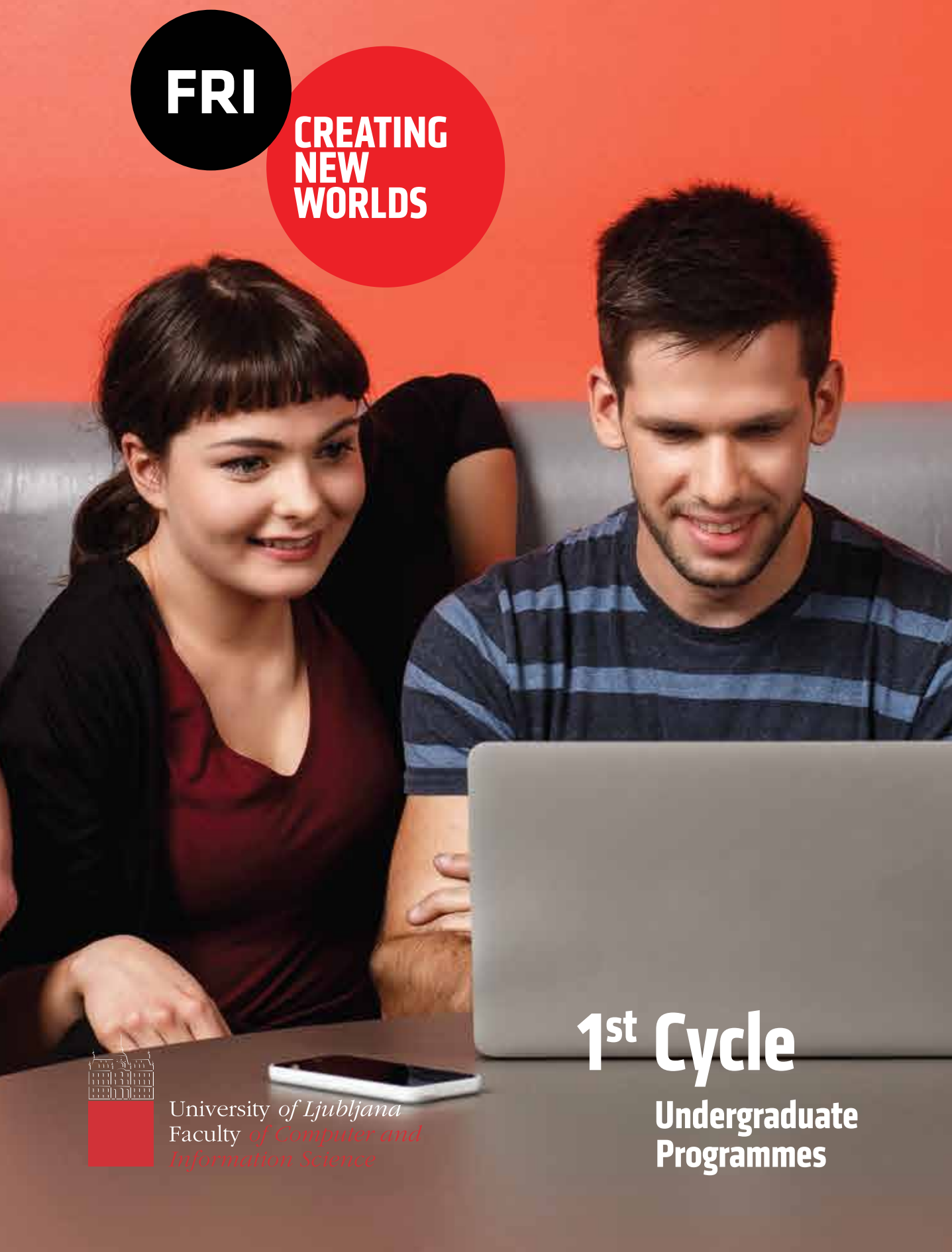
FRI

CREATING NEW WORLDS



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

1st Cycle

Undergraduate Programmes

Get to know the world of computer science and create new worlds

Computer knowledge is indispensable in today's society, but computer literacy is much more than simply being able to use computers, games, apps and technological devices. An understanding of how computers work and a knowledge of programming languages will open up new worlds to you – much as foreign languages provide you with a key to understanding other cultures. Acquiring this knowledge is a great advantage.

What can we promise our computer science students? For one thing, you will never be bored. Have you ever asked yourself how artificial intelligence (AI) learns, how blockchains work or how virtual reality (VR) is complemented by augmented reality (AR)? Have you ever dreamed of developing a smartphone application, perhaps one for home or car? Have you ever thought about how the worldwide web and social media work? We give you the opportunity to gain an understanding of all these things – and much more.

Computer science is developing more rapidly than any other branch of science or technology, and this accelerated development is creating new opportunities and new professions. So you shouldn't be asking yourself whether you'd like to do the things that computer scientists are doing today. Instead, ask yourself what you would like to do and what world you would like to live in. A knowledge of computer science will most certainly enable you to realise your dreams.

Study Programmes

The Faculty of Computer and Information Science offers university and professional study programmes. First cycle study programmes of the Bologna process consists of three years, after which students can enrol in the second cycle that lasts two years. The faculty also offers a third cycle (doctoral) programme that lasts three years.

CYCLE 1st

Undergraduate Study programmes

- University Study Programme in Computer and Information Science
- Professional Study Programme in Computer and Information Science
- Interdisciplinary University Study Programme in Computer Science and Mathematics (with the Faculty of Mathematics and Physics)
- Interdisciplinary University Study Programme in Multimedia (with the Faculty of Electrical Engineering)
- Interdisciplinary University Study Programme in Administrative Information Systems (with the Faculty of Administration)

CYCLE 2nd

Master's Study Programmes

- Computer and Information Science
- Interdisciplinary Study Programme in Computer Science and Mathematics (with the Faculty of Mathematics and Physics)
- Interdisciplinary Study Programme in Multimedia (with the Faculty of Electrical Engineering)
- Interdisciplinary Study Programme in Computer Science Education (with the Faculty of Education)
- Interdisciplinary Study Programme in Cognitive Science (with the Faculty of Education, the Faculty of Arts and the Faculty of Medicine)

CYCLE 3rd

Doctoral Study Programmes

- Computer and Information Science
- Interdisciplinary Study Programme in Biosciences (with the Biotechnical Faculty, the Faculty of Electrical Engineering and the Faculty of Mechanical Engineering)

LUKA MRAVINEC,
Computer and Information Science Student

The study of computer and information science is not just about writing code and sitting behind a screen. It is also about understanding concepts, and why and how things work. You travel the entire path during your studies: from how things are built and how hardware works, to what goes into making an information system. With over 100 fellow students, you'll make new friends to help you navigate student life successfully.

University Study Programme in Computer Science

The university study programme in Computer and Information Science offers a selection of courses that cover knowledge of programming, algorithms, mobile app development, information systems, web technologies, integrated systems, computer networks and administration. It provides students with skills and the wide range of knowledge necessary and important for working in computer science according to the highest standards and criteria.

Terms and conditions of enrolment

Candidates meeting the following requirements can enrol in the university study programme:

a) A completed final exam (matura);

b) A completed vocational final exam at any secondary school and an exam in one of the following subjects: Computer Science, Mathematics or Physics; the chosen subject must not be the same as the subject the candidate passes for the vocational final exam;

c) Any four-year secondary school study programme completed prior to 1 June 1995.

In the event of a decision limiting enrolment, candidates referred to in points a) and b) will be selected according to:

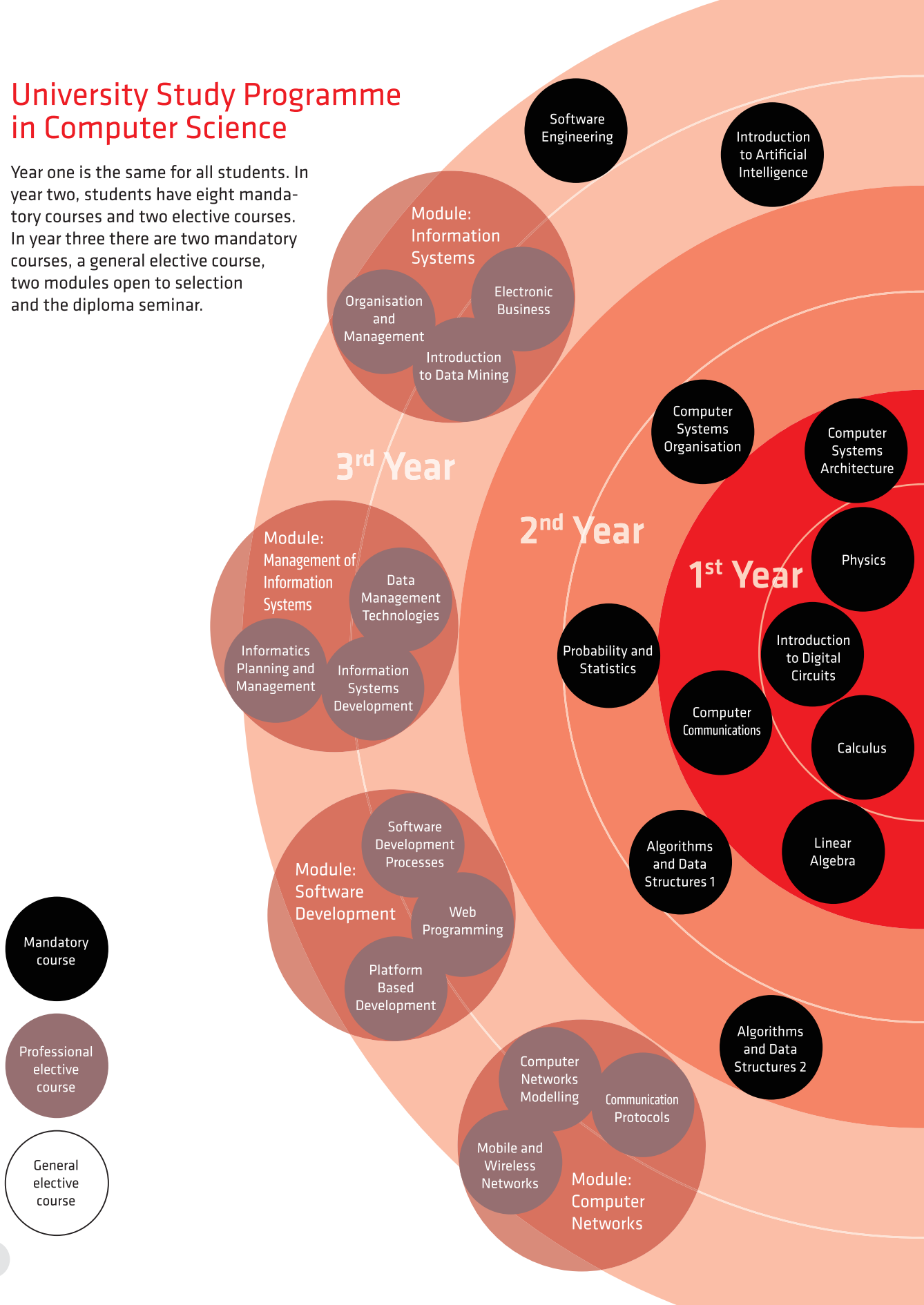
- the GPA in the final exam (matura) or secondary school final exam 60%;
- the GPA of Year 3 and 4 of secondary school 40%.

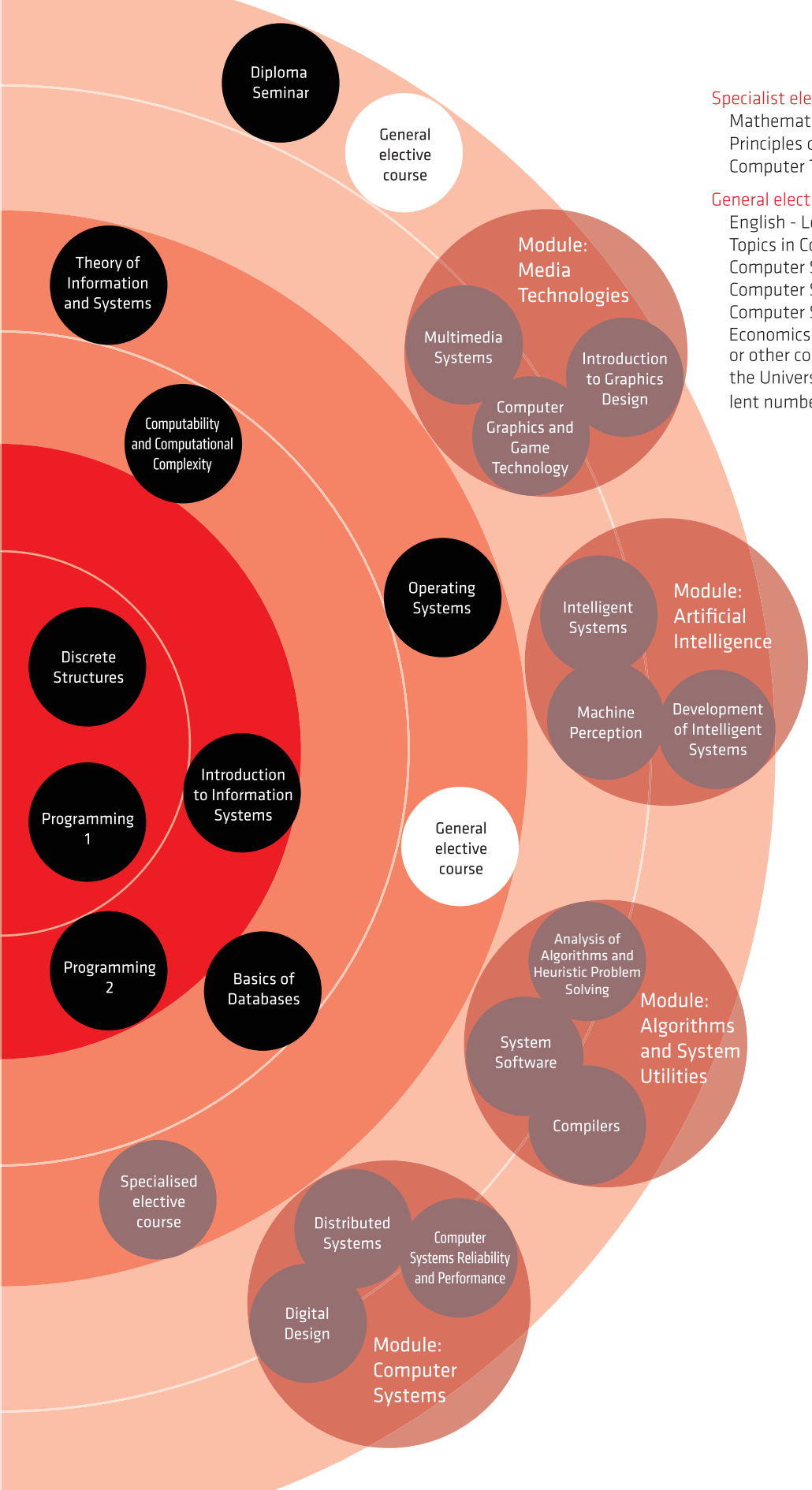
Candidates from point b) will be selected according to:

- the GPA in the vocational final exam 20%;
- the GPA of the Year 3 and 4 of secondary school 40%;
- the grade average of one final exam subject 40%.

University Study Programme in Computer Science

Year one is the same for all students. In year two, students have eight mandatory courses and two elective courses. In year three there are two mandatory courses, a general elective course, two modules open to selection and the diploma seminar.



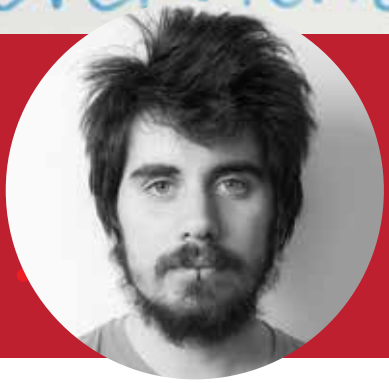


Specialist elective courses:

Mathematical Modelling,
Principles of Programming Languages,
Computer Technologies.

General elective courses offered at FRI:

English - Level A, B, C,
Topics in Computer and Information Science,
Computer Science in Practice I,
Computer Science in Practice II,
Computer Science Skills,
Economics and Entrepreneurships,
or other course provided by the faculties of the University of Ljubljana with the equivalent number of ECTS.



KERRY MAHNE,
Computer and Information Science Student

The study programme offers a flexible syllabus – one that I have been able to design in line with my own interests and wishes. This has further fired my enthusiasm for computer science. I have gained knowledge of various fields of computer science, such as machine learning, AI, gaming technology and recommender systems, as well as practical industrial knowledge, like software technology. On professional study programme we also have to undertake work experience, which is an excellent opportunity for the student to test their knowledge in practice – and perhaps find employment in an enterprise of their choice.

Professional Study Programme in Computer and Information Science

The professional study programme's emphasis is on practical and professional knowledge of computer and information science. The programme offers a more flexible selection of courses, especially in Years 2 and 3 when students can choose their courses in order to specialise in a branch of computer science, e.g. web technologies, software, hardware, information systems, computer networks etc. In the last semester, students have a nine week traineeship in a company and finish their thesis. Essentially, the programme aims to prepare students for employment immediately after completing their studies, but they still have the option of continuing in the 2nd and 3rd cycle studies.

Terms and conditions of enrolment

Candidates meeting the following requirements can enrol in the professional study programme:

a) A completed final exam (matura);

b) A completed vocational final exam at any secondary school;

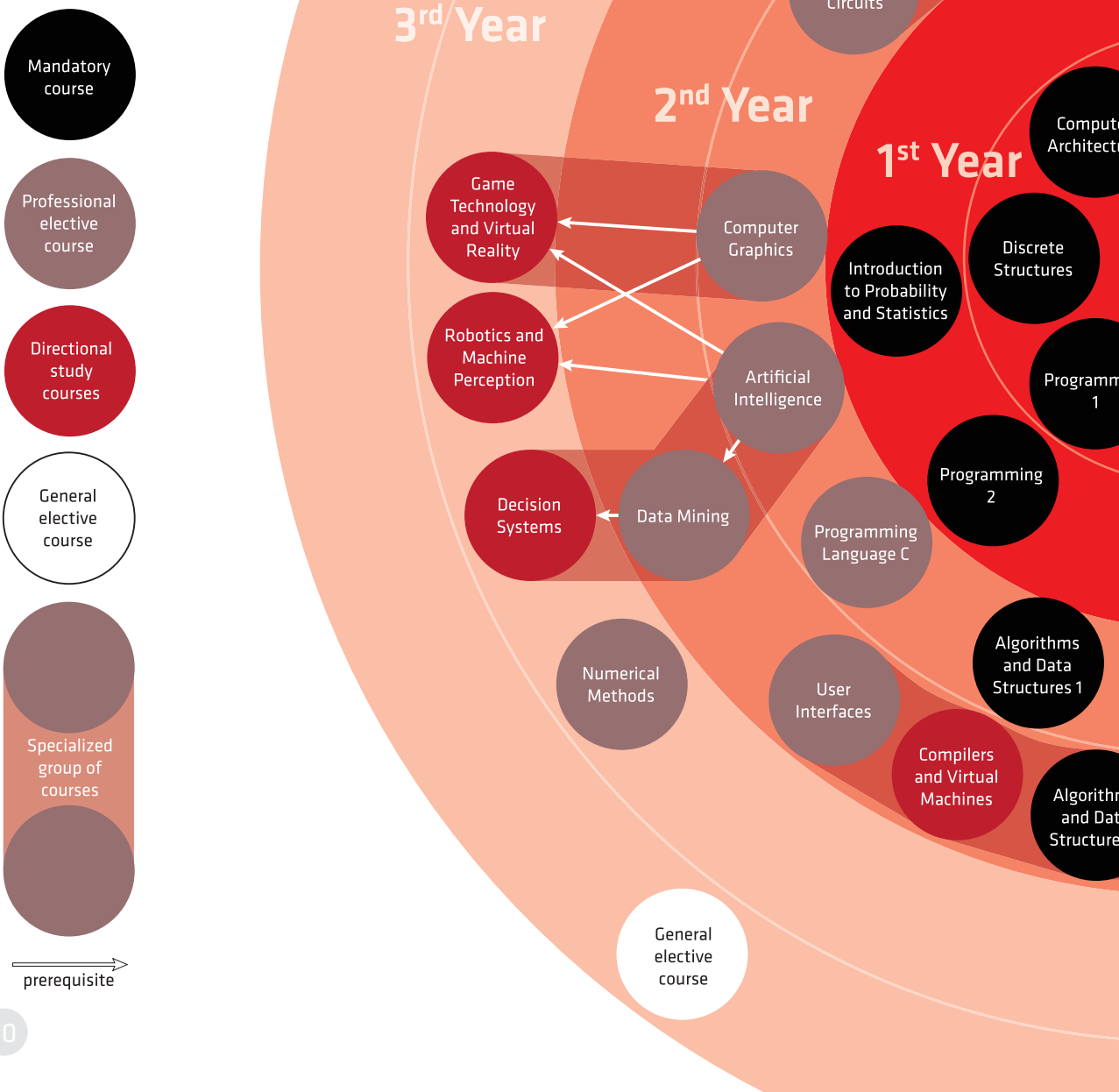
c) Any four-year secondary school study programme completed prior to 1 June 1995.

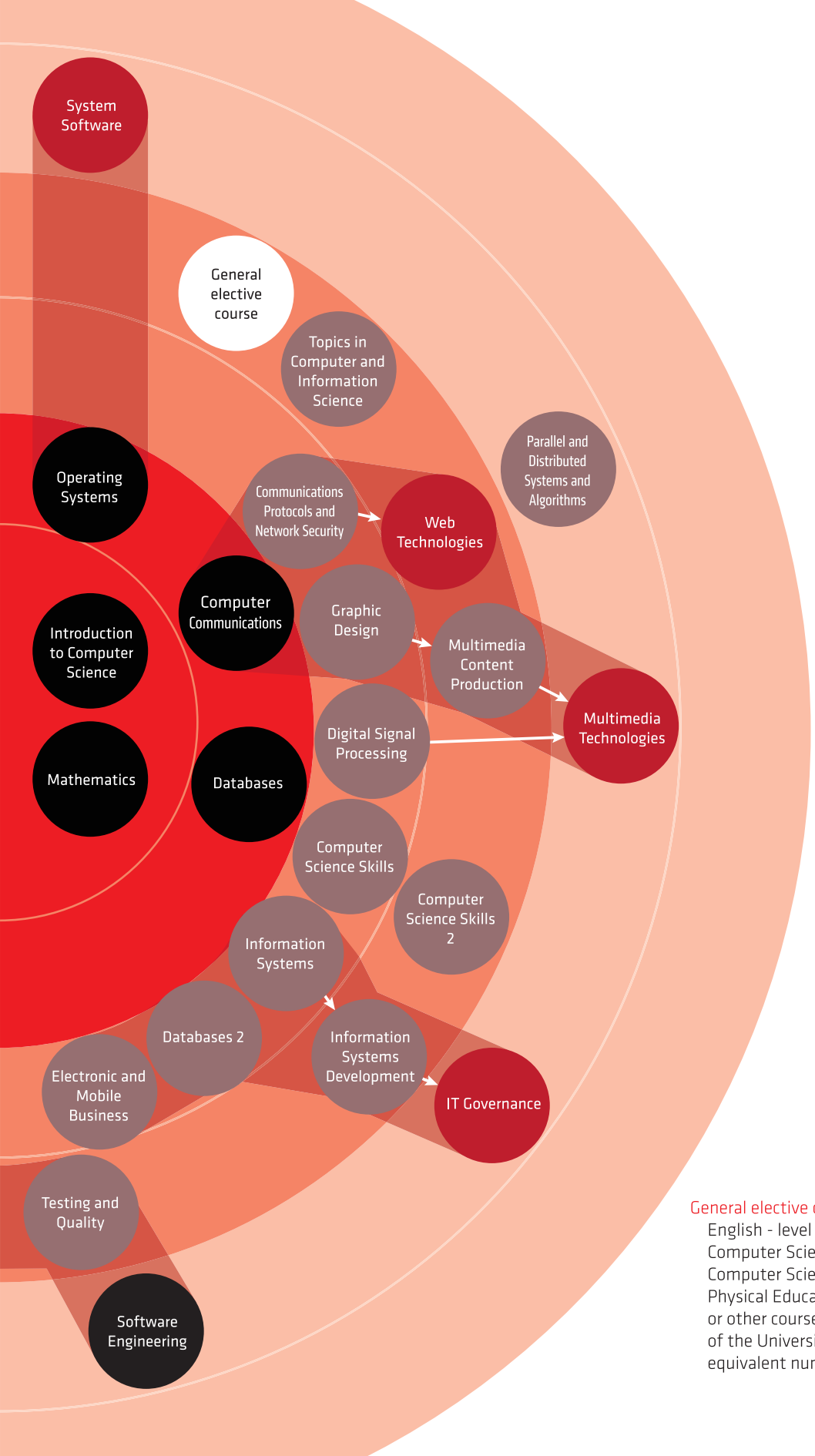
In the event of a decision limiting enrolment, candidates will be selected according to:

- the GPA in the final exam (matura) or secondary school final exam 60%;
- the GPA of Year 3 and 4 of secondary school 40%.

Professional Study Programme in Computer and Information Science

Year 1 consists of ten mandatory courses. In year two, two courses are mandatory, seven courses are professional elective courses and one is a general elective course. In year 3, there is one mandatory course, four professional elective courses and one general elective course, along with work practice and the diploma seminar.





General elective courses offered at FRI:

English - level A,B,C,
Computer Science in Practice I,
Computer Science in Practice II,
Physical Education,
or other course provided by the faculties of the University of Ljubljana with the equivalent number of ECTS.

LIDIJA MAGDEVSKA,
Computer Science and Mathematics Graduate

I have always been more interested in theoretical matters than in practical skills. In addition to mathematics subjects, I gained most satisfaction during the Computer Science and Mathematics programme by taking part in iGEM, the international synthetic biology competition, and by undertaking research work at the Computer Structures and Systems Laboratory. I owe the highest debt of gratitude to my mentors. Without their approachability and their commitment to teaching and research work, I would not have been able to publish my first conference papers and scientific articles as early as I did.

Interdisciplinary University Study Programme in Computer Science and Mathematics

The study programme is implemented in cooperation with the Faculty of Mathematics and Physics. It is oriented towards delivering the theoretical bases of computer science and related advanced fields of discrete and computational mathematics. During the course of studies, students acquire a wide range of knowledge of the basics of computer science, informatics and mathematics, and learn to control and later on develop new advancements in the field. A solid mathematical basis helps them understand and integrate new interdisciplinary fields such as biotechnology, biomedical informatics, theoretical chemistry etc.

Terms and conditions of enrolment

Candidates meeting the following requirements can enrol in the interdisciplinary university study programme:

a) A completed final exam (matura);

b) A completed vocational final exam at any secondary school and an exam in one of the following subject in Mathematics; if candidates have already completed this for the vocational final exam, then they must complete any of the other final exam subjects that they have not yet completed for the vocational final exam;

c) Any four-year secondary school study programme completed prior to 1 June 1995.

In the event of a decision limiting enrolment, candidates, reffered to points a) and c) will be selected according to:

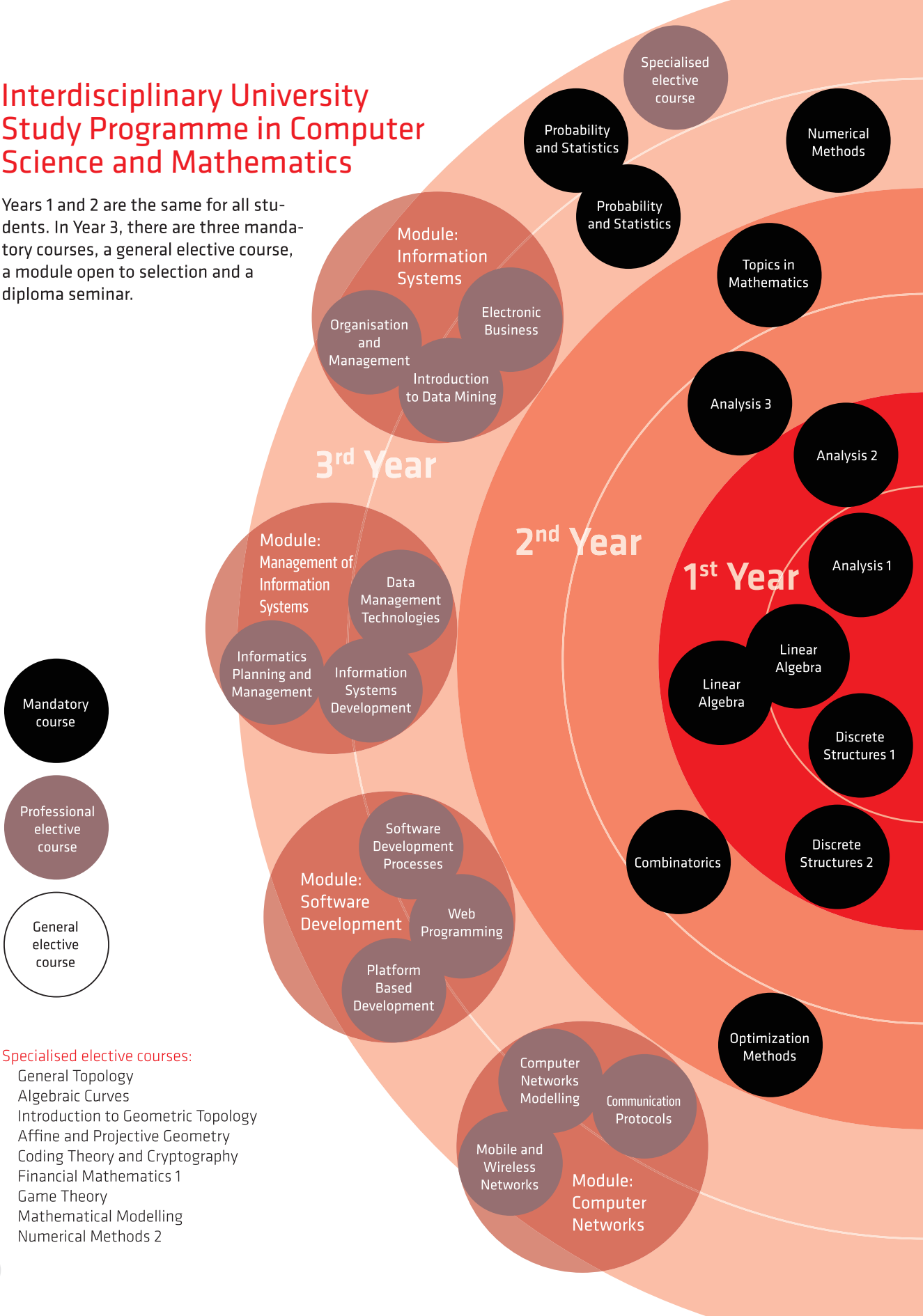
- the GPA in the final exam (matura) or secondary school final exam 60%;
- the GPA of Year 3 and 4 of secondary school 20%;
- the GPA of Year 3 and 4 in Mathematics 20%;

Candidates from point b) will be selected according to:

- the GPA in the vocational final exam 30%;
- the grade of the final exam subject 30%;
- the GPA of the Yaer 3 and 4 of secondary school 20%;
- the GPA in Mathematics in Year 3 and 4 20%.

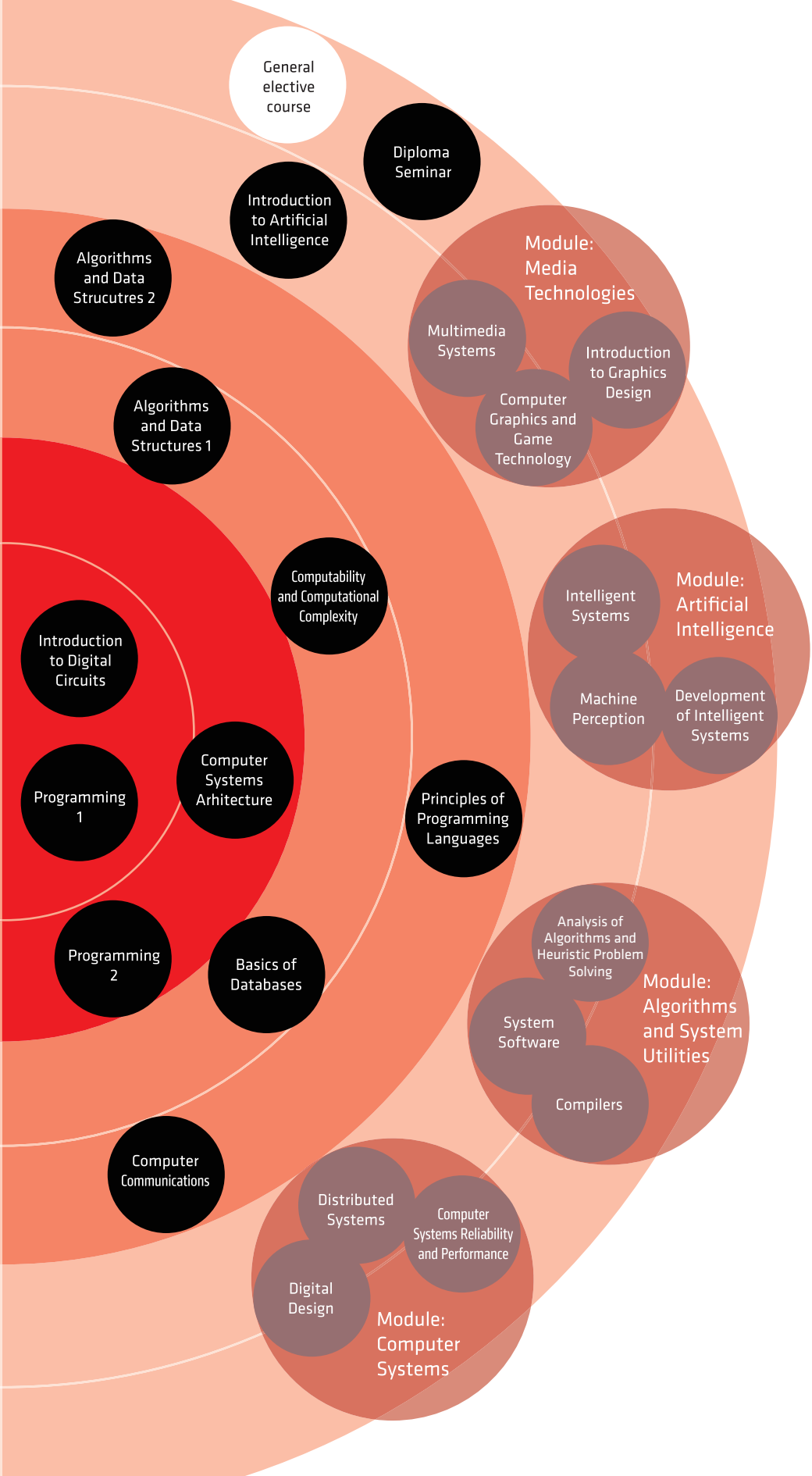
Interdisciplinary University Study Programme in Computer Science and Mathematics

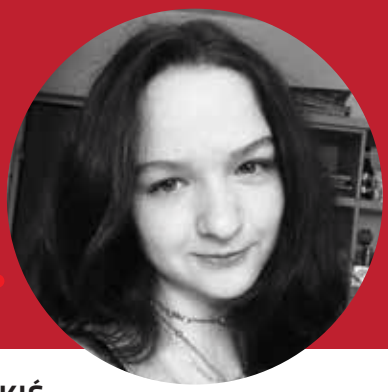
Years 1 and 2 are the same for all students. In Year 3, there are three mandatory courses, a general elective course, a module open to selection and a diploma seminar.



Specialised elective courses:

- General Topology
- Algebraic Curves
- Introduction to Geometric Topology
- Affine and Projective Geometry
- Coding Theory and Cryptography
- Financial Mathematics 1
- Game Theory
- Mathematical Modelling
- Numerical Methods 2


General elective course
Diploma Seminar
Introduction to Artificial Intelligence
Algorithms and Data Strucutres 2
Module: Media Technologies
Multimedia Systems
Introduction to Graphics Design
Computer Graphics and Game Technology
Algorithms and Data Structures 1
Computability and Computational Complexity
Module: Artificial Intelligence
Intelligent Systems
Machine Perception
Development of Intelligent Systems
Introduction to Digital Circuits
Computer Systems Arhitecture
Programming 1
Principles of Programming Languages
Analysis of Algorithms and Heuristic Problem Solving
Module: Algorithms and System Utilities
System Software
Compilers
Programming 2
Basics of Databases
Computer Communications
Distributed Systems
Computer Systems Reliability and Performance
Digital Design
Module: Computer Systems



NEŽA ĐUKIĆ,
Multimedia Student

The Multimedia study programme is special because of the breadth of knowledge you obtain. There is great emphasis on effective group work, which is good preparation for subsequent employment. Because of the smaller number of students on this programme there is a lot of mutual cooperation, encouragement and assistance. Whatever your field of interest, you will always find a laboratory, a professor or an assistant to help you develop new knowledge and skills.

Interdisciplinary University Study Programme in Multimedia

The interdisciplinary university study programme in Multimedia is offered jointly with the Faculty of Electrical Engineering. It combines knowledge of electrical engineering, computer science, design and business. The study programme teaches skills in multimedia while familiarising students with the latest technology and equipment that form the basis of new industry. The study programme brings together some of the best features of electrical engineering, computer science, communications and business, and prepared graduates for work in top domestic and foreign businesses, as well as for research and continuing studies at the postgraduate level.

Terms and conditions of enrolment

Candidates meeting the following requirements can enrol in the interdisciplinary study programme:

a) A completed final exam (matura);

b) A completed vocational final exam at any secondary school and an exam in one of the following subjects not already completed in vocational final exam;

c) Any four-year secondary school study programme completed prior to 1 June 1995.

In the event of a decision limiting enrolment, candidates referred to in points a) and c) will be selected according to:

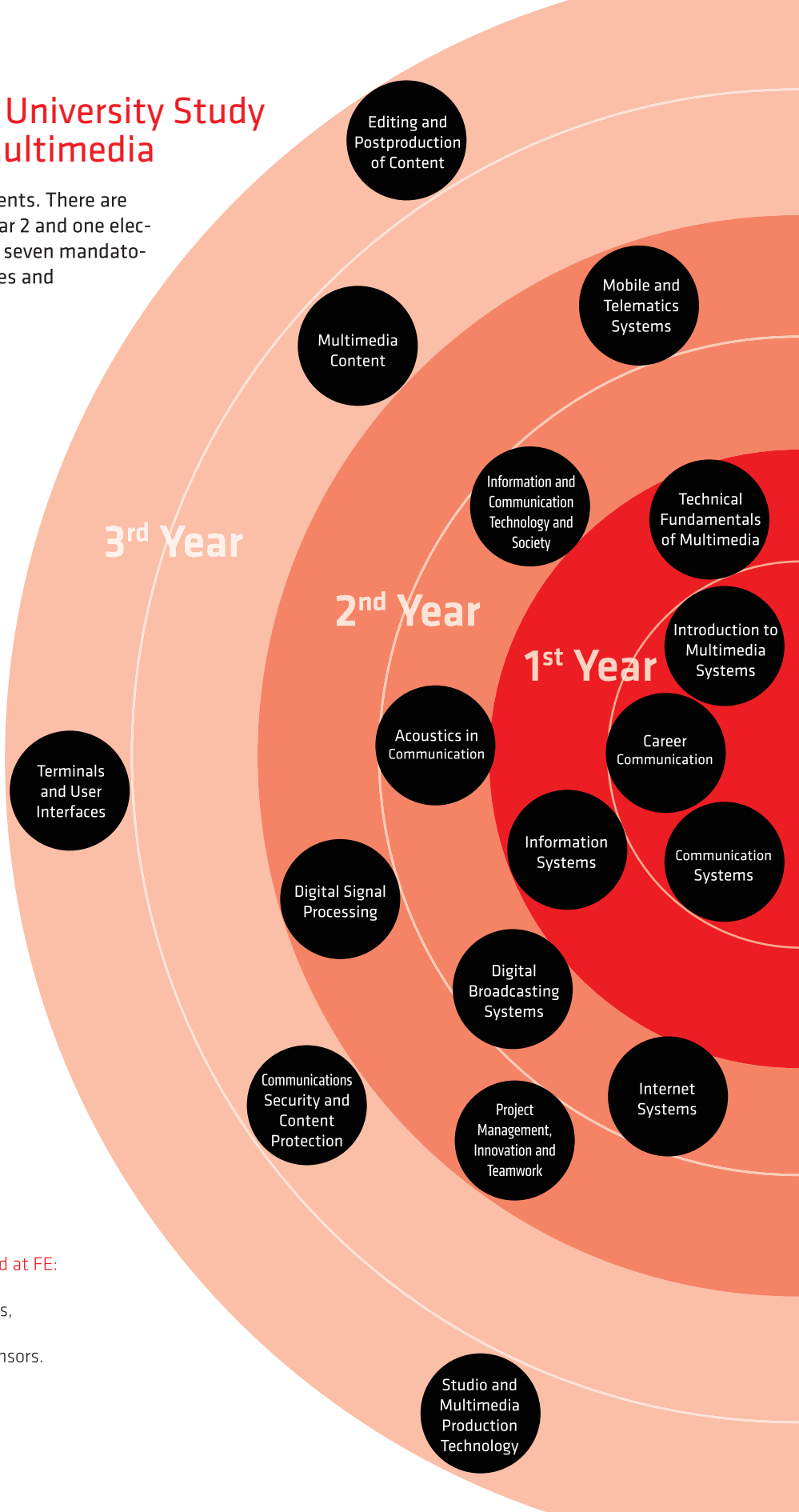
- the GPA in the final exam (matura) or secondary school final exam 60%;
- the GPA of Year 3 and 4 of secondary school 40%.

Candidates from point b) will be selected according to:

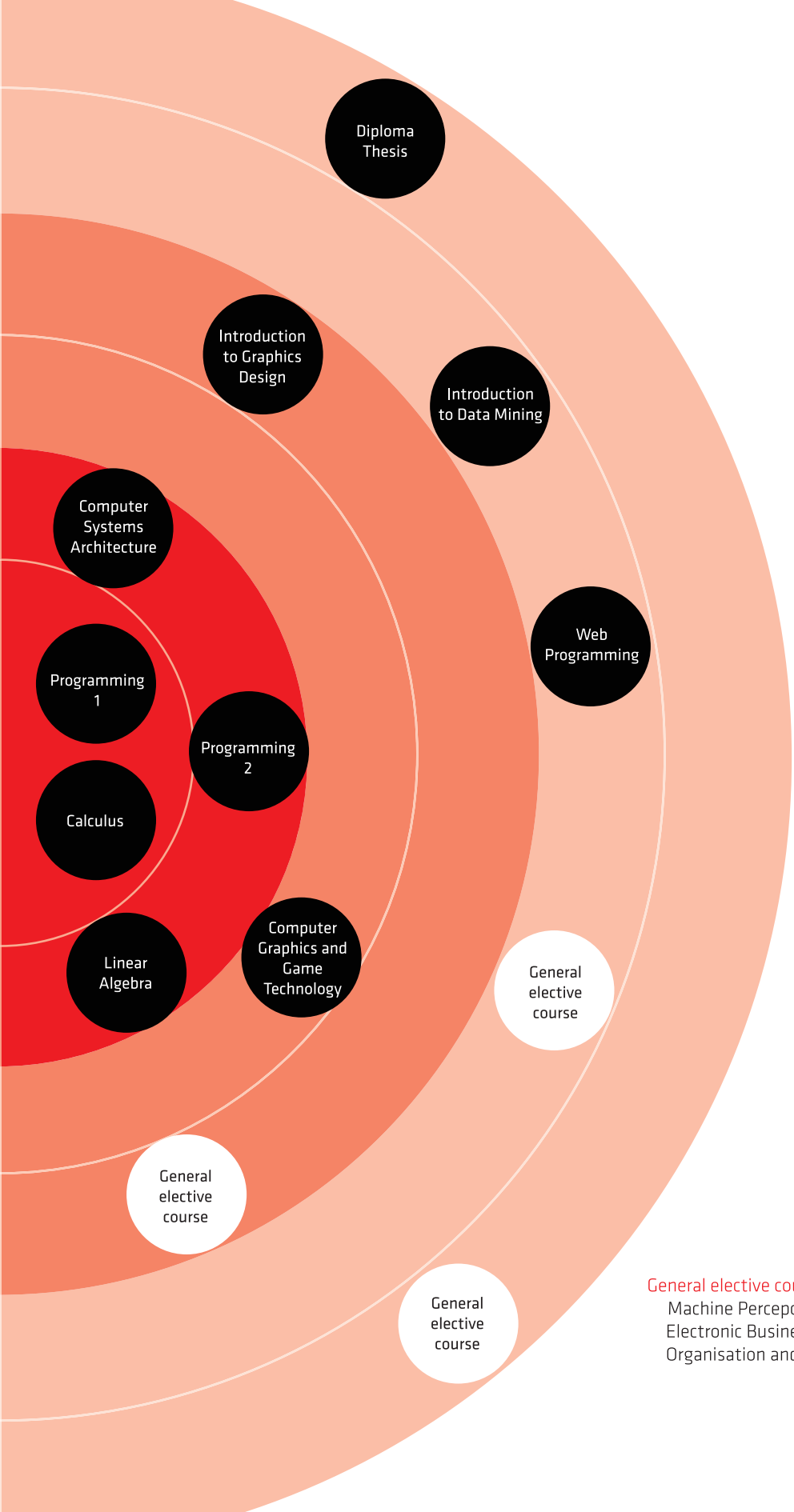
- the GPA in the vocational final exam 40%;
- the GPA of the Year 3 and 4 of secondary school 40%;
- overall success of one final exam subject 20%.

Interdisciplinary University Study Programme in Multimedia

Year 1 is the same for all students. There are nine mandatory courses in year 2 and one elective course. Year 3 consists of seven mandatory courses, two elective courses and the Diploma Thesis.



General elective courses offered at FE:
Computer Simulation,
Speech and Image Technologies,
Telecommunication Protocols,
Electronic Components and Sensors.



General elective courses offered at FRI:
Machine Percepcion,
Electronic Business,
Organisation and Management.

MARIJA ĐURĐEVIĆ,
Computer and Information Science Master's Graduate

I decided to study abroad because I was always yearning to challenge myself beyond the traditional classroom setting. During my studies at FRI I gained precious knowledge, but the highlight of the experience was the people that I met. I made new friendships with the other exchange students as well as Slovenian students, and I got the chance to work with experienced professors with international background.

Interdisciplinary University Study Programme in Administrative Information Systems

This study programme is implemented jointly with the Faculty of Administration. It is an interdisciplinary programme that offers in-depth knowledge of computer technology, internet and information technology, as well as administrative-legal, economic and organisational skills, which are necessary for understanding public and business administration. Elective courses can be chosen by students from a list of courses offered by both universities.

Terms and conditions of enrolment

Candidates meeting the following requirements can enrol in the interdisciplinary study programme:

a) A completed final exam (matura);

b) A completed vocational final exam at any secondary school and an exam in one of the following subjects not already completed in vocational final exam;

c) Any four-year secondary school study programme completed prior to 1 June 1995.

In the event of a decision limiting enrolment, candidates referred to in points a) and c) will be selected according to:

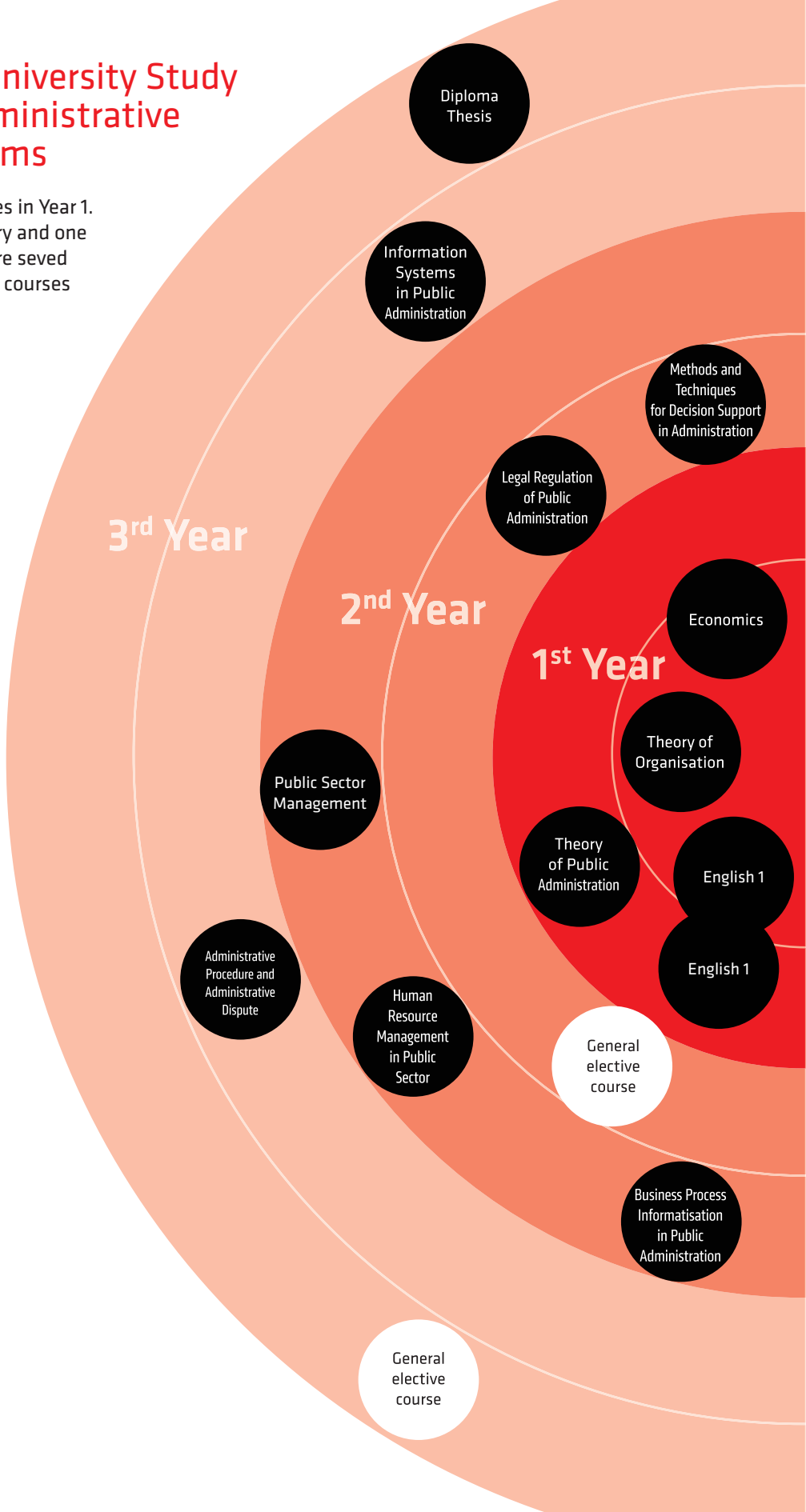
- the GPA in the final exam (matura) or secondary school final exam 60%;
- the GPA of Year 3 and 4 of secondary school 40%.

Candidates from point b) will be selected according to:

- the GPA in the vocational final exam 20%;
- the GPA of the Year 3 and 4 of secondary school 40%;
- overall success of one final exam subject 40%.

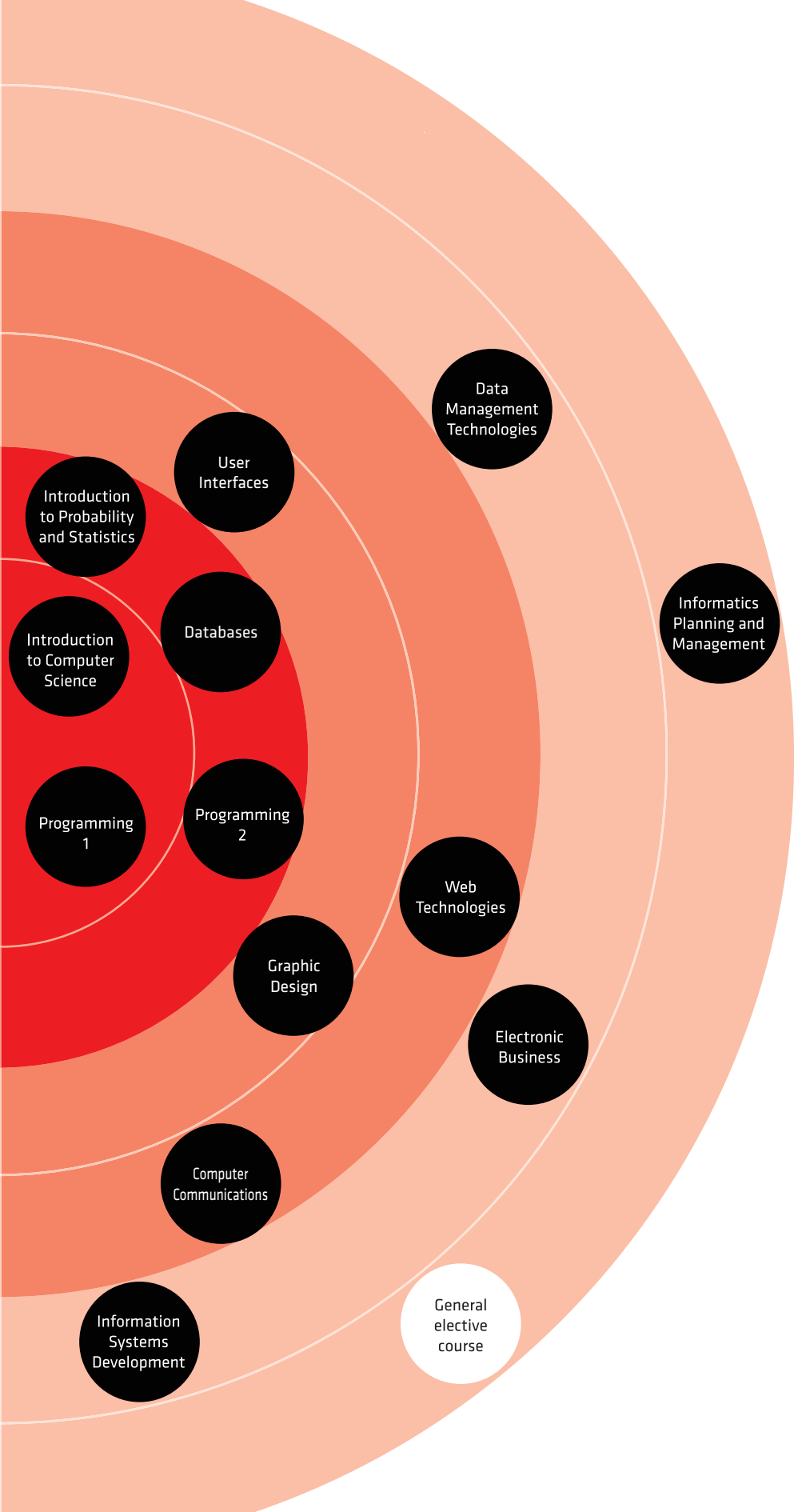
Interdisciplinary University Study Programme in Administrative Information Systems

There are nine mandatory courses in Year 1. Year 2 consists of nine mandatory and one elective course. In Year 3 there are seved mandatory courses, two elective courses and the Diploma Thesis.



General elective courses

Students are able to select optional courses from a list of options offered by other study programmes at both faculties.


Data Management Technologies
User Interfaces
Introduction to Probability and Statistics
Informatics Planning and Management
Databases
Introduction to Computer Science
Programming 1
Programming 2
Web Technologies
Graphic Design
Electronic Business
Computer Communications
General elective course
Information Systems Development

How to Apply?

Enrolment Procedure

Students apply for studies via eVŠ web portal at http://portal.evs.gov.si/prijava. Application deadline for EU member states citizens is in the first week of March and for the non-EU citizens in the mid of April. Application process includes recognition of foreign education. Detailed information regarding application process is available in the call for enrolment.

Tuition fee

Fee is paid by students of non-EU countries, excluding persons granted international protection, applicants for international protection and persons from countries with which the Republic of Slovenia has concluded bilateral agreement (with Macedonia, Bosnia and Herzegovina, Serbia, Montenegro and Kosovo).

Scholarships

Public Scholarship, Development, Disability and Maintenance Fund of the Republic of Slovenia offers scholarships for foreign nationals.

Contact Information

Study programmes at the Faculty of Computer and Information Science

Ms. Vesna Gračner Žitnik
international.office@fri.uni-lj.si
Phone: +386 1 479 8249

Application process at the University of Ljubljana

Ms. Tanja Žužek, tanja.zuzek@uni-lj.si
Ms. Alenka Šuligoj, alenka.suligoj@uni-lj.si

Phone: +386 1 241 85 05
www.vpis.uni-lj.si

Useful Information

Year Plus

During their first year at the University of Ljubljana international students may attend the Year Plus module in which the Slovenian language courses are mandatory. Student has to pass at least 30 ECTS credits to be entitled for a Year Plus. This module is designed to help international students to adapt to the Slovenian system and culture in their first year of study in Slovenia. With the module students can prolong their studies for one year.

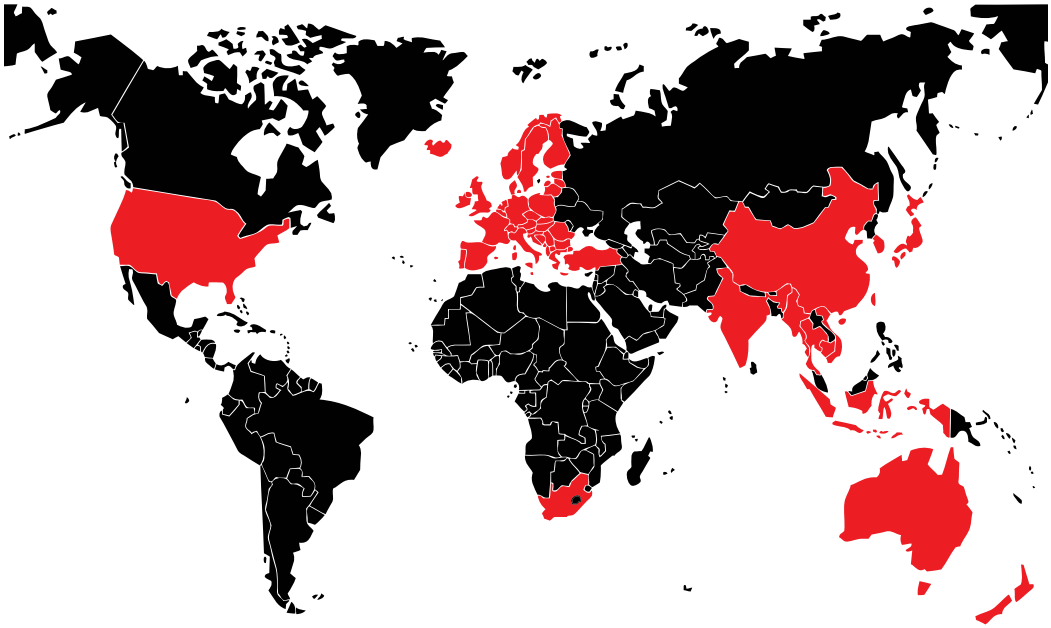
Students life in Ljubljana

During their stay in Ljubljana all students are entitled to food and transport subventions. The price for a meal in a restaurant is 2-5€ and 20€ for a monthly bus ticket. International students should find a private room as there are no dormitories available for international students. The average price for a room is 150–250€. Living expenses (rent, food, public transport, books) in the Republic of Slovenia roughly amount to 500€ per month.

Students from EU countries and countries with which Slovenia has an agreement can enter without a visa and stay up to 90 days. They can apply for the residence permit in Slovenia. Non-EU students need a visa to enter the Republic of Slovenia.

International Mobility

Discovering the unknown, an invaluable life experience, an opportunity to form new connections, broaden your horizons, lears new skills – this and much more is available at your fingertips through student exchange programmes. The experiences of students who have completed part of their studies abroad vary, but they all share the conviction that their semester abroad was one of the best times of their lives. International exchange programmes enable students to study abroad or complete internships/placements.



Double Degree Programme with Kyungpook National University

The Faculty of Computer and Information Science at the University of Ljubljana (UL FRI) offers a double undergraduate study programme in collaboration with Kyungpook National University (KNU), South Korea. Students who undertake their third year of study in South Korea may be awarded a joint UL FRI/KNU degree.

Elective Courses Taught by Jure Leskovec, PhD., from Stanford University

Undergraduate and postgraduate university students have the unique opportunity in their general elective courses to also choose two courses delivered by Jure Leskovec, PhD, from the prestigious Stanford University. The courses are Analysis of Networks, and Mining Massive Datasets. *Analysis of Networks* covers practical approaches to analysing and understanding large real networks on the basis of various models of their structure and development. The Mining Massive Datasets course looks at machine learning algorithms that are able to process very large volumes of data and help us acquire information on and the properties of that data. The letter is also available to PhD students.

IZA GRASSELLI,
Computer and Information Science Student

I spent the third year of undergraduate study on an exchange programme at Syddansk Universitet in Denmark. The different way of learning, the different culture and the international atmosphere were a welcome addition to my studies, and helped me gain new knowledge and forge new friendships. I am grateful that students at the Faculty of Computer and Information Science can undertake part of their study abroad. This opportunity gave me a set of rich experiences that will be of great help in my career and personal growth.

SUMIN PARK,
Double Degree Programme Student from KNU

I integrated at FRI quickly as there are a many international students from different countries. I learned how to communicate from another part of the world. At FRI all students participate not only in lectures, but also in laboratory work and on seminar projects. Those improved my teamwork and practical skills, even though I didn't have much knowledge in computer science at first.

Careers

According to Forbes magazine the number of tech employment opportunities is expected to increase by 12% by 2024, which will lead to more and more jobs becoming available to IT professionals. Tech positions in web development, data analysis, IT architecture, cybersecurity, AI, VR and AR, are expected to grow exponentially within the next year. Furthermore, European Commission estimates that by 2020 Europe will lack 900,000 experts in IT.

Specialist in Computer Interactions

Adapting computers, smartphones, multitouch tables and new web technologies to the potential needs and tastes of the everyday user.

App Designer

Graduates gain expert knowledge in various programming languages, algorithms, data structures and web security.

Robotics Expert

Developing robots such as the iRobot Roomba vacuum cleaner and mobile robots designed to search ruins, avalanches and mine fields.

Data Analyst

With database analysis skills and by observing amoebas, students can develop new antibiotics, double revenue based on client data or help with the economic crisis in international bank transactions.

Computer Vision Expert

Graduates with appropriate skills can be employed on projects, such as Google Lens or Microsoft HoloLens. They gain skills for the development of computer vision for self-driving cars and create virtual and augmented reality experiences.

ANDRAŽ TORI,
founder and technical director of Zemanta

My passion for computers was the reason why I enroled in computer science studies. During my studies, I already used my computer skills in various ways - in the non-government sector, for activist and entrepreneurial purposes. It is important for students to get to know the great world out there, which is why at Zemanta we try to cooperate with the Faculty in order to open student's minds and subsequently their future opportunities. We cooperate in the University challange and in "in the Mud" lecture series. We started with "Up to our Ankles", continued with "Up to our Knees, Waists and Necks", while this year we are already "Over our Heads in (industrial) Mud". More is avalable at:
http://meetup.com/vblatu

IZA LOGIN,
founder of Outfit7, the creator of Talking Friends

Samo and I created our first multimedia app for children while we were still students at FRI. At the time, this represented quite a technological challenge and was a lot of fun. Later on, our business path led us to different enterprises, where we gained skills in business and leadership. When Samo decided to create a mobile app company in 2009, he invited me, along with six of his colleagues. We decided to build entertaining apps for children, which had been my dream fifteen years ago. The scope of our work has grown considerably and now also involves the development of various apps (cartoons, films, physical products, music and so on). For areas where we had no experience, we hired top experts from Slovenia and abroad.

2nd Cycle
Master's Study Programmes

Graduates of all disciplines can continue on one of four second cycle study programmes divided into blocs of two years or four semesters. The programmes offer a wide scope of knowledge of computer and information science and prepare students for a successful career in either the industry or academia.

Study Programme in Computer and Information Science

Interdisciplinary Study Programme in Computer Science and Mathematics
(with the Faculty of Mathematics and Physics)

Interdisciplinary Study Programme in Multimedia
(with the Faculty of Electrical Engineering)

Interdisciplinary Study Programme in Computer Science Education
(with the Faculty of Education)

Interdisciplinary Study Programme in Cognitive Science
(with the Faculty of the Arts, the Faculty of Medicine, the Faculty of Education and other foreign universities)

Requirements for Enrolment

The requirement for enrolment into second cycle studies is a completed first cycle degree (university or professional study programme) or an equivalent study programme.

In the case of limited enrolment, a selection exam is required for the Computer and Information Science programme and the Computer and Information Science Education programme. Enrolment candidates are classified on the basis of their undergraduate study results and the selection exam results. The selection exam aims to rank students and, in the case of limited enrolment, is a requirement for admission into the Master's programme.

Double Degree Programme

In the 2013-2014 academic year, the Faculty of Computer and Information Science launched the double degree programme in cooperation with the Graz University of Technology. Students in Year 2 of the Master's programme in Computer and Information Science spend one semester at the Graz University of Technology. Upon completion, they receive degrees from both universities.

3rd Cycle
Doctoral Programme

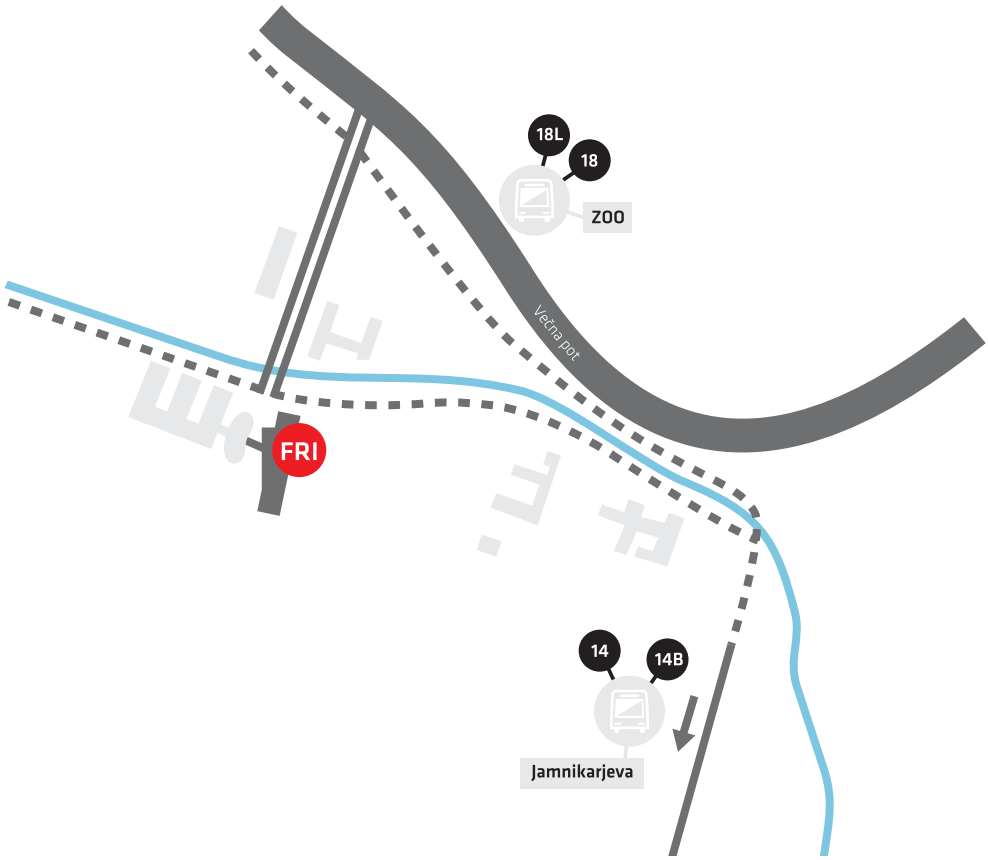
Faculty of Computer and Information Science delivers a doctoral programme in Computer and Information Science. It also cooperates in the delivery of the Biosciences programme. The study programme aims to deepen the students' knowledge of computer science and train them for research. We recommend it for students who intend to stay in academia and also others whose goal is to work in more demanding development and innovation computer science industries. The entire study programme is conducted in English.

MATEVŽ PESEK,
doctoral student

A computer science engineer must be an expert in two fields: in his or her own and in the field of the task assumed. Doctoral study enables me to work during the day on ideas that I dream about at night. Research, which is an essential component of doctoral studies, is appealing not only because of the approach to the unknown, but it is also personally fulfilling, because I grow and am becoming a better man as I achieve research progress.

The Faculty of Computer and Information Science of the University of Ljubljana relocated to its new premises which provides a good basis for the future growth and development of the faculty in all areas, including research, education and knowledge transfer.

It is located in the South-West of Ljubljana within walking distance from the center of Ljubljana. To reach the Faculty from the center take bus lines 18/18L or 14/14B.



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