





# Dean's foreword



The Faculty of Electrical Engineering, Computer Science and Information Technology Osijek is a modern faculty that has constantly been developing in all areas of its expertise. The educational process consists of three levels with study programmes being continually upgraded and harmonised with recent scientific discoveries and economy needs.

Scientific research is essential for the development of the Faculty. The Faculty actively participates in numerous domestic and international consortia used by the Faculty's established research groups for conducting successful scientific research. The Faculty's research groups have participated in numerous domestic and European projects as either heads or associates.

Cooperation with the economy, encouragement of entrepreneurship and transfer of knowledge and technologies are fundamental indicators of the Faculty's development. The Faculty successfully cooperates with the most important companies in the fields of electrical engineering, computer engineering and information and communication technologies. Cooperation with the economy has been supported by professional and development projects and research studies. Furthermore, doing their practical work, bachelor and master theses, students have gradually been prepared for the job market and solving real engineering problems.

Undoubtedly, powerful faculties and universities are imperatives for the society's development. Information and communication technology, electrical and computer engineering providing additional values for new products and services represent strategic priorities for the development of modern economies. Hence, the Faculty of Electrical Engineering, Computer Science and Information Technology Osijek continues to successfully fulfil its mission – provision of support for knowledge and technology-based economy.

Dean

Dr Drago Žagar, Full Professor





Dr **Drago Žagar,** Full Professor Dean



Dr **Tomislav Matić**, Associate Professor Vice-Dean for Education and Student Affairs



Dr **Irena Galić**, Associate Professor Vice-Dean for Science and Postgraduate Studies



Dr **Kruno Miličević**, Associate Professor Vice-Dean for Business Activity, Technology and Economic Cooperation



Dr **Snježana Rimac-Drlje**, Full Professor Vice-Dean for International Cooperation

- Department of Core Courses (ZZP)
- Department of Power Engineering (ZEE)
- Department of Electromechanical Engineering (ZES)
- Department of Communications (ZAKOM)
- Department of Software Engineering (ZPI)
  - Department of Computer Engineering and Automation (ZRIA)

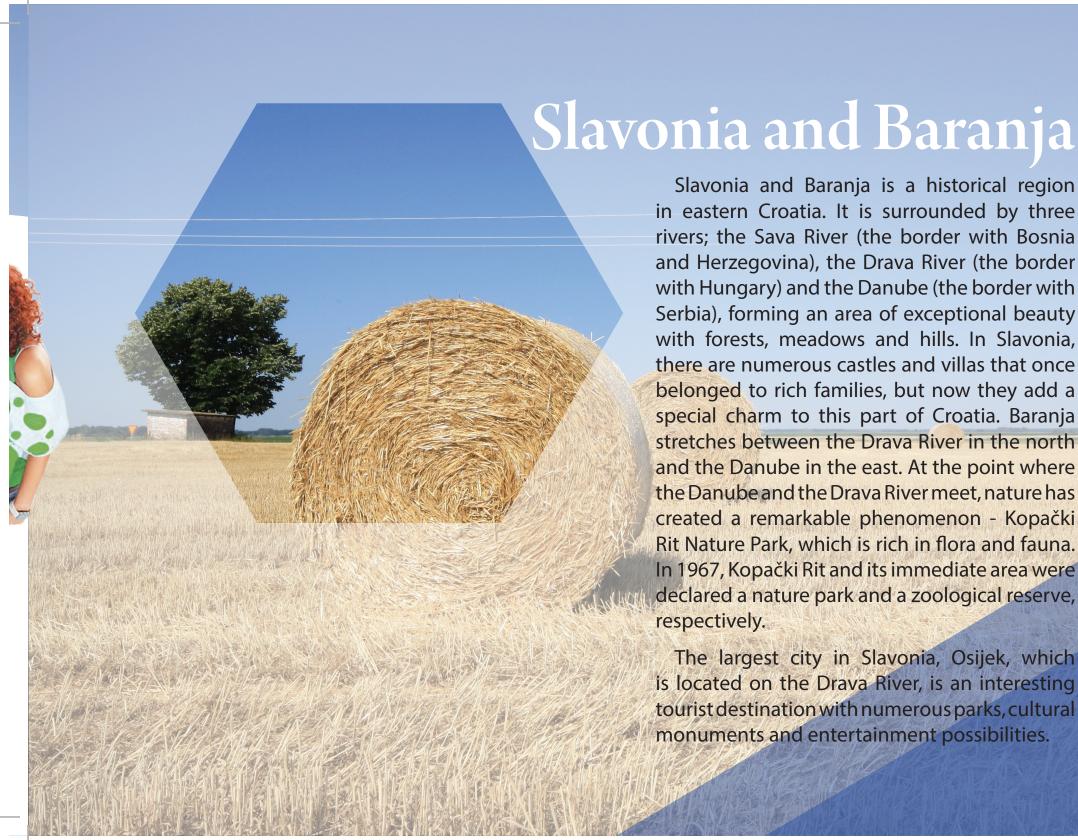




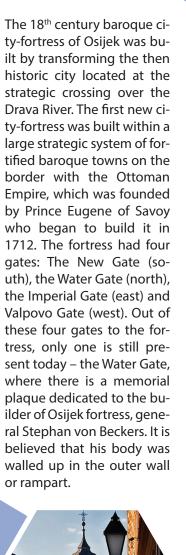


The Republic of Croatia is geographically located between Central and Eastern Europe. It covers the geographical area that extends from the spacious Pannonian Plain across a narrow area of the Dinaric Alps to the

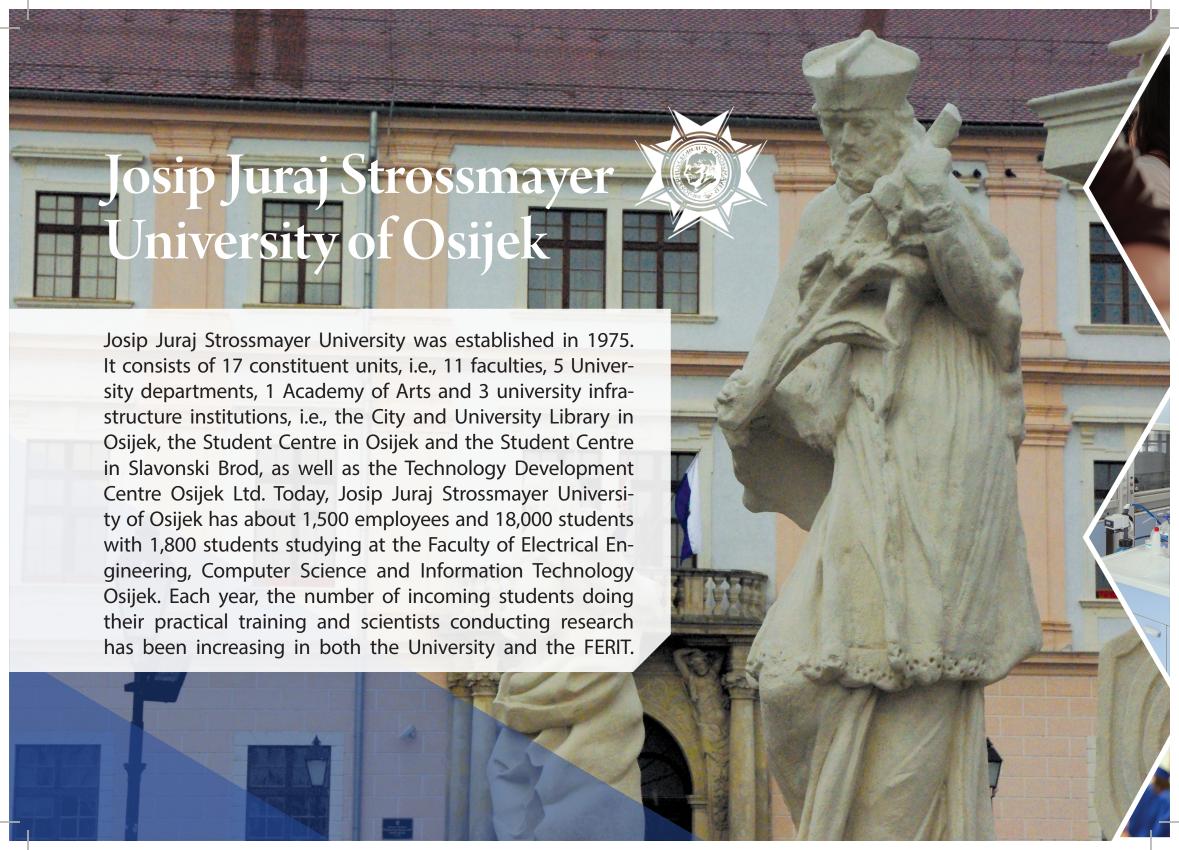






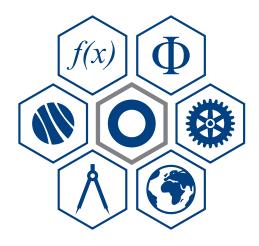








# DEPARTMENTS AT THE FERIT OSIJEK







# DEPARTMENT OF CORE COURSES

Chair of Mathematics and Physics

Chair of Mechanical Engineering and Foreign Languages

# DEPARTMENT OF COMMUNICATIONS

Chair of Radiocommunications and Telecommunications

**Chair of Electronics and Microelectronics** 

Chair of Multimedia Systems and Digital Television

Laboratory for High Frequency Measurements

# DEPARTMENT OF SOFTWARE ENGINEERING

Chair of Visual Computing

Chair of Programming Languages and Systems







# DEPARTMENT OF COMPUTER ENGINEERING AND AUTOMATION

Chair of Automation and Robotics

Chair of Computer Engineering

# DEPARTMENT OF POWER ENGINEERING

Chair of Power Systems and Substations

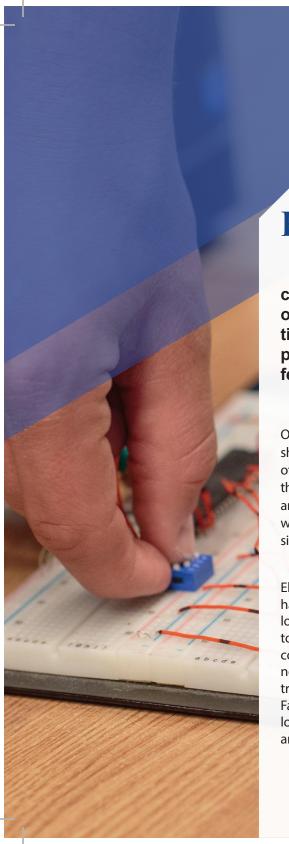
Chair of Power Plants and Energy Processes

Electromagnetic Compatibility Laboratory

# DEPARTMENT OF ELECTROMECHANICAL ENGINEERING

Chair of Fundamentals of Electrical Engineering and Measurements

Chair of Electric Machines and Power Electronics



# FERIT OSIJEK

The Faculty of Electrical Engineering, Computer Science and Information Technology Osijek is a higher education, scientific and research institution that conducts scientific, research, development and educational projects and performs undergraduate, graduate, postgraduate and professional study programmes in technical sciences.

Higher education curriculum in electrical engineering was first established in Osijek in 1978 as the third study of the kind in the Republic of Croatia. The establishment of the Study of Electromechanical Engineering resulted from an initiative of the University of Osijek and took place in 1977 and 1978. It was supported by the economy of the city of Osijek and surrounding municipalities in the Slavonia and Baranja region. In 1993, the Faculty of Electrical Engineering Osijek (ETFOS) was founded as a public institution of higher education. Today, it is organised in six departments with a total of thirteen chairs and two accredited laboratories.

Through its university and professional study programmes, the Faculty of Electrical Engineering, Computer Science and Information Technology Osijek has been educating and training its staff to be able to keep up with technology advances in the areas of electrical and computer engineering as well as to apply their knowledge to engineering problem solving and, through direct cooperation with industry, to transfer knowledge of new technologies based on new scientific findings. Study programmes are in line with European and global trends, but also adapted to the needs of the economy in the environment. The Faculty of Electrical Engineering, Computer Science and Information Technology Osijek is also a regional scientific and research centre of excellence in the areas of electrical and computer engineering.

A Quality Management System (QMS) supported by ISO 9001:2008 has been established at the FERIT Osijek. The purpose and the goal of establishing the QMS at the Faculty of Electrical Engineering, Computer Science and Information Technology Osijek is to ensure the required level of quality of higher education (i.e., the teaching process), scientific, research and professional work, and systematic documentation of important elements of the defined procedures and activities.

# **STUDY PROGRAMMES**

The FERIT Osijek implements study programmes in the scientific fields of electrical and computer engineering. Currently, ten study programmes are being delivered, i.e., two undergraduate university study programmes (in electrical engineering and computer engineering), three graduate university study programmes (in electrical engineering, computer engineering, automotive computing and communications), one postgraduate doctoral study programme, three postgraduate specialist study programmes and one professional study programme.



# Postgraduate specialist study programme in

# Postgraduate doctoral study programme in Electrical Engineering

Power Engineering, Communications and Informatics
(3 years, 180 ECTS)

# Postgraduate specialist study programme in

Communication Technologies

# Postgraduate specialist study programme in

#### Graduate university study programme in Computer Engineering

Elective modules: **Computer Engineering Process Computing** Software Engineering nformation and Data Science (2 years, 120 ECTS)

#### Graduate university study programme in **Electrical Engineering**

Branch: Power Engineering Elective modules: Electric Power Systems Sustainable Power Systems ndustrial Power Engineering (2 years, 120 ECTS)

#### Graduate university study programme in **Electrical Engineering**

**Branch: Communications** and Informatics Elective modules: Communication Technologies **Network Technologies** (2 years, 120 ECTS)

Graduate university study programme in
Automotive Computing and Communications

(2 years, 120 ECTS)

Undergraduate university study programme in Computer Engineering

(3 years, 180 ECTS)

# Undergraduate university study programme in Electrical Engineering

Elective modules: ed in the second year of study) Power Engineering Communications and Informatics (3 years, 180 ECTS)

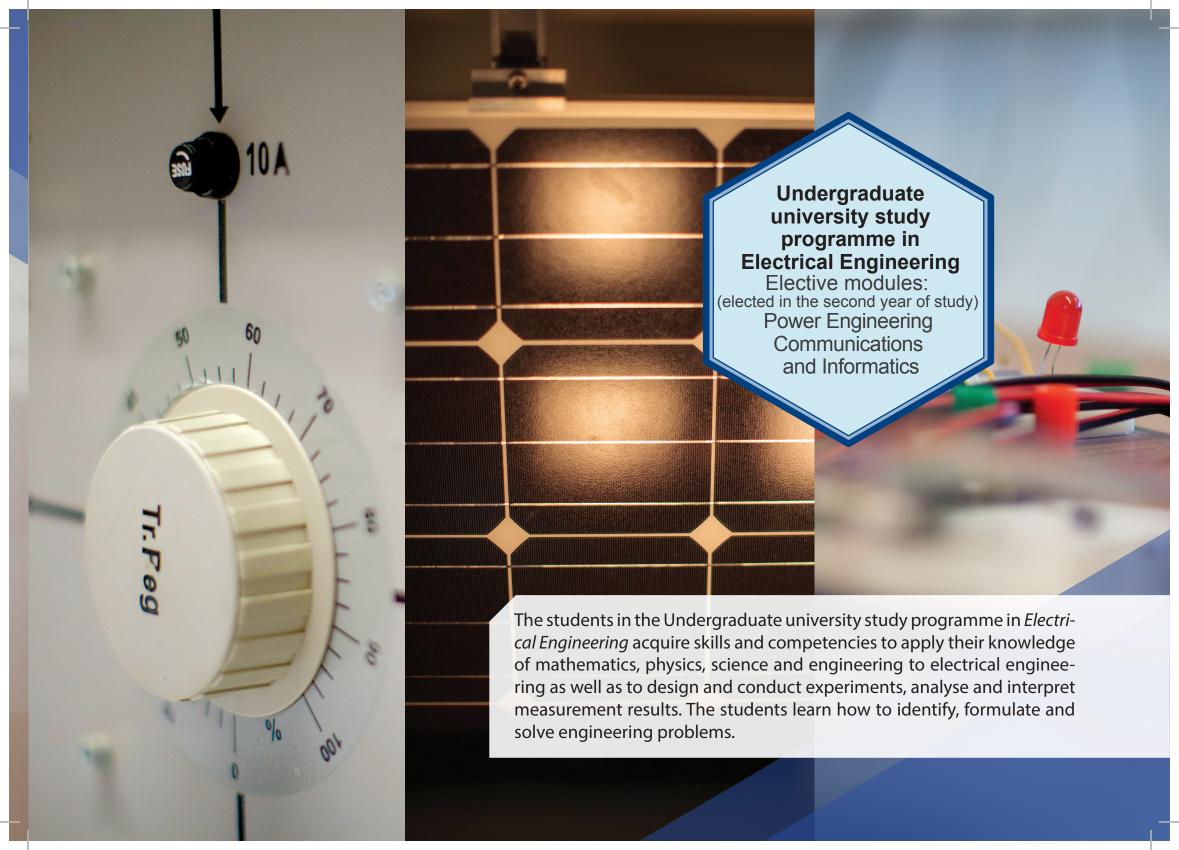
# Additional coursework (1 year)

Professional study programme in **Electrical Engineering** 

Branches: **Power Engineering** Automation Informatics

(3 years, 180 ECTS)







The students in the professional study programme branch **Power Engineering** acquire knowledge and skills to design, test and maintain electrical installations at all levels of complexity, transmission and distribution networks and lines, switching substations, city substations, distribution overhead and underground networks, facilities and plants of flexible production systems, automated electromotive plants, etc.

The students in the professional study programme branch **Automation** acquire knowledge and skills to design, implement, test and maintain automated technological, power and transport plants and processes, etc.

The students in the professional study programme branch **Informatics** acquire knowledge and skills to purchase, develop and maintain computers and computer systems as well as software products; they will be able to apply computers in production process management, design and exploit computer networks, design, implement and maintain business and private networks and corresponding computer systems, apply and maintain hardware and software for design systems in other sectors, etc.



The graduate study programme in *Computer Engineering* at the Faculty of Electrical Engineering, Computer Science and Information Technology Osijek allows the students the opportunity to become qualified in various aspects of process computing and other scientific areas. Upon graduation, the students will be able to:

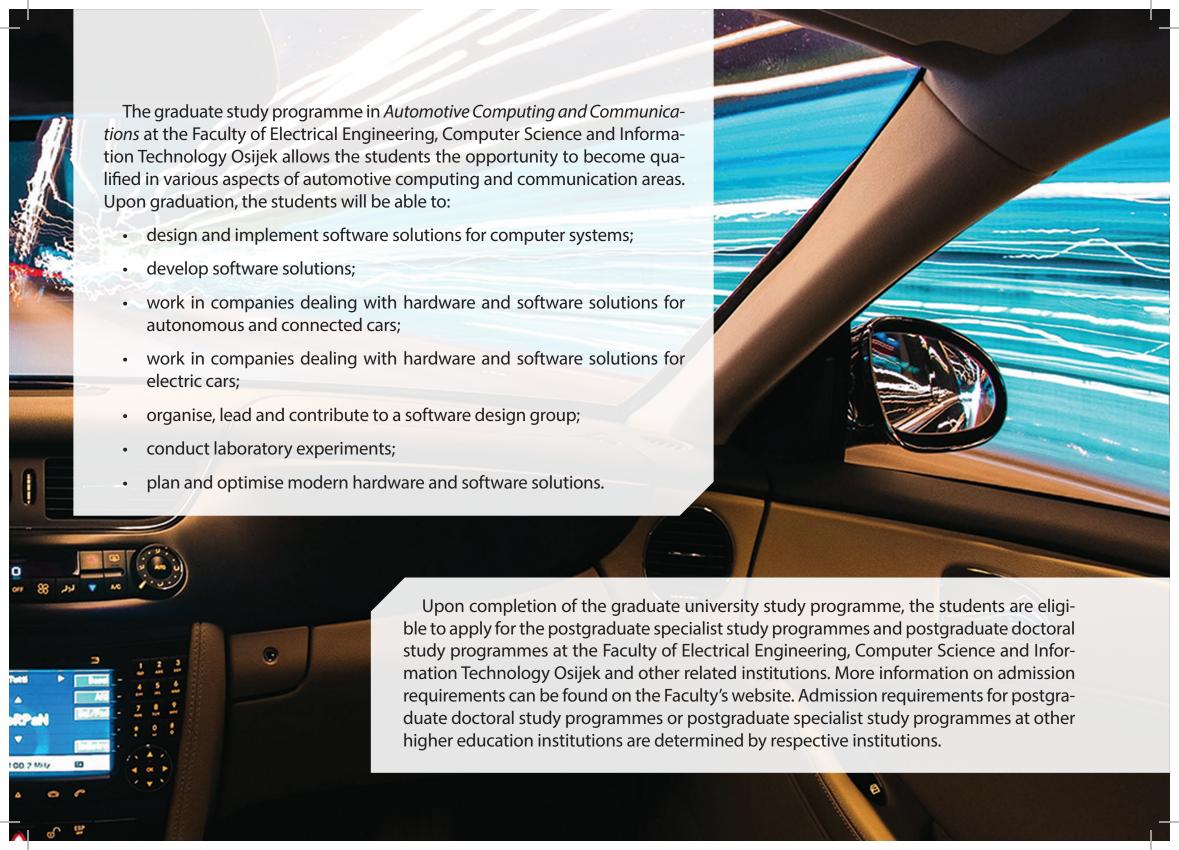
- plan, design, and discover hardware and software solutions for computing systems in economy, industry, business and other applications in companies;
- develop hardware and software solutions;
- participate in interdisciplinary efforts, either independent or as a member of a team in creative or systematic solving of complex engineering problems in the area of computing or programming;
- operate laboratory research;
- plan and optimise contemporary hardware and software solutions.

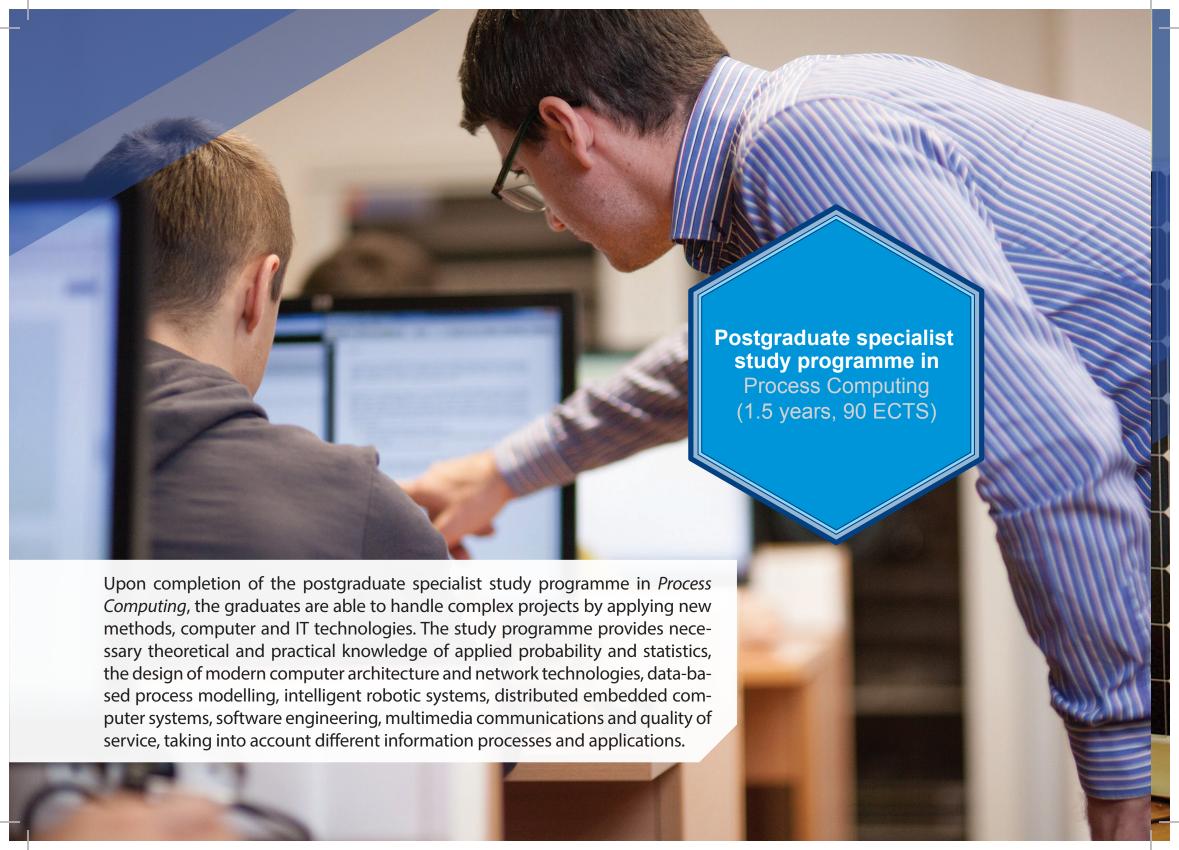
Furthermore, the students will acquire additional competencies depending on the courses of the elective module (Computer Engineering, Process Computing, Software Engineering and Information and Data Science).

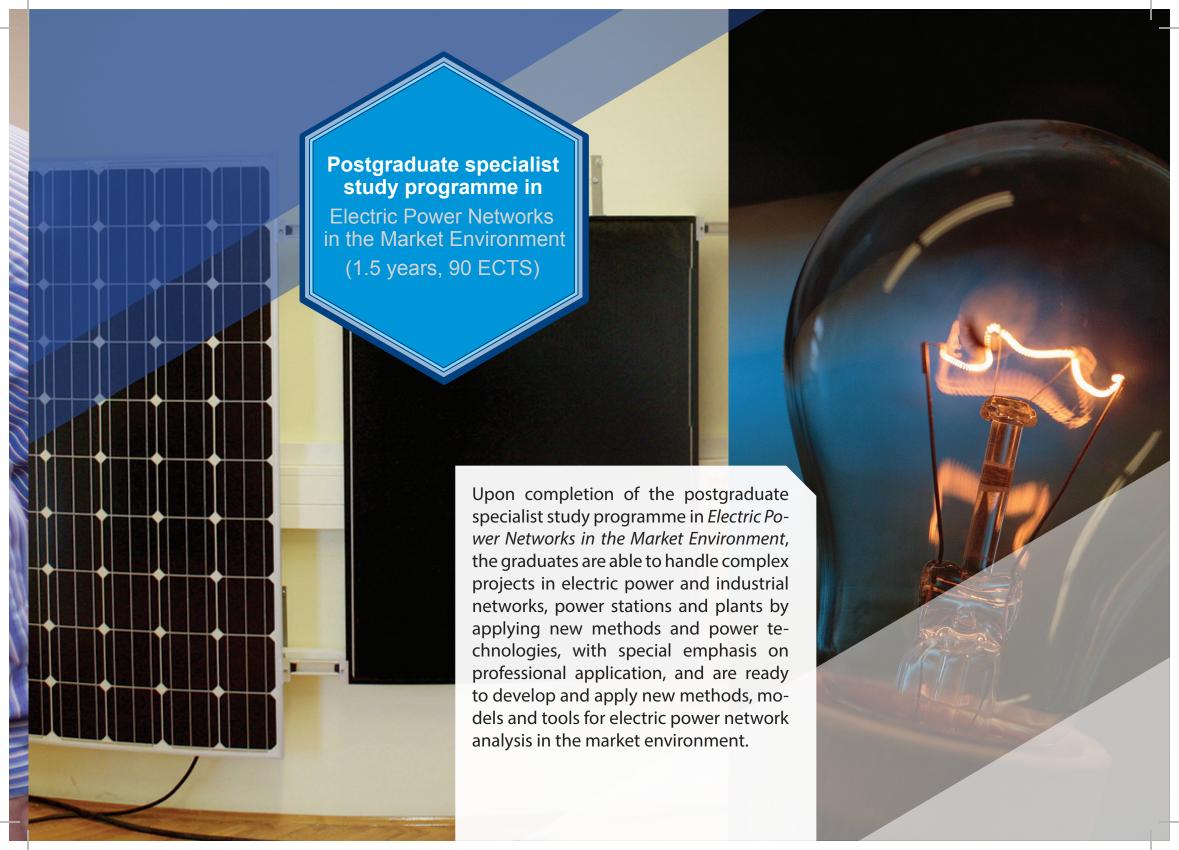


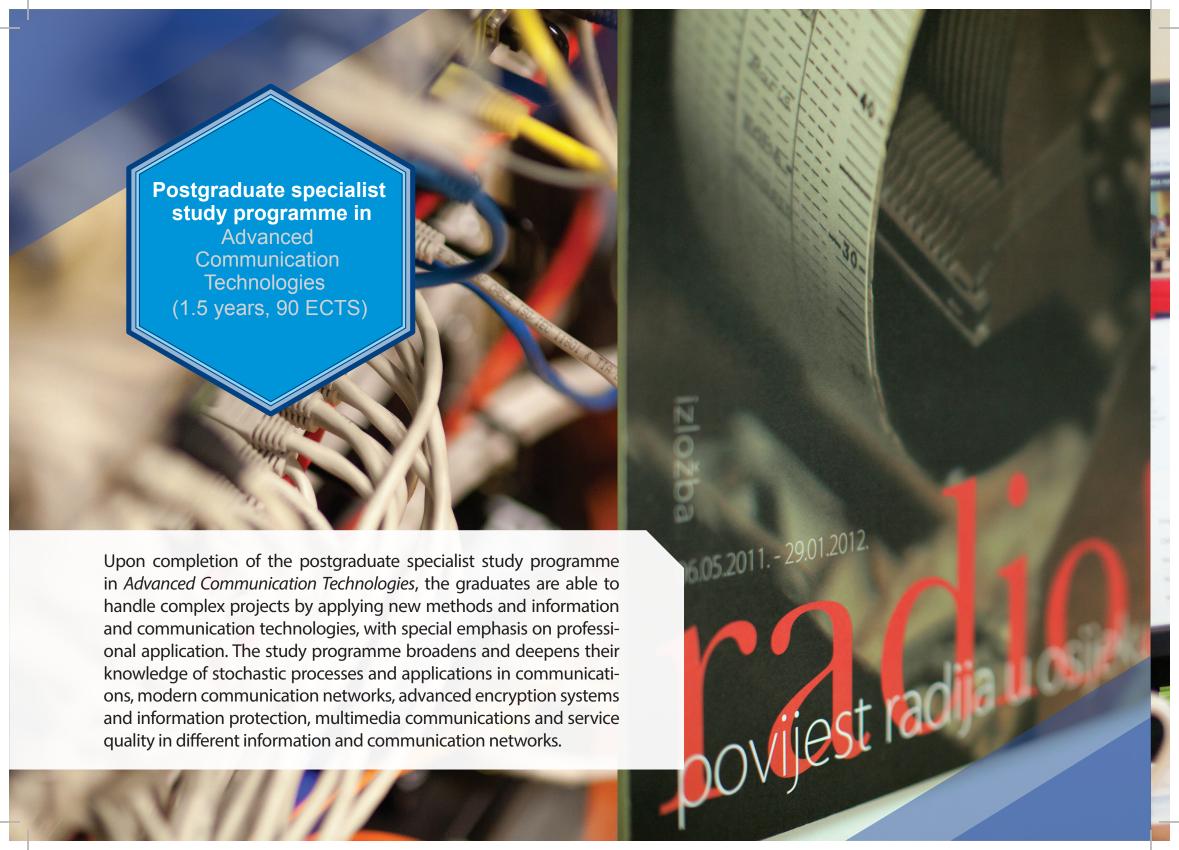


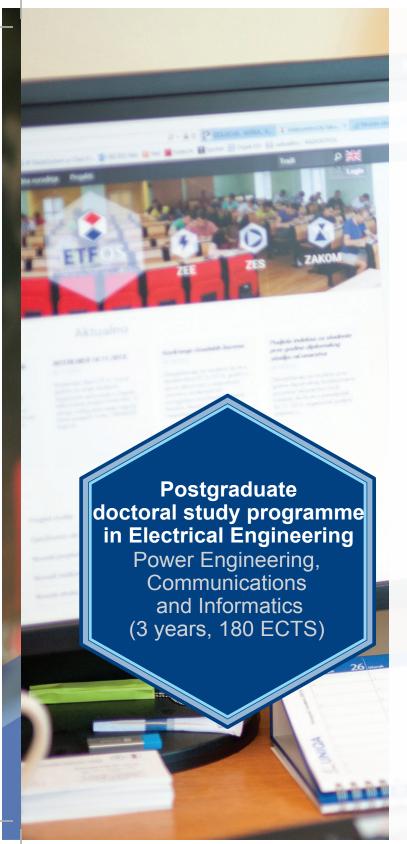












The Faculty of Electrical Engineering, Computer Science and Information Technology Osijek has had a postgraduate study programme since the year 2000. The postgraduate doctoral study programme in Electrical Engineering, which has been completely harmonised with the Bologna Declaration, has been carried out at the FERIT Osijek since the 2006/2007 academic year. Upon completion of the postgraduate doctoral study programme in Electrical Engineering, the students are able to conduct research projects, develop and apply new technologies as well as to educate professional and scientific staff. The programme has two branches, namely *Power Engineering* and *Communications and Informatics*.

# **Branch Power Engineering**

The postgraduate doctoral study programme in *Power Engineering* extends knowledge relative to energy generation, transmission, distribution, consumption and management previously acquired at the graduate study programme. Furthermore, the study programme aims at providing a comprehensive study of physical processes and a theoretical background with respect to the aforementioned issues as well as to introduce scientific methods used for development, construction, management and maintenance planning of the electric power system.

# **Branch Communications and Informatics**

The postgraduate doctoral study programme in *Communications and Informatics* broadens the prior knowledge of information theory, information networks, programming and processing algorithms in networks, analyses and applications of modulation processes, state-of-the-art radio communications systems, theory, analysis and synthesis methods as well as a design of embedded, distributed and expert computer systems and software solution for system and application software. Moreover, the students gain theoretical and scientific knowledge covering the fields of analysis, optimisation, planning and a design of communications and information systems, radio communications systems, multimedia systems, process control systems, intelligent and broadband integrated services digital networks, modern computer architecture and its software.

# SCIENTIFIC AND RESEARCH ACTIVITY

The scientists employed at the Faculty of Electrical Engineering, Computer Science and Information Technology Osijek conduct research in the fields of electrical engineering, information and communication technologies, automation, electromechanical and computer engineering. In the past five years, the scientists participated in more than 30 scientific and technological projects and published more than 120 research papers in international journals.

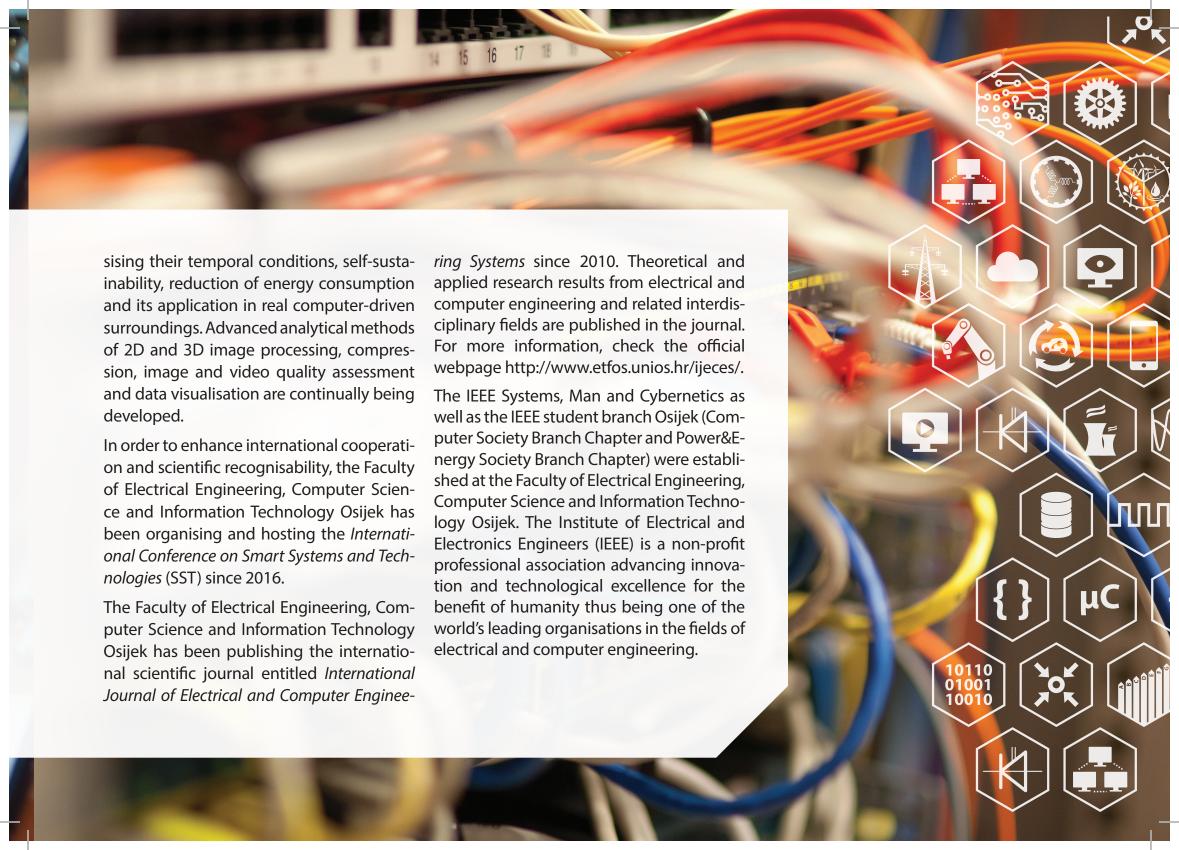
The Faculty of Electrical Engineering, Computer Science and Information Technology Osijek cooperates with the Scientific Centre of Excellence in Data Science and Cooperative Systems – the first Croatian centre of excellence in technical sciences. The Centre's purpose is to improve Croatian science encouraging its participation in the European Research Area.

Research on current-voltage characteristics, efficiency, production and a quality of energy with different technologies of photovoltaic systems with respect to regional climate conditions, estimations of reliability and availability of windmills, stochastic estimation of voltage sags caused by short-circuit faults in power systems and development of a solar-powered car are very important.

Substantial results are achieved in the fields of nonlinear systems, ferroresonant circuits, application of soft computing methods on machines and devices, chaos theory application, modelling of processes based on measurement results, building of soft-sensors for estimation of difficult-to-measure variables and industrial processes supervision. Furthermore, algorithms for overcoming obstacles for humanoid robots are created. Research on flexible manufacturing systems, robots and manipulators in

manufacturing automation are conducted. In addition, the researchers are studying possibilities of applying evidential reasoning algorithms for a multiple attribute analysis in complex technical systems estimation, grey systems application theory and visual detection of malfunction in the ceramic tiles industry.

Research are carried out in the fields of radio frequency and capacitive passive identification systems, conformal antennas, radio waves propagation, optimisation of industrial wireless sensor networks as well as application and implementation of various QoS in computer networks. Further, a new energy efficient system for wireless measurement of biological signals has been developed. Numerous research are conducted in the fields of software engineering, artificial intelligence of embedded, distributed and service-oriented computer systems empha-



# PROFESSIONAL ACTIVITY AND COOPERATION WITH THE ECONOMY

The main research and professional activities of cooperation with the economy are done within the Faculty departments. The Faculty signed cooperation agreements with more than 20 companies just in 2016 and 2017. Two faculty laboratories are extremely important for undertaking professional activities.



# ELECTROMAGNETIC COMPATIBILITY LABORATORY

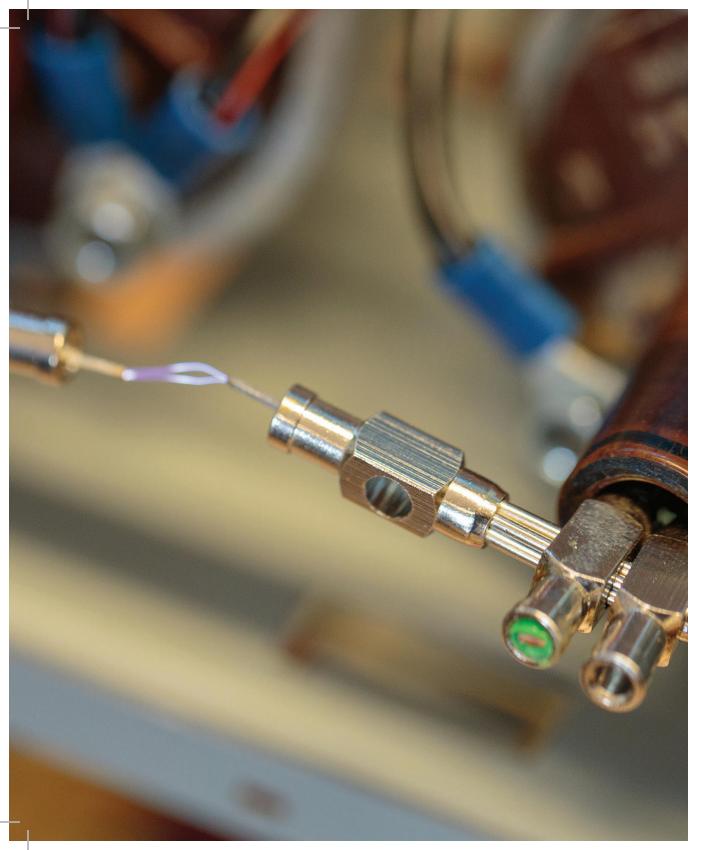
The Electromagnetic Compatibility Laboratory functions within the Faculty of Electrical Engineering, Computer Science and Information Technology Osijek. The main activities undertaken in the laboratory are measurements of low frequency magnetic and electric fields and electrical energy quality insurance.



# LABORATORY FOR HIGH FREQUENCY MEASUREMENTS

The Laboratory for High Frequency Measurements functions within the Department of Communications. The main activities done in the laboratory are measurements, calculations and estimations of high frequency electromagnetic fields and estimations of electromagnetic field radiation harmful effects in high frequency fields.







# ENERGY PERFORMANCE CERTIFICATE OF BUILDINGS

Together with partners, the Faculty of Electrical Engineering, Computer Science and Information Technology Osijek is authorised to carry out inspections and issue energy performance certificates of buildings compliant with current law regulations. It also suggests the implementation of the most recent technological solutions for improvements in energy efficiency.



# STUP, PRO-STUDENT, CAREER DEVELOPMENT CENTER TEACHING COLLABORATION WITH COMPANIES AND STUDENT START-UPS



Hoping that students and their future employers will get closer even during the study, on 1st May 2016, the Faculty of Electrical Engineering, Computer Science and Information Technology Osijek (FERIT) launched a web-portal for FERIT students and employers – Stup http://stup.ferit.hr/.

The portal is a platform for partner companies to inform students about open internships, cooperation opportunities in doing master theses, scholarships, vacancies and all other activities that are of interest to FERIT students. On the other hand,

FERIT uses Stup to inform companies about curricular and extracurricular activities which they could participate in.

In the academic year 2016/2017, after just over 12 months of launching Stup, very significant indicators of Stup success were shown:

- 251 partner companies are Stup users;
- 92 companies offered 332 internships;
- 189 students did their internships in 74 companies;
- 46 "confrontations" of companies and students during the teaching process (guest lectures and workshops at FE-RIT, visits to companies, etc.);
- 222 students presented their profiles

to companies for possible additional cooperation (final papers and master theses, additional internships, scholarships, jobs, etc.).

Having that presented, openness for close cooperation of companies and students is evident. The Faculty has encouraged and made this more straightforward and effective by undertaking the initiative.









CEK

CAREER DEVELOPMENT
CENTRE

In addition, the Faculty supports students' self-employment, i.e. students' desire to start their own companies. Namely, the student competition Pro - Student (http://pro-student.ferit.hr/) supports and encourages the best and most interesting student ideas whether it is an idea with a commercial potential (KOMPOT call) or simply a non-commercial project of interest to students (ZAPRO call). In the last three years, students have proposed 56 ideas for interesting prototypes, devices and gadgets 18 of which were selected for funding by the Faculty.

Since October 2017, all these activities have been carried out by the Faculty through the established Career Development Centre (CEK). CEK's activities include coordination and systematic support to students, companies and the University aiming to prepare students for the labour market.

Through this initiative, the Faculty aims to make students' "life after FERIT" easier, i.e. upon successful completion of the study, to introduce students to the labour market, increase their visibility and facilitate recruitment whether they want to work in a company or start their own.





**Erasmus+** mobility programmes enable university-level students and staff as well as staff of organisations and institutions participating in higher education to study and work abroad. In addition to universities, companies can take part in Erasmus programmes. Students can do their practical training and staff can apply for continuing professional development courses within the programme.

Most courses at the Faculty of Electrical Engineering, Computer Science and Information Technology Osijek, some of which are Erasmus+ courses, can be taken in the English language. The number and duration of both incoming and outgoing student, staff and partners' mobility have been continually increasing.

The International Association for the Exchange of Students for Technical Experience (IAESTE) is an independent, non-profit and non-political student exchange organisation with 85 member states from all over the world. It provides students in technical degrees (primarily Science and Engineering) with paid, course-related, training abroad. Since it was established, IAESTE Osijek activities have been organised by student volunteers. In addition to outgoing and incoming student practical trainings, IAESTE Osijek supports students' continuous education and practical training by organising seminars, trips to exhibitions and other specialised events abroad.

The EUROWEB+ Scholarship Programme is open to selected nationals in the EU countries and the Western Balkans who want to study or work at one of the partner institutions. It is a scholarship programme for students on undergraduate, master, doctoral and post-doctoral level, as well as for university staff in academic or administrative positions financed by the European Commission. In addition to 17 institutional partners, the FERIT Osijek participates in the mobility programme.

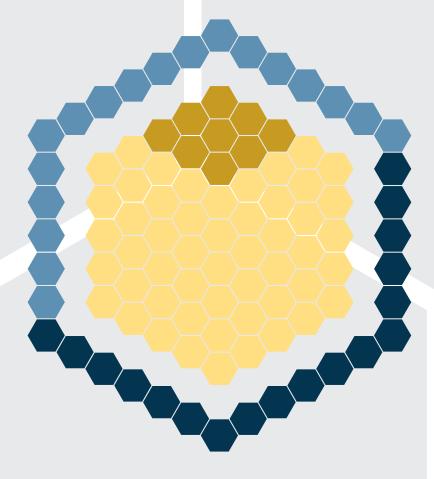
The overall objective of the EUROWEB+ project is to create a partnership in research and education with the aim of strengthening the ties between the EU member states and the Western Balkans. The official project webpage is available at http://www.mrtc.mdh.se/eurowebplus.







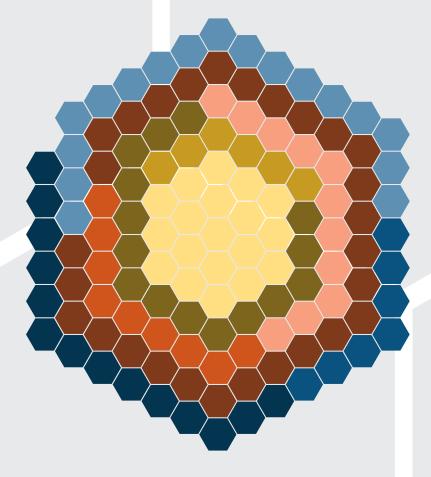
# **PREMISES AND EQUIPMENT**



- 12 LABORATORIES
- 13 LECTURE HALLS
- TEACHERS' OFFICES
- 9 COMPUTER CLASSROOMS

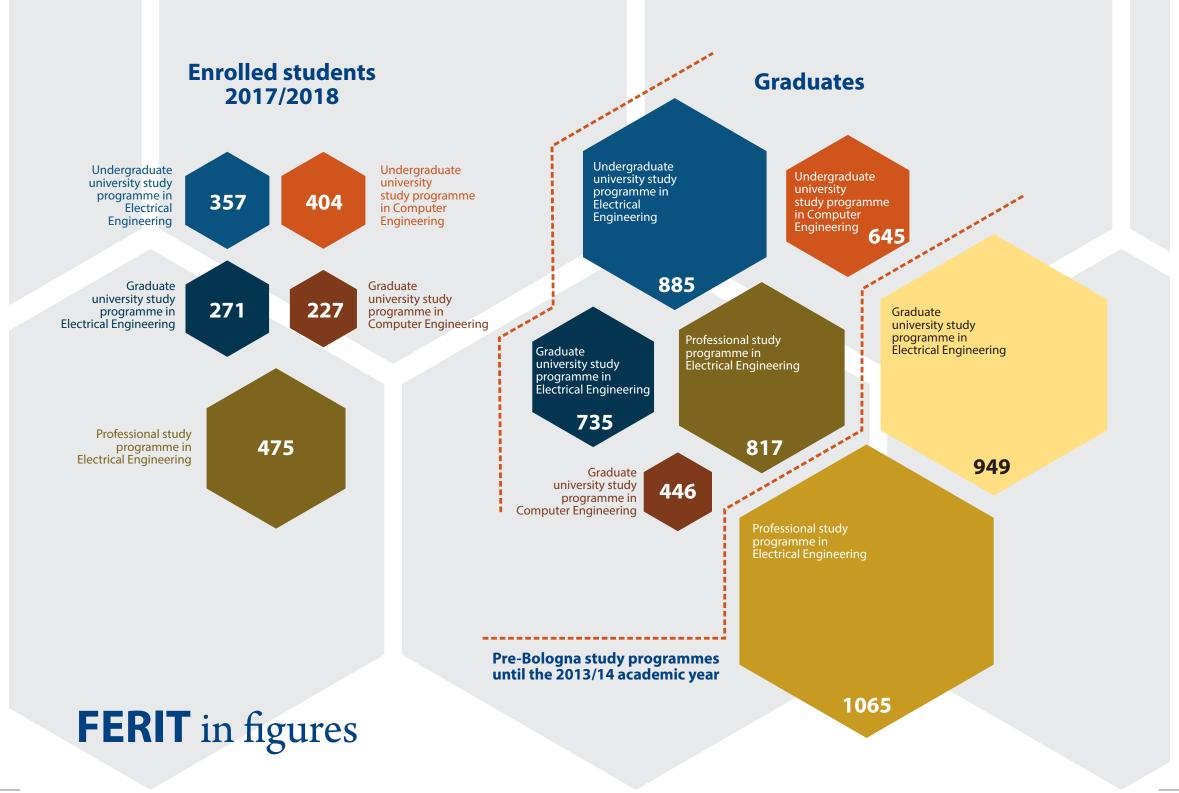
# FERIT in figures

# **TEACHERS**



- 11 FULL PROFESSORS
- 9 ASSOCIATE PROFESSORS
- 28 ASSISTANT PROFESSORS
- LECTURERS, SENIOR LECTURERS AND COLLEGE PROFESSORS
- 7 POSTDOCTORAL RESEARCHERS

- ASSISTANTS AND RESEARCH ASSISTANTS
- 6 EMPLOYEES PROMOTED TO PROFESSIONAL TITLES
- 15 LABORATORY TECHNICIANS
- 20 + EXTERNAL ASSOCIATES









# PARTNER INSTITUTIONS







# **ALBANIA**

- Aleksandër Xhuvani University of Elbasan
- · Polytechnic University of Tirana

#### **AUSTRIA**

- · Campus 02 University of Applied Sciences, Graz
- · Vienna University of Technology
- · Alpen-Adria-Universität Klagenfurt

## **BOSNIA AND HERZEGOVINA**

- · Faculty of Electrical Engineering, University of Sarajevo
- · University of Mostar
- University of Tuzla

#### **BULGARIA**

• "Angel Kanchev" University of Ruse

# **FRANCE**

· Telecom ParisTech

#### **HUNGARY**

- Faculty of Mechanical Engineering and Automation, Kecskemét
- Óbuda University, Budapest
- University of Pécs
- Budapest University Of Technology And Economics

#### **GERMANY**

- Albstadt-Sigmaringen University
- City University of Applied Sciences, Bremen
- Paderborn University
- University of Applied Sciences Würzburg-Schweinfurt
- Deggendorf Institute of Technology, University of Applied Sciences Deggendorf
- University of Applied Sciences Rosenheim

- University of Applied Sciences Gießen
- Paderborn University

## ITALY

• University of L'Aquila

## **LATVIA**

· Latvian Business College

## **MACEDONIA**

• International University of Struga

## **MONTENEGRO**

· Mediterranean University Montenegro

# **NETHERLANDS**

• Hanze University of Applied Sciences Groningen

## **POLAND**

- · Lodz University of Technology
- · Poznan University of Technology
- · University of Applied Sciences in Nysa
- Lomza State University of Applied Sciences
- · University of Science and Technology, Bydgoszcz

## **PORTUGAL**

- · Polytechnic Institute of Castelo Branco
- · Polytechnic Institute of Porto

## **ROMANIA**

- "1 Decembrie 1918" University of Alba Iulia
- Technical University of Cluj-Napoca
- · University Politehnica of Bucharest
- · University "Stefan cel Mare" of Suceava

#### USA

- College of Computing and Informatics, The University of North Carolina at Charlotte, NC
- North Carolina University, Raleigh, NC

## **SLOVENIA**

- Faculty of Electrical Engineering and Computer Science, University of Maribor
- · Jožef Stefan International Postgraduate School, Ljubljana
- · University of Primorska, Koper

# SERBIA

- Faculty of Electronic Engineering, University of Niš
- Faculty of Technical Sciences, University of Novi Sad
- University of Belgrade
- Technical College of Professional Studies, Subotica

#### SLOVAKIA

- Technical University of Kosice Faculty of Electrical Engineering and Informatics
- University of Žilina Faculty of Management Science and Informatics

## **SPAIN**

• Barcelona College of Industrial Engineering

#### **SWEDEN**

• Mälardalen University, Västerås

#### **SWITZERLAND**

 The University of Applied Sciences Northwestern Switzerland FHNW

# **TURKEY**

• Süleyman Demirel University, Isparta

