



PÁZMÁNY

Pázmány Péter Catholic University
Faculty of Information Technology and Bionics



ITK

Master's Programs
Post-Graduate Certificates

ABOUT US

The Faculty of Information Technology and Bionics at Pázmány Péter Catholic University (Pázmány ITK) stands at the intersection of technology and life sciences, fostering innovation and excellence in education and research. Our mission is to shape the engineers and scientists of tomorrow by providing a solid foundation of knowledge paired with practical, hands-on experience.

We take pride in being a small yet dynamic faculty, where students, lecturers, and researchers form a close-knit, supportive community. Rooted in the rich traditions of Hungarian science and enriched by international perspectives, our approach integrates intensive learning, cutting-edge research, and a commitment to personal growth. At Pázmány ITK, education is not just about acquiring skills but embarking on an intellectual journey to explore, innovate, and uncover the truths of nature.

Join us as we bridge disciplines, push boundaries, and inspire the future of technology and bionics.

Our faculty is located in Budapest, close to leading professional partners such as Semmelweis University, the Institute of Experimental Medicine, Nokia Skypark, Corvin Technology and Science Park, and the Corvin Innovation Campus. This strategic location fosters daily collaboration opportunities, strengthening the impact and reach of our research-based initiatives.

RESEARCH

With over 30 research groups working in interconnected fields, Pázmány ITK stands at the cutting edge of technological innovation. By integrating the latest advancements in biology, bionics, bioinformatics, electrical engineering, computer science, and machine vision, our faculty ensures that education and research remain dynamic and future-focused. A distinctive aspect of our research environment is the active participation of undergraduate and master's students. Their innovative contributions have already led to the formation of seven successful startup companies, highlighting the entrepreneurial spirit of our community.



For more details about our research groups and their groundbreaking work, please visit our website (you may use the QR code).



ENGLISH-TAUGHT PROGRAMS AT A GLANCE

PhD

2+2 years

Biology

Electrical
Engineering

Computer
Sciences

Postgraduate Certificate

2 semesters

Biodata
Analysis
(online)

High-
Throughput
Biology
(in-person)

Master's Programs

1+4 semesters

Computer
Science
Engineering

Quantum
Engineering

Image
Processing and
Computer Vision

Info-Bionics
Engineering

Bioinformatics

Medical
Biotechnology

BIOINFORMATICS MSC



INNOVATION BASED ON BIOLOGICAL DATA

Discover the Secrets of Biology with IT Tools

Bioinformatics is a science at the intersection of computer science and life sciences. By processing ever-increasing amounts of biological data, bioinformatics transforms data into information, paving the way for further scientific discoveries.

The knowledge of bioinformatics is indispensable in all areas of biotechnology, including personalised medicine, drug and vaccine development, and database and software development for biomedical data.

Get Ahead in Your Career

As the healthcare, biotechnology, and pharmaceutical industries rely more and more on data analytics and artificial intelligence, the demand for professionals with biological knowledge and programming/analysis skills is growing.

The Bioinformatics MSc at Pázmány ITK will prepare you to find your place in this dynamically growing market with its ever-new discoveries.

Key Focus Areas

- Sequence Analysis
- Structural Biology
- Bioinformatics Algorithms
- Biostatistics
- Molecular Diagnostic Data Processing Techniques
- Systems Biology Modelling Techniques
- Mathematical Description of Complex Systems
- Modelling of Neurobiological Processes

Specializations

- Biomolecular Data Interpretation
- Systems Biology

COMPUTER SCIENCE ENGINEERING MSC



INFORMATION TECHNOLOGY IN THE SERVICE OF HUMANITY

The Symbiosis of Life Sciences and Technology

Our approach revolves around observing functional techniques that have evolved in the natural world over millions of years and building these insights into the designed world of information technology. Our goal is to create new, innovative solutions through the close collaboration of life sciences and informatics, contributing to the development of the technological world and enhancing the quality of human life.

Modern Technologies, Marketable Knowledge

We place particular emphasis on hardware issues, including kilo-processors and reconfigurable architectures. Through the education of sensor applications, our curriculum also opens doors to the world of info-bionics. Neuro-morphic computations (mimicking the nervous system), digital language processing, machine learning, data science, image processing, and analysis are all exciting and contemporary areas that can be studied and researched at our Faculty.

Key Focus Areas

- Software Design and Mobile Applications
- Artificial Intelligence
- Non-Conventional Computing
- Image Processing, Computer Vision
- Prompt Engineering
- Database Management, Big Data
- Robotics, Control Systems
- Parallel Systems

Specializations

- High-Performance Computational Tools and Architecture
- Software Engineering
- Machine Learning for Data Science





IMAGE PROCESSING AND COMPUTER VISION EMJM (IPCVAI)



FIND YOUR VISION WITH US!

The four-semester Artificial Intelligence for Image Processing and Computer Vision master's program offers a curriculum designed to provide in-depth expertise in image and video processing, computer vision, and artificial intelligence. Students form a close-knit international community while earning degrees from three leading European universities: Pázmány Péter Catholic University (Hungary), Universidad Autónoma de Madrid (Spain), and Université de Bordeaux (France).

The IPCVAI Erasmus Mundus Joint Masters Program blends insights from electrical engineering, applied mathematics, computer science, and computer engineering, with a strong focus on AI-powered neural models in the IPCV domain. Fully taught in English, this 120 ECTS master's program addresses the growing demand for top-tier professionals, offering graduates invaluable knowledge, hands-on experience, and access to internships through a robust network of industry partners.

Graduates of the IPCVAI program earn three master's degrees and are equipped with the advanced skills and interdisciplinary expertise sought after by leading high-tech companies and research institutions worldwide. They help close the talent gap in cutting-edge fields like artificial intelligence, computer vision, and image processing, driving innovation in Europe and beyond. With endless job opportunities and an excellent foundation for pursuing a PhD or advancing into state-of-the-art research, graduates are well prepared to shape the future of technology and science.



INFO-BIONICS ENGINEERING MSC



INNOVATION AT THE INTERFACE OF LIFE SCIENCES AND INFORMATICS

Shape the Future with Your Knowledge!

The field of info-bionics integrates computer science, electronics, and biotechnology. The goal of our interdisciplinary master's program in Info-Bionics Engineering is to enhance students' complex modeling competencies and develop their proficiency in operating and designing tools. A deep understanding of biological processes and measurements strengthens the development of engineering solutions, devices, computational algorithms, and models used in biological systems.

Practice-Oriented Education, Broad and Marketable Knowledge

Application and research examples include prosthetics, rehabilitation, bionic glasses, brain-computer interfaces, neural electrodes, limb operation, wheelchair navigation, minimally invasive surgical tools, multimodal medical imaging, bioinformatics, intelligent or sensor-operated robotics, nanosensors.

Key Focus Areas

- Medical Imaging
- Robotics, Prosthesis
- Brain-Computer Interface (BCI)
- Neural Electrodes
- Nanobiotechnology
- Bioinformatics

Specializations

- Bionic Interfaces
- Bio-Nano Sensors and Imaging Devices
- Neural Data Science
- Systems Biology





MEDICAL BIOTECHNOLOGY MSc

CELLULAR-LEVEL KNOWLEDGE, TUNED FOR HEALING

From Data to Health

Bioinformatics merges computer science and life sciences, turning vast biological data into insights that drive discovery. Our Medical Biotechnology MSc, in collaboration with Semmelweis University, Budapest, provides advanced expertise at the intersection of medicine and informatics. Learn to apply and develop molecular diagnostics and bioinformatics methods, manipulate cells and biomolecules, and model biological systems. Gain proficiency in managing medical biotechnology databases, enabling you to analyze complex datasets and stay ahead in this dynamic field.

Research and Innovation for Our Health

Medical biotechnologists advance personalized medicine, drug and vaccine development, and biomedical data analysis. The Medical Biotechnology MSc prepares graduates to excel in molecular diagnostics, therapies, and informatics, using cutting-edge tools like computer-based modeling and simulation. Ready to innovate in research labs, biotechnological companies, or experimental institutes, they play a key role in shaping the future of healthcare.

Key Focus Areas

- Bionanotechnology
- Biopharmacy-Pharmacokinetics
- Recombinant DNA Techniques
- Bioinformatics

Specializations

- Applied Bioinformatics
- Molecular Biotechnology

QUANTUM ENGINEERING MSc

STAND AT THE FOREFRONT OF THE TECHNOLOGICAL REVOLUTION!



In the coming years, quantum-based measuring instruments, computers, and quantum electronic devices are expected to be widely adopted. The knowledge of quantum mechanics will be indispensable in designing automotive instruments, as well as in the pharmaceutical industry, chip design, medical device design, and programming artificial intelligence algorithms.

The Quantum Engineering MSc program is specifically designed as an engineering discipline. Although it aims primarily to train industrial research and development professionals with higher mathematical, physical, and computational knowledge than standard engineering programs, students with a background in physics are also welcome.

Key Focus Areas

- Quantum Algorithms
- Theory of Quantum Sensors
- Nanotechnology
- Integrated Photonic Systems
- Modelling
- Microelectronics and Semiconductors



POSTGRADUATE CERTIFICATES

BIODATA ANALYSIS

DECIPHER THE HIDDEN MEANING OF BIOLOGICAL DATA!



Unlock the potential of genomic, transcriptomic, and proteomic data with specialized training in large-scale biological data analysis. This fully online program—among the few of its kind in Europe—offers the flexibility to study from anywhere in the world while equipping you with cutting-edge skills in modern biodata analysis. Taught entirely in English, it provides a comprehensive understanding of molecular biology test data and state-of-the-art analytical techniques.

Insights for Diverse Research Domains

The explosion of genomic, transcriptomic, and proteomic data from tissue studies—and increasingly from single-cell analyses—demands professionals proficient in high-throughput data interpretation.

Specialist Online Training in Large-Scale Biodata Analysis

This program trains professionals to manage and interpret biomolecular data for academic and industry needs. Jointly run by Pázmány University's Faculty of Information Technology and Bionics (Hungary) and HiDucator Ltd (Finland), it combines expert teaching with practical applications.

The curriculum focuses on R-based data analysis while incorporating Python and Java skills. Core topics include biostatistics, sequence analysis, high-throughput genomics, proteomics, transcriptomics, phylogenetics, and structural bioinformatics.

Apply now!

Applications can be submitted through our online portal at <https://apply.ppke.hu/>.



HIGH-THROUGHPUT BIOLOGY

BE AT THE FOREFRONT OF MODERN BIOLOGY!



This program equips you with the expertise to automate large-scale laboratory and biological data processing tasks, preparing you for the future of high-throughput biology.

Over two semesters, this English-taught, on-site program emphasizes modern bioanalytics, microscopy, laboratory automation, and bioinformatics. You will gain hands-on experience with cutting-edge tools such as liquid-handling robots, spectrophotometers, and mass spectrometers, while also learning programming and data science, from fundamentals to advanced techniques, using Python and R.

Automate Large-Scale Experiments with Confidence

As high-throughput methods become indispensable in both industry and academia, this program trains professionals to design and evaluate large-scale biological experiments using state-of-the-art instruments and robotic systems. Modern diagnostic and bioanalytics facilities rely heavily on automation, utilizing advanced tools capable of executing complex, large-scale experiments efficiently.

Our goal is to prepare students to excel in this rapidly evolving field. The curriculum focuses on the practical applications of advanced instruments and technologies, alongside building a solid foundation in programming and data science to meet the demands of today's biological sciences.

Apply now!

Please note that this program does not offer online participation.

Applications can be submitted through the program's webpage (<https://kepzes.itk.ppke.hu/htb>).



PATHWAYS TO STUDY AT PÁZMÁNY ITK

Your Journey as a Self-Funded Student

Self-funded students from any country of the world are welcome to our faculty.



ACCESS TO EXCELLENCE

All of our MSc programs are open to self-funded students, providing diverse options to pursue your academic and career goals.

ACCOMMODATION MADE EASY

You may be able to secure accommodation in the university dormitory, ensuring a convenient and supportive environment.

HEALTH COVERAGE

Enjoy the benefits of a private health insurance package funded by the university, giving you added security during your studies.

FLEXIBLE PAYMENT CONDITIONS

From your second semester onwards, you may pay the tuition fee in three instalments.

GLOBAL OPPORTUNITIES

You are eligible for Erasmus+ grants, opening doors to international experiences and connections.

VISA SUPPORT

Self-funded students are guaranteed a student visa and then a residence permit for study purposes for the entire duration of their studies.

Broadening Horizons with Erasmus+

EXPAND YOUR HORIZONS

Participate in study or internship opportunities abroad for up to 12 months through the Erasmus+ Program. Courses completed abroad are fully recognized by Pázmány ITK, ensuring uninterrupted academic progress.



PARTNER UNIVERSITIES

Choose from over 20 partner universities across Europe, offering courses relevant to Pázmány ITK students.

COST AND FINANCIAL SUPPORT

Receive a mobility grant to partially cover living and travel expenses during your stay abroad. Continue paying tuition fees at Pázmány ITK while being exempt from tuition fees at the host university.

ELIGIBILITY

The Erasmus+ program is open to all self-funded international students at Pázmány ITK.

Transformative Scholarship Opportunities

Hungary offers a range of prestigious scholarship programs designed to foster international collaboration and support talented individuals worldwide. These programs embody Hungary's commitment to education, cultural exchange, and global development.



RECIPIENTS

- Stipendium Hungaricum (SH): students from over 90 partner countries
- Scholarship Programme for Christian Young People (SCYP): young Christians from crisis regions or countries where they face religious threats
- Hungarian Diaspora Scholarship (HDS): individuals of Hungarian heritage worldwide, living in the diaspora, to help reconnect with their roots

ALLOWANCES

Allowances are meant to contribute to students' living expenses but do not cover all their costs.

- SH: exemption from tuition fee, monthly scholarship, dormitory accommodation or housing allowance, free state-funded healthcare, complementary private health insurance, free visa and residence permit administration
- SCYP: exemption from tuition fee, monthly scholarship, dormitory accommodation or housing allowance, free state-funded healthcare, complementary private health insurance, travel allowance, free visa and residence permit administration
- HDS: exemption from tuition fee, monthly scholarship, dormitory accommodation or housing allowance, free state-funded healthcare, complementary private health insurance, one-time travel allowance for relocations over 8,000 km, free visa and residence permit administration

VISA SUPPORT

Scholarship holders are guaranteed a student visa and then a residence permit for study purposes for the entire duration of their studies.

FURTHER GENERAL INFORMATION, APPLICATION

- SH: stipendiumhungaricum.hu
- SCYP: hungaryhelps.gov.hu/en/programs/scholarship
- HDS: diasporascholarship.hu/en/

FACULTY-SPECIFIC INFORMATION

For further details, eligible master's programs etc., please visit our website: <https://itk.ppke.hu/en/scholarships-at-itk>



A UNIQUE DESTINATION FOR LEARNING AND LIVING

Studying in Hungary offers a unique blend of academic opportunity and cultural exploration. Located in the heart of Europe, Hungary is a gateway to iconic destinations, rich history, and vibrant modern life. With affordable living costs, a lively international community, and one of the safest environments in Europe, Hungary ensures an unforgettable experience for students. Explore Budapest's dynamic city life, Hungary's enchanting landscapes, and its welcoming atmosphere as you embark on your academic journey.

HUNGARY AT THE HEART OF EUROPE

Located at the crossroads of Europe, Hungary offers the perfect starting point for exploring the continent's most famous destinations. Budapest's international airport serves as a major regional hub, making it easy to reach other parts of Europe, while Hungary's excellent rail network connects you seamlessly to neighbouring countries. Cities like Vienna, Prague, or Rome, as well as the stunning Adriatic coast, are all within easy reach. Hungary's thousand-year cultural heritage, rich traditions, and breathtaking landscapes make it an inspiring and memorable place to study. While focusing on your academic journey, you'll also have the chance to experience Europe's diversity from this central hub.

LIFE IN BUDAPEST

Budapest, the vibrant capital of Hungary, offers a unique blend of historic charm and modern dynamism. Divided by the majestic Danube River, the city balances the scenic hills of Buda with the lively cultural energy of Pest. A vibrant international community, countless opportunities for students, and activities catering to all tastes and interests make Budapest one of the best student cities in the world. From its architectural wonders and cozy streets to exciting festivals and world-class gastronomy, Budapest is a city where tradition meets innovation. With countless cultural and social events, it's the ideal place to immerse yourself in local and international student life.



STUDENT LIFE AND AFFORDABILITY

Hungary's welcoming atmosphere and affordable living costs make it a hotspot for international students. Each year, thousands of young people come here to join its lively academic and social communities. With student-friendly pricing, you can enjoy dining out, travelling, and attending events without breaking your budget. You can easily find the best programs for you in the rich selection of world-renowned festivals, vibrant nightlife, and a wide range of cultural activities.

SAFETY AND LANGUAGE

Hungary is ranked among the safest countries in Europe, providing a secure environment for students to focus on their education and leisure activities. While Hungarian ("magyar") is the official language, English is also widely spoken, particularly by younger people, making it easy to navigate everyday life. At Pázmány ITK, international students also benefit from two semesters of Hungarian language classes, giving them the chance to connect more deeply with local culture and traditions.

CLIMATE AND SEASONS

Hungary's continental climate brings four distinct seasons, each offering its own unique charm. Summers are warm and sunny, perfect for outdoor activities, while winters can be cold, creating picturesque snowy landscapes. Temperatures range from -7°C in January to 35°C in July and August, giving you the opportunity to experience everything from vibrant summer festivals to cozy winter traditions.



ADMISSION FOR MSc PROGRAMS



Degree Requirements

Applicants must hold a bachelor's degree (180 ECTS) before starting the master's program.

You can find a detailed list of BSc degrees typically accepted for each study program on our website.

Language Requirements

Applicants must provide an English language certificate corresponding to a B2 level (CEFR).

You are exempt from this requirement if English is your native language, if your bachelor's degree was completed fully in English (with proof of medium of instruction), or if your degree was obtained in a country where English is an official language.

Entrance Examination

The entrance examination for our MSc programs (excluding the IPCVai EMJM) consists of an online written test and an oral interview. The written test (on the University's Moodle platform within a specified period of 2–3 days) includes multiple-choice questions on program-specific subjects. Based on the test results and academic track record, shortlisted applicants are invited to a 20-minute online interview to discuss their background, motivation, career plans, and exam topics.

The entrance procedure for the IPCVai EMJM program involves a preselection stage, where candidates are evaluated based on their academic records, motivation, and recommendations. Shortlisted applicants are then invited for interviews. During the assessment, particular attention is given to programming skills, mathematics, and overall motivation.

Finances

Tuition fees for the MSc programs vary depending on the program and the applicant's nationality. For detailed information about tuition fees and application costs, please visit itk.ppke.hu.



STARTING YOUR JOURNEY AT PÁZMÁNY ITK

Foundation Semester

International master's students (excluding IPCVai) are required to complete a Foundation Semester during the fall term before officially starting their MSc program, which begins in February.

The Foundation Semester is designed to ensure that students are well-prepared for their studies in Budapest, providing a thorough review and enhancement of bachelor-level knowledge and skills necessary for success in their chosen master's program. This preparatory period helps students adapt academically and professionally to meet the program's standards.

Only students who satisfactorily complete the Foundation Semester are eligible to progress to the four-semester master's program. As a result, the total duration of the master's programs for international students is 1+4 semesters.

Comfortable Living Options

Dormitories are a favoured accommodation option in Hungary, due to their affordable rates. Conveniently located to the Faculty, our university dorm in Múzeum utca serves as accommodation for the university's international students throughout their studies.

Our university dorm offers twin, triple and quadruple rooms, featuring a private bathroom, equipped with a washing machine. Each room is furnished with a kitchenette.

Another option is to rent a flat. You may reduce the costs if you share the flat with other students.

Important Dates for the Academic Year

In Hungary, the academic year is divided into two semesters: the Fall semester and the Spring semester. The year begins in September with the Fall semester, which starts with a study period (lectures and seminars) lasting until early December. This is followed by the exam period, running from early December to late January.

The Spring semester begins in February, mirroring the structure of the Fall semester, with the study period lasting until mid-May and the exam period extending through late June. Students enjoy a summer break in July and August.

We also have seasonal breaks: fall break (around the end of October), winter break (around Christmas), and spring break (near Easter). This structure offers a balance between academic commitments and time for rest and personal pursuits.

SUPPORT, CONNECTION, AND COMMUNITY

MENTOR SERVICE

Your Support Network in Hungary

Our mentor system pairs international students with Hungarian or international mentors (students of the Faculty) to provide personalized support before and during their stay in Budapest. From assisting with travel arrangements to navigating administrative tasks, academics, and leisure activities, mentors ensure a smooth transition and vibrant community life enriched with cultural and sports events.

ORIENTATION WEEK

Start Strong: Your Introduction to University Life

Orientation Week is a mandatory, activity-filled program designed to help students adapt to university life. It includes academic advising, enrollment assistance, campus tours, and social events to ensure a seamless transition while fostering connections with fellow students, faculty, and staff. Plan your arrival accordingly to attend all required sessions.

FAITH LIFE

A Welcoming Community for All Beliefs

Being a Catholic university means a commitment to human values, fostering a strong community, offering personal attention, and striving to improve the quality of life through our work. These principles shape both our academic mission and the inclusive environment we create for all students.

For Catholic students, the university offers a familiar and supportive space to practice their faith, with weekly Holy Masses in the faculty chapel and the opportunity to meet the chaplain for spiritual conversations and confessions also in English.

Our campus culture values tolerance and inclusivity, welcoming students of all faiths or none. While we ask for respect for Catholic traditions and values present on campus, we equally respect everyone's individual beliefs. This mutual understanding fosters a harmonious and supportive community where we can live, learn, and grow together.



WHY CHOOSE PÁZMÁNY ITK?

INNOVATE, CONNECT, AND EXCEL IN A GLOBAL ACADEMIC ENVIRONMENT.

RESEARCH-ORIENTED EXCELLENCE

Join a faculty at the forefront of innovation, equipped with state-of-the-art laboratories and cutting-edge research facilities. As a student of a Research University Faculty, you will collaborate with top experts, contribute to groundbreaking projects, and connect with innovative SMEs shaping the future of information technology and life sciences.

EARN A EUROPEAN DEGREE

Pázmány ITK offers high-quality academic programs that meet European standards, providing you with a globally recognized degree. Choose our programs to combine academic excellence and innovative knowledge with affordability.

SUPPORTIVE AND CLOSE-KNIT COMMUNITY

Experience the warmth of a family-like atmosphere, where a strong student community and comprehensive student services ensure that you feel supported every step of the way. At Pázmány ITK, personal attention and collaboration create a nurturing environment for academic and personal growth.

A LIVEABLE AND SAFE COUNTRY

Study in Hungary, one of Europe's safest and most liveable countries. Affordable living costs, a vibrant cultural scene, and a peaceful environment allow you to focus on your studies and enjoy a high quality of life.

INTERNATIONAL AND MULTICULTURAL ENVIRONMENT

Immerse yourself in a diverse and dynamic community, where students from all over the world come together to learn and grow. At Pázmány ITK, you will gain not only a degree but also a global perspective, building connections that last a lifetime.



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