Pázmány Péter Catholic University
Faculty of Information Technology and Bionics
LET US ENGINEER THE FUTURE TOGETHER
Bionics is a new field where life sciences, electronics and computer technology meet. New inventions and services are being designed and developed, including fMRI, lab-on-a-chip devices, prostheses and body-machine symbioses, such as pacemakers or neuro-stimulators in the brain. This is a brand new world in which we are laying down the foundations for a special field that will pave the way for a new industry.

Following the ideas of the late Professor Tamás Roska, the founding Dean of our Faculty, around twenty internationally-renowned researchers developed an innovative Electronic and Computer Engineering curriculum with a hint of neuroscience, which later expanded into an independent Molecular Bionics Engineering program. Along with Imperial College London, PPCU was the first university in Europe to offer the study of this new interdisciplinary field at the undergraduate level.

I invite you to visit us and enroll in one of our computer science or bionics programs. You will find an environment that is both professionally and personally inspiring, and I am sure you will return with knowledge and memories that will benefit you for a lifetime.

Kristóf IVÁN, PhD
Dean
Program Structure

**PhD: 2+2 years**

- Computer Science and Engineering, Electrical Engineering, Biological Sciences

**MSc: 4 semesters**

- MSc in Computer Science Engineering
- MSc in Info-Bionics Engineering
- MSc in Medical Biotechnology

**BSc: 7 semesters**

- BSc in Computer Science Engineering
- BSc in Molecular Bionics Engineering

Did you know? We provide versatile training to increase your chances of finding a job.

Introduction

Credit system

The abbreviation ECTS stands for European Credit Transfer System. 1 ECTS = 1 credit = 30 study hours

Further information: ec.europa.eu/education

Undergraduate programs

On the BSc program students acquire the theoretical foundations and basic practical skills, and learn how this knowledge can be applied in real-life situations. A total of 210 credits are needed for the BSc degree, and these are distributed over seven semesters. Individual student work, individual laboratory practice and an internship all form part of our curriculum. BSc programs prepare students for further study on one of the MSc programs.

- **BSc in Computer Science Engineering (BSc CSE)**
  The Computer Science Engineering program gives students a special insight into those fields where information technology is facing new, unknown challenges such as medical sciences, human-machine contact, parallel computation, and the world of nano- and micro-electronics.
  Areas in which we are able to explore new ground at both domestic and international level include the revolution of sensors, the growth of chip complexity, ubiquitous kilo-processor chips, the facilitation of natural human communication, and human language technology.

- **BSc in Molecular Bionics Engineering (BSc MBE)**
  Molecular Bionics is at the frontiers of biology, molecular physics, chemistry, and computer technology and guides the way for rapidly developing fields of science, such as computer-assisted pharmaceutical industry, medical biotechnology or nanobiotechnology. Students will encounter lab-on-a-chip technology, computer-aided drug design, complex biolaboratory practice, physiology measurements, 2D and 3D imaging and processing, genome-chip technology, etc. After finishing the BSc program, students can pursue their studies on the Info-Bionics Engineering or Medical Biotechnology Master courses in order to become the pioneers of a new industry.

Graduate programs

MSc programs allow students to gain knowledge of specialized areas, while offering a much deeper insight into the theoretical aspects of the subject. In addition to compulsory subjects, students can choose from a wide selection of elective courses, enabling MSc students to follow a study track based on their interests. In their research projects, our MSc students might help to develop exciting high-tech inventions, such as bioprosthesis, implants, diagnostic and robotic appliances. These may seem like something from a science fiction movie, but sooner or later they will be part and parcel of our lives.

**Length of program: 4 semesters (2 academic years)**

- Compulsory credits: 120
- Language instruction for MSc programs: English

Did you know? The student-teacher ratio is 6.4 to 1
MSc in Computer Science Engineering (MSc CSE)

One of the strengths and special features of the MSc Computer Science Engineering program at PPCU FIT is the synergy of information technologies and life sciences. Our goal is to teach human-centered information technology with the fundamental concepts of life sciences. The essence of our Computer Science Engineering training approach is that we try to find and understand techniques developed over millions of years in biological systems and transfer them into engineered informatics environments. In this field of continuously developing technologies we provide the necessary fundamentals to enable the professionals trained by our Faculty to work at the highest level, therefore our Computer Science Engineer graduates can adapt well to the ever changing professional environment.

Besides basic natural sciences our students study the most relevant programming languages and their application in different environments. They become familiar with the principles of complex software systems and artificial intelligence. We emphasize a hardware-based approach and kiloprocessor and reconfigurable architectures. By teaching students about sensory applications we introduce them to the world of info-bionics. Neuromorphic calculations, digital language technology, machine learning, and image processing and analysis are also very exciting and modern fields that can be studied and explored at our Faculty.

There are several experimental research laboratories at the Faculty which are equipped with modern and unique instruments. Our students can therefore explore the world of research and development as soon as they start their Masters studies. Depending on their specialization, students can expand their theoretical and practical knowledge in the fields of software design, communication networks, intelligent systems, sensing computers, mobile applications or image processing. Students who select the Image Processing and Computer Vision specialization will spend one semester at the University of Bordeaux, one at the Universidad Autónoma de Madrid, and one at PPCU FIT. At the end of their studies on this joint Masters program they will then receive diplomas from these universities.

Specializations:
- General (no specialization)
- Machine Learning for Data Science (MLDS)
- Image Processing and Computer Vision (IPCV)

MSc in Info-Bionics Engineering (MSc IBE)

Many of the innovative new products today come from the interdisciplinary field of info-bionics, which combines computer science, electrical engineering and biotechnology (e.g. sequencing tools, BCI, implants, sensory robotics).

Our Masters program aims to develop students' core competencies through courses in modeling, neural sciences, electrophysiology, electronics and computer science.

By fully understanding biological processes and measurements (e.g. neural signals, communications, cell-cell interactions, data processing of living organisms) we are able to develop engineering solutions, instruments, devices, computational algorithms and models to augment or supplement a biological system. These also help us to measure, control and operate vital processes affecting living organisms and the quality of human life.

Examples of applications and research: prostheses, rehabilitation, bionic eyeglass, brain computer interfaces, neural electrodes, limb actuation, wheelchair navigation or minimally invasive surgery tools, multimodal medical imaging, bioinformatics, intelligent or sensory-actuating robotics, nanosensors.

We would be happy to welcome you on our Masters program if you have previous training in molecular biology, electrical engineering, image processing or neuroscience.

Two specializations are offered in this field:
- Bionic interfaces
- Bio-nano sensors and imaging devices
**MSc in Medical Biotechnology (MSc MB)**

The program, which is operated jointly with Semmelweis University Budapest, allows students to gain advanced theoretical and practical knowledge of a field which combines medicine and informatics. Medical biotechnologists work in the rapidly developing bio-medicinal field where their responsibilities include research, development, application and management. They are able to model and simulate biological systems on computers, are familiar with the current methods in molecular diagnostics and therapies, and design, create, manage and use databases in the field of medical biotechnology. Medical biotechnologists are able to handle and interpret large-scale data sets of medical relevance. As specialists trained in science, informatics and specific fields of medicine, they are employed in basic research, pharmaceutics, medical/molecular diagnostics and biotechnology. From February 2019 the program will be taught in English.

**Two specializations are offered in this field:**
- Molecular biotechnology
- Applied bioinformatics

**Biodata analysis program**

The online Biodata analysis program is a one-year, 60-credit program providing enhanced knowledge and skills in the analysis of large-scale molecular data from biological systems. The specific aim of the program is to equip students with the skills needed to meet the demands of academic and industrial organizations performing high-throughput gene expression and sequencing studies.

To enter the program, candidates requires a BSc degree or higher in the field of bionics, molecular biology or information technology with adequate basic knowledge of biomolecular sequence, structure and function.

The program is fully online with courses accessible through an e-learning system and includes substantial individual project work with hands-on help from lecturers available upon request.

The tuition fees for the program are currently HUF 1,000,000 (approx. EUR 3128) per semester.

Contact: biodata@itk.ppke.hu

**Did you know?**

We carry out research in order to improve people’s lives.
Erasmus Mundus Joint Master Degrees (EMJMDs) are international study programs delivered by a consortium of higher education institutions from different countries.

The EMJMD scholarship covers the participation costs (including tuition fees, library and laboratory costs, and full insurance coverage); it also contributes towards travel and relocation costs and includes a monthly allowance for the entire duration of the study program.

The Image Processing and Computer Vision (IPCV) program trains specialists in a field of increasing importance. Processing images and videos is essential in domains such as medicine, surveillance, industrial control, remote sensing, e-commerce and automation.

Three partner universities with internationally recognized experience in these domains have pooled their complementary expertise and developed this two-year Masters program. The result is a high-quality, widely recognized, triple Masters degree that respects the 120 ECTS syllabus, and is well adapted to job market criteria. All students follow the same curriculum and spend an entire semester at each university:

› 1st semester: Pázmány Péter Catholic University, Budapest, Hungary
› 2nd semester: Universidad Autónoma de Madrid, Spain
› 3rd semester: University of Bordeaux, France
› 4th semester: Internship in an academic laboratory or industry

Program website: www.ipcv.eu

Stipendium Hungaricum Scholarship Program

Thousands of students from all around the world apply each year to study at higher education institutions in Hungary. Both the number of Stipendium Hungaricum applicants and the number of available scholarship places are continuously increasing.

Students may apply for the following study programs under the scholarship:

› MSc in Computer Science Engineering
› MSc in Info-Bionics Engineering
› MSc in Medical Biotechnology
› PhD in Biological Sciences
› PhD in Information Science
› PhD in Electrical Engineering Sciences

The scholarship covers the following:

› Tuition-free education
  ▶ exemption from tuition fees
› Monthly stipend*
  ▶ Masters students: monthly scholarship of HUF 40 460 (approx. EUR 130) as a contribution toward living expenses in Hungary, for 12 months a year, until the end of the program
  ▶ PhD students: the monthly scholarship is HUF 140 000 (approx. EUR 450) for the first phase of the program (4 semesters) and HUF 180 000 (approx. EUR 580) for the second phase (4 semesters) - for 12 months a year, until the end of the program
› Accommodation*
  ▶ dormitory place or a contribution of HUF 40 000 (approx. EUR 130) towards accommodation costs for the duration of the scholarship period
› Medical insurance

*financial data are for the 2018/19 academic year and are only provided for information purposes further information: itk.ppke.hu/en/admissions/stipendium-hungaricum

Did you know?
We believe that people are the core value in scientific work, education and everyday relationships.
Scholarship Program for Christian Young People

The core mission of the program is to give young Christian students, living in crisis regions around the world and/or those threatened in their country because of their faith, the opportunity to study in Hungary. After completing their studies, scholarship holders will return home to help their home communities.

Students may apply for the following study programs under the scholarship:

▶ MSc in Computer Science Engineering
▶ MSc in Info-Bionics Engineering
▶ MSc in Medical Biotechnology

Provisions covered by the scholarship:

▶ Tuition-free education
▶ exemption from tuition fees
▶ Monthly stipend*
▶ Masters students: monthly scholarship of HUF 119 000 (approx. EUR 390) as a contribution towards living expenses in Hungary, for 12 months a year, until the end of the program
▶ Accommodation*
▶ dormitory place or a contribution of HUF 40 000 (approx. EUR 130) towards accommodation costs for the duration of the scholarship period
▶ Reimbursement of travel costs
▶ HUF 200 000 / year (approx. EUR 650)
▶ Medical insurance

*financial data are for the 2018/19 academic year and are only provided for information purposes
Further information: itk.ppke.hu/en/admissions/christian-scholarship

Doctoral School

The Roska Tamás Doctoral School of Sciences and Technology opened in 2001. The Doctoral School is accredited to issue PhD degrees in three fields of science: information science and technology, electrical engineering, and biology. The education and research work is organized into the following five sub-programs:

▶ Bionics, Bioinformatics, Bio-inspired Wave Computers, Neuromorphic Models
(Head: Prof. Sándor PONGOR)
▶ Computer Technology Based on Many-Core Processor Chips, Virtual Cellular Computers, Sensory and Motoric Analog Computers
(Head: Prof. Péter SZOLGAY)
▶ Feasibility of Electronic and Optical Devices, Molecular and Nanotechnologies, Nano-architectures, Nanobionics, Diagnostic and Therapeutic Tools
(Head: Prof. Árpád CSURGAY)
▶ Natural Language Technologies, Artificial Understanding, Tele-presence, Communication
(Head: Prof. Gábor PRÓSZÉKY)

Further information: itk.ppke.hu/en/phd

The Faculty has international cooperation agreements and works closely with several foreign universities, most notably with

▶ University of Notre Dame, USA
▶ Polytechnic University of Turin, Italy
▶ Catholic University of Leuven, Belgium
▶ University of California, Berkeley, USA

This extensive cooperation network, together with the Faculty’s outstanding resources, gives students access to a state-of-the-art research infrastructure and opportunities for scientific discussion. Graduates either pursue an academic career or become involved in applied research through spin-off companies. A number of successful spin-off companies have been launched from research projects at our Faculty.
The last two years were a blessing being at this amazing university. I was very lucky to be able to work with my supervisor who is the best professor ever who was kind enough to trust me with his original ideas. You will belong at our university, regardless of your religion, ethnicity, nationality, gender or beliefs. The students here are like a big family and you can ask anyone for their help.

Jalal ALAFANDI, Syria
PhD student

PCCU FIT is a very welcoming place and I have felt at home here since my very first day. The community consists of both international and Hungarian students, top academics and lovely staff. When I started my second MSc year, I began to see things from a different perspective, more as an engineer, thanks to our professional teachers at the university who did their best to enlighten us in a comprehensive manner.

Nawar SHEER, Iraq
MSc in Computer Science Engineering

Fabio MARCUCCIO, Italy
Erasmus student

What is it like studying at PPCU? It is located in the heart of Budapest, one of the most beautiful capitals in Europe. You have the opportunity to meet new friends from all over the world, very cooperative teachers and supervisors, and you can get involved in many new activities, aside from struggling with a very special language containing 14 vowels which helps you to expand your melodic skills. In short, I like it :) 

Sam KHOZAMA, Syria
PhD student

My time here at Pazmany Peter Catholic University has been characterized by immense knowledge acquisition. The university is like a big family where irrespective of your nationality there is always a strong bond and we are a team in all activities carried out at the university, whether academic or recreational. I appreciate that the university has such wonderful administrative staff and lecturers and that it offers such a conducive environment.

Chidiebere Edwin NWAGU, Nigeria
MSc in Computer Science Engineering

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Nawar SHEER, Iraq
MSc in Computer Science Engineering

Fabio MARCUCCIO, Italy
Erasmus student

My time in Budapest was probably the best period of my life. I will never forget the view of the great Danube from Margit bridge. Once you’ve seen it, it will stay in your mind for the rest of your life. PPCU is very nice and very small compared to the university I came from. The atmosphere is very friendly and one of the best things is that professors know you, just like in high school! I never felt embarrassed for asking anything and I received all the help and support I needed. This was the first (and probably the last) time when reality exceeded my expectations... and expectations for an Erasmus experience are always very high!

Yvett-Nikolett KRILEK, Romania
Erasmus student

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I really enjoyed my stay here as an Erasmus student. Before my period abroad I was looking for a pleasant and well-equipped place to go with professional teachers and an awesome student community. PPCU FIT was perfect. Coming to Pazmany was definitely one of the best decisions of my life. It gave me useful experience and left me with unforgettable memories.

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Research work at the Faculty predominantly focuses on the interdisciplinary area between the life sciences, computer science and engineering, and on strengthening the convergence paradigm of these fields. The Faculty’s flat structure makes cooperation between different research groups particularly straightforward.

The Faculty’s capacities in computing and dedicated hardware architecture design are also outstanding, which in particular helps solve complex computational problems that arise in engineering design or biological data analysis.

Research and education are closely linked at the Faculty, which was awarded the title of ‘Research University Faculty’ by the Hungarian Government in 2013. This title was only given to four faculties out of 115 in Hungary.

Students actively take part in research during their university years. They can work individually or in teams on a chosen topic with the assistance of a researcher or professor as part of the Research Experiences for Undergraduates Program, and later join one of 22 research groups at the Jedlik Laboratories.

Jedlik Laboratories is the center of scientific activity at the Faculty, where professors and researchers are joined by PhD and Masters students. Study and innovation are linked through major research laboratories and state-of-the-art SMEs, from both Hungary and abroad. Jedlik Laboratories was established with partners like the Semmelweis Medical University, major start-up companies, and five research institutes of the Hungarian Academy of Sciences:

- Institute for Computer Science and Control
- Institute of Experimental Medicine
- Institute of Enzymology
- Institute of Technical Physics and Materials Science
- Institute of Cognitive Neuroscience and Psychology

Jedlik Laboratories

- Analysis and Control of Dynamical System
- Bioinformatics Laboratory
- Biocatalysis and polymer optoelectronic technologies
- Cellular wave computing and spatial-temporal algorithms
- Data.Media.Community
- Discovery research in Neurobiology
- Electrophysiology
- Experimental Mathematics
- Microanalysis and Pharmacology
- Microelectronic systems and integrated circuits
- Mobile Sensing Networks
- Movement rehabilitation
- Multi-photon Microscopy
- Natural Language Processing
- Programmable optics
- Programming languages and software technology
- Sensory Robotics
- Simulations of electromagnetic fields, and field-matter interactions - toward engineering quantum electrodynamics
- Smart Sensory Computing
- Software Defined Electronics and Virtual Instrumentation
- Structural Bioinformatics and Proteomics
- Superresolution in Optical, Ultrasonic, and Nanomagnetic Detection (SOUND)
- Systems Biology of Molecular and Cellular Networks
- Virtual and Physical Machines with Mega-processor Chips
To give you a flavor of what our laboratories do, we have described a few of them in more detail below.

**Electrophysiology Laboratory**  
*István ULBERT, György KARMOS*

The Laboratory incorporates several disciplines including electrophysiology, materials science, chip- and micro electromechanical systems (MEMS) research, computational research, neurology research and optical imaging research in order to investigate the physiological and pathological functions of the central nervous system. Since 2014 the Laboratory has been involved in the Hungarian Brain Research Program.

**Main research interests:**
- bionic probe research by designing and validating various probe structures
- investigation of the cortical generators of event-related potentials, spontaneous and epileptic activity
- functional characterization of the thalamo-cortical neural networks responsible for sensory information processing
- brain computer interface studies for registration, and intervening EEG, EOG, EMG and eye movement following algorithms

**Did you know?**

99% of our graduates find jobs in computer science engineering and bionics.

**Sensory Robotics**  
*György CSEREY*

Non-intrusive human recognition techniques allow people to be distinguished by their biological traits without their active participation. The technique pursued in this research is gait recognition, i.e. identifying someone by the unique way he or she walks. This is obviously of particular interest in security applications, but other areas also stand to benefit from an increased access to information about gait. Examples include walking rehabilitation and shoe design.

It is difficult to measure the continuous arterial blood pressure waveform in an accurate, non-invasive manner and innovative blood pressure measurement technology is urgently needed. Our system uses a new measurement strategy provided by the OptoForce 3D force sensor, which is attached to the wrist at the radial artery.

The lab has produced preliminary results in two areas. The first one is the pure simulation of a robotic arm playing table tennis. The machine-learning part is based on reinforcement learning and combined with the modified versions of DDPG and Prioritized Experience Replay algorithms. The second is a robotic arm to reach and grasp objects.

With the Anatomically Correct Biomechatronic Hand, our aim is to restore not just basic hand functionality (like the ability to produce simple grasps and gestures), but to mimic the delicate dexterity of the human hand in order to facilitate the development of a prosthetic device. While the model is still under development, the current version is already able to perform movements in a natural and human-like manner, preserving the "feel" and behaviour of the human hand.
In the Smart Sensory Computing Lab we have a special focus on machine vision and artificial intelligence. Many aspects of our comprehensive research are related to real-life applications, such as:

- intelligent analysis of medical images (e.g. recognizing cancer cells on microscopic images, automatic eye diagnosis using fundus cameras)
- an internally-developed face recognition-based access control system,
- a cell phone app helping visually impaired people to get around,
- vision systems for smart cities that identify vehicles and pedestrians as well as predict dangerous situations.

In our theoretical research we primarily focus on understanding the principles of learning and vision. A key challenge is improving the generalization ability of learning algorithms and more specifically neural networks. We can learn a great deal from the human nervous system in this regard, and our goal is to avoid the necessity of huge datasets and to enable sensible inference based on just a few samples.

Did you know?
We have a human-oriented and nature-motivated approach to information technology.

Superresolution in Optical, Ultrasonic, and Nanomagnetic Detection (SOUND) Laboratory
Miklós GYÖNGY, György CSABA

Our laboratory hosts two research groups:

The aim of the imaging group is to understand various wave processes and phenomena in order to map the properties of various objects, including biological tissue. Primarily ultrasound is used, however other methods such as optics and CT are also of interest.

**Imaging (Miklós Gyöngy)**

We are developing a portable ultrasound device which takes images of skin using high frequencies (~ 20 MHz) in order to provide high-resolution (< 1 mm) images. Our research into image resolution enhancement also covers CT imaging, where our recent results suggest the potential superiority of CNN approaches over classical deconvolution methods.

**Optics, nanomagnetics (György Csaba)**

Our group is working on nanomagnet and spin-wave-based computing devices. These emerging computing architectures replace electrical signals by magnetic (spin-based) signals and may allow ultra-low energy and fast electronic circuitry. In our lab we are currently building a unique time-resolved magneto optical Kerr erect (TR-MOKE) setup. The samples will be produced by our colleagues at the University of Notre Dame, USA and the Technical University of Munich, Germany.
Systems Biology of Molecular and Cellular Networks
Attila CSIKÁSZ-NAGY

The lab combines computational system biology modelling techniques with experiments to investigate the dynamics of molecular and cellular interaction networks.

We translate the wiring diagrams of molecular interaction networks into mathematical forms and analyze the equations to understand the physiological responses the system might give. Our main research lines are broadly in the topics of cell growth and cell division. We collaborate with multiple experimental groups, who provide data for our models and platform to test our predictions. As a further step recently we have established an experimental laboratory where we test the effects of cell-cell communication in yeast colonies and combine these with our newest computational models. We also work on theoretical ideas related to effective simulation, simulation methods and noise filtering.

**Biological topics we investigate:**
- Cell cycle, cell size, cell polarity and cell growth regulation
- Protein aggregation and its effect on ageing
- Evolution of biological switches and clocks
- Biocomputation
- Cell-cell communication
- Protein complex composition and abundance predictions
- Coupling between the circadian clock, cell cycle and DNA damage

Virtual and Physical Machines with Mega-Processor Chips
Péter SZOLGAY

Many-core computers are used nowadays to solve computationally intensive problems. Many-core may currently mean 1000 processing elements but soon several hundreds of thousands of processing elements will be available on a desktop machine. New ideas and new methods are required in algorithm development for these types of architectures. A new kind of parallel algorithms have to be developed using the cellular architecture of processors and memories. In the lab our aim is to develop new, algorithmic and implementation-centered thinking in our students. We also plan to advance some structurally new algorithms for the algorithmic assignment categories and to establish connected software-development methods in the lab projects.

**Typical assignment categories:**
- spatiotemporal dynamic system-analysis,
- real-time image and signal processing.

Did you know?
We teach you to think so you will be able to create freely and independently.
Research Highlights

- Algorithmic combination of logical, analogue and noise signals; application of spatial temporal metrics and commands for solving non-linear wave equations on cellular wave computer chips
- Design and development of a bionic eyeglass for visually impaired people
- Lab-on-a-chip development with microfluidic laboratory background
- Development of new methods for the modeling of molecular dynamics on supercomputers
- Development of ultrasound technologies for diagnostic purposes (e.g. for cancer detection)
- Designing and characterizing MEMS electrode for cerebral bionic interfaces
- Electronic phonendoscope as a sensing–computing device for newborn phonocardiography and diagnostics
- Developing new hardware/software tools for medical image analysis
- New language technological devices for Hungarian and foreign language text analysis and computer aided translation (CAT)

Student Services

Mentors
Mentors welcome international students and help them throughout their studies. The active community life developed via the mentor system is complemented by several cultural programs and sports activities where students have the opportunity to get to know one another better.

Accommodation
Mentors help students find accommodation in dormitories, hostels or small apartments.

Meals
The Faculty has a cafeteria, where special dietary needs are catered for (e.g. gluten-free, lactose-free and diabetic meals). There are several other self-service restaurants and cafeterias in the area offering a wide range of meals from pizza to gyros, as well as traditional Hungarian lángos or kürtőskalács.

Sport
The Faculty offers facilities for badminton, basketball, football, gymnastics, table tennis and volleyball. Sports classes are free, but students must register in advance. There are also many sports and fitness facilities nearby.

Public transport
Budapest has an extensive public transport network of buses, trolley buses, trams, suburban trains and subway lines. With their student ID, students can buy a monthly Budapest pass at a reduced price. The operating company, BKK, has a website in English with information on daytime and night transportation services. It also allows you to plan your route around the city: www.bkk.hu/en.

Services for students with special needs
At the beginning of their course the Equal Opportunities Coordinator will help students with special needs find student mentors who provide individualized assistance to students. The mentors study with the students with special needs and help them prepare for everyday life at the university. The Faculty offers additional opportunities for digitalization and the possibility to buy special tools and software. The Faculty building is wheelchair-accessible.

Students with families
Students arriving with their families receive extra administrative and practical assistance.

Estimated living costs per month in EUR

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost in EUR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accommodation in dormitory</td>
<td>130-180</td>
</tr>
<tr>
<td>or hostel in a room/small flat</td>
<td>260-320</td>
</tr>
<tr>
<td>Utilities</td>
<td>50-80</td>
</tr>
<tr>
<td>Laundry/Towlettes</td>
<td>100</td>
</tr>
<tr>
<td>Meals</td>
<td>100</td>
</tr>
<tr>
<td>Public transport</td>
<td>12</td>
</tr>
</tbody>
</table>
What does being a Catholic university mean for students?

This primarily represents an opportunity, not an obligation. The university’s Catholic nature is reflected mainly in the values of its lecturers and staff, and in its community-based organizational structure. For Catholic students, it is certainly a bonus to study in a place which reflects their values, and to practice their religion in different ways. Mass is held in the chapel every week (participation is optional). The university chaplain is happy to answer your questions and is there for conversations, advice, etc. We also organize spiritual and religious events on a regular basis.

However, non-religious students or students of other religions are merely asked to respect the values of the Catholic Church and are in no way compelled to conform to its beliefs. It is important to know that there are no compulsory religious subjects in the curriculum, but there are optional courses about Christian values and the Bible for those who are interested.

Erasmus+ and other Partner Institutions

Austria
- University of Applied Sciences FH Campus WIEN (Vienna)

Belgium
- KU LEUVEN

Bulgaria
- Technical University of SOFIA

Estonia
- TalTech University

Finland
- TAMPERE University of Technology

France
- Université de BORDEAUX
- EPITECH PARIS
- Institut Supérieur d’Électronique de PARIS
- Université - TOULOUSE III - Paul Sabatier

Germany
- Technische Universität DRESDEN
- Technische Universität MÜNCHEN (Munich)

Italy
- Università degli Studi di CAGLIARI
- Università degli Studi di SIENA
- Politecnico di TORINO (Turin)

Netherlands
- Radboud University NIJMEGEN

Poland
- Jagiellonian University in KRAKOW
- Adam Mickiewicz University Faculty of Biology POZNAN

Portugal
- Universidade Católica Portuguesa LISBON

Romania
- Universitatea Politehnica din BUCHAREST
- Universitatea Babes-Bolyai CLUJ-NAPOCA
- Universitatea din ORADEA
- Universitatea Politehnica TIMISOARA

Slovenia
- University of LJUBLJANA

Spain
- Ramon Llull University, BARCELONA
- Universidad de Deusto, BILBAO
- Universidad Autonoma de MADRID
- Universidad CEU San Pablo, MADRID

Turkey
- İşık University, ISTANBUL
- İSTANBUL Technical University

Japan
- National Institute of Technology, TOYAMA College

USA
- Berkeley University of CALIFORNIA
- University of NOTRE DAME
Why choose Pázmány Péter University as your Erasmus+ Destination?

Info for ERASMUS + students
When to study at PPCU:
› BSc students: Fall semester (this is when courses are available in English)
› MSc students: Fall and Spring semesters
Students should contact their supervisor in advance in order to verify project or research topics with a local lecturer or researcher at PPCU FIT.

For Computer Engineering students:
Why PPCU? We excel in:
› biology-related computer engineering
› hardware-software co-design
› neuromorphic computation
› sensor-based computations and fusions
› artificial intelligence

Ideal background:
› computer engineering
› computer science
› electrical engineering

For Bionic Engineering students:
Why PPCU? We excel in:
› well-equipped, high-quality labs
› interdisciplinary studies integrating electronics, computer science and biotechnology
› neural interfaces
› imaging devices

Ideal background:
› biomedical engineering
› mechatronics
› bioengineering
› electrical engineering
› molecular biology

Admissions

Application documents required for MSc programs:
› Application Form
› Transcript of Records
› English language proficiency certificate
› BSc degree with a mark of over 75%

Qualification requirements
› MSc in Computer Science Engineering: BSc degree in Computer Engineering, Computer Science or Electrical Engineering
› MSc in Info-Bionics Engineering: BSc degree in Molecular Bionics, Biomedicine, Electrical Engineering, Engineer in Informatics, Chemical Engineering, Biology or Chemistry
› MSc in Medical Biotechnology: BSc degree in Molecular Bionics, Biomedicine, Chemical Engineering, Medical Laboratory and Imaging Diagnostic Analysis, Biology or Chemistry

Further information: itk.ppke.hu/en/admissions

Application documents required for PhD programs:
› Application Form
› Transcript of Records
› English language proficiency certificate
› MSc degree in Electrical Engineering, Biology or Information Technology (with a mark of over 75%)
› Research plan (2-3 pages) describing the applicant’s results, projects and the proposed research topic
› Reference letter from the applicant’s mentor (previous supervisor or other mentor)

Further information: itk.ppke.hu/en/phd

English language proficiency certificate – equivalent to B2 according to the CEFR or any of the following:
› IELTS with an average score of 6.0 points
› internet-based TOEFL (altogether at least 90 points)
› PTE Academic (at least 59 points)
The capital of Hungary is full of surprises. This small country in the center of Europe has a capital that is both captivating and elegant. If you have not been here before, coming here to study is an excellent opportunity to do so. With its rich history, the city is the perfect destination for those who wish to learn, as it allows you to combine an excellent education with quality free time. An endless number of pubs, bars and festivals make Budapest a city that never sleeps. The fact that so many Hollywood movies are filmed here is a testament to its beauty. The heart of downtown Budapest is also a UNESCO world heritage site.

Budapest is also known for its many thermal baths. Their tranquil atmosphere will take you back in time to Hungary’s imperial past as part of the Austro-Hungarian empire. Budapest is also an excellent base for exploring other parts of Europe. Hungary is located in Central Europe so you will be able to combine your studies with a fair amount of traveling. Living in Budapest is relatively cheap compared to many other EU capitals. If you want to experience living in a city where East meets West, you enjoy challenges and you are ready to be surprised and captivated by Budapest, then this is the place for you.

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E-mail: international.office@itk.ppke.hu
itk.ppke.hu/en

Let us engineer the future together