20			105	180	6	Spring	Yes
3.	63553	Advanced Computer Graphics	Matija Marolt	45		30			105	180	6	Fall	Yes
4.	63554	Image Based Biometry	Peter Peer	45	10	20			105	180	6	Fall	Yes
Total				180	20	100	0	0	420	720	24		

Year 2, Thematic set FRI D Multimedia Systems Engineer (students choose 2 courses from the set offered; precondition: selection of Module FE B)

No.	Course code	Study unit	Lecturer	Contact hours					Individ. work	Total	ECTS	Semester	Elective
				Lectures	Seminar	Tutorial	Laboratory work	Field work					
1.	63541	Cloud Computing	Branko Matjaž Jurič	45	20	10			105	180	6	Fall	Yes
2.	63511	Wireless Sensor Networks	Nikolaj Zimic	45	10	20			105	180	6	Spring	Yes
3.	63528	Cryptography and Computer Security	Aleksandar Jurišić	45	10	20			105	180	6	Fall, Spring	Yes
4.	63521	Information Security and Privacy	Denis Trček	45		30			105	180	6	Fall	Yes

	Total	180	40	80	0	0	420	720	24	
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Year 2, General elective courses

				Contact hours									
No.	Course code	Study unit	Lecturer	Lectures	Seminar	Tutorial	Laboratory work	Field work	Individ. work	Total	ECTS	Semester	Elective
1.	63534	Computer Science and Society I	Gašper Fijavž	5				40	45	90	3	Fall, Spring	Yes
2.	63535	Computer Science and Society II	Gašper Fijavž	5				40	45	90	3	Fall, Spring	Yes
3.	64318	Interdisciplinary projects	Andrej Kos, Boštjan Likar, Damijan Miklavčič, Matevž Pogačnik	30		60			90	180	6	Fall, Spring	Yes
		Total		40	0	60	0	80	180	360	12		

