



University of Primorska

Faculty of Mathematics,
Natural Sciences and
Information Technologies



Welcome

to the University of Primorska,
Faculty of Mathematics,
Natural Sciences and
Information Technologies

About us – View from the top

Dear reader,



Dean of the Faculty
Assoc. Prof. Klavdija
Kutnar, PhD

I gladly welcome your interest in our Faculty of Mathematics, Natural Sciences and Information Technologies (UP FAMNIT), member of the University of Primorska in Koper, Slovenia. Committed to academic excellence we lively, curiously and enthusiastically work in the challenging and ever evolving field of higher education and research. Despite our youth, we already enjoy international recognition, especially with our outstanding scientific achievements.

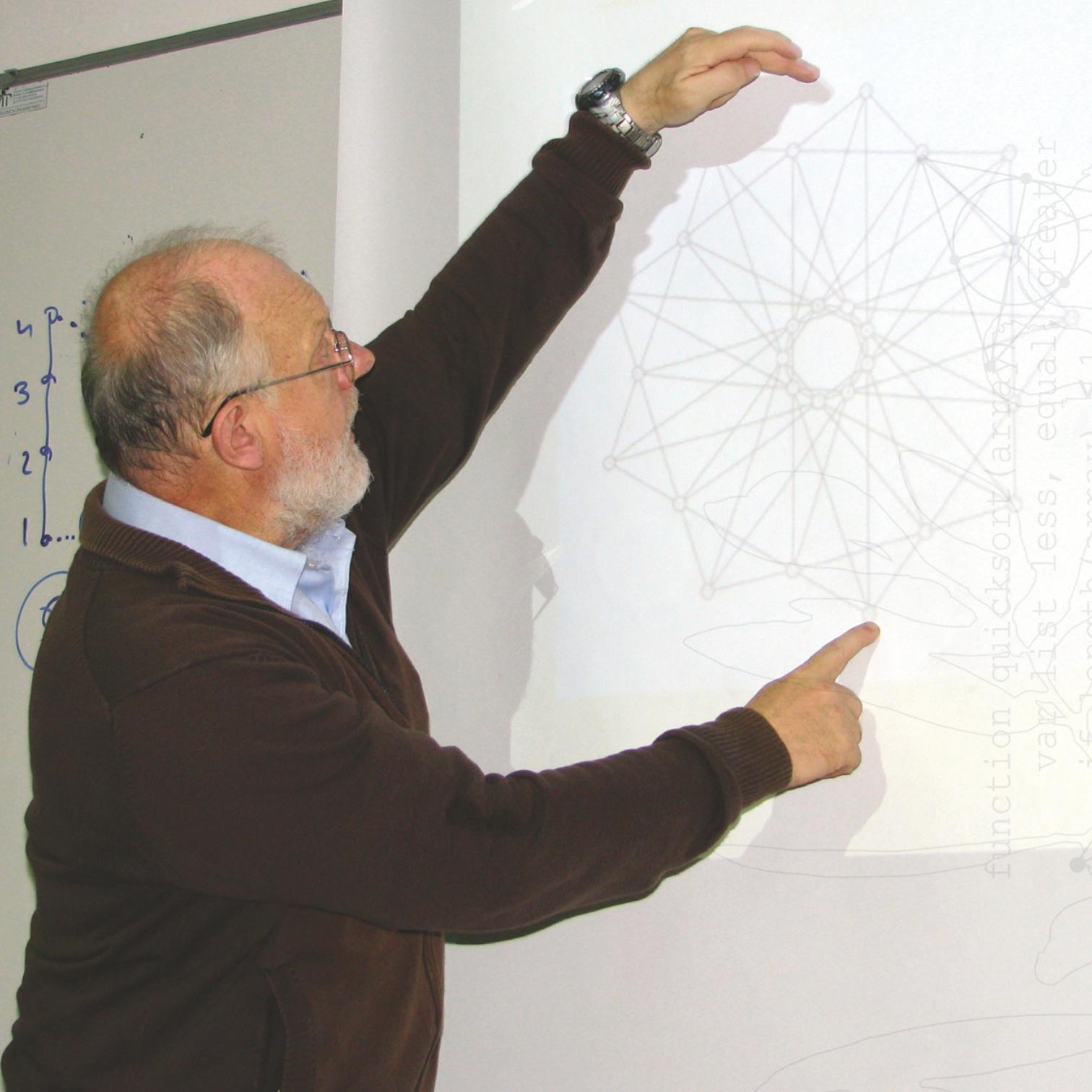
Strong international activity is one of our priorities since the beginning, as we believe that the academic sphere can only gain from interchanging and sharing knowledge, good practices and talents. In the academic year 2016–2017 we welcomed 91 international students on all three levels of higher education. Aware of the demands of today's world we offer them both – knowledge and skills, delivered through modern methods by our competent, highly motivated teaching staff, whose pedagogical work is backed by their own active research work. Our researchers strictly keep pace with all latest findings in science by visiting resounding international scientific meetings and conferences and organizing several per year themselves.

Last but not least, I would like to stress our pleasant position in a Mediterranean coastal environment, just two hours' drive away from Venice and on the crossroads of great historical cultures. We highly appreciate the benefits of such inter-cultural environment and are determined to continue to transcend any borders in that sense – gender, national or cultural.

I therefore kindly invite you to get to know us better by reading through the following pages and I look forward to meeting you in Koper.

```
return array  
select a pivot value  
for each x in array  
if x < pivot then append x to less  
if x = pivot then append x to equal  
if x > pivot then append x to greater  
return concatenate(quickSort(less), equal,
```





4
3
2
1

```
function quicksort(array)
  var list less, equal, greater
  if (length(array) > 1)
    pivot = array[0]
    for each element in array
      if element < pivot
        list = list + element
      else if element == pivot
        equal = equal + element
      else
        greater = greater + element
    return quicksort(list) + equal + quicksort(greater)
```

UP FAMNIT highlights

TOP 4

We proudly rank in top four research groups in the field of algebraic graph theory in the world and are the leading research group in Europe.

Horizons unlimited

In the past years we welcomed students from Argentina, Azerbaijan, Belgium, Belarus, Bosnia and Herzegovina, Croatia, Italy, Iran, Kosovo, Macedonia, Montenegro, Mexico, Poland, Russia, Serbia and Ukraine. In the current academic year 2016-2017, we host professors and researchers from Argentina, Australia, Canada, Croatia, France, Germany, Hungary, Italy, Netherlands, Norway, P.R. China, Poland, Russian Federation, Serbia, Turkey, United Kingdom, USA and Uzbekistan.

More than numbers

Our students highly value a personal approach and our surveys show their high satisfaction with student-teacher relationship.

SCI Journal

University of Primorska and the Society of Mathematicians, Physicists and Astronomers of Slovenia publish the journal *Ars Mathematica Contemporanea* which is indexed in the top quarter of scientific magazines in the Science Citation Index (SCI).

Involvement in research work from the start

Majority of our teaching staff conducts their research work at the Andrej Marušič Institute (UP IAM) where students from UP FAMNIT are encouraged to participate at scientific work in order to progress from theory to practice, get introduced to possible future work opportunities, and develop their own research interests.

Sharing and exchanging knowledge

In order to share and discuss new findings in specific scientific fields, our researchers organised several very successful international conferences in the past years, some of which have already become traditional (Slovenian Conference of Graph Theory, Triple I, Annual Mississippi Discrete Mathematics Workshop, to name just a few).

Department of Mathematics

With some of the world's best researchers on board, the department strives to pass on its excellent knowledge, emphasizes the importance of analytical thinking and provides all that is necessary for students to develop a strong sense for identification and use of appropriate mathematical approaches, techniques and tools in given problem-solving situations. Our *undergraduate* programme **Mathematics** already attracted some of the most talented students of their generation, among them Ratko Darda from Bosnia and Herzegovina, who joined us as an international student. »*I like the fact that I can freely talk to professors and ask them for help when I need it and the opportunity to do research at my age feels great, too!*«, says Darda, who, among other successes, won a silver medal at the Balkan Mathematical Olympiad 2012 in Turkey and a bronze medal at the International Mathematical Olympiad 2012 in Argentina. After graduating at UP FAMNIT, Ratko decided to continue his studies at Paris Diderot University in France.

Sergio Hiroki Koike Quintanar, a Mexican who finished undergraduate studies at the National University of Mexico, and the *doctoral* programme **Mathematical Sciences** at UP FAMNIT, came here because »*it was a great opportunity for me to continue my studies in one of the strongest research groups from the field of Algebraic Graph Theory. For someone coming from abroad, FAMNIT is also a very friendly and hospitable institution*«.

Our mathematicians, in cooperation with the representatives of all Slovene mathematical research institutions, were granted the honour to organise the *8th European Congress of Mathematics* in 2020 (8ecm.si), which will be attended by approximately 1,000 researchers and doctoral students. This is a major success for Slovenian mathematicians and science in general, as such an important event has not yet been hosted in Slovenia.



Because of the growing need for describing, simulating and analysing financial problems with the use of mathematical analysis and numerical methods, the department also carries out an *undergraduate* programme **Mathematics in Economics and Finance** and a *master's* programme **Mathematics with Financial Engineering**. Solving the most complex scientific as well as practical problems of the economy is nowadays primarily based on a mastery of Computer Science and mathematical analysis. Therefore, with their distinctly applied value, the two programmes provide much needed experts for responsible job placements in economy, public administration or academia.



Department of Biodiversity

Preservation of biodiversity – the overall richness of life on the Earth in the face of increasing human activities, is of the critical importance for ensuring healthy ecosystems and supporting our life and well-being. The challenge posed by global biodiversity crisis led to the emergence of new applied interdisciplinary science of conservation biology. It is our mission to educate a new generation of conservation biologists – scientists and practitioners in the theory and methods of biodiversity conservation

in both marine and terrestrial ecosystems. In order to do so, our Department of Biodiversity carries out two academic programmes, an *undergraduate* programme **Biodiversity** and a *master's* programme **Nature Conservation**. By integrating basic biological and applied sciences with social policies, our academic programmes are designed to teach students the tools and skills used for practical problem solving of emerging environmental issues associated with the biodiversity loss, with emphasis on quantitative methods and evidence-based approach.

Matic Jančič attended our *master's* study in **Nature Conservation** and now is working as researcher at the department »*I was looking for a programme in biology and conservation of marine systems, and as Nature Conservation includes the whole module in Marine Conservation, I decided to continue my master-level education here at the University of Primorska. My favourites were Marine Ecology, Marine Conservation Biology, Population Biology, and Biology and Conservation of Large Marine Vertebrates. Many classes were taught in English, by an international team of lecturers who are also known and established scientists, so we had an excellent opportunity to get the state-of-the-art knowledge and practical first-hand experience.*«

Recently, the Department received support for two international projects. The first one, STARBIOS₂ (2016–2020) is financed by the European Commission under the European Union Framework Programme for Research and Innovation Horizon 2020. Within the project we are developing and implementing action plans that will lead to structural changes in the field of responsible research and innovation in selected research institutions that are active in the field of bioscience. The second one, EU-ROTURTLES (2016–2021), is financed by the LIFE programme of the European Commission and is implemented in collaboration with partners from Croatia, Italy, Greece, Cyprus, and Malta. The project is oriented towards the complete protection of European population of loggerhead sea turtle through the development of coordinated protective measures and the integration of the main breeding and feeding habitats in the waters of the European Union.

Department of Information Sciences and Technologies

Undergraduate, master's and doctoral programmes in **Computer Science** at UP FAMNIT are built on solid theoretical and practical aspects of computer science, which are a prerequisite for education of competent, independent and confident experts. Committed to excellence, we motivate our students to cultivate intensive interaction with practice right from the start and encourage them to develop their skills to the highest level.

Between 2007 and 2011, Irman Abdić attended our *undergraduate* programme. Among the courses which particularly drew his attention were Programming III, Data Structures and Algorithms, Geographic Information Systems, and Systems III. In terms of the pedagogical pro-



cess, he recalls his constructive and inspiring cooperation with supportive lecturers, especially prof. Andrej Brodnik, PhD, and prof. Janez Žibert, PhD, who was also his final thesis supervisor. In 2013, Irman proceeded with studies at the Technische Universität München. »*My interests lay in international entrepreneurship, research and innovation,*« he summarizes his plans for professional future. In the past years he very successfully participated at several national and international innovation contests.

In the following decade, major challenges in science will be addressed through integration of various scientific disciplines. Mathematics, as a universal scientific language, and Computer Science, with countless options for ever more optimal exploitation of this language, will certainly play a leading role in these processes. Through the concept of complementarity, the department also helps interlacing the disciplines of Mathematics, Economics, Bioinformatics, and Environmental Sciences, following an advanced concept of computing where computing can appear everywhere and can be used anywhere. Backed with this broader perspective and equipped with all the necessary skills, our graduates represent high quality ICT personnel.

Irman is currently the director and partner of the Swiss group Catenate, which counts 140 employees and has offices in six European countries. His biggest challenge represents the creation of the accelerator in Munich, where he wants to help interesting start-ups in penetrating global markets. »*Most of all, I wish my innovations would prove useful and helpful to society.*«

In May 2017, the Department hosted the 30th jubilee ECCO congress (European Chapter on Combinatorial Optimization). For the first time the congress was jointly organized by EURO (The Association of European Operational Research Societies) and ORSC (Operations Research Society of China). More than 100 researchers in the field of combinatorial optimization from Europe and China presented their work, exchanged experiences, and discussed new theoretical and practical knowledge in this field.

Department of Psychology

The key to understanding a complex riddle called human being is in integral analysis of the subject as a bio-psycho-social phenomenon. Our *undergraduate* and *master's* programmes of **Biopsychology** follow this concept through interweaving social and natural sciences and provide access to all necessary theoretical knowledge and practical skills for thorough study and comprehension of individuals, groups and society at large.

»I chose to attend this programme at FAMNIT because it provides me with important neurological background for different psychological processes that I am interested in«, says Tin Šenija, who gained his BSc at UP FAMNIT in 2013 and his MSc in Cognitive Neuropsychology at the VU University Amsterdam. His favourite courses were *Neurological bases of higher nervous functions* and *Psychopharmacology*, as they gave him a deeper understanding of what is happening in the human brain under different psychological conditions. Tin is currently a PhD student at the University of Barcelona.

Since 2013 the Department successfully implemented a research programme called *Alive? Alive! Research and prevention of suicide*, funded by the Slovenian Research Agency. The programme presents a comprehensive approach to the prevention of suicide as a major social and public health problem in Slovenia and offers innovative ways to research suicidal behaviour.

Another important activity of the Department is the yearly organization of the international conference *Triple I - intuition, innovation and imagination and Suicidiology*, which over the years has become a platform of fruitful exchanges of views between distinguished experts and young experts in suicide, mental health professionals, students and the wider public from all around the world.



Starting with the academic year 2016/17, we offer the new master's programme **Applied Psychology**, which aims to educate psychologists whose knowledge and competencies are in compliance with the EuroPsy Certificate. During the two years of study, students develop the needed skills to work independently in psychological practice, since the programme gives them the opportunity to gain in-depth knowledge to understand, interpret and tackle various issues and problems of contemporary applied fields of psychology. An important part of the programme is the process of transferring theoretical knowledge into practice, which students carry out during the 7 weeks long traineeship in different workplaces or organizations such as institutions of public education, social and health services, primary health care institutions, non-governmental organizations, private companies or other educational and research institutions.



Department of Applied Natural Sciences

Growing databases of various biological data suitable for computer analysis (e. g. genetic information) brought up the need for experts with skills in computer and information sciences but also with adequate understanding of natural sciences. Miha Šaberl, our *undergraduate* student of **Bioinformatics** between 2010 and 2013, decided to attend this programme because it combines both subjects of his interest - Biology and Computer Science. *“Professors lectured with excellent pedagogical approach and*

more than justified their leading roles in specific scientific fields,” he recalls. With knowledge obtained in this interdisciplinary programme, our students are capable of understanding processes within complex biological systems and are skilled for mathematical modelling, algorithm development and use of ICT in problem-solving.

When he finished his studies at UP FAMNIT, Miha Šaberl felt quite ready to go international. In 2015 he gained his MSc in Biology-Biotechnology at University of Copenhagen, Denmark, and looks forward to his future, where he wishes to become a board member of an international biotechnological or pharmaceutical company or start his own high-tech company.

Conservation and protection of the environment, sustainable use and management of natural resources and production and processing of quality food are undoubtedly some of the most vitally important global challenges of today's and future world. They are all addressed in our *undergraduate* programme **Mediterranean Agriculture**, which focuses on specific needs of agricultural production in Mediterranean agro-ecological conditions and tries to link stable economy with nature. At the end of the day, agriculture is what brings food on our plates, or, as Volenec et al. stated in Science Magazine (335: 917) in 2012: *»Agriculture isn't dead. In fact, no other industry feeds the world's population, which could hit 9 billion by 2050. The need for graduates in agriculture, horticulture, and animal science programmes will be critical to finding ways of safely doubling food production in order to meet the demand of a growing population.«*

Department's activities are highly involved in local environment, and maintain regular contact with end-users of our knowledge, which provide us with constructive feedback and allows for a quick response to further needs of various industry branches, as well as for a further development and improvement of applied research methods.



Sustainability is another key word of the research and pedagogical activity of the department. In fact, climate change and its disastrous consequences are stimulating the transformation towards sustainable development with its increasing economic efficiency, protection and restoration of ecological systems, and improvement of human well-being.

»Today people spend most of their time indoors; our physical surroundings are known to affect us. Therefore, creating healthy indoor environments, such as work places, classrooms, living rooms, dining rooms, and bedrooms, is an important aspect for healthy living. Wood is an excellent building material because of its excellent strength to weight ratio and the variety of forms in which it can be used with other materials.« explains Assoc. Prof. Andreja Kutnar, PhD, coordinator of the new master's programme **Sustainable Built Environments** which will have its first generation of students in the academic year 2017/18.

The programme offers a complete set of skills and knowledge in the fields of engineering, wood, and architectural science and will train graduates who will be able to solve complicated problems and face challenges that arise in the field of the sustainable built environment. Students will work in direct cooperation with the wood industry and the international team of researchers of the new established Innorenew Center of Excellence in Koper.

The Center was established in 2017 and it is co-funded the Horizon 2020 Framework Programme of the European Union. In the next years it will strive to become an international hub of scientific excellence in the field of renewable materials and ensuring quality of life.



Research in progress

Soon after the Faculty establishment in 2006, our professors and assistants became part of UP *FAMNIT Research Group*. Their research covers a wide range of scientific sub-disciplines within the fields of Mathematics, Natural Sciences, Computer Science, and Psychology. UP FAMNIT Research Group is closely connected with *University of Primorska Andrej Marušič Institute* (UP IAM), which provides a vibrant and productive working environment for scientists carrying out both fundamental and applied research. UP IAM supports international scientific cooperation through establishing connections with similar organizations around the world, and follows its mission to actively contribute to the goal of the European Union to create a knowledge-based society. By transmitting the incentives formed at the junction of the Mediterranean and the Central European area into the international university community, UP IAM also contributes to the sustainable development of the local community and wider.

»At IAM we firmly believe that among all ways of knowledge transfer, the most important is the transmission of experiences and knowledge from older generations to young. Therefore we encourage the participation of FAMNIT students in our projects – this way our projects get new drive, and students get experience and insight in practical use of gained knowledge.«Associate Professor Vito Vitrih, PhD, Director of UP IAM

UP IAM consists of four Departments (Department of Technology, Department of Mathematics, Department of Information Science and Technologies, Department of Health Study) and two Centres - Slovenian Centre for Suicide Research (SCSR) and Centre for Industrial Applications (CIA). Young forces from UP FAMNIT classrooms and labs are highly welcomed and appreciated within their research and development activities. *»Programmers and lab assistants at our Department of Technology and Department of Information Science and Technologies, psychologists and bio-psychologists at SCSR, and doctoral students as young researchers at the Department of Math-*



*ematics are our investment for the future and a guarantee for a successful continuation of our already established research paths,« states Vitrih, who also participates at the educational process on UP FAMNIT and teaches two courses - *Selected Topics in Numerical Mathematics* and *Introduction to Numerical Calculation*.*

»*No man is an island, entire of itself; every man is a piece of the continent, a part of the main.*« *John Donne*

We enjoy and value our interaction with the community and contribute as well as gain from surrounding inter-culturally rich environment. Our teaching staff is actively involved in diverse *workshops* where they present scientific findings to future generations of students as well as to general interested public in attractive and intriguing ways.

FAMNIT Excursions into the Mathematical Universe is a series of popular monthly lectures on Mathematics, its tricky questions and its amazing role in our everyday life.

FAMNIT Excursions into the World of Natural Sciences comprise of lectures, workshops and camps, dedicated to discovering and protecting our natural heritage and promoting sustainable development among Secondary School students.

FAMNIT Excursions into the World of Science are designed to boost interest in topics from Mathematics, Computer Science, Information Science and Natural Sciences among Primary and Secondary School students.

Biological Evenings at FAMNIT offer a wide range of lectures from the exciting field of Biology for all students and general public who are interested in applied research and current goings-on in this scientific area.

The so-called *Orada* is held by enthusiastic experts who encourage all Primary and Secondary school students interested in Computer Science to join them at our hands-on approach *FAMNIT Computer Science Workshop*.

Summers by the Adriatic are not only hot and sunny, but also fun, educational and international, since we attract more and more participants from abroad to our *FAMNIT Summer Schools*. After Primary and Secondary School students relax from their curricular engagements, we offer them a glimpse into the topics of our attractive

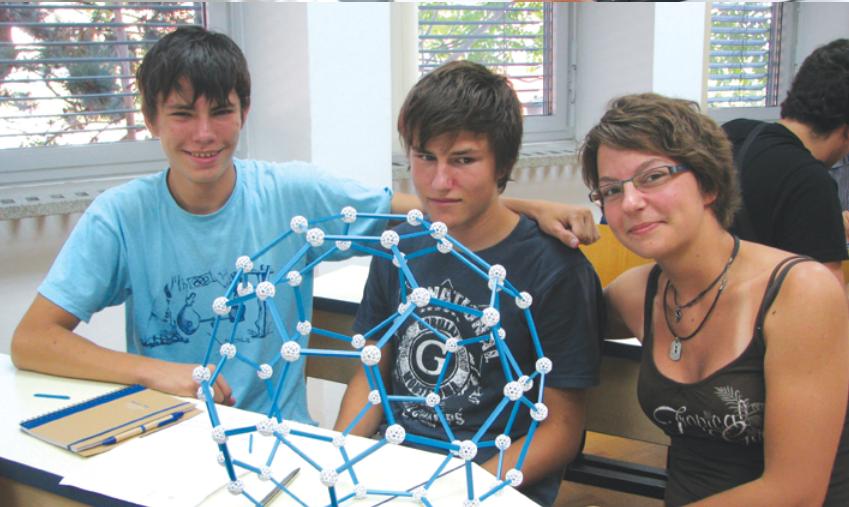


programmes to curl their brain a bit more and to possibly raise their further interest in presented subjects.

FAMNIT Summer Math Camp »*Mathematics is Cool*« includes lectures and workshops on various mathematical topics as well as numerous social activities. We believe it convinces every participant how fun and useful math can be.



FAMNIT Natural Science Camps encourage interested Secondary School students to pack their rubber boots, hats, pencils and notebooks, switch classrooms for field and join our teachers and researchers on exciting journeys of biologic exploration.



Good to know

In this section you can find basic information about procedures, deadlines and documentation for enrolment in undergraduate and postgraduate study programmes at the Faculty. You can also find basic information regarding fees, Slovene language examination, health insurance and scholarships.

The academic year lasts from 1 October to 30 September.

Application procedures for undergraduate studies

In accordance with Slovene legislature the procedures for application and enrolment are different with regard to citizenship of the candidate: the procedures for EU citizens and foreign citizens with permanent residence in Slovenia who themselves or their parents are liable for tax in Slovenia are identical to the procedures for Slovene citizens, while non-EU citizens and Slovene nationals without Slovene citizenship are treated as foreign citizens.

The candidate applies for enrolment in accordance with the **annual call for enrolment for undergraduate study programmes**, which includes the basic data on study programmes, number of places available, admission requirements, as well as application procedures and deadlines for enrolment.

The call for enrolment for undergraduate study programmes is published at the end of January for the next academic year. Candidate can apply (the term can vary from year to year):

- EU citizens: the first application term usually lasts from 5 February to 5 March,
- non-EU citizens: the first application term usually lasts from 5 February to 15 July.

For detailed information regarding deadlines for enrolment and other important information please visit our website <http://www.famnit.upr.si/en> (Education / Enrolment).

Application procedures for postgraduate studies

The candidates apply for enrolment in accordance with the annual call for enrolment for postgraduate studies, which includes the basic data on study programmes, the number of places available, admission requirements, criteria for selection, as well as application procedures and deadlines for enrolment in the first year and the subsequent year of postgraduate study.

The call for enrolment for postgraduate study programmes is published at the end of March for the next academic year. The last date for submitting the application form is in the beginning of September.

For detailed information regarding deadlines for enrolment and other important information please visit our website <http://www.famnit.upr.si/en> (Education / Enrolment).

Recognition of foreign diplomas

The procedure of recognition of foreign education is obligatory for all candidates who are holders of foreign diplomas and have not yet undergone the procedure of recognition. The application for recognition shall be submitted at the same time as the application for enrolment in the study programme. The recognition procedure is conducted by the University of Primorska. The decision on recognition shall be issued no later than within two months after the date of receipt of a complete application.

Tuition fees

Non-EU citizens have to pay the tuition fee in accordance with the Higher Education Act. Tuition fees for a study programme are divided in individual years of study, and can be paid by instalments.

Detailed information regarding tuition fees and *foreign citizens who are exempt from paying tuition fees* are published on our website <http://www.famnit.upr.si/en> (Education / General Information).



Scholarships

Best students of University of Primorska are supported by the Scholarship fund of University of Primorska. Scholarships range from 2.000 to 4.500 EUR per academic year, depending on individual's academic performance.

Slovene language examination

Foreign students are obliged to pass the Slovene language examination:

- students enrolled in undergraduate and master's study programmes have to pass the exam at the basic level prior to enrolment in the second year of studies,
- students enrolled in doctoral study programmes are recommended to attend the course at the basic level (during their studies).

Slovene language examination is not obligatory for foreign students enrolled in the study programme implemented in English.

Residence permit and health insurance in the Republic of Slovenia

Foreign students must hold a *residence permit* to be able to enter the Republic of Slovenia. The permits are issued, upon students' request, by the diplomatic missions and consular posts of the Republic of Slovenia abroad.

Citizens of the EU Member States are not required to hold a residence permit during the first three months following their entry into the Republic of Slovenia; however, after the initial three months, they are obliged to apply for a residence permit with an Administrative Unit.

Foreign students must provide *health insurance* before entering the Republic of Slovenia. For additional information candidates should contact health insurance companies in their country.

Let us know what you think or ask for more information

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Our graduates

»Most of all, I wish my innovations would prove useful and helpful to society.«

Irman Abdić, Computer Science graduate



»I enjoy my work in the lab. Since molecular methods and their application in conservation are developing so fast, there is always a lot to learn and research which, I believe, will keep me very busy and happy.«

Nataša Fujs, Nature Conservation graduate



»Professors lectured with excellent pedagogical approach and more than justified their leading roles in specific scientific fields.«

Miha Šaberl, Bioinformatics graduate

Complete list of programmes

Undergraduate Study Programmes (first Bologna cycle)

- Mathematics (in Slovene and English)
- Mathematics in Economics and Finance
- Computer Science (in Slovene and English)
- Bioinformatics
- Biodiversity
- Mediterranean Agriculture
- Biopsychology

Master's Study Programmes (second Bologna cycle)

- Mathematical Sciences (in Slovene and English)
- Computer Science
- Nature Conservation
- Mathematics with Financial Engineering
- Biopsychology
- Applied Psychology
- Sustainable Built Environments

Doctoral Study Programmes (third Bologna cycle)

- Mathematical Sciences (in Slovene and English)
- Computer Science

For more information about UP FAMNIT study programmes and description of offered courses please visit <http://www.famnit.upr.si/en/education>.

Welcome to the Faculty of Mathematics, Natural Sciences and Information Technologies

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