

FACULTY OF **ELECTRONICS** AND **INFORMATICS**



VILNIAUS | UNIVERSITY OF
KOLEGIJA | APPLIED SCIENCES

ABOUT THE CITY

Vilniaus Kolegija/University of Applied Sciences is situated in Vilnius, the capital and the largest city in Lithuania. Relatively small and cosy, with a population of less than a million, Vilnius is the most international city in Lithuania and the second youngest city (after Copenhagen) in Nordic European countries. In 2019 Vilnius made the top 100 Best Student Cities list taking into account university rankings, student mix, desirability, employer activity and affordability.

Here the historic and modern come together. Vilnius medieval old town is famous for its baroque and gothic architecture and is a UNESCO World Heritage Site. On the other hand, Vilnius is full of modern sites to discover.

Throughout the year the capital hosts numerous cultural events, such as the Vilnius International Film Festival, Capital Days, Vilnius Jazz Festival and Culture Night. Moreover, it is a magnificent location to explore the Baltics.

You are more than welcome to enjoy!



ABOUT VIKO

Vilniaus kolegija/University of Applied Sciences (hereinafter VIKO) was established in 2000, when the best schools in Vilnius merged into one professional higher education institution. Currently VIKO is one of the largest and leading professional higher education institutions in Lithuania.

- ▶ 39 Professional Bachelor study programmes, 8 of them in English.
- ▶ Highly competent and experienced academic staff.
- ▶ Active cooperation with social partners.
- ▶ Over 31 thousand graduates having entered the national and international labor market.
- ▶ Qualification development courses for different field specialists.
- ▶ Membership in numerous international associations and networks.

Students and teachers gain valuable experience in Erasmus+ and other international exchange programmes. VIKO provides each student with the opportunity to develop his/her creative learning approach in the student-centered learning environment.

Creative, proactive and curious individuals are welcome to join VIKO community and make it their Alma Mater!

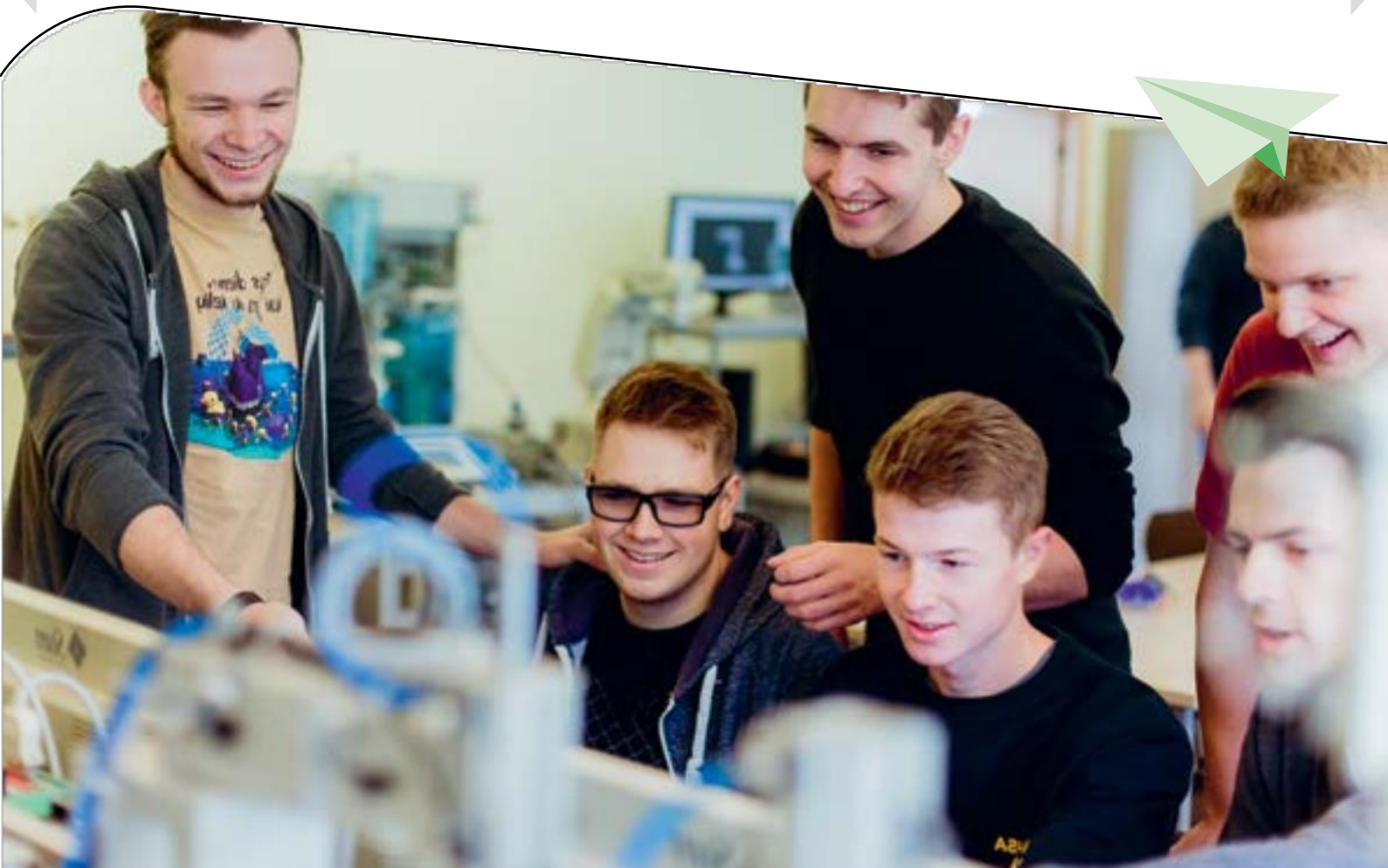


ABOUT THE FACULTY

The Faculty of [Electronics and Informatics](#) provides higher education college studies focused on practical activities. Being open to innovations and corresponding to labour market needs the faculty offers study programmes designed to prepare well-qualified specialists, able to work under conditions of rapid technological changes and integrate into the labour market in Lithuania and abroad.

WHAT DO WE OFFER?

- 1 Provides higher education college studies in physical and technological sciences; simulation and problem-based approach to the teaching and learning.
- 2 Closely cooperates with other educational institutions, state and business enterprises.
- 3 Implements projects of EU structural funds and participates in EU lifelong learning programmes.



WE INVITE

Vilniaus Kolegija/ University of Applied Sciences welcomes Erasmus exchange students selected for Erasmus+ mobility by their home higher education institutions in Programme and Partner countries: https://ec.europa.eu/programmes/erasmus-plus/about/who-can-take-part_en

- ▶ Join VIKO for Erasmus+ [studies](#) if you are enrolled at least in the second year at your higher education institution.
- ▶ Do [a traineeship](#) with us or our social partners (enterprises and companies) if you have finished at least your 1st year of studies.

LANGUAGE

The language of instruction at VIKO is Lithuanian, and studies for incoming students are offered in English. Therefore, a certain level of English is required (preferably B2).



Study programme SOFTWARE ENGINEERING

The aim of the study programme is to prepare software engineering specialists who will be able to:

- ▶ communicate in foreign languages;
- ▶ work in a multicultural environment;
- ▶ improve their qualification and adapt to market changes;
- ▶ follow ethical and professional behaviour;
- ▶ share professional knowledge;
- ▶ apply quality management methods;
- ▶ analyse and design data structures;
- ▶ design and implement algorithms using programming tools;
- ▶ select and apply testing tools and methods;
- ▶ prepare software user manual and its technical documentation;
- ▶ design, create and modify databases, user interfaces, software;
- ▶ analyse, select and implement information security solutions;
- ▶ create and modify data processing and Web-based service solutions;
- ▶ administer database management and Web-based service systems.

FULL-TIME STUDIES / Degree Course 2022

Subject	Credits	Evaluation*
1st semester (30 credits)		
Professional English	6	E
Speciality Language	3	P
Mathematics	6	E
Operating Systems	6	E
Structured Programming	6	E
Introduction to Informatics	3	P
2nd semester (30 credits)		
Environmental and Human Safety	3	P
Probability Theory and Mathematical Statistics	3	P
Algorithms and Data Structures	6	E
Discrete Mathematics	3	E
Human-Computer Interaction Design	6	E
Computer Graphics	6	E
First Programming Practice	3	P



FULL-TIME STUDIES / Degree Course 2022

Subject	Credits	Evaluation*
3rd semester (30 credits)		
Methods of Computation and Optimization	6	E
Database Design	6	E
Information Systems	3	E
Law	3	P
Object-Oriented Programming	6	E
Management	3	P
Second Programming Practice	3	P
4th semester (30 credits)		
Sociology	3	P
Business Management Systems	3	P
Computers and Networks	6	E
Multithreaded Programming	3	E
Web Services	6	E
Information Security	6	E
Database Practice	3	P
5th semester (27 credits)		
Economics	3	P
Software Testing	3	P
Software Engineering	3	E
Optional subject 1**	3	P
Optional subject 2**	3	P
Specialization: Database Systems		
Database Management Systems	6	E
Data Mining	6	E
Specialization: Internet Technologies		
Client-Side Web Development	6	E
Server-Side Web Development	6	E
Specialization: Smart Device Programming		
Hybrid Mobile Applications	6	E
Native Mobile Applications	6	E



FULL-TIME STUDIES / Degree Course 2022		
Subject	Credits	Evaluation*
6th semester (33 credits)		
Artificial Intelligence	6	E
Software Development Management	3	E
Professional Practice	12	P
Optional subject 3**	3	P
Optional subject 4**	3	P
Specialization: Database Systems		
Database Servers Management	3	E
Non-Relational Databases	3	E
Specialization: Internet Technologies		
Web Security	3	E
Website Optimization for Search Engines	3	E
Specialization: Smart Device Programming		
Internet of Things	3	E
Smart Device Sensors Programming	3	E
7th semester (30 credits)		
Final Practice	15	P
Final Project	15	Defense

* E – exam, P – project

**Optional subjects are freely selectable subjects from the list of predefined subjects.



SUBJECT DESCRIPTION

Professional English

The subject is designed to develop the ability to apply various linguistic strategies of creating and perceiving verbal and written text, to develop creativity, self-study, and self-evaluation skills.

Specialty Language

The subject aims at developing essential linguistic skills to communicate in spoken and written environment using specific terminology. Students learn to communicate in formal and informal styles, find and apply necessary information.

Mathematics

The subject discusses linear algebra, analytic geometry, mathematical analysis, differential equations, number and function series. Students learn to create simple mathematical model of science and technology, solve, interpret, and evaluate it using modern software.

Operating Systems

The subject provides knowledge about the internal structure of operating systems, internal computer processes, memory and resource management, file systems. Students are introduced to the structure, composition and operation of UNIX and Windows operating systems family; they learn to use basic commands, create batch (scripts) files, and configure them.

Structured Programming

In this course students learn to create and use basic algorithms, simple constructs (conditions and loops), operate simple and compound data structures, use various features and libraries in C++.

Introduction to Informatics

The subject concentrates on modern information technology. Students learn about document management information systems used at VIKO/UAS, databases and their usage, information search, the possibilities of social networks and cloud computing. They develop skills to prepare and edit documents, spreadsheets, presentations on the spot or in the cloud.

Environmental and Human Safety

The subject concentrates on the principles of safe and healthy working conditions, ensuring the prevention of accidents. Students are introduced to society-environment interactions, ecological problems, sustainable development strategies in Lithuania and the EU. Legal standards for safe work organization are studied.

Probability Theory and Mathematical Statistics

The subject presents Probability Theory concepts and definitions the knowledge to be later applied in Statistics. Students learn to collect, structure, and interpret data.

Algorithms and Data Structures

The subject introduces a variety of complex data structures such as stack, deck, linked list and their realization. Students learn various searching and sorting algorithms, application of the recursive algorithms and recursive data structures.



Discrete Mathematics

The subject discusses mathematical logic, combinatorics, elements of graphs and algorithm theory. Concepts and theories of discrete mathematics are presented.

Human-Computer Interaction Design

The subject considers the importance of human-computer interaction and affecting factors. Detailed attention is given to the graphical user interface design, development, testing and efficacy analysis, appropriate selection of elements and their layout on screen.

Computer Graphics

The subject covers graphical design tools, graphic algorithms, properties of graphic primitives, 2D and 3D modelling transformations, library design systems. Students learn to evaluate the possibilities and spheres of CorelDraw and Photoshop tool, model 2D objects, work with photos and layouts.

First Programming Practice

During the practice, students create applications for solving real problems, prepare documentation for those applications.

Methods of Computation and Optimization

Students learn to describe various methods with programming language, choose programming environment and apply numerical and optimization methods.

Database Design

The subject discusses database in information systems field, presents the elements of database theory, the methodology and basic concepts of database modelling and the principles of programming realization. Students learn to model and create a database, modify its structure, perform data processing, review database security and data control aspects.

Information Systems

In this subject students get familiar with the structure, classification of information flows in information systems. The course covers lifetime cycles of information systems, discusses objective area (user scope) methods of analysis and modelling the problem domain.

Business Management Systems

The subject is designed to acquaint students with the architecture of business management systems, their structure, application possibilities and basics of programming. The subject also provides students with practical knowledge of business management system application in the activities of organizations.

Object-Oriented Programming

Students achieve skills in module, data structures, file input/output programming considering class design principles and technology closely related to the object-oriented programming.

Management

The subject focuses on the development of general management skills, appropriate decision-making procedures, employee relations, management subtleties and motivation theories.



Second Programming Practice

During the practice students compose algorithms, find optimal methods for task specific problems. Data structures and actions with classes, modules, and events are taken into consideration. Object-oriented programming methods are applied while solving practical tasks.

Sociology

Students analyse the origins of sociology, its development and sociological ideas of the 20th century. They study the methodology of sociological research, quantitative and qualitative research peculiarities and acquire the ability of applying the methodology of sociological research in practical life.

Law

Students get introduced to the basic concepts of fundamental law, learn to use legal sources to gather information, analyse legal situations, comment and provide findings to explain workers rights and obligations, consumer rights, etc.

Computers and Networks

The subject provides information about organization and principles of computer network operation. Students develop skills of evaluation and practical use of computer networks, deployment and configuration of internetwork protocols and equipment.

Multithreaded Programming

The subject is designed to introduce multithreaded software development principles.

Web Services

The course introduces to basic technologies used for the creation of Web services. It covers XML syntax, namespaces, XML Schema, and WSDL before exploring Web Service client or server-side development.

Information Security

The subject covers the integration and combination of an asymmetric and symmetric algorithm such as RSA, ElGamal, DSA, AES, standard secret key distribution, authentication, TCP/IP security protocol. Students learn to use hash functions to ensure information integrity.

Database Practice

During the practice students design, create, and normalize database, assess data process anomalies. They design user environment, test database for errors, assess improvement possibilities.

Economics

The subject introduces to the main economic concepts and develops students skills for future careers.

Software Testing

Software testing results describe software quality – it can tell software bottlenecks, identify software crashing points.



Software Engineering

The topics covered by the subject include software process and agile methods, essential software development activities, plan-driven development, requirement engineering. Students learn the principles of the architectural design decision and implementation, software testing, evolution processes and issues.

Database Management Systems

Students are introduced to database manipulation languages, various database management systems, learn to project and manage structures of text, video, and audio data.

Data Mining

In this subject students are introduced to data mining methods, standards and tools. They learn to use existing tools for data mining and develop new ones.

Artificial Intelligence

The subject covers mind-set and behaviour modelling principles, solution search, fuzzy logic elements, implementation methods of artificial intelligence, models of semiotics, etc.

Software Development Management

The subject presents systems development life cycle model; students gain knowledge about classical and iterative lifecycle model and their practical implementation. Team work, project management and risk management competences are developed.

Database Servers Management

The subject provides basic knowledge on database server complexity and administration aspects. Students become familiar with data safety problems, standard settings for most database systems, front-end database development systems, etc.

Non-Relational Databases

This subject is to give knowledge in designing solutions to work with heavy load of data.

Client-side Web Development

The subject covers client-side web development, hypertext languages, the usage of Cascading Style Sheets, client-side scripts programming. Website maintenance, usability, adaptation to mobile devices is also analysed. Additional attention is paid to universal desktop applications development.

Server-Side Web Development

This subject focuses on providing knowledge necessary to develop server-side websites.

Web Security

The subject introduces to web application attack, common security vulnerabilities and various web security techniques.

Website Optimization for Search Engines

In this subject students learn to create high-quality website for search engine optimization.



Hybrid Mobile Applications

This subject teaches mobile application development and covers the whole app development cycle – from project design to publication and maintenance.

Native Mobile Applications

This course provides the knowledge needed to create mobile apps and covers the entire gadget development cycle - from coding to publishing and support.

Internet of Things

The Internet of Things is about connecting home, health care, natural disaster monitoring, logistics to the Internet. With the help of the Internet, these devices can greatly facilitate the quality of our living environment. This subject explores the creation and improvement of communication between objects via the Internet.

Smart Device Sensors Programming

The subject introduces to sensor programming principles, reading and interpreting sensors (light, sound, temperature).

Professional Practice

The practice is aimed at consolidation of theoretical knowledge and is carried out in a company. Students analyse company performance and its software, measure software quality, analyse its improvement possibilities and develop maintenance plan. They work on tasks assigned by their internship advisors, selecting appropriate tools and methods.

Final Practice

The internship is carried out in a company. Students analyse the company software and information systems, evaluate their purpose, quality and improvement possibilities. Students perform tasks provided by their practice managers, selecting appropriate tools and methods. They perform computer maintenance and diagnostics, administer computer networks, e-mails, create Web pages, etc.

Final Project

Final project preparation is the final stage of study where students guided by their supervisors analyse problems, demonstrate theoretical background and offer their own solutions. After successful completion of the study program and project defence, students receive programmer qualification, specialization and higher education diploma.



Electrical Engineering

The subject introduces key concepts of electrical engineering, electrical diagrams and their basic parameters for the calculation of the variable, constant, and three phase streams; a variety of electrical equipment (transformers, DC and AC machinery) and physical phenomena participation of transients in linear circuits, magnetic circuits and their application. Students learn to set up electric schemes, analyse current circuits, transformers, electric motor works, etc.

Signals and Circuits

The subject covers basic knowledge on electrical signals and circuits and their application. Signal design and modulation techniques are analysed; various signal transmission, communication principles and opportunities are studied.

Electronics

The subject provides knowledge about materials and components used in electronics industry. Students learn the basics of electronic semiconductor devices, understand their application. They are introduced to the structure and properties of materials, passive and active electronic components. Semiconductor devices, electronics and optoelectronics, integrated microcircuits, electronic visual indication devices, their properties, main characteristics, classification, marking, labelling, application in modern electronics are analysed. Students use various sources of information and apply the acquired knowledge in engineering internship.

Programming of Electronic Devices

The subject concentrates on modern electronic device with programmable logic devices, Arduino programmable controller, C programming language. During practical studies, students undertake specific tasks and apply their theoretical knowledge.

Microprocessors and Controllers

The subject provides basic knowledge of the processor structure and operation. The structure of the microcontroller and the programmable logic controller is explained. PIC 16Fxxx family microcontroller architecture, FESTO, Crouzet and Mitsubishi programmable logic controllers are overviewed. Students learn the basics of STL, FBD and Ladder programming languages; they acquire knowledge about processor types, characteristics, computer CPU structure, functions of main parts and their interaction, the program of controlled data processing, the influence of processor characteristics on the operation of the computer system, etc.

Electronics Internship

Students acquire basic knowledge about electronic component marking, parameters, assembling methods and operations, printed circuit board manufacturing technologies. They learn to assemble simple electronic devices, use measuring equipment to control and adjust electronic device parameters. Safety requirements for assembling and combining electronic equipment are overviewed. Existing tools and materials used in assembling and installation of electronic equipment are presented.

Professional English

The subject aims at the development of foreign language skills necessary for further studies, professional activity, and lifelong learning. Students acquire knowledge of appropriate language structures and academic terminology.



Programmable Logic Controllers

The aim of this subject is to provide knowledge of the application of programmable logic controllers, emphasizing the requirements of the IEC-61131 standard. It aims at the development of the ability to apply the given knowledge to signal input and output, graphical and textual programming languages and data exchange between controllers. The subject content provides knowledge about the technical equipment of control systems, develops skills to apply them in engineering practice. General methods of controller configuration and programming are mastered. Students develop abilities to select the appropriate controller configuration for the to-be-solved task, its communication equipment and programming language.

Automated design systems

The aim of this subject is to introduce computer design methods and design technologies used. The subject provides knowledge about three-dimensional models and spatial modelling methods. A universal package of three-dimensional object modelling and simulation software Solidworks is mastered. Practical skills in developing two-dimensional technical drawings, editing, documenting, forming and using specialized libraries of drawing elements are developed. Students acquire skills to create spatial volume models, generate and modify their images, perform experimental computer simulations, visualize processes.

Digital Automation

The aim of this subject is to provide knowledge of the structure of digital automation systems, the capabilities of logic automation devices in the development and improvement of digital automation systems using the resources of the Festo Fluidsim software package. The structure, operating principles, practical application, advantages and disadvantages of pneumatic and electro pneumatic systems are analysed. The ability to read and create pneumatic and electro pneumatic automation schemes, to select their elements, to install and combine them is developed.

Basics of Intelligent Control Systems

The aim of this subject is to provide knowledge of numerical intelligence methods and algorithms. Technologies and training algorithms of modern intelligent control systems are analysed. Practical skills are mastered in the development of intelligent control systems that combine the advantages of artificial neural networks, fuzzy sets, experimental systems and classical modelling methods.

Robotic Systems (+Course Project)

The aim of this subject is to provide knowledge about the structure, operation and principles of robotic systems. The problems of industrial and public sector robotisation are analysed. Practical skills are developed in designing a robotic system – selecting suitable components, simulating and visualizing its operation, installing and performing technical maintenance of the system, eliminating malfunctions.

Computer Process control Systems

The aim of this subject is to provide knowledge about the development of three-dimensional visualization, introduce the principles of 3D computer modelling, learn to model and transform simple basic three-dimensional objects, combining them with programmable logic controllers of the real process. The knowledge provided applies to the Siemens WinCC software package environment.



APPLICATION PROCEDURE

A few steps are to be taken to start your exchange journey with us.



STEP 1

Apply for [Erasmus exchange studies or traineeship](#) at your home institution and get nominated. To approve your nomination your coordinator will have to fill VIKO online nomination form.

- ▶ The deadlines for nominations are:
Spring Semester: 1st May.
Autumn Semester: 1st November.



STEP 2

Send the [required documents](#) (including passport copy, and health insurance copy) as well as fill-in some online forms such as application form and online learning agreement.

- ▶ The deadlines for documentation are:
Spring semester: 31st May.
Autumn semester: 30th November.



STEP 3

Make sure you [keep in touch with Incoming students' coordinator](#) while planning your trip. Some international regulations might change during your preparation stage. However, we will do our best to keep you updated.



STEP 4

Follow us at <https://en.viko.lt/> and [VIKO International Facebook](#) page to get a glimpse at our community and connect with your future fellow students.

For more information visit <https://en.viko.lt/international-relations/admission-procedure/>

ACCOMMODATION

VIKO offers **comfortable and affordable** housing for Erasmus exchange students in a hostel situated close to the city centre.

Address: Giedraičių Str. 81, LT-08213, Vilnius

Prices:

- ▶ Single room: 170 EUR/month
(a limited number of rooms)
- ▶ Double room shared: 140 EUR/month (price for 1 person)
- ▶ Double room single use: 260 EUR/month

For more information visit

<https://en.viko.lt/practical-information/accommodation/>



**ERASMUS
COORDINATOR**

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Location ➔



Erasmus+

