



UNIVERSITY OF ZAGREB
FACULTY OF ELECTRICAL ENGINEERING AND COMPUTING

DEVELOPMENT STRATEGY 2019-2023







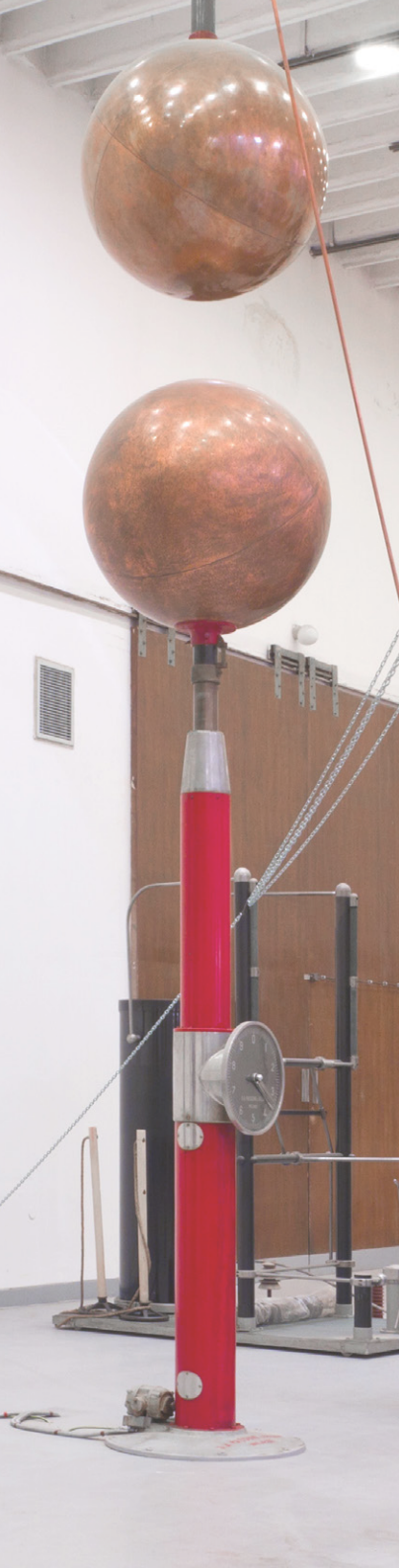
**UNIVERSITY OF ZAGREB
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DEVELOPMENT STRATEGY 2019-2023



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FOREWORD

Faculty of Electrical Engineering and Computing of the University of Zagreb (Croatian acronym: FER) is a leading research and higher education institution in the Republic of Croatia in the area of electrical engineering, computing, and information and communication technology.

From 1919 to 1926, the predecessor of the Faculty operated as the Electrical Engineering Department of the Royal College of Engineering, from 1926 to 1956 as a Department of the Faculty of Engineering, from 1956 to 1994 as the Faculty of Electrical Engineering (ETF), and since 1995 under its current name - 99 years of continuous education, research and professional activity. In these 99 years, FER has valuably contributed to the development of the Croatian industry, primarily through the education of high quality and versatile graduated engineers, as well as through realizing research and development, and professional projects within the Croatian economy.

In the forthcoming period - from 2019 to 2023 - the overall activity of FER will be directed towards high levels of educational, research and innovation achievements, as well as towards creating the necessary institutional framework for their realization, bearing in mind the circumstances in which FER operates.

This document represents a strategic framework for educational, research and innovation development of FER, as well as development of organisation and management activities, infrastructure and quality assurance system at FER for the period from 2019 till the end of 2023. The document is partly based on the *Research, Technology Transfer and Innovation Strategy of the University in Zagreb*, proposal of *Regulation of the European Parliament and of the Council establishing Horizon Europe – the Framework Programme for Research and Innovation from 2021-2027*, and *Strategic Directives for Education, Science and Technology of the Republic of Croatia*.

The Faculty Council adopted FER Development Strategy 2019-2023 at the 683rd regular session held on 12 December 2018.

Dean

Prof. Gordan Gledec



1. STARTING POINT

1.1. GENERAL INFORMATION

The study of electrical engineering in Croatia started on 10 December 1918 with establishment of the Technical High School in Zagreb and the Department of Electrical Engineering. On 31 August 1926, the Technical High School transformed into the Technical Faculty, joining the University of Zagreb. The Department of Electrical Engineering merged with the Department of Mechanical Engineering into the Electromechanical Department in the academic year 1927/1928. Mechanical Engineering Division with the Department of Electrical Engineering was established two years later by merging the Electromechanical department and the Department of Naval Architecture. The Parliament of the People's Republic of Croatia enacted a Decision to transform the departments of the Technical Faculty into separate faculties on 26 April 1956, thus forming the Faculty of Electrical Engineering (Croatian acronym: ETF). Within its first curriculum, ETF-1, two study programmes, *Strong Current* and *Weak Current* were performed. As early as 1959, the ETF was the first faculty at the University to introduce a new (for that time revolutionary) Statute. It prescribed a "Year after Year" study system: for enrolment in subsequent year, all the examinations from the previous year had to be passed. The calendar of all the examination terms was published before the beginning of each academic year, and the time table of lectures and exercises assured that every student had a personal seat in any lecture room or laboratory. In 1961, the Faculty moved to the Building A on its current location in Unska 3. The premises B and C were completed and moved to in 1963.

In 1967, the new curriculum ETF-2 was introduced with the following specialisations: Electrical power engineering, Electrical drives and automation and Electronics (with subspecialisations Electrical communications and Control). Only a year later, in 1968, the first computer was acquired, marking the start of education in computing. Accordingly, in 1971, as part of the curriculum ETF-3, and within the profile Electronics, the following new profiles were introduced in addition to already established profile Control: Telecommunications and informatics, Computing engineering and informatics, and Radiocommunications.

In 1978, the curriculum ETF-4 was formed, covering Power engineering, Electrical drives and automation, Industrial electronics, Telecommunications and informatics, Automation, Computer engineering, Radio communications and professional electronics, and Nuclear power engineering. In 1989, the Faculty expanded to the Building D. Since then, the Faculty's premises have not been further extended, although the number of students and employees has doubled.

Having recognised the importance of the scientific field of Computing, the Faculty changed its name into the Faculty of Electrical Engineering and Computing (Croatian acronym: FER) in 1995. New curriculum, FER-1, was also designed, whereby for the first time two study programmes were performed: Electrical engineering (consisting of six profiles, mostly corresponding to those in the previous curriculum) and Computing. Gradually, the number of enrolled students increased, reaching the current quota of 650. FER used the 2005 reform, known as the Bologna process, as an opportunity to renew and modernise the curriculum, but also to radically reform the educational process. As part of the FER-2 curriculum, there are two study programmes at the undergraduate level – *Electrical engineering and information technology*, and *Computing*. In addition to these two study programmes, and once again recognizing the importance of the new scientific field, the programme of *Information and communication technologies* was introduced at the graduate level.

By the Faculty Statute from 2005 the educational process was described in detail, classical examination terms were eliminated, and the examination proceeded only through an ongoing assessment of student achievements. Furthermore, instead of the former concept, the prerequisite system was introduced - a student can enrol in all the courses in the next academic year, satisfying the gained prerequisites, but the number of enrolled ECTS credits cannot exceed a prescribed amount.

Teaching is performed in smaller groups, with more interaction between lecturers and students. In order to enrol in the graduate study, the candidates must pass an entrance examination, except for those students who, according to defined criteria, are regarded as having been adequately prepared during their undergraduate study.

The former concept of grouping students exclusively into those fully financed by the Ministry or fully tuition paying was substituted with a financial participation scheme, where the amount of student's payment depended upon the student's

success, whereas successful students are free of any payment. Every year approximately 550 students complete their graduate study, which corresponds to about 85% of those enrolled in the first year of the undergraduate study.

In 2006, FER acquired international accreditation from the German accreditation agency ASIIN (*Akkreditierungsagentur für Studiengänge der Ingenieurwissenschaften, der Informatik, der Naturwissenschaften und der Mathematik*) for its curricula and for awarding the degrees *Bachelor of Science* and *Master of Science*. After introduction of the state final examination in secondary schools in 2009, FER was among the first higher education institutions to accept the new criteria for enrolment of students, realizing that in this way the number of candidates could broaden and the chance for selection of even better entering students would grow.

In 2011, the new Statute was adopted, where the excessively detailed prescriptions regarding the educational process were relocated into the new *Regulations for undergraduate and graduate study*. Additionally, in order to increase the students' passing rate further, the examination terms have been partly resumed.

FER started with its doctoral study programme even before the Bologna reform, at the time when other higher education institutions predominantly practiced doctorates without a doctoral study. Until the academic year 2009/2010, the doctoral study consisted mainly from education through lectures.

Since the academic year 2010/2011, the new doctoral study curriculum has been performed, containing less lectures and more research, including research seminars and seminars for acquiring generic skills. The change has proved successful because all the enrolled students passed the qualification doctoral exam in their first year of study, while the number, as well as the quality of published scientific papers, has increased.

At the end of 2011, work on development of a new FER3 study programme began. Furthermore, undergraduate study programme was accredited by the end of 2017 and started in October 2018. All the principles that envisaged the mechanism of the Croatian Qualification Framework were applied in the process of drawing up the FER3 study programme. In other words, the development of the study was based on the identification of key skills and jobs relevant for future professions. Therefore, these competences, which were recognized and confirmed by employers, were transferred to groups of learning outcomes and,

finally, the courses, the structure and organization of the study, as well as the final qualification itself.

The Faculty is also recognizable by its scientific work, the largest number of international projects at the University, as well as its enviable cooperation with the economy, thus keeping the high standards in regard to providing equipment and conditions for studying and working, funded partly by income from co-operation with the economy and through the core business.

For the last ten years, FER has been very active in research programmes and tenders: according to the European Commission's data, FER is at the top of Croatian institutions in withdrawing funds from European funds.

During 62 years of independent existence, FER has always persevered in reforms, building the current system of study, traditionally attracting the best among the secondary school population, assuring a small dropout and high completion rate, and offering excellent employment opportunities.

1.2. ACTIVITIES AND ORGANISATION

FER is a constituent unit of the University in Zagreb, where the University, according to regulations of the *Act on Scientific Activity and Higher Education* and the *University Statute*, enjoys the founding rights over the Faculty.

FER is a legal person evidenced in the legal register of institutions and in the Register of Higher Education of the Ministry of Science, Education and Sports.



The departments are as follows:

- Department of Applied Physics
- Department of Applied Mathematics
- Department of Applied Computing
- Department of Fundamentals of Electrical Engineering and Measurements
- Department of Electric Machines, Drives and Automation
- Department of Energy and Power Systems
- Department of Telecommunications
- Department of Electronic Systems and Information Processing
- Department of Control and Computer Engineering
- Department of Electroacoustics
- Department of Electronics, Microelectronics, Computer and Intelligent Systems
- Department of Wireless Communications.

Administrative and Support Services are as follows:

- Secretary's Office Services:
 - Office for General Affairs
 - Human Resources
 - Student Administration Office
 - Maintenance
 - Protection at Work and Fire Protection
- Financial Service
- Central Library
- Information Support Centre
- Career Centre
- Faculty Centre to Support Research.

FER consists of 12 departments. Departments are organisational units where research and educational activities are coordinated. Each department is a core of educational, research and scientific work of a specific field or branch.

The Faculty is managed by the **Dean** and the **Faculty Council**. Permanent members of the Faculty Council are full and associated professors, assistant professors and representatives of collaborators, research assistants and students. The Faculty Council is in regular session once a month with the dean as a chairperson. The FER management assures participation of students and employees in decision-making process at the Faculty. Also, students are members of committees and commissions of the Faculty Council. The stakeholders (business managers and employers) form the majority of the Faculty Advisory Board. At dean's proposal, the Faculty Council can establish temporary working bodies.

Standing working bodies of the Faculty Council are as follows:

1. Committee for Undergraduate and Graduate Study
2. Committee for Doctoral Study
3. Committee for Life-Long Education
4. Committee for Professional Promotion
5. Committee for Research and Innovation
6. Commission for Quality Management
7. Library Commission
8. Commission for Awarding of Employees and Students
9. Commission for Enrolment of Undergraduate and Graduate Students
10. Disciplinary Commission for Students
11. Ethical Commission.

1.3. ABOUT THE DEVELOPMENT STRATEGY

FER Development Strategy defines:

- mission and vision
- strategic development goals: (1) education, (2) research and innovation, (3) organisation and management, infrastructure development and quality assurance system
- certain objectives for each area, with highlighted specific activities
- key performance indicators, monitoring, responsible persons, implementation
- deadline and prerequisites for implementation of each activity
- documents to be created and applied.

In defining and forming the Development Strategy, care has been taken of FER particularity, its development plans and capabilities of each service and department, having in mind a broader social context as well. Promotion of quality and establishment of quality management and assurance in every segment of FER's activity is paramount. The goal is to satisfy all the stakeholders – students and their future employers, domestic and international partners in research, but also the investors in higher education. The foundation of FER's success and the dominant factor of quality in completing tasks at the Faculty in the period 2019 - 2023 shall be the firm commitment of the dean and the Faculty employees to persevere in accomplishing the FER mission, vision and the Development Strategy.



Ivana Patunko
University of Zagreb

2. MISSION AND VISION

2.1. MISSION

FER's Mission:

- to educate students capable of carrying out the technological and social development of Croatia through education in the field of electrical engineering, computing and information and communication technology based on the results of research
- to create new knowledge by internationally acknowledged research
- to innovatively develop the economy and public services, hence contributing to the overall development of the society
- to be an institution of high academic values and ethical principles, a place of critical thinking and questioning, and the equality of all its members, as well as to be the driving force of Croatian society.

In fulfilling the mission of FER, we rely on our core values that we continue to develop: we are the leading national and regional higher education and research institution with outstanding staff and students, we are closely connected with the economy, remarkably organised and internationally recognised.

2.2. VISION

Our vision is to be integrated and competitive in the European higher education and research domain as the leading Croatian higher education and research institution in the field of electrical engineering, computing and information and communication technology, to create new forms of knowledge transfer into the economy and to launch Croatia's economic activity.



3. STRATEGIC GOALS FOR DEVELOPMENT

3.1. EDUCATION

STRATEGIC GOAL: Providing high quality education to students, founded on an interconnection of teaching, research and innovation, along with regional and European recognition of academic programmes in the field of electrical engineering, computing and information and communication technology, as well as related multidisciplinary areas, increasing the mobility of students and staff, and the development of lifelong learning and training programmes.

3.2. RESEARCH AND INNOVATION

STRATEGIC GOAL: Strengthening research excellence and innovation activities and enhancing research and development resources to generate new scientific ideas and knowledge that will be transmitted to the Croatian economy through the development of high-tech products and companies, ensuring sustainability of research and research results through technology and knowledge transfer at post-graduate level, and increasing the visibility of research, development and innovation activities in all branches and related fields of science traditionally cultivated at FER.

3.3. ORGANIZATION AND MANAGEMENT, INFRASTRUCTURE DEVELOPMENT AND QUALITY ASSURANCE SYSTEM

STRATEGIC GOAL: Increasing business efficiency, improving all forms of infrastructure that will technically support FER development, expanding the quality assurance system to all areas of the Faculty's activities and strengthening the *alumni* organization.



4. REVIEW OF STRATEGIC ELEMENTS ACCORDING TO DEFINED AREAS OF ACTIVITY

4.1. EDUCATION

STRATEGIC GOAL: Providing high quality education to students, founded on an interconnection of teaching, research and innovation, along with regional and European recognition of academic programmes in the field of electrical engineering, computing, and information and communication technology, as well as related multidisciplinary areas, increasing the mobility of students and staff, and development of life-long learning and training programmes.

Implementation of higher education based on learning outcomes at undergraduate, graduate and postgraduate level is achieved through the following specific objectives:

1. assuring high quality studies
2. promoting international recognition of FER studies and increasing the mobility of students and teaching staff
3. improving the status of students in accordance with European standards of studying
4. expansion of life-long learning and of knowledge transfer between FER and the economy.

Specific objectives and activities that need to be implemented to achieve goals, as well as the indicators for measuring the success in fulfilment of specific tasks, are listed below. The reference year for assessing the effects of certain indicators is the academic year 2017/2018.

SPECIFIC OBJECTIVE 1: ASSURING HIGH QUALITY STUDIES

Continuous quality management of content and performance of study programmes through partnership with students, economy, professional associations, *alumni* and other stakeholders.

- ACTIVITY 1.1:** Encouraging the acquiring of long-term knowledge and development of study programmes in accordance with labour market needs and trends in technology development.
- ACTIVITY 1.2:** Provision and maintenance of teaching laboratories and classrooms, and the availability of appropriate literature.
- ACTIVITY 1.3:** Involving employers in teaching (“Partnership in Education”).
- ACTIVITY 1.4:** Ensuring the dignity of teachers and students.
- ACTIVITY 1.5:** Encouraging work on graduation theses in partnership with the economy.
- ACTIVITY 1.6:** Improving the quality of student internship.
- ACTIVITY 1.7:** Improving teacher competence in teaching and appropriate application of technology in learning and teaching.
- ACTIVITY 1.8:** Systematic determination of admission quotas.
- ACTIVITY 1.9:** Balancing the workload of professors and teaching associates.
- ACTIVITY 1.10:** Promoting the profession as well as the Faculty to attract the best high school students.

SPECIFIC OBJECTIVE 2: IMPROVEMENT OF INTERNATIONAL RECOGNITION OF THE STUDIES AT FER AND INCREASING THE MOBILITY OF STUDENTS AND TEACHING STAFF

Continuous development of international co-operation with related institutions from Europe and the world, increasing international recognition of FER studies, as well as increasing incoming and outgoing mobility of students and teachers.

- ACTIVITY 2.1:** Increasing international exchange of students and teachers.
- ACTIVITY 2.2:** Attracting students from abroad to study at FER.
- ACTIVITY 2.3:** Launching study programmes that are fully performed in English.
- ACTIVITY 2.4:** Attracting students of Croatian origin.

SPECIFIC OBJECTIVE 3: IMPROVING THE STATUS OF STUDENTS IN ACCORDANCE WITH EUROPEAN STANDARDS OF STUDYING

Preserving traditionally excellent relations with students through their active involvement in all areas of activity and development of FER, rewarding the best students, and demonstrating a special care for gifted students and students with disabilities.

- ACTIVITY 3.1:** The continuation of partnership with students based on mutual respect, democratic relationship, and two-way communication.
- ACTIVITY 3.2:** Provision of spatial, material, technical and other resources to students of the Faculty.
- ACTIVITY 3.3:** Supporting professional, cultural, social and sports activities of students.
- ACTIVITY 3.4:** To continuously improve the quality of the study by applying a quality assurance system.

- ACTIVITY 3.5:** Stimulating rewards and student scholarships.
- ACTIVITY 3.6:** Involving students in the Faculty's professional and scientific projects.
- ACTIVITY 3.7:** Providing additional knowledge and skills, especially to gifted students, guiding them towards FER doctoral study.
- ACTIVITY 3.8:** Providing ongoing career support, and systematically monitoring and supporting the community of former students.
- ACTIVITY 3.9:** Increasing students' retention by providing support to students who have problems in mastering study materials and adapting to study environment.
- ACTIVITY 3.10:** Systematic monitoring of the overall work, commitment and success of students at the Faculty.

SPECIFIC OBJECTIVE 4: EXPANSION OF LIFE-LONG EDUCATION AND KNOWLEDGE TRANSFER BETWEEN FER AND THE ECONOMY

Maintaining the existing and organizing new postgraduate specialist studies, seminars and short courses in the framework of lifelong education and training programmes of economic experts to contribute to the economic development of Croatia, but also to systematically invest in lifelong education of FER employees.

- ACTIVITY 4.1:** Expansion, empowerment and more intensive promotion of postgraduate specialist studies.
- ACTIVITY 4.2:** Qualitative and quantitative improvement of seminars and training courses aimed for professionals from industry.

SPECIFIC OBJECTIVE 1: ENSURING HIGH QUALITY UNDERGRADUATE AND GRADUATE STUDIES

| Activity | Key performance indicators | Monitoring mechanisms | Responsible persons | Deadline | Prerequisites for implementation |
|----------|--|--|---|----------------------------|--|
| 1.1 | Defining the needs for all the study programmes and their implementation in the Performance plan through modifications of learning units | Feedback from external stakeholders and former students in co-operation with the <i>alumni</i> association | President of the Committee for Undergraduate and Graduate Studies; Lecturers in charge of courses to be modified | 31 May of every year | Good communication with the <i>alumni</i> association and with external stakeholders |
| | A certain number of new multidisciplinary study programmes involving FER employees | Comparison of ISVU status with the previous period | President of Committee for Undergraduate and Graduate Studies | 30 September of every year | Collaboration with scientific-teaching staff with other disciplines |
| 1.2 | Funds invested in equipment and maintenance of instructional laboratories, classrooms and literature in printed or electronic format | Comparison with the previous period | Vice Dean for Management | 30 September of every year | Teacher Suggestions; A draft procurement plan drawn up; Provided funds |
| 1.3 | Number of courses involving employers' representatives | Comparison with the previous period | Vice Dean for Education | 30 September of every year | Election to nominal titles; Employers' surveys |
| | Number of invited lectures | Comparison with the previous period | Head of Career Center | 30 September of every year | Business interest |
| | Number of workshops when developing new study programmes in which employers participate | Comparison with the previous period | Vice Dean for Education | 30 September of every year | Curriculum created |
| 1.4 | Definition of procedures to obtain students' feedback; presentation of survey results, follow-up and other forms of communication with teachers and students | Satisfaction of teachers and students observed in survey results Number of accepted proposals which were submitted by teachers and students | Vice Dean for Education President of the Commission for Quality Management (in order to organise surveys) | 15 July of every year | Implementation of surveys in the FER information system |

| Activity | Key performance indicators | Monitoring mechanisms | Responsible persons | Deadline | Prerequisites for implementation |
|----------|--|---|---|----------------------------|---|
| | The number of students referred to the proper procedures for citing and using other people's work | The number of students who have been introduced to these procedures systematically through certain courses or other available content | Vice Dean for Education | 30 September of every year | Motivation of students; Existence of appropriate courses and content |
| 1.5 | The number of graduation theses in partnership with the economy | Comparison of ISVU status with the previous period | Head of the Student Administration Office | 30 September of every year | Motivation of companies and students |
| 1.6 | The number of companies that offered job positions and the number of students who took the positions offered | Comparison based on the Career Center records | Main coordinator of student internship and coordinator of internship by profile | 30 September of every year | Motivation of companies and students |
| 1.7 | Organized teacher education on preparing and giving a quality lesson, and the use of new technologies in education | Education Report | Vice Dean for Education | 30 September of every year | Interest of teaching staff |
| | Number of education participants | Education Report | Vice Dean for Education | 30 September of every year | Interest of teaching staff |
| | Amount of financial resources invested in access to new technologies used by students | Comparison to previous period | Vice Dean for Education | 30 September of every year | A defined list of new technologies |
| 1.8 | Analysis of the success of studying according to the State Matura results | Reports and analyses by responsible persons | Vice Dean for Education | 15 October of every year | Enrolled students |
| | Database on <i>alumni</i> , needs of companies in the area of FER activity, as well as labor market trends | Available database | Chairman of the <i>alumni</i> association | 30 September of every year | Access to state bodies databases |

| Activity | Key performance indicators | Monitoring mechanisms | Responsible persons | Deadline | Prerequisites for implementation |
|----------|---|--|-------------------------------|----------------------------|---|
| 1.9 | Record of teachers and teaching associates standard teaching hours | Regular filling out of the teacher workload database of teachers and teaching associates | Vice Dean for Education | 30 September of every year | The existence of an updated teacher workload database and the correct entry into the database |
| | Workload analysis of teachers and teaching associates | Regular filling out of the workload database of teachers and teaching associates | Vice Dean for Education | 30 September of every year | The existence of an updated workload database and the correct entry into the database |
| 1.10 | Analysis of the number of newly enrolled students and their success in study compared to success on the state final examination in secondary schools | Qualitative and quantitative comparison with the previous period | Vice Dean for Education | 30 September of every year | Interests of employees for inclusion in related activities |
| | Number of popularisation of science activities held in elementary and secondary schools | Comparison with previous period | Vice Dean for Research | 30 September of every year | Science popularization activities that were carried out |
| | Number of participants and organisation of popularisation events (Festival of Science, The University of Zagreb Fair, Open Door Day, professional events, competitions) | Comparison with previous period | Vice Dean for Research | 30 September of every year | Interest in organising events |
| | Promotion in the media | Comparison with previous period | Public Relations Professional | 30 September of every year | Person hired as a Public Relations Professional |

SPECIFIC OBJECTIVE 2: IMPROVING INTERNATIONAL RECOGNITION OF FER STUDY AND INCREASING THE MOBILITY OF STUDENTS AND STAFF

| Activity | Key performance indicators | Monitoring mechanisms | Responsible persons | Deadline | Prerequisites for implementation |
|-----------------|--|---|--|----------------------------|---|
| 2.1 | The number of incoming and outgoing mobility of students and teachers | Comparison with previous period | Main ECTS coordinator | 30 September of every year | Interest of students and teachers |
| 2.2 | The number of incoming students | Comparison with previous period | Head of the Student Administration Office | 30 September of every year | Interest of students |
| | Number of courses performed in English | Comparison with previous period | Vice Dean for Education; Vice Dean for Research | 30 September of every year | Interest of teachers |
| | Number of new teaching and professional literature in English written by FER staff | Comparison with previous period | President of the Library Commission | 30 September of every year | Interest of teachers to write new literature in English |
| | Booklets about all FER study programmes in English | Printed booklets | Vice Dean for Education | 31 May of every year | Prepared materials in English |
| | An updated English version of FER web site | Available web site | Vice Dean for Research | Ongoing | Prepared materials in English |
| 2.3 | The number of new study programmes created or the number of performed existing study programmes in English | Adopted Performance plan for new study programmes or increasing the level of performing the existing courses in English | President of the Committee for Undergraduate and Graduate Studies; President of the Committee for Doctoral Studies; President of the Committee for Life-Long Education | 30 September of every year | Interest of students and teachers |
| | The number of developed course content and teaching of existing courses in English | Defining incentive measures and assisting teachers in developing teaching content, as well as performing classes of existing courses in English | President of the Committee for Undergraduate and Graduate Studies | 30 September of every year | Interest of students and teachers |

| Activity | Key performance indicators | Monitoring mechanisms | Responsible persons | Deadline | Prerequisites for implementation |
|----------|--|---------------------------------|---|----------------------------|--|
| 2.4 | The number of new foreign students of Croatian descent | Comparison with previous period | Head of the Student Administration Office | 30 September of every year | Provided support from diplomatic missions and Croatia consular offices in the world, as well as support from the respective Ministry |

SPECIFIC OBJECTIVE 3: IMPROVING THE STATUS OF STUDENTS IN ACCORDANCE WITH EUROPEAN STANDARDS OF STUDYING

| Activity | Key indicators | Monitoring mechanisms | Responsible persons | Deadline | Prerequisites for implementation |
|----------|---|-------------------------------------|---|----------------------------|--|
| 3.1 | Number of students involved in the Faculty Council, FER committees and commissions and the number of their activities | Comparison with the previous period | General Secretary | 30 September of every year | Students' interest in inclusion and active participation in FER's activities |
| 3.2 | Number of approvals for study rooms usage | Comparison with the previous period | Vice Dean for Management | 30 September of every year | Students' suggestions |
| | Funds invested in resources for students | Comparison with the previous period | Vice Dean for Management | 30 September of every year | Provided funds |
| | Records on student use of FER information resources | Comparison with the previous period | Head of the Information Support Centre | 30 September of every year | -- |
| | Number of students with disabilities who are included in the systematic FER support programme | Comparison with the previous period | Co-ordinator for students with disabilities | 30 September of every year | -- |
| | Number of supported professional, cultural and sporting student activities | Comparison with the previous period | Vice Dean for Management | 30 September of every year | Students' suggestions |
| 3.3 | Funds invested into supporting the work of student organisations and student sporting activities | Comparison with the previous period | Vice Dean for Management | 30 September of every year | Provided funds |

| Activity | Key indicators | Monitoring mechanisms | Responsible persons | Deadline | Prerequisites for implementation |
|----------|---|--|---|--|---|
| | Provided space for the work of student associations | Number of student associations that have been granted space | Vice Dean for Management | 30 September of every year | Interest of associations |
| 3.4 | Updated Regulations of the Quality Assurance System | Adopted changes and amendments to the Regulations | Vice Dean for Research | 30 September of every year | Appropriate documents at the state and University level |
| | Defined procedures and handling methods for conducting surveys, providing feedbacks on surveys, follow-ups and other forms of communication with students | Student satisfaction through survey results; Number of accepted student suggestions | Vice Dean for Education; President of the Commission for Quality Management (for organization of surveys) | 31 January of every year for preparation of report | Implementation of surveys into FER information system |
| | Defined procedures for determining consistency between knowledge tests with predicted learning outcomes | Number of classes with tested consistency between knowledge tests with predicted learning outcomes | Vice Dean for Education | 30 September of every year | Implementation of information support for this process |
| 3.5 | Number of awarded students | Comparison with the previous period | President of the Awards Committee | 31 December of every year | Published tenders |
| | Number of students with scholarships | Comparison with the previous period | Vice Dean for Education | 31 December of every year | Published tenders |
| 3.6 | Number of students who participate in professional and scientific projects | Comparison of project database with the previous period | Vice Dean for Research | 30 September of every year | Contracted professional and scientific projects |
| 3.7 | Number of students who enrolled and completed classes for gifted students | Comparison with the previous period | Vice Dean for Education | 30 September of every year | Enrolled classes for gifted students |
| | Student satisfaction with offered classes | Comparison with the previous period | President of the Commission for Quality Management | 30 September of every year | Implementation of surveys into FER information system |

| Activity | Key indicators | Monitoring mechanisms | Responsible persons | Deadline | Prerequisites for implementation |
|----------|--|--|---|----------------------------|---|
| 3.8 | Number of the Career Center activities aimed at providing students with career support | Notifications about activities at FER webpages | Head of the Career Center | 30 September of every year | Defined activity plan |
| | Number of students who participated in the Career Center activities | Activities reports | Head of the Career Center | 30 September of every year | Student interest |
| | Number of external stakeholders participating in the Career Center activities | Activities reports | Head of the Career Center | 30 September of every year | Interest from external stakeholders |
| 3.9 | Number of counselled students | Comparison with the previous period | Vice Dean for Education; Head of the Student Counselling Service | 30 September of every year | Student interest and turnout |
| 3.10 | Availability of relevant data about a student's work, commitment and success | Comparison with the previous period | Vice Dean for Education; Head of the Information Support Centre | 30 September of every year | Existence of information system which enables gathering of the necessary data |

SPECIFIC OBJECTIVE 4: EXPANSION OF LIFE-LONG EDUCATION PROGRAMME AND KNOWLEDGE TRANSFER BETWEEN FER AND THE ECONOMY

| Activity | Key indicators | Monitoring mechanisms | Responsible persons | Deadline | Prerequisites for implementation |
|----------|---|-------------------------------------|--|----------------------------|--|
| 4.1 | Number of enrolled students into existing studies | Comparison with the previous period | President of the Committee for Life-Long Education | 30 September of every year | Interest from heads of the existing studies in promoting study |
| | Number of newly formed studies | Comparison with the previous period | President of the Committee for Life-Long Education | 30 September of every year | Interest from professors in suggesting new studies |
| 4.2 | Number of held seminars and lectures for professionals from the economy | Comparison with the previous period | President of the Committee for Life-Long Education | 30 September of every year | Interest from professors in organising seminars and lectures |

4.2. RESEARCH AND INNOVATION ACTIVITIES

STRATEGIC GOAL: Increasing research excellence and innovation activities and improving research and development resources in order to generate new scientific ideas and insights which will be transferred into Croatian economy through development of high-tech products and companies based on those products, ensuring sustainability of research and research results through technology transfer, knowledge transfer at the postgraduate level and increasing the visibility of research, development and innovation activities in all branches and corresponding fields of science which are traditionally fostered at FER.

As a scientific and educational institution that operates in the field of technical sciences, FER should focus on scientific projects in the areas of fundamental and industrial research and experimental development. It is important to make the most out of all the comparative advantages that FER has in order to improve co-operation with other research groups in Croatia and abroad, and to promote co-operation within individual departments and among departments.

The Faculty will encourage research aimed at pushing scientific boundaries in co-operation with Croatian and European institutions and in accordance with specific strategic goals focused towards smart, inclusive and sustainable growth, which are defined by Smart Specialisation Strategy of the Republic of Croatia and EU Framework Programme for Research and Innovation. FER will promote the mobility of researchers in order to prepare them for addressing present and future global challenges on one hand, and support the establishment of Croatian and European research infrastructure on the other.

The priority in research and innovation activities at FER is placed on application of new and frontier technologies in economy and society in order to achieve and maintain FER's leading role in technological and economic development of the Republic of Croatia, in its basic areas of research:

- Electrical engineering
- Computing
- Information and communication technology

FER also encourages scientific research in the fields of mathematics and physics as a foundation and support of basic areas of research.

Successful application of new technologies is crucial for improvement of Croatian economy and its integration into European and global market. Leading re-

sults in those research areas are a starting point for interdisciplinary application of those results in Croatian and regional production and service economy, and an impetus for the creation of new economic operators and encouragement of investment of economic resources in research and innovation, which directly contributes to development of Croatia and creation of new jobs.

For the period from 2019 to 2023, the research and innovation activities of the Faculty in the fields of electrical engineering, computing and information and communication technology, coupled with a strong support to projects in mathematics and physics, will be aimed at solving global challenges and initiating sustainable development and industrial competitiveness in co-operation with domestic and international partners in order to improve their effect. In accordance with European strategic documents, the research and innovation activities at FER are divided into following activity clusters, which are also in the interest of economic and service sectors of Republic of Croatia:

1 CLUSTER “HEALTH” IN THE FOLLOWING AREAS OF ACTIVITIES

- **Tools, Technologies and Digital Solutions for Health and Care**, with the emphasis on biomedical engineering, bioinformatics, applied information and communication systems in health sector, application of artificial intelligence and other digital technologies, mobile and telehealth and autonomous and co-operative robot systems.
- **Health Care Systems**, with the emphasis on the analysis and usage of large amounts of healthcare data, as well as information and communication systems for interaction with healthcare and social workers.

2 CLUSTER “INCLUSIVE AND SECURE SOCIETY” IN THE FOLLOWING AREAS OF ACTIVITIES

- **Democracy**, with the emphasis on big data, social networks and application of artificial intelligence.
- **Cultural Heritage**, with the emphasis on digital content and creative information management, information and communication technologies, autonomous and co-operative robot systems for access, sharing, conservation, safeguarding, enhancement and restoration of cultural heritage and language.
- **Social and Economic Transformations**, with the emphasis on systems and technologies in education, information society services, social

networking, ubiquitous computing, reduction of the digital divide, digital accessibility, e-inclusion, assisted communication and services for people with disabilities.

- **Disaster-Resilient Societies**, with the emphasis on information and communication technologies, autonomous and co-operative robot systems for emergency first response and prevention of crisis and disaster situations.
- **Protection and Security**, with the emphasis on information and communication technologies, autonomous and co-operative robot systems for protection of people, public spaces and infrastructure.
- **Cybersecurity**, with the emphasis on trust and security in information systems and protection of a large number of IoT devices.

3 CLUSTER “DIGITAL AND INDUSTRY” IN THE FOLLOWING AREAS OF ACTIVITIES

- **Manufacturing Technologies**, with the emphasis on industrial robotics, autonomous and co-operative robot systems and mobile robotics, information and communication systems as support to production processes, new generations of components and systems, human integrated manufacturing systems, artificial intelligence, advanced batteries technologies, smart workstations, smart manufacturing systems and innovations in automatization techniques.
- **Key Digital Technologies**, with the emphasis on micro- and nano-electronics, photonics, advanced materials, Internet of Things, neuromorphic computing, applications based on artificial intelligence and quantum computing, computer architecture, computer hardware, technologies of system engineering for support of autonomous systems, software technologies and emerging technologies.
- **Advanced Materials**, with the emphasis on application of nano-technologies in energy conversion, new energy sources and communication systems.
- **Artificial Intelligence and Robotics**, with the emphasis on explainable artificial intelligence, unsupervised machine learning, human-robot interaction, complex embodied systems, autonomous and co-operative robot systems, deep analytics of big data and decision support systems.

- **Next Generation Internet**, with the emphasis on trusted and energy-efficient smart grids and service infrastructure, connectivity beyond 5G, software defined infrastructure, communication between machines and Internet of Things, services, infrastructure and cloud computing, virtualisation and decentralised management, edge computing, blockchain, multimodal interaction concepts including immersive and credible media, social media and social networks, decentralised management of transaction records, artificial intelligence, communication and mobile services, co-operative communications, service quality and experiential quality.
- **Advanced Computing and Big Data**, with the emphasis on high performance computing (HPC), exascale and post-exascale technologies and systems, hybrid infrastructure for HPC and high-performance analysis of big data.
- **Low-Carbon and Clean Industries**, with the emphasis on industrial and process technologies with substantial reductions or avoidance of industrial emissions of greenhouse gases and pollutants, electrification and unconventional energy sources, energy and resource exchanges between industrial plants.
- **Space**, with the emphasis on the synergy between space technologies and key enabling technologies (big data, advanced manufacturing, robotics and artificial intelligence), global navigation satellite systems, new technologies (quantum technologies, optical links, reprogrammable payloads), drones, light satellites and secure and comprehensive satellite communication.

4 CLUSTER “CLIMATE, ENERGY AND MOBILITY” IN THE FOLLOWING AREAS OF ACTIVITIES

- **Energy Supply**, with the emphasis on renewable energy sources and solutions for electric power generation, heating and cooling, technologies and solutions for reducing greenhouse gas emissions.
- **Energy Systems and Grids**, with the emphasis on advanced energy grids, utilisation of synergy between different grids and actors, integration of renewable energy sources and information and communication technology for management of energy systems and efficiency.

- **Buildings and Industrial Facilities in Energy Transition**, with the emphasis on process management in manufacturing facilities, smart buildings and large mobility hubs (ports, airports, logistic centres) and energy efficiency of buildings.
- **Communities and Cities**, with the emphasis on smart cities, development of energy systems and mobility systems in cities, digital technologies for urban planning, infrastructure and systems, quality of life, safe mobility and energy efficiency and ecology.
- **Industrial Competitiveness Transport**, with the emphasis on research and development in the fields of vehicle, vessel and aircraft design, energy storage and recovery, security systems, accidents avoidance systems and improvement of cyber-security, and human-machine interfaces.
- **Clean Transport and Mobility**, with the emphasis on electric and hybrid vehicles, fast charging and supply, energy harvesting and accessible and available interfaces with the charging infrastructure, intelligent vehicle control and traffic management systems, communication infrastructure and services, and transportation systems.
- **Smart Mobility**, with the emphasis on advanced decision support systems, artificial intelligence, next generation traffic management, usage of big data, use of innovative satellite positioning/navigation, solutions for advanced automatization, connectivity and safety, advanced rail technologies, connected, co-operative and automated mobility systems and services.
- **Energy Storage**, with the emphasis on storing energy from renewable energy sources, batteries technologies and hydrogen technologies, including fuel cells.

5 CLUSTER “FOOD AND NATURAL RESOURCES” IN THE FOLLOWING AREAS OF ACTIVITIES

- **Environmental Observation**, with the emphasis on gathering and processing of big data, autonomous and co-operative land, air, surface and underwater robot systems, information and communication systems and Internet of Things.
- **Agriculture, Forestry and Rural Areas**, with the emphasis on methods, technologies and tools for sustainable and resilient production in farming and forestry, digital innovations in agriculture and forestry, autonomous

and co-operative land, air, surface and underwater robot systems, information and communication systems and Internet of Things.

- **Sea and Oceans**, with the emphasis on technologies for digital ocean, renewable energy sources from seas and oceans, blue innovations, autonomous and co-operative land, air, surface and underwater robot systems, information and communication systems and Internet of Things, information and communication systems with potential maritime applications.
- **Bio-based Innovation Systems**, with the emphasis on connecting digital technologies with biosciences and biotechnology.
- **Circular Systems**, with the emphasis on sustainable and regenerative development of cities, peri-urban areas and regions, eco innovations, circular use of water resources including reduction of water demand, prevention of losses, water reuse, recycling and revalorisation of wastewater and governance models for smart water allocation.

FER will encourage development and networking of research of expertise centres capacities across Europe and around the world, as well as the development of and participation in industrial test platforms and pilot services.

Furthermore, FER will encourage development and establishment of companies. The fact is that advantage can be achieved only by rapid innovation cycles, because today research results are mostly published and therefore immediately available to competition. Because of that, FER will operate in a way which makes research and development of products organisationally connected and will encourage small dynamic companies to develop in a way which includes a research component and connects them with research groups at FER. FER will continue with its efforts to intensify the equally envisaged collaboration with the entire Croatian and regional economy.

Considering the above-mentioned assumptions and guidelines for research and development of FER, we are setting the following specific objectives of research and innovation activities at FER:

1. strengthening research excellence and innovation activities,
2. improvement of research and development resources,
3. ensuring sustainability of research and research results through technology transfer, knowledge transfer at a postgraduate level and increased visibility.

SPECIFIC OBJECTIVE 1: STRENGTHENING RESEARCH EXCELLENCE AND INNOVATION ACTIVITIES

- ACTIVITY 1.1:** Introduction of career development programmes for assistant professors, with the aim of improving their research and development activities.
- ACTIVITY 1.2:** Encouragement of participation at international and domestic tenders.
- ACTIVITY 1.3:** Encouragement of publication of research papers in prestigious international publications.
- ACTIVITY 1.4:** Encouragement of innovations and their commercialisation.
- ACTIVITY 1.5:** Encouragement of co-operation with renowned scientists of Croatian origin who live and work abroad.

SPECIFIC OBJECTIVE 2: IMPROVEMENT OF RESEARCH AND DEVELOPMENT RESOURCES

- ACTIVITY 2.1:** Development of a business support system for researchers.
- ACTIVITY 2.2:** Encouraging the work of research laboratories and research and development centres.
- ACTIVITY 2.3:** Introduction of programmes for monitoring the work of research laboratories and research and development centres.
- ACTIVITY 2.4:** Employment of researchers, assistant professors and research support staff.
- ACTIVITY 2.5:** Improving the quality of researchers and research support staff through mobility and training.

SPECIFIC OBJECTIVE 3: ENSURING SUSTAINABILITY OF RESEARCH AND RESEARCH RESULTS THROUGH TECHNOLOGY TRANSFER, KNOWLEDGE TRANSFER AT A POSTGRADUATE LEVEL AND INCREASED VISIBILITY

- ACTIVITY 3.1:** Systematic awareness raising about innovation management and intellectual property and encouragement of implementation of the technology transfer model.
- ACTIVITY 3.2:** Networking the Faculty's research activities with innovation centres and organisations for technology transfer.
- ACTIVITY 3.3:** Establishing relationships with industry through work on final and graduate theses.
- ACTIVITY 3.4:** Development of the doctoral study oriented towards the needs of Croatian and European higher education markets.
- ACTIVITY 3.5:** Internalisation of postgraduate doctoral and specialist studies.
- ACTIVITY 3.6:** Increasing domestic and international visibility in industrial, academic and school sectors and popularisation of science.



SPECIFIC OBJECTIVE 1: STRENGTHENING RESEARCH EXCELLENCE AND INNOVATION ACTIVITIES

| Activity | Key indicators | Monitoring mechanisms | Responsible persons | Deadline | Prerequisites for implementation |
|----------|--|---|---|---|--|
| 1.1. | Decision on implementation of support programme for career development of assistant professors | Adopted Decision on implementation of programme | Vice Dean for Research for preparation of the Decision; President of the Research and Innovation Committee for preparation of the programme | 31 December 2018 for the programme proposal; 31 March 2019 for adoption of Decision | For Decision: prepared and accepted programme |
| | Organisation of an annual workshop for assistant professors (DORA) | Workshop report | President of the Research and Innovation Committee | One week after the workshop all materials on FER web | New assistant professors employed |
| | Number of assistant professors who participated in the annual workshop | Workshop report | President of the Research and Innovation Committee | One week after the workshop all materials on FER web | New assistant professors employed |
| | The amount of funding invested in co-financing the research activities of assistant professors | The report on invested funds | Vice Dean for Research | 30 September of every year | Provided funds; Accepted assistant professors' research projects |
| 1.2 | Internal workshops on tenders, applications and project management | Notifications about the internal workshop on FER web | Head of the Research Support Centre | One week after the workshop all materials on FER web | Appropriate national and international tenders announced |
| | Number of submitted and accepted research projects | Comparison of project database with the previous period | Head of the Research Support Centre | 30 September of every year | Project database |
| | The amount of funding for programmes and projects | Comparison of project database with the previous period | Head of the Research Support Centre | 30 September of every year | Project database |

| Activity | Key indicators | Monitoring mechanisms | Responsible persons | Deadline | Prerequisites for implementation |
|----------|--|--|-------------------------------------|----------------------------|---|
| 1.3. | Number of publications | Comparison of the CROSBİ database with the previous period | Head of the Central Library | 30 September of every year | -- |
| | Number of applications for allocation of incentive funds in accordance with the <i>Regulations on the Programmes for Stimulation of Research and Innovations</i> | Comparison with the previous period | Vice Dean for Research | 30 September of every year | Published papers and submitted project proposals |
| 1.4. | Number of innovations and commercialised products or services | Comparison with the previous period | Head of the Research Support Centre | 30 September of every year | Interest in commercialisation |
| | Number of applications for allocation of incentive funds in accordance with the <i>Regulations on the Programmes for Stimulation of Research and Innovations</i> | Comparison with the previous period | Vice Dean for Research | 30 September of every year | Employees' interest in submission of applications |
| 1.5. | <i>Alumni</i> database | Establishment of the <i>Alumni</i> database | Head of the <i>alumni</i> community | 31 March 2019 | Collected data on <i>alumni</i> |
| | Number of scientists of Croatian origin from abroad who co-operate with FER | Notifications about co-operations on FER web | Vice Dean for Research | 30 September of every year | Realised collaborations |



SPECIFIC OBJECTIVE 2: IMPROVEMENT OF RESEARCH AND DEVELOPMENT RESOURCES

| Activity | Key indicators | Monitoring mechanisms | Responsible persons | Deadline | Prerequisites for implementation |
|----------|---|--|--|----------------------------|---|
| 2.1 | List of equipment and software at FER | A list of equipment and software available on the FER internal network | Head of the Financial Service and Head of the Information Support Centre | Completion of inventory | Collected and updated data |
| | System for human resources management | Available system on FER's internal web pages | Head of Information Support Centre | 30 September 2022 | -- |
| | Project database | Available database on FER's internal web pages | Head of the Research Support Centre | 31 December 2019 | Defined database specification |
| | System for document management | Established system for document management | Vice Dean for Management | 30 June 2020 | Defined system specification |
| 2.2. | Number of active research laboratories and research and development centres | Comparison with the previous period | Vice Dean for Research | 30 September of every year | Employees' interest in establishment and work in research laboratories and research and development centres |
| 2.3. | Decision on implementation of programme for monitoring activities of research laboratories and research and development centres | Adoption of Decision on implementation of programme | Vice Dean for Research | 30 June 2020 | For Decision: prepared and accepted programme |
| | Number of research laboratories and research and development centres that participated in the programme | Comparison with the previous period | President of the Research and Innovation Committee | 30 September of every year | Prepared programme for monitoring activities of research laboratories and research and development centres |
| 2.4 | Number of newly employed researchers | Comparison with the previous period | Head of the Office for General Affairs | 30 September of every year | Provided funds for employment of new researchers |
| | Number of projects in which newly employed researchers participate | Comparison with the previous period | Head of the Research Support Centre | 30 September of every year | Acceptance of new research projects |

| Activity | Key indicators | Monitoring mechanisms | Responsible persons | Deadline | Prerequisites for implementation |
|----------|--|-------------------------------------|---|----------------------------|---|
| | Number of newly employed assistant professors | Comparison with the previous period | Vice Dean for Research | 30 September of every year | Provided funds for employment of new assistant professors |
| | Number of new projects headed by assistant professors | Comparison with the previous period | Head of the Research Support Centre | 30 September of every year | Acceptance of new research projects |
| | Number of newly employed administrative staff for project implementation | Comparison with the previous period | Head of the Office for General Affairs | 30 September of every year | Provided funds for employment of new administrative staff |
| 2.5 | Number of mobilities and training of research staff | Comparison with the previous period | Head of the Student Administration Office | 30 September of every year | Interest of research staff |
| | Number of mobilities and training of research support staff | Comparison with the previous period | Head of the Student Administration Office | 30 September of every year | Interest of research support staff |

SPECIFIC OBJECTIVE 3: ENSURING SUSTAINABILITY OF RESEARCH AND RESEARCH RESULTS THROUGH TECHNOLOGY TRANSFER, KNOWLEDGE TRANSFER AT A POSTGRADUATE LEVEL AND INCREASED VISIBILITY

| Activity | Key indicators | Monitoring mechanisms | Responsible persons | Deadline | Prerequisites for implementation |
|----------|---|---|-------------------------------------|--|--|
| 31. | Changes and amendments to <i>Intellectual Property Regulations</i> | Adoption of a new <i>Intellectual Property Regulations</i> | Vice Dean for Research | 31 December 2019 | -- |
| | <i>Technology Commercialisation Regulations</i> | Adoption of <i>Technology Commercialisation Regulations</i> | Vice Dean for Research | 31 December 2018 | -- |
| | Internal workshops on innovation management and intellectual property | Notifications about internal workshops | Head of the Research Support Centre | One week after the workshop all materials on FER web | Interest of teaching staff |
| | Number of patent applications | Comparison with the previous period | Head of the Research Support Centre | 30 September of every year | Interest of researchers in patent applications |

| Activity | Key indicators | Monitoring mechanisms | Responsible persons | Deadline | Prerequisites for implementation |
|----------|---|-------------------------------------|---|----------------------------|--|
| | Number of realised technology transfer models | Comparison with the previous period | Head of the Research Support Centre | 30 September of every year | Interest of researchers in technology transfer |
| 3.2. | Number of established co-operations with innovation centres and organisations for technology transfer | Comparison with the previous period | Head of the Office for General Affairs | 30 September of every year | Signed contracts with organisations |
| 3.3. | <i>Regulation on Final and Graduate Theses in Co-operation with the Economy</i> | Adoption of the Regulation | President of the Research and Innovation Committee | 31 June 2019 | - - |
| | Number of final and graduation theses in co-operation with the economy | Comparison with the previous period | President of the Committee for Undergraduate and Graduate Studies | 30 September of every year | Interests of stakeholders from the economy in co-operation |
| 3.4. | Number of joint doctoral degrees with other universities | Comparison with the previous period | Head of the Student Administration Office | 30 September of every year | Interest in co-operation |
| | Number of doctoral theses with mentors from other institutions | Comparison with the previous period | Head of the Student Administration Office | 30 September of every year | Interest of researchers |
| | Number of doctoral theses in co-operation with the economy | Comparison with the previous period | Head of the Student Administration Office | 30 September of every year | Interests of stakeholders from the economy in co-operation |
| | Number of doctoral students from the economy | Comparison with the previous period | Head of the Student Administration Office | 30 September of every year | Interests of stakeholders from the economy in co-operation |
| 3.5. | Number of classes in English language | Comparison with the previous period | President of the Committee for doctoral studies | 30 September of every year | Accredited study in English language; Interest of teachers and the number of foreign students |
| | Number of international undergraduate students | Comparison with the previous period | Head of the Student Administration Office | 30 September of every year | Establishment of doctoral study in English language |

| Activity | Key indicators | Monitoring mechanisms | Responsible persons | Deadline | Prerequisites for implementation |
|----------|--|-------------------------------------|---|---|---|
| 3.6. | Number of activities in popularisation of science in elementary schools and high schools | Comparison with the previous period | Vice Dean for Research | 30 September of every year | Science popularization activities that were carried out |
| | Catalogue of researchers' and research laboratories' expertise | Available catalogue on FER web | Vice Dean for Research | 31 December 2019 | Established online system for expertise recording |
| | Number of organised scientific conferences and symposiums | Comparison with the previous period | Vice Dean for Research | 30 September of every year; Announcement of the conference at least one month in advance on the FER web | Interest in organisation of conferences |
| | Number of agreements with international institutions | Comparison with the previous period | Head of the Office for General Affairs | 30 September of every year | Signed agreements |
| | Doctoral study web page in English language | Available web page | President of the Committee for Doctoral Studies | 31 October 2019 | Prepared materials about doctoral study in English language |
| | Serial publications (<i>FER Newsletter</i> , <i>Progress Report</i> , <i>Freshman Guide</i>) | Regular publishing | Vice Dean for Research | <i>FER Newsletter</i> - monthly; <i>Progress Report</i> - 31 October every two years; <i>Freshman Guide</i> - 30 June of every year | - - |

4.3. ORGANISATION AND MANAGEMENT, INFRASTRUCTURE DEVELOPMENT AND QUALITY ASSURANCE SYSTEM

STRATEGIC GOAL: Improvement of business efficiency, enhancements of all forms of infrastructure which will support development of FER in a technical sense, expansion of quality assurance system to all areas of Faculty's activities and strengthening the *alumni* organisation.

In modern times, when budgets of organisations and institutions are restricted at all levels by economic situation, it is important to introduce and sustain an efficient organisation and management, while simultaneously providing services at the highest possible level.

Approach to quality management at FER is based on self-evaluation, student surveys and external evaluations. FER considers quality assurance to be an ongoing process which is integrated into education, research and innovation activities. The objective of quality assurance is the establishment of mechanisms for promoting quality and achievement of highest levels of quality in education, research and innovation activities, as well as in professional and administrative activities of the Faculty.

In order to achieve efficient organisation and management, development of infrastructure and quality assurance system, we are setting the following specific objectives:

1. establishment and ongoing evaluation of efficient organisation of the Faculty
2. improvement of Faculty management
3. improvement of Faculty infrastructure
4. establishment of quality assurance system in all segments of Faculty's activities



SPECIFIC OBJECTIVE 1: ESTABLISHMENT AND ONGOING EVALUATION OF EFFICIENT ORGANISATION OF THE FACULTY

Development of human resources and efficient organisation of all services at the Faculty. Constant evaluation and analysis of existing organisation with the purpose of accelerating the flow and reducing response time.

- ACTIVITY 1.1:** Introduction of new organisational forms in accordance with *Regulations on the Organisation*.
- ACTIVITY 1.2:** Facilitating the needs of the environment in which the Faculty operates in co-operation with the external stakeholders of the Faculty.
- ACTIVITY 1.3:** Improvement of the overall quality of work and co-ordination of activities at the Faculty through the work of the Faculty committees and commissions.

SPECIFIC OBJECTIVE 2: IMPROVEMENT OF FACULTY MANAGEMENT

Continuous investment in management information systems and improvement of management, whereby the activities regarding administrative, financial and legal aspects of contracted domestic and international projects are generally carried out by joint Faculty services and non-teaching administrative staff.

- ACTIVITY 2.1:** Improvement of efficiency of Faculty management in administrative, financial and legal areas.
- ACTIVITY 2.2:** Strengthening the efficiency of Faculty professional services and departments.
- ACTIVITY 2.3:** Training the staff of joint Faculty services for activities related to international operations.
- ACTIVITY 2.4:** Strengthening the role of the Secretary's Office in conclusions of contracts, especially when preparing international contracts.

SPECIFIC OBJECTIVE 3: IMPROVEMENT OF FACULTY INFRASTRUCTURE

Improvement of Faculty infrastructure with the aim of improving working efficiency of all services and improving working conditions for students and employees at the Faculty.

- ACTIVITY 3.1:** Construction of additional spatial infrastructure for realisation of long-term development plans of the Faculty.
- ACTIVITY 3.2:** Computerisation of the entire Faculty management, with the aim of improving efficiency of management, teaching and research and development processes.
- ACTIVITY 3.3:** Monitoring and improving the efficiency of usage of Faculty infrastructure regarding energy and water.
- ACTIVITY 3.4:** Sustained investment in the development of information infrastructure of the Faculty
- ACTIVITY 3.5:** Improvement of Croatian and English versions of FER webpages.

SPECIFIC OBJECTIVE 4: ESTABLISHMENT OF QUALITY ASSURANCE SYSTEMS IN ALL SEGMENTS OF FACULTY'S ACTIVITIES

Improving the functionality and efficiency of quality assurance system by applying the mechanisms for monitoring and analysing the feedback of all stakeholders in the quality assurance system.

- ACTIVITY 4.1:** Quality assurance as an ongoing process of integration into education, research, innovation and administrative activities at the Faculty.
- ACTIVITY 4.2:** Approach to quality management based on self-evaluation and student surveys, periodical internal and external evaluations and co-operation of internal and external stakeholders.

ACTIVITY 4.3: Systematic investment in pedagogical education of teachers and professional training of non-teaching staff at the Faculty.

SPECIFIC OBJECTIVE 1: ESTABLISHMENT AND CONTINUAL EVALUATION OF EFFICIENT ORGANISATION OF THE FACULTY

| Activity | Key indicators | Monitoring mechanisms | Responsible persons | Deadline | Prerequisites for implementation |
|----------|--|--|--|----------------------------|---|
| 1.1 | Changes and amendments to the <i>Regulations on the Organisation</i> | Adoption of changes and amendments to the <i>Regulations on the Organisation</i> | Vice Dean for Management | 1 October 2020 | Identified need for changes and amendments |
| | Conduction of surveys among stakeholders related to the cooperation with the economy | Planning and analysing surveys | President of the Research and Innovation Committee | 30 September of every year | Active participation of all stakeholders |
| 1.2 | Professional qualifications and the number of employees in Faculty services | Comparison with the previous period | Heads of services, Vice Dean for Management | 30 September of every year | Provided funds; Job openings |
| | Admission quotas | Comparison with the previous years and the needs of the economy | Vice Dean for Education; Vice Dean for Management | 31 December of every year | Quality information from the economy; Teaching capacity |
| 1.3 | Faculty committees and commissions' sessions held | Minutes of the sessions of the Faculty committees and commissions | Heads of committees and commissions | 30 September of every year | Active participation of all members of the Faculty committees and commissions |
| | Updated <i>Quality Regulations and Regulations of the Quality Assurance System</i> | Adopted changes | President of the Commission for Quality Management | 30 September of every year | Definition of necessary changes |

SPECIFIC OBJECTIVE 2: IMPROVEMENT OF FACULTY MANAGEMENT

| Activity | Key indicators | Monitoring mechanisms | Responsible persons | Deadline | Prerequisites for implementation |
|----------|---|---|--------------------------|----------------------------|---|
| 2.1 | Clearly defined procedures and handling methods in the management process | All management processes available and clearly described on FER web | Vice Dean for Management | 30 September of every year | Integration of management and information system at FER |
| 2.2 | Document processing speed | Employee satisfaction through results of a short survey | Vice Dean for Management | 30 September of every year | Integration of management and information system at FER |
| 2.3 | Number of professional trainings for employees of joint services | Comparison with the previous period | Vice Dean for Management | 30 September of every year | Provided funds |
| 2.4 | Contract processing speed and legal support | Employee satisfaction through results of a short survey; Number of accepted employee suggestions | Vice Dean for Management | 30 September of every year | Implementation of surveys into FER information system |



SPECIFIC OBJECTIVE 3: IMPROVEMENT OF FACULTY INFRASTRUCTURE

| Activity | Key indicators | Monitoring mechanisms | Responsible persons | Deadline | Prerequisites for implementation |
|-----------------|--|---|--|--|---|
| 3.1 | Additional spatial infrastructure | Additional spatial infrastructure built | Dean | 30 September 2022 | Funds provided by structural funds and other sources of funding |
| 3.2 | Computerisation of Faculty management | Surveys among administrative and research staff | Vice Dean for Management | 30 September of every year | Provided funds and clearly defined needs and guidelines |
| 3.3 | Reduction of energy and water costs, while preserving comfortable working conditions | Bills for electricity, heat, gas and water | Vice Dean for Management | 30 September of every year | Provided funds for maintenance of system for energy management |
| 3.4 | Invested funds in FER information infrastructure | Comparison with the previous period | Vice Dean for Management | 31 January of every year for the preparation of the report | Suggestions by Head of the Information Support Centre |
| 3.5 | Updating FER web pages | The status of the FER web page | Head of the Information Support Centre | Ongoing | -- |

SPECIFIC OBJECTIVE 4: ESTABLISHMENT OF QUALITY ASSURANCE SYSTEMS IN ALL SEGMENTS OF FACULTY'S ACTIVITIES

| Activity | Key indicators | Monitoring mechanisms | Responsible persons | Deadline | Prerequisites for implementation |
|----------|---|--|--|--|---|
| 4.1 | Annual reports and quality assurance activity plans | Documents passed at the Faculty Council | President of the Commission for Quality Management | 30 November of every year | Held sessions of the Commission for quality management |
| 4.2 | Defined procedures and methods for surveying, providing feedback on survey results, follow-ups and other forms of communication | Number of accepted proposals based on survey results | President of the Commission for Quality Management | 31 January of every year for preparation of report | -- |
| | Periodic internal and international evaluation | Report at Faculty Council | Dean | Every 5-7 years | Provided funds for international evaluation |
| | Number of resolved issues at sessions and meetings | Minutes from sessions and meetings | Dean, Vice Deans and other appointed FER employees | Ongoing | Available working time |
| 4.3 | Number of workshops and lectures on pedagogical methods of teaching and learning | Comparison with the previous period | Vice Dean for Education | 30 September of every year | Interests of teachers in participation in these activities; Provided funds |
| | Number of professional trainings of non-teaching staff | Comparison with the previous period | Vice Dean for Management | 30 September of every year | Interest of non-teaching staff in participation in appropriate activities; Provided funds |







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