

UNIRI

SELF-EVALUATION REPORT

University of Rijeka, Faculty of Physics

for the period 2021 - 2025

FIZRI

Faculty of Physics
University of Rijeka

April 2026

Name of evaluated higher education institution: **FAKULTET ZA FIZIKU**

Name of university of which the evaluated higher education institution is a constituent unit:
SVEUČILIŠTE U RIJECI

Year of establishment: 2007 (as the Department of Physics); renamed Faculty of Physics in 2022.

Address: Ulica Radmile Matejčić 2, 51000 Rijeka

Phone: +385 51 584 600

Website: <https://phy.uniri.hr/>

E-mail: fizika@phy.uniri.hr

Title, name and surname of head of higher education institution: **Prof. Rajka Jurdana-Šepić**

Committee for the preparation of the self-evaluation report:

- Assoc. Prof. Nataša Erceg
- Assoc. Prof. Ivana Jelovica Badovinac
- Prof. Rajka Jurdana-Šepić
- Assoc. Prof. Diana Mance
- MSc Mariza Sarta Deković
- Assoc. Prof. Iva Šarić Janković
- Assoc. Prof. Tomislav Terzić

Date of adoption of the self-evaluation report by the Faculty Council:

15 April 2026

Period covered by the self-evaluation report:

1 January 2021 – 31 December 2025

Academic year 2024/2025

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ABBREVIATIONS:

AY – Academic Year

AZOO – Education and Teacher Training Agency

AZVO – Agency for Science and Higher Education

CON – University of Rijeka’s Teacher Education Centre

COUK – University of Rijeka’s Quality Assurance and Improvement Centre

ECTS – European Credit Transfer and Accumulation

EK – European Commission

ENIC – European Network of National Information Centres

FizKO – Development of Physics studies with application of Croatian Qualifications Framework

STEMp – Development of modern curricula for informatics, technics, biology, chemistry, physics and mathematics teacher education based on Croatian Qualifications Framework

HAD – Croatian Astronomical Society

HFD – Croatian Physical Society

HKO – Croatian Qualifications Framework

HRZZ – Croatian Science Foundation

HVD – Croatian Vacuum Society

HZZ – Croatian Employment Service

IFM – Engineering and Physics of Materials Study Programme

ISVU – Information System for Higher Education Institution

LA – Learning Agreement

NANORI – University of Rijeka's Centre for Micro- and Nanosciences and Technologies

NARIC – National Academic Recognition Information Centres

NISpVU – National IT System of Applications to Higher Education Institutions

NPOO – National Recovery and Resilience Plan

OOUK – Quality Assurance and Improvement Committee

PGŽ – Primorsko – Goranska County

RH – Republic of Croatia

SOUK – Quality Assurance and Improvement System

SSC – University of Rijeka's University Counselling Centre

UNIRI – University of Rijeka

UTT – Technology Transfer Office, University of Rijeka

Introduction

History of the Development of the Faculty of Physics

The Faculty of Physics is a constituent unit without legal personality of the University of Rijeka, dedicated to implementing and developing study programmes in physics and achieving excellence in scientific research. The faculty is the successor to higher education institutions that introduced physics teaching in Rijeka as early as 1960. At that time, the Department of Natural Sciences was established at the Higher Professional Pedagogical School, followed a year later by the Department of Mathematics and Applied Physics. In 1964, a four-year study programme in mathematics and physics was organised – the oldest such programme in Rijeka.

Four-year education for teachers of mathematics and physics continued at the Higher Industrial Pedagogical School, and from 1972 at the Faculty of Industrial Pedagogy through the Chairs of Mathematics and Physics. The Faculty of Industrial Pedagogy was one of the founding institutions of the University of Rijeka in 1973. External collaborators significantly contributed to the development of studies, and from 1972 to 1977 more physicists were employed, enabling the organisation of study groups with different combinations of mathematics, physics, and technical education.

With the establishment of the Faculty of Education in 1977, physics studies were conducted through the Department of Physics within various teacher education programmes, including physics and chemistry. In 1998, the Faculty of Education was renamed the Faculty of Humanities and Social Sciences, and departments began offering programmes in mathematics and physics, mathematics and informatics, and physics and computer science. From the academic year 2000/2001, Chairs of Applied, Experimental, and Theoretical Physics were active.

In 2007, university departments were established at the University of Rijeka. The Department of Physics began operating in 2008, marking a new period in higher education and scientific research in physics. Undergraduate and graduate studies became university-level programmes, and in 2012 the departments moved to the University of Rijeka Campus. The educational vertical in physics was completed in 2017 with the establishment of a postgraduate (doctoral) university study in physics. In 2022, the Department of Physics became the Faculty of Physics.

Today, it employs 44 staff members: 25 teaching staff, 8 associate staff, one professional position within the science and higher education system, 7 administrative and technical staff, and three project employees. Since 2008, when the Department of Physics –

now the Faculty of Physics – was established, 11 PhD graduates, 133 master's degree holders, and 161 bachelor's degree holders have graduated from the Faculty of Physics.

Mission

The mission of the Faculty of Physics is to advance science and education through excellence in research, to train experts for various sectors, to educate new generations of physics teachers, and to contribute to solving contemporary social, technological, and scientific challenges.

Vision

The Faculty of Physics is a modern institution equally focused on scientific research, teaching, and the development of study programmes in physics, and is also active in the popularisation of science and STEM fields. Scientific research at the faculty is conducted using modern equipment, and students are educated in laboratories equipped to meet contemporary needs. Work, learning, and teaching take place in a pleasant environment with strong incoming and outgoing mobility of researchers, teachers, administrative and technical staff, and students. Scientific research activities focus on strengthening research groups, with particular emphasis on the physics and chemistry of advanced materials, environmental physics, medical physics, and astrophysics. In addition, the Faculty of Physics fulfils its scientific and teaching role through cooperation with most constituent units of the University by educating their students in a range of physics courses and collaborating on scientific research projects.

Activities

The core activity of the Faculty of Physics is the organisation and delivery of university study programmes, as well as the development of scientific and professional work in the field of natural sciences, specifically physics. Its activities include conducting scientific and professional projects, providing advisory and consulting services, and organising, hosting, and participating in scientific and professional conferences.

The faculty also provides professional services and consulting, manages publishing, library, and IT activities for the needs of higher education and research, ensures the availability of textbooks and other necessary materials, and develops and delivers professional training programmes. All these activities support the faculty's core mission and ensure the quality of education and research.

Organisation and Governance

The Faculty of Physics comprises two departments, two chairs, and nine laboratories (as shown in the organisational chart, Fig. 2). Departments are responsible for conducting and advancing scientific work, while chairs are responsible for teaching and professional activities in one or more related subjects. The Chair of Environmental Sciences was established in 2024 in response to increased scientific, professional, and teaching activities related to environmental research. Laboratories are subordinate organisational units within

departments, where scientific and professional research, projects, and the practical and demonstration components of teaching are carried out.

The internal organisation of the Faculty, including the names and scope of work of its organisational units, the selection and responsibilities of their heads, as well as the list of positions and the requirements for employees holding those positions, is regulated by the Ordinance on Internal Organisation and Job Systematisation of the Faculty of Physics. This Ordinance is adopted by the Dean with the approval of the Faculty Council.

The Faculty of Physics is a constituent unit of the University of Rijeka without legal personality, conducting university studies and developing scientific and professional work within a specific field or interdisciplinary scientific area. The founder of the Faculty is the University of Rijeka. The Faculty's fundamental legal act is the Faculty of Physics Ordinance, which regulates its structure and scope of work in accordance with the founding decision and the University Statute. The Ordinance is adopted by the Faculty Council with the approval of the University Senate.



Figure 1. Administrative Bodies of the Faculty of Physics

The governing bodies of the faculty are the Dean, the Faculty Council, and the Dean's Collegium. The Dean represents and acts on behalf of the faculty, manages its operations, and is responsible for its activities and overall performance. The Dean is assisted by Vice-Deans; currently, the Faculty of Physics has one Vice-Dean.

The highest governing body of the faculty is the Faculty Council, which decides on development strategy, study programmes, academic matters, and resources. The Council coordinates the work of institutes, chairs, and laboratories, and oversees the quality of education and research.

The Council comprises all full professors with tenure, full professors, associate professors, assistant professors, senior lecturers, and lecturers employed on a permanent basis who work at least half-time at the Faculty, two representatives of research associates, one representative of employees, and student representatives who make up 10 % of the Council members, of whom no more than 20% are postgraduate students.

In addition to the Dean and Vice-Dean, the Dean's Collegium includes the heads of institutes, full professors with tenure, and full professors.

DIVISIONS AND CHAIRS

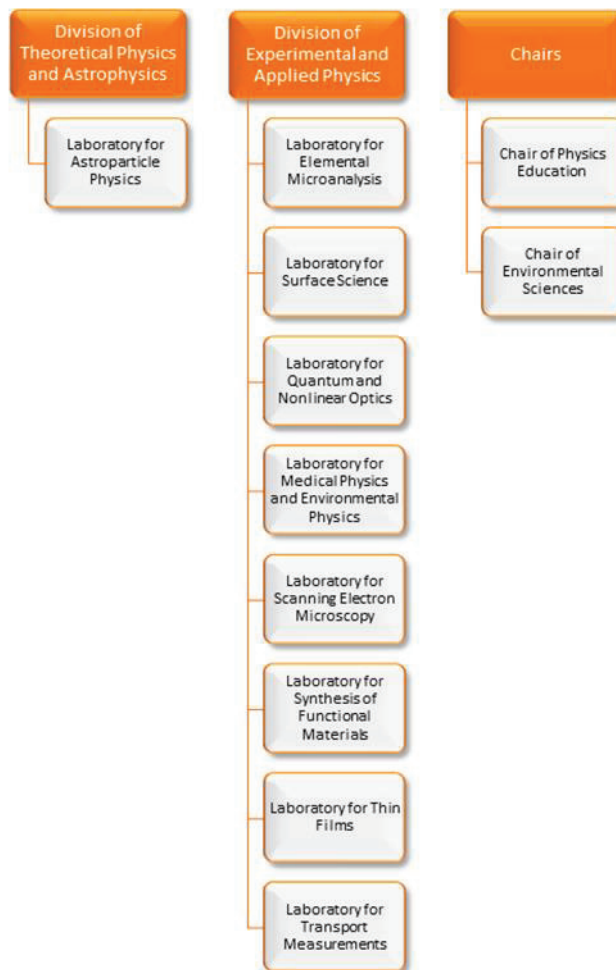


Figure 2. Divisions and Chairs of the Faculty of Physics

The Doctoral Study Council of the Faculty of Physics is an advisory body that monitors and evaluates the implementation of the doctoral programme in physics. It proposes academic and scientific policies and evaluates programmes, mentorship, and the quality of doctoral research projects.

The Faculty also has four advisory bodies involved in academic and strategic decision-making: the Council for Science and Projects, the Council for Teaching and Student Affairs, the Council for Enhancing the Visibility of the Faculty and Popularisation of Science, and the External Stakeholders Council.

Study Programmes

The Faculty of Physics operates in modern, well-equipped facilities at the University campus in Trsat. It offers a three-year undergraduate university programme in Physics, as well as five two-year graduate university programmes which, in accordance with the principles of the Bologna Process, build upon different undergraduate study tracks.

Three of these are teacher-oriented programmes: Physics and Mathematics, Physics

and Computer Science, and Physics and Philosophy. The graduate study programme in Physics is research-oriented and includes three specialisations: Solid State Physics, Astrophysics and Elementary Particle Physics, and Environmental Physics. The interdisciplinary study programme Engineering and Physics of Materials is carried out jointly by the Faculty of Physics and the Faculty of Engineering of the University of Rijeka.

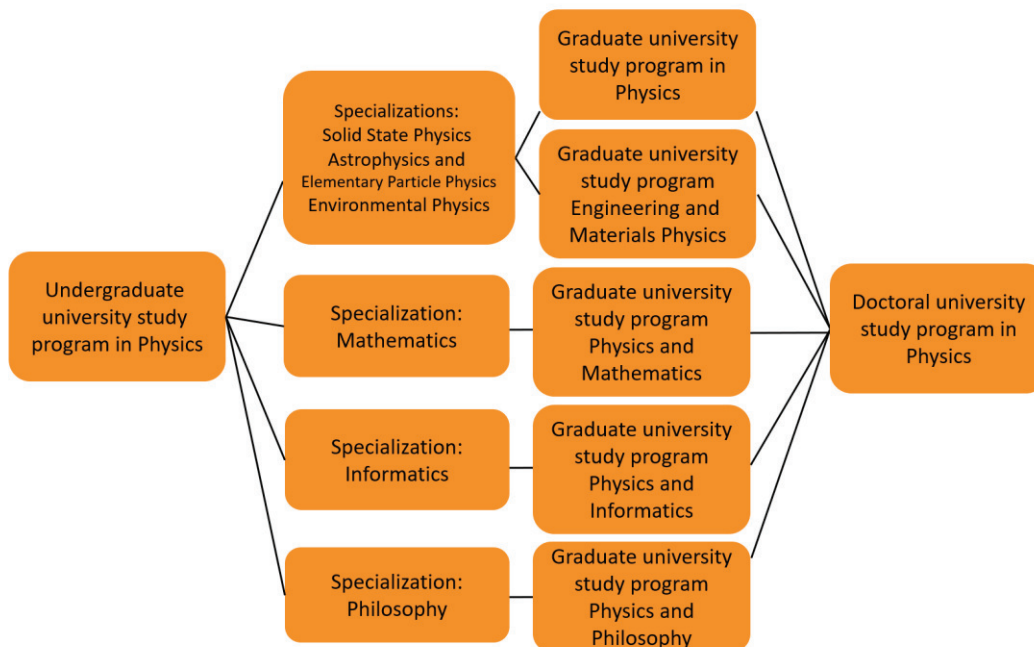


Figure 3. Study Programmes of the Faculty of Physics

Faculty of Physics staff teach physics courses at six faculties of the University of Rijeka and organise and deliver lifelong learning programmes. These include the Programme for Acquiring Missing Knowledge, Skills, and Competencies required for enrolment in the graduate university study programme in Engineering and Physics of Materials, and the Specialised Programme in Natural Sciences and Mathematics for Primary School Teachers.

Since 2017, the Faculty of Physics has offered a postgraduate (doctoral) university study programme in Physics, designed in accordance with modern European doctoral studies focused on the scientific research contributions of candidates. The program is oriented towards areas in which the faculty has developed internationally recognised research, such as condensed matter physics, elementary particle physics, astrophysics, and medical physics.

Scientists from the Faculty of Physics, in collaboration with other institutions and the Center for Micro- and Nanosciences and Technologies of the University of Rijeka, conduct experimental research in laboratories equipped with state-of-the-art instruments, unique in this part of Europe. This advanced equipment, together with expert teachers and mentors, enables students to acquire knowledge and skills tailored to the challenges of the future.

Review of the Results of Previous External Evaluations

At the Faculty, external quality assurance procedures are conducted by the Agency for Science and Higher Education (ASHE), while internal quality assurance reviews are conducted by the University of Rijeka.

Previous external quality assurance procedures for the Department of Physics at the University of Rijeka, conducted by ASHE, took place in 2015 and 2021. Previous internal evaluations of the Department, that is, the Faculty of Physics, conducted by the University of Rijeka, were carried out in 2014, 2019, and 2024.



Figure 4. Previous External and Internal Evaluations of the Faculty of Physics (until 2022 the Department of Physics), University of Rijeka

External Evaluation of the Department of Physics by ASHE in 2015

Based on the [Report of the Expert Panel on the reaccreditation of the Department of Physics](#) in Rijeka (OFRI) and the [Accreditation Recommendation](#) issued by the Agency for Science and Higher Education (ASHE) on 23 November 2015, the Ministry of Science, Education and Sports issued, on 28 December 2015, a certificate confirming that OFRI met the requirements for performing higher education activities, along with a letter of expectation for conducting scientific activities, setting a three-year deadline for addressing identified deficiencies.

After this period, a [statement in response](#) to the accreditation recommendation was submitted. The [ASHE response](#) of 4 February 2019, included a proposal to the Minister to issue a certificate confirming that OFRI meets the requirements for conducting both higher education and scientific activities.

Within the prescribed timeframe, the Department of Physics submitted to ASHE an [Action plan](#) for Quality Improvement as part of the second cycle of reaccreditation for the period 2019 – 2024.

External Evaluation of the Department of Physics by ASHE in 2021

Based on the [Report of the Expert Panel](#) on the reaccreditation of the Department of Physics of the University of Rijeka from May 2021, and the [Accreditation Recommendation](#) of the Agency for Science and Higher Education issued on 6 December 2021, within the reaccreditation procedure, the Ministry of Science, Education and Sports issued, on 31 December 2021, a certificate confirming that the Department meets the requirements for conducting higher education and scientific activities.

The Department of Physics (OFRI) submitted to ASHE an [Action Plan](#) for Quality Improvement as part of the second cycle of reaccreditation for the period 2021 – 2026.

Details and documents related to the conducted reaccreditations are available on the [Reaccreditation](#) website.

Internal Evaluation of the Quality Assurance System of the Department of Physics by the University of Rijeka in 2014

[Report on the Results](#) of the Internal Evaluation of the Quality Assurance System, 2014

Internal Evaluation of the Quality Assurance System of the Department of Physics by the University of Rijeka in 2019

[Report on the Results](#) of the Internal Evaluation of the Quality Assurance System, 2019 was prepared based on the submitted self-evaluation. The Committee for Quality Assurance and Improvement (OOUK) prepared an [Action Plan](#) for the Quality Assurance and Enhancement System of OFRI for the period 2019 – 2021.

Internal Evaluation of the Quality Assurance System of the Department of Physics by the University of Rijeka in 2024

[Report on the Results](#) of the Internal Evaluation of the Quality Assurance System, 2024 was conducted based on the submitted self-evaluation. The Committee for Quality Assurance and Improvement (OOUK) prepared an [Action Plan](#) for the Quality Assurance and Enhancement System of OFRI for the period 2024 – 2027.

Information on the Preparation of the Self-Evaluation

Following the Reaccreditation Plan for Higher Education Institutions in 2025, submitted by the Agency for Science and Higher Education, the management of the Faculty of Physics initiated the process of proposing members for the committee responsible for preparing the Self-Evaluation and conducting the reaccreditation procedure.

All employees of FIZRI were involved in preparing the Self-Evaluation. They participated in data collection, reviewing and preparing the text, and partly in its writing. The process included systematic data collection, collaboration among various stakeholders, and the use of specialised digital tools. Shared folders and documents were established to enable task distribution by topic and continuous monitoring of progress for all participants. Numerous meetings of working groups, chapter coordinators, and faculty management were held, along with thematic consultations with staff from professional services. Faculty management coordinated the work of teaching staff, research associates, and administrative personnel involved in data submission and processing.

Preparation of the Self-Evaluation began with the appointment of topic coordinators and the collection of data led by these coordinators. The Dean of the Faculty of Physics, Prof. Rajka Jurdana-Šepić, appointed five coordinators responsible for preparing five chapters of the Self-Evaluation, with the active participation of all Faculty employees.

I. GOVERNANCE OF THE HIGHER EDUCATION INSTITUTION AND QUALITY ASSURANCE

Coordinator: Assoc. Prof. Iva Šarić Janković, PhD, Chair of the Committee for Quality Assurance and Enhancement of the Faculty of Physics

II. STUDY PROGRAMMES AND LIFELONG LEARNING PROGRAMMES

Coordinator: Assoc. Prof. Ivana Jelovica Badovinac, PhD, Vice-Dean of the Faculty of Physics

III. STUDENT-CENTRED LEARNING AND TEACHING – TEACHING PROCESS AND SUPPORT

Coordinator: Assoc. Prof. Nataša Erceg, PhD, Head of the Chair of Educational Physics

IV. TEACHING CAPACITIES AND INFRASTRUCTURE OF THE HIGHER EDUCATION INSTITUTION

Coordinator: Assoc. Prof. Diana Mance, PhD, Head of the Chair of Environmental Science

V. SCIENTIFIC/ARTISTIC AND PROFESSIONAL ACTIVITY

Coordinator: Assoc. Prof. Tomislav Terzić, PhD, Head of the Department of Theoretical Physics and Astrophysics

Data were collected from relevant systems (ISPIK, CroRIS, ISVU, Dabar, etc.), internal sources including reports, minutes, plans, and strategic documents of the Faculty and the University of Rijeka, as well as from professional services and staff where organised databases were not available. During the preparation of the Self-Evaluation, data were also entered and verified in the CroRIS system. From December 2025, Faculty staff attended organised training sessions for working in the CroRIS and ISPIK systems. The following persons were appointed for system management:

CroRIS Coordinator:

Assoc. Prof. Ivana Jelovica Badovinac, PhD

CroRIS Module Editors – Projects:

Asst. Prof. Nenad Kralj, PhD; Franko Alač

CroRIS Module Editors – Persons:

Katarina Benac Kružić, MSc (Econ); Ivana Bjedov Keleković, MSc (Law); Mariza Sarta Deković, MSc (Phys)

CroRIS Module Editors – Equipment and Services:

Prof. Aleš Omerzu, PhD; Assoc. Prof. Ivana Jelovica Badovinac, PhD

CroRIS Module Editors – Events:

Assoc. Prof. Ivana Jelovica Badovinac, PhD; Prof. Rajka Jurdana-Šepić, PhD

CroRIS Module Editor – Research Outputs/Publications (CROSBI):

Daria Jardas Babić, PhD

ISPIK Coordinator:

Mariza Sarta Deković, MSc (Phys)

During Faculty Council sessions, all members were informed of the progress of the reaccreditation process and asked to provide relevant data. Administrative staff were primarily engaged in data collection, either independently or in coordination with University

of Rijeka services responsible for specific areas (e.g., the Finance and Accounting Centre provided financial data). Services of the University Library were also utilised.

The coordination team maintained continuous communication and held meetings where data were interpreted, processed, and discussed, before being incorporated into the text. Chapter coordinators prepared drafts for individual standards, while other staff members contributed where their expertise was most relevant. After drafting, each section was reviewed by the coordination team and then circulated among all Faculty staff for feedback. Coordinators subsequently incorporated final revisions and additions, after which the text was translated.

The consolidated document was submitted as material for the Faculty Council session on 15 April 2026, where it was adopted.

In preparing the Self-Evaluation, the Accreditation Recommendation from 2021, the Self-Evaluation from 2021, the Self-Evaluation from 2024, and the Internal Evaluation Report from 2024 were considered. Since the last accreditation, progress has been made across all standards, as presented and elaborated in the document. The process relied on digital tools for collaboration and document sharing, with clearly defined responsibilities and effective communication between faculty management, chapter coordinators, and staff responsible for technical and content preparation, ensuring a transparent and well-documented preparation for external evaluation.

1. HIGHER EDUCATION INSTITUTION MANAGEMENT AND QUALITY ASSURANCE

1.1. *The mission of a higher education institution guides the process of operational planning and the development of quality assurance processes.*

1.1.1. *The higher education institution has a publicly available state-of-the-art mission, which represents the framework and direction of action, along with the defined values and objectives.*

FIZRI has its own up-to-date strategy, mission, and vision defined within the [Development Strategy 2021–2025](#), which is publicly available on the Faculty's website. The mission of the Faculty of Physics clearly defines its core values and objectives, including the promotion of excellence in scientific research and education, training experts for the needs of the economy and society, the education of future physics teachers, and active engagement in addressing contemporary social, technological, and scientific challenges. The FIZRI Quality Assurance Policy is aligned with the mission, vision, and objectives defined in the Development Strategy 2021–2025. The development of a quality culture at FIZRI is carried out through the continuous improvement of the quality assurance and improvement system (SOUK). The system is based on university criteria as well as European and national standards and guidelines for quality assurance, while considering the specific characteristics of the Faculty. Its aim is to support the development of student competences in line with societal needs. All stakeholders are actively involved in the quality assurance process, including the Faculty management, academic and administrative staff, students, and external collaborators. Emphasis is placed on fostering scientific productivity and developing study programmes based on innovative research conducted by FIZRI staff, in accordance with the principles of the [Croatian Qualifications Framework](#) (HKO), thereby strengthening the Faculty's role in the development of the local economy and the community.

Quality culture is further ensured through transparency in operations, responsible management, and the creation of a stimulating environment for research, learning, and teaching. Continuous monitoring of quality indicators enables periodic review and improvement of FIZRI's quality assurance policies, objectives, and procedures. The [FIZRI Quality Assurance Policy](#) is publicly available on the Faculty's website and is implemented in accordance with the relevant regulations and documents of both FIZRI and the University of Rijeka. According to the [Statute of the Faculty of Physics](#) and the [Regulations on the Quality Assurance and Improvement System of the Faculty of Physics, University of Rijeka](#), the structure and functioning of the quality assurance system are defined, integrating and coordinating all quality-related activities at FIZRI. In defining criteria and standards for ensuring the effective organisation of studies and supporting students in achieving intended learning outcomes, FIZRI relies on the [Handbook for the Quality of Study at the University of Rijeka](#) as a key document of the quality assurance system. The Handbook provides a formal framework, standards, and guidelines for achieving and continuously improving the quality of study programmes and teaching processes. It is aligned with European and national standards and guidelines for quality assurance in higher education.

The Quality Assurance and Improvement Committee (OOUK) of FIZRI is responsible for implementing procedures defined in the University's quality assurance manuals and other relevant quality system documents, as well as for their adaptation, further development, and continuous improvement in line with the needs and specific characteristics of FIZRI.

1.1.2. The mission clearly defines the specific role of the higher education institution in performing higher education, scientific, and professional activities, and in contribution to the development of modern society. The mission positions the higher education institution in a domestic and international context, guides the development of the content of study and education programmes, and all activities of the higher education institution.

The development of FIZRI is based on strategic planning through the [UNIRI Development Strategy 2021–2025](#), which was adopted by the FIZRI Council. By a decision of the Senate of the University of Rijeka dated 16 December 2025, the implementation of the University of Rijeka Development Strategy 2020–2025 was extended for an additional year, that is, until the end of 2026, by which time the new University administration will adopt the Strategy for the next period. In accordance with that decision, at its session held on 21 January 2026, the FIZRI Council adopted a decision extending the validity of the FIZRI Development Strategy. As a supplement to the UNIRI strategy for the period 2021–2025, the [FIZRI strategy](#) was also prepared, elaborating the UNIRI strategy while considering the specific characteristics of FIZRI. The FIZRI Development Strategy is the fundamental strategic document which, in line with the University of Rijeka Strategy, defines the Faculty's mission and vision, the key strategic areas of activity, measurable objectives and performance indicators, as well as planned activities aimed at the further development of FIZRI's scientific, teaching, and social role. The mission of FIZRI defines its specific role in the field of higher education, scientific research, and professional activities, as well as its active contribution to the development of contemporary society. By promoting top-quality scientific work and excellence in education, FIZRI positions itself as a relevant scientific and teaching institution in the national and international academic arena, particularly in the field of fundamental and applied research in physics.

The fulfilment of strategic goals is monitored annually through the indicators of the UNIRI strategy. Depending on the results presented in the annual reports, an Action Plan is drafted and adopted, and at the end of the year a report on its implementation is submitted. By achieving the set strategic goals, FIZRI also fulfils its mission, primarily through the implementation of scientific and development research, through which its teaching activities are developed and modernised. The mission of the Faculty guides the development and implementation of study and educational programmes, with an emphasis on training experts for the needs of the economy and society, educating future physics teachers for work at all levels of education, and developing students' competencies in accordance with the principles of the [Croatian Qualifications Framework](#). On this basis, FIZRI provides [undergraduate](#), [graduate](#) and [postgraduate](#) education in the field of physics, based on its scientific research and professional work. An example of the operational implementation of the Faculty's mission is the document "[Analysis and Measures for Study Programme Sustainability](#)", which is used regularly to monitor the status of study programmes, the number of enrolled students, pass rates, and other indicators of study quality, and to propose measures for their improvement.

The teaching activities of FIZRI are founded on the contemporary scientific research carried out by the Faculty's staff, thereby ensuring a connection between scientific research and educational work. Research is conducted through the Faculty's own research projects, inter-university cooperation, and participation in international collaborations and projects. In addition to scientific and teaching excellence, participation in activities promoting physics is also encouraged to highlight the importance of the natural sciences for social progress and sustainable development. In its work, FIZRI actively promotes the principles of scientific integrity, professional ethics, academic freedom, and critical thinking, with full openness to scientific, educational, and social changes. Recognition and visibility in scientific research and teaching in higher education, together with a contribution to the knowledge society, constitute the vision of FIZRI as part of the European Higher Education and Research Area. FIZRI seeks to contribute to the sustainable development of the economy and society through the transfer of technology and knowledge to all members of the local and wider community.

1.1.3. Representatives of various stakeholder groups participate in the development and definition of the mission of the higher education institution.

The process of designing, adopting, implementing, and revising the mission is an integral part of drafting a new Strategy. Since 2014, FIZRI has implemented the UNIRI 2014-2020 Strategy, and it adopted its own strategy for the first time in 2018 for a three-year period. The drafting of the latest FIZRI Strategy for the 2021-2025 period began at the initiative of the Faculty Management, in line with the strategic goals and guidelines of the University of Rijeka Strategy and was carried out with the participation of the Faculty's teaching and non-teaching staff.

Proposals for the mission, vision, and strategic goals were considered and aligned through discussions at the level of the Faculty Management, meetings with members of OOUK, in whose work representatives of external stakeholders also participate, as well as through the work of the Dean's Collegium ([see Minutes of the Collegium of 9 November 2022](#)). The Dean's Collegium is normally held one week before Faculty Council sessions, with the aim of discussing and harmonizing all agenda items submitted to the Council. The work of the Dean's Collegium involves members of the Faculty Management, all full professors and tenured professors, as well as heads of departments, thereby ensuring the involvement of key holders of teaching, scientific, and organizational activities in the process of shaping strategic decisions. The final proposal of the Strategy was presented as a thematic item at the session of the FIZRI Council, in whose work teachers in scientific-teaching and teaching positions, representatives of associates, employees, and students (10%) participate ([FIZRI Regulations](#)). In this way, the participation of different groups of internal stakeholders in the process of shaping the Faculty's strategic direction was ensured. The final proposal of the mission, vision, and the Faculty Development Strategy [was adopted at the Faculty Council session](#) (CLASS: 602-03/22-01/95; REF. NO.: 2170-57-003-01-22-1, dated 16 November 2022). Pursuant to this decision, at its 75th session held on 22 November 2022, the Senate of the University of Rijeka gave its [consent](#) to the Faculty of Physics for the Strategy of the Faculty of Physics of the University of Rijeka for the period 2021-2025.

1.1.4. The mission statement is the starting point for the process of strategic planning and setting the strategic goals.

The mission of FIZRI serves as the starting point for the process of strategic and operational planning and for defining the Faculty's strategic and institutional goals. Based on the adopted mission and vision, and in accordance with the UNIRI Development Strategy, the [Development Strategy of the Faculty of Physics for the period 2021-2025](#), aligned in both timeframe and content with the university strategy, was prepared and adopted by the [Senate of the University of Rijeka](#). FIZRI's Development Strategy naturally builds on the previous Strategy adopted for the 2018-2020 period, the first strategy adopted in written form, and represents the continuity of strategic thinking about the Faculty's development. The FIZRI Development Strategy 2021-2025 is directly grounded in the Faculty's mission and elaborates it into clearly defined strategic goals, priorities, and operational activities. The Faculty's mission provides the foundation for shaping strategic guidelines and directs the Faculty's activities in scientific research, education, and its overall development. The goals are structured within four key strategic areas of activity (learning and teaching, research, knowledge transfer and regional engagement, and internationalization), thereby ensuring the systematic and measurable implementation of the mission through clearly defined activities and performance indicators aligned with FIZRI's quality assurance policy. The connection between the mission and strategic and operational planning is also reflected in the institutional mechanisms for its implementation. The process of strategic planning, adoption, and monitoring of the Development Strategy is directly aimed at achieving the Faculty's mission, and all key stakeholders actively participate in it, including the Faculty Management, the competent committees and working bodies, the Faculty Council, representatives of the academic and non-academic staff, students, and external stakeholders. Their participation ensures that the mission is viewed as an operational framework that guides decision-making and development priorities.

The operational level of planning translates the implementation of the mission into regular meetings of the [Faculty Management advisory bodies](#), at which strategic goals are transformed into annual and short-term activity plans, task holders are identified, deadlines are set, and implementation indicators are monitored. In the process of operational management and decision-making, the Management also relies on the Faculty's advisory bodies: the Council for Science and Projects, the Council for Teaching and Student Affairs, the Council for Strengthening the Faculty's Visibility and the Popularization of Science, and the External Stakeholders Council, which are engaged in situations requiring an appropriate perspective. In this way, expert support is ensured in planning and implementing activities in the Faculty's key areas of work. Examples include the [Council for Science and Projects](#), which proposes recipients of the [Award for Scientific Work](#), and the [Council for Teaching and Student Affairs, which proposes recipients of awards for the best student papers](#).

The Quality Assurance and Improvement System (SOUK) is a key mechanism through which the achievement of strategic goals, and consequently the implementation of the Faculty's mission, is continuously monitored. In this way, a permanent, clear, and functional connection is ensured between the mission, strategic planning, and everyday operational practice. The operational plan for implementing strategic activities, with defined persons or bodies responsible for implementation and implementation indicators (as mechanisms for monitoring and reporting on the execution of activities), is contained in the [Action Plan 2021-2026](#). The achievement of strategic goals and the implementation of the Faculty's mission are systematically monitored through annual reports on strategy implementation and action plans for every year from 2015 to the present, and these are publicly available on the [FIZRI website](#). This ensures regular evaluation of goal achievement, the involvement of relevant

stakeholders in carrying out the mission, and the continuous improvement of FIZRI's strategic and operational activities.

FIZRI recognizes the Strategy as a key tool for achieving its mission and long-term development, which is confirmed through the continuous monitoring of performance indicators, regular reporting, and the adjustment of strategic and operational activities in line with the results achieved and changes in the academic and social environment.

1.2. The higher education institution defined the internal organizational structure and processes that are managed responsibly, efficiently and effectively, and the higher education institution's stakeholders are included in the decision-making processes.

1.2.1. The management of the higher education institution is based on the academic self-governance of higher education institutions and the autonomy of universities.

The Faculty of Physics is a scientific and teaching constituent of the University of Rijeka without legal personality, operating within the framework of academic self-governance and the institutional autonomy of the University, as established by the Act on Higher Education and Scientific Activity ([ZVOZD](#), Official Gazette 119/2022), and as defined by the [Statute of the University of Rijeka](#) and the applicable regulations. FIZRI has the status of a branch within the meaning of Article 9 of the [Act on Institutions](#), and the founder of the Faculty is the University of Rijeka.

The Faculty governance system is based on the above principles of academic self-governance and University autonomy and is implemented through the work of the Faculty bodies, particularly the head of the institution (the Dean) and the expert council (the Faculty Council). The basic general act of the Faculty is the [Regulations of the Faculty of Physics](#), which regulates the organization of the Faculty, its bodies, their composition and scope of work, and the decision-making process, in accordance with the [Founding Decision](#) and the [University Statute](#). The Regulations of the Faculty of Physics are adopted by the [Faculty Council](#), with the consent of the Senate of the University of Rijeka, thereby ensuring that the Faculty's internal organization and governance are aligned with the University's general acts. The activities and operations of FIZRI are managed by the Dean, whose powers, responsibilities and election procedure are determined by the University Statute and the Faculty Regulations. The Dean is assisted in this work by the Vice-Dean, who is accountable to the Dean and the Council. The [Faculty Council](#) is the expert council of FIZRI and the highest expert body in the field of the Faculty's teaching, scientific and professional activities, through which the principles of academic self-governance and autonomous decision-making are exercised. The composition, mode of operation, decision-making procedures and competences of the [Faculty Council](#) are regulated by the [Rules of Procedure of the Faculty Council of the Faculty of Physics, University of Rijeka](#). The Faculty Council consists of teachers elected to scientific-teaching positions employed at the Faculty, representatives of teachers in teaching positions and associates in associate positions, representatives of other employees, and student representatives, in accordance with the Statute of the University of Rijeka and the applicable regulations. The [Faculty Council](#) discusses and decides on matters of importance for the Faculty's activities, especially in study programmes, admission requirements and criteria, employee election and

promotion, planning of the Faculty's development, and other matters laid down by the [University Statute](#), the [Faculty Regulations](#) and the [Rules of Procedure of the Faculty Council](#).

Although FIZRI does not have legal personality, the governance system ensures the Faculty's autonomy in key aspects of its operations, including the organization of its internal structure, the design of study programmes, the determination of student admission rules, the independent application for and implementation of scientific and professional projects, the management of financial and other resources, and human resources management. In accordance with the principle of functional integration prescribed by the University Statute of the University of Rijeka (Article 11), certain key strategic functions are carried out in an integrated manner at the University level, particularly in the areas of strategic planning for the development of scientific and teaching excellence, enrolment policy, quality assurance, development of study programmes, scientific infrastructure and international cooperation. In this way, the Faculty's development is aligned with the mission and strategic objectives of the University, while ensuring efficient use of shared resources and support systems, and the Faculty's autonomy in day-to-day operations and expert decision-making is fully preserved.

1.2.2. The autonomy of universities includes the regulation of internal organisation and management in accordance with the Act on Higher Education and Scientific Activity, its by-laws and regulations; identification of educational, scientific, artistic and professional programmes; deciding on the acceptance of projects and international cooperation; financial autonomy under a programme agreement; and responsibility towards the social community.

The autonomy of the University and its constituent units is exercised through clearly defined powers in the field of internal organization and governance, the development of educational, scientific and professional programmes, decision-making on scientific and professional projects and international cooperation, the management of financial resources within the framework of the programme contract, and responsibility towards the social community. As a constituent of the University of Rijeka without legal personality, the Faculty of Physics (FIZRI) exercises these forms of autonomy in accordance with the Act on Higher Education and Scientific Activity ([ZVOZD](#), Official Gazette 119/2022), the [Statute of the University of Rijeka](#) and the applicable university regulations. The Faculty's autonomy is reflected in independent decision-making and action within its prescribed powers, while simultaneously respecting the principle of functional integration at the University level. The following outlines how FIZRI exercises autonomy in individual areas of activity.

The Faculty's internal organization, job classification, and the responsibilities of organizational units and posts are regulated by the [Regulations on the Internal Organization and Job Classification of FIZRI](#). The Faculty has an expert council, whose name, method of appointment, scope of work and powers are determined by the Statute of the University of Rijeka, while the manner of work, decision-making and procedures of the Faculty Council are regulated by the [Rules of Procedure of the FIZRI Faculty Council](#). In accordance with the FIZRI Regulations and relevant university acts, FIZRI proposes and elects the Dean and Vice-Dean and conducts the procedures for the election and re-election of teachers to scientific-teaching and teaching positions. The method of appointing the Dean, the conditions, mandate, rights, duties and other matters are laid down in the [FIZRI Regulations](#) and the [University Statute](#). For planned human resources management, the Faculty prepares each year, and the [Faculty](#)

[Council](#) and the University Senate adopt, a Staff Employment and Promotion Plan. Procedures for calls, appointments and reappointments to scientific-teaching and teaching positions are carried out in accordance with the FIZRI Strategy. The conditions and procedures for appointments, reappointments, the conclusion of employment contracts, and other related matters are prescribed by law, the Statute of the University of Rijeka, and other general acts. The procedure is described in the [Protocol for Election/Re-election at the Faculty of Physics, University of Rijeka](#), and the relevant regulations and forms can be found among the regulations and decisions on the FIZRI website (see the section [Regulations and Decisions for Election to Scientific-Teaching and Teaching Positions](#)).

FIZRI has autonomy in designing university undergraduate, graduate and postgraduate [study programmes](#) in line with the needs of the profession, the labour market and educational policies. FIZRI participates in the development of educational, scientific and professional programmes by initiating amendments to and improvements of study programmes and by developing scientific research activity in the field of physics and interdisciplinary fields. The rules of study, the types and levels of studies, the organization and delivery of study programmes, and the rights and obligations of students at all constituent units of the University of Rijeka, including FIZRI, are regulated by the [Regulations on Studies and Studying](#) at the University of Rijeka, which are applied at the Faculty in accordance with the applicable university and legal framework. The [Faculty Council](#) adopts decisions on amendments to the admission criteria for the Faculty's study programmes. The decisions of the Faculty Council are considered and adopted by the Expert Council of the Centre for Studies, after which the Senate of the University of Rijeka adopts the final decision on admission requirements, thereby ensuring that the Faculty's study policies are aligned with the University's development guidelines. Admissions to the first year of undergraduate and graduate study programmes are conducted each year based on the Call for Applications for Enrolment in the first year of university undergraduate, integrated undergraduate and graduate, and professional undergraduate study programmes of the University of Rijeka and its constituent units. Applications for enrolment in the first year of FIZRI undergraduate and graduate study programmes are submitted through the National Information System for Applications to Higher Education Institutions (NISpVU) and the National Information System for Applications to Graduate Studies (NISpDS). Details of the admission procedure, decisions related to admissions and the required documents are published in due time on the [Admissions](#) website, both for enrolment in the first year and for enrolment in higher years of study. The Faculty independently applies for and implements scientific, professional and development [projects](#) and engages in [international cooperation](#), including the [mobility](#) of students and staff and partnerships with foreign institutions and organizations.

In the area of managing financial and other resources, in accordance with Articles 93 and 94 of the Statute of the University of Rijeka, FIZRI is financed from the University budget. The Faculty manages financial and other resources within the framework of the University's financial autonomy and the programme contract concluded at the University level with the Ministry of Science, Education and Youth. All operations are carried out in accordance with the principle of public accountability and applicable regulations. Additional sources of funding (projects, professional services, tuition fees) are used to support scientific infrastructure and teaching. The Faculty's financial operations are conducted through special sub-accounts for projects and external funding sources, thereby ensuring that funds are used for their intended purpose. Accounting services for the Faculty are provided by the [UNIRI Department of Finance and Accounting](#), while employees are, where necessary, given access to information on

available funds in projects and other funding sources. All major financial decisions are made at meetings of the Faculty Council or in cooperation with project leaders, thereby ensuring transparent and responsible management of the Faculty's resources.

FIZRI fulfils its responsibility towards the social community through transparent work and active social engagement. Recognition and visibility in scientific research and teaching in higher education, together with a contribution to the knowledge society, are the vision of FIZRI as part of the European Higher Education and Research Area. The Faculty upholds the principles of public accountability by ensuring the openness of the work of its bodies and by regularly reporting on teaching, scientific and financial activities. The Faculty's social role is particularly reflected in the popularization of science, which brings physics closer to the wider community, and in cooperation with business entities and educational institutions, through which FIZRI actively contributes to the transfer of knowledge and technology to all members of the local and wider community. In its work, the Faculty consistently promotes the principles of scientific integrity, professional ethics, academic freedom and critical thinking, while remaining fully open to scientific, educational and social changes.

Other forms of autonomy are exercised in accordance with the Act, the University Statute and the general acts of the University.

1.2.3. The higher education institution, using a quality assurance system and available information systems, collects, processes, analyses the data and generates reports using various methods. Based on the results of the analyses, further actions and improvements are planned using an approach based on risk and opportunities. The management and the competent authorities make informed decisions. Students and other stakeholders are involved in these processes.

FIZRI systematically collects, processes, and analyses data on all key aspects of its operations using the OOUK system and available information systems (ISVU, NISpVU, ISPiK, CroRIS, Dabar, Merlin, CROLIST, Turnitin, e-HR, SharePoint/UNIRI portfolio, COP, Libusoft, Ensolva, Faros), with the aim of monitoring trends, preparing reports, planning further activities, and making informed decisions. Data are collected on students and their progress, study programs, teaching delivery, pass rates and completion rates, scientific activity, employability of graduates, student and other stakeholder satisfaction, and the implementation of the Faculty's and University's strategic goals.

Analyses of the collected data are carried out within OOUK, the Faculty Management, and the Faculty Council, using data from national and university information systems as well as the results of various surveys and evaluations. Based on these analyses, regular annual and thematic reports are prepared, including [OOUK reports](#), reports on study success (see Annex 3, Table 3.4, completion rate in the study programme, [see Minutes of the 18th Thematic Session of the Council, November 22, 2023](#) and [Annexes 3-6 to the minutes](#)), reports on analyses of student evaluations of teachers' work (see [Minutes of the OOUK session of March 2, 2023, Item 6](#), [Minutes of the OOUK session of March 25, 2024, Item 7](#), [Minutes of the OOUK session of March 21, 2025, Item 5](#) and [Minutes of the OOUK session of February 19, 2026, Item 4](#)), reports on implemented lifelong learning programs (see Chapter 2.4., subchapter 2.4.4.), graduate satisfaction reports (see [2020./2021.](#), [2021./2022.](#), [2022./2023.](#), [2023./2024.](#), and [2024./2025.](#) academic year and OOUK reports ([OOUK Report 2020/2021, p. 3](#); [OOUK Report 2021/2022, p. 2](#); [OOUK Report 2022/2023, p. 1](#), [OOUK Report 2024, p. 2](#), [OOUK Report 2025, p. 2](#)), teacher and non-teaching staff satisfaction reports (see [Minutes of](#)

[the OOUK session of January 21, 2020, Item 4](#), [Minutes of the OOUK session of March 25, 2020, Item 3](#), [Survey of non-teaching staff satisfaction at UNIRI 2022](#), [Minutes of the OOUK session of March 25, 2024, Item 4](#), and [Institutional survey of employee satisfaction at the University of Rijeka - preliminary results](#)), reports on employability of graduates (see [Minutes of the thematic session of the Council, November 22, 2023](#)) and alumni career paths (see Chapter 1.3.1.), reports on the [implementation of the Faculty Development Strategy and Action Plans](#), report on the [results of the internal review of the quality assurance system](#), [reports of the Expert Committee on the reaccreditation of FIZRI](#) and financial performance reports ([financial reports](#)).

The results of the analyses are used as a basis for planning further activities and improvements, applying an approach based on identifying risks and opportunities. This approach is formalised through the Faculty's strategic documents, which include a SWOT analysis, clearly defined strategic goals, operational plans, performance indicators, responsible persons or bodies, and monitoring and reporting mechanisms. For example, in July 2018 the Department of Physics (now FIZRI) adopted the [Development Strategy for the period 2018 to 2020](#), identifying strengths, weaknesses, opportunities, and threats (SWOT) and, on that basis, defined strategic goals in five areas: scientific research, education, public engagement, organisation, and regulation of financial operations. Strategic planning continued with the adoption of the [FIZRI Development Strategy for the period 2021-2025](#), which builds on the previous period. In the current Strategy, strategic goals are defined with a focus on improving learning and teaching, developing and strengthening research activity, knowledge transfer, and regional engagement and internationalisation. The operational plan for implementing these activities, with defined persons or bodies responsible for implementation and indicators of implementation (as mechanisms for monitoring and reporting on the implementation of activities), is contained in the [Action Plan 2021-2026](#). Implementation of the Strategy is systematically monitored through regular [reports and analyses](#) within the quality assurance system, and the monitoring results are used to update action plans and further improve the Faculty's work, as confirmed in the internal review of the FIZRI quality assurance system by the University of Rijeka in [2024](#).

Based on the prepared reports, the Faculty Management and the competent bodies make informed strategic and operational decisions, for example on [changes to and improvement of study programmes](#), the application of teaching methods, the organisation of studies, student support systems, and the Faculty's development priorities (see [Decision on compensation for student demonstrators](#), [Decision on the amount of the minimum compensation for student work](#), [Decision on the appointment of student demonstrators](#)). An example of such a developmental and organisational decision is the establishment of the [Chair of Environmental Sciences](#) in 2024, in response to the intensification of scientific, professional, and teaching activities related to environmental research.

Students and other stakeholders are actively involved in these processes. Students participate directly through regular surveys and other forms of collecting feedback, as well as indirectly through their representatives in the [Faculty Council](#), in which they make up 10 % of the Council members, and in [OOUK](#) (one representative). The work of OOUK also includes a representative of external stakeholders, ensuring that the perspective of the broader academic and social community is considered. The involvement of external stakeholders and alumni is further ensured through the [Alumni Club of FIZRI](#), which maintains regular communication with former students through a newsletter service and collects data on their employability and professional careers. The Club's activities are regulated by the [Alumni Club](#)

[Rulebook](#). Data on the employment and career paths of alumni are also monitored at the UNIRI level through the [Alumni UNIRI network](#) and the [Career Office of the University Counseling Centre](#). The results of this monitoring, along with data obtained through direct contact with alumni, are used as a basis for assessing the relevance of study programs and their further improvement. In addition, within the [FizKO](#) project, employer surveys were conducted with the aim of developing occupational standards and qualification standards for the profiles educated by FIZRI (see surveys conducted with employers: [Physics Engineer Surveys](#), [Environmental Surveys](#)). Analyses of employability and labour market needs, as well as the results of employer surveys, were considered at thematic sessions of the Faculty Council (see [Minutes of the thematic session of the Council, November 22, 2023](#)) and are used as the basis for planning revisions and adjustments to study programmes. Alumni also actively participate in increasing the Faculty's visibility (see [Example of communication with alumni](#)). In this way, feedback from students, alumni and external stakeholders is systematically integrated into the processes of assuring and improving the quality of the Faculty's educational, scientific, and management activities.

1.2.4. *The higher education institution regularly and transparently informs stakeholders on strategy implementation, operations, and implementation of programme agreements, where applicable.*

[Development Strategy of the Faculty of Physics for the Period 2021–2025](#) is aligned in terms of timeframe and indicators with the Strategy of the University of Rijeka and was adopted by the [Senate of the University of Rijeka](#) (UNIRI). The achievement of strategic goals is monitored annually through the indicators of the UNIRI Strategy. Each year, the Faculty Administration reports to the Faculty Council on the achievement of the qualitative and quantitative goals of the University Strategy (see [Strategy Implementation Report – Qualitative 2024](#), [Strategy Implementation Report – Quantitative 2024](#), [FIZRI Decision on the Adoption of the Qualitative Report 2024](#), [FIZRI Decision on the Adoption of the Quantitative Report 2024](#), [Strategy Implementation Report – Qualitative 2025](#), [Strategy Implementation Report – Quantitative 2025](#), [FIZRI Decision on the Adoption of the Qualitative Report 2025](#), and [FIZRI Decision on the Adoption of the Quantitative Report 2025](#)).

Reports on the implementation of the UNIRI Strategy, which include reports on the implementation and achievement of FIZRI's qualitative strategic goals, for all years from 2016 to 2025 are publicly available on the [UNIRI website](#), within the sections "Report on the Implementation of the Strategy of the University of Rijeka (2016–2020)" and "Report on the Implementation of the Strategy of the University of Rijeka (2021–2025)". Based on the results presented in the annual reports, an Action Plan is prepared and adopted, and at the end of the year a report on its implementation is submitted. [Faculty Action Plans](#) for all years from 2015 to the present are available on the FIZRI website (see the Quality Assurance website, subpage Reaccreditations and Internal Evaluations), thereby ensuring transparency in monitoring and reporting on the implementation of strategic goals.

The annual report on the Faculty's work is submitted once a year by the Dean of FIZRI to the Faculty Council at the ceremonial session held on Faculty Day, while monthly work reports are submitted at regular sessions of the Faculty Council. At the ceremonial session of the Faculty Council, the annual report on student activities is also submitted by the President of the FIZRI Student Union, thereby systematically informing the Faculty Council about the work and activities of the FIZRI Student Union in the previous academic year, that is, in the

period since the previous ceremonial session (see [Minutes of the Ceremonial Session of the Faculty Council 2024](#), [Minutes of the Ceremonial Session of the Faculty Council 2025](#)). Since 2018, OOUK has submitted [annual reports on the work of OOUK](#) to the FIZRI Council and the UNIRI Quality Committee.

FIZRI manages financial resources transparently through clearly defined procedures for planning, monitoring and reporting. The Faculty Administration submits [annual financial reports](#) to the Faculty Council, with a detailed presentation and explanations of the structure of income and expenditure. The Faculty Council adopts the financial plans and financial reports, after which they are adopted by the University Senate. The FIZRI income and expenditure financial plans for 2021–2025, showing funding sources and the structure of expenditure by purpose, the amendments and supplements to the financial plans for 2021–2025, the reports on the implementation of the FIZRI income and expenditure financial plan for 2021–2025, as well as all related decisions on the adoption of these documents by the Faculty Council, are available at the link [Financial Documents of the Faculty of Physics 2021–2025](#).

The financial plans and financial reports of the University of Rijeka, which also include the financial operations of FIZRI as a faculty without legal personality, are publicly published every year on the [University website](#), thereby ensuring full transparency of financing.

1.2.5. The higher education institution manages its financial resources transparently, efficiently, purposefully, and sustainably.

FIZRI's financial management is based on the principles of transparency, rationality and long-term sustainability and is aimed at ensuring stable conditions for the implementation of the Faculty's scientific, teaching and public activities. Financial sustainability and efficiency are visible in all aspects of the Faculty's work, and a strategic approach to financial management has been systematically developed since 2014, when the Faculty (then the Department) implemented the UNIRI Strategy for the period 2014–2020, while it first adopted its own Development Strategy for the period 2018–2020. The Development Strategy of FIZRI for 2018–2020 analysed the Faculty's financial situation in detail and defined concrete measures for stabilizing and improving financial operations. The implementation of those measures resulted in positive annual operations and eliminated the accumulated debt from previous years, thereby ensuring the Faculty's full financial consolidation for the first time. The achieved results formed the basis for further sustainable financial management and development of the Faculty in the following period. The [FIZRI Development Strategy for the Period 2021–2025](#), aligned in terms of timeframe and indicators with the [UNIRI Strategy](#), further elaborates the goals and measures for preserving financial stability and for the continued sustainable management of financial resources, with clearly defined activities and implementation indicators in accordance with the FIZRI quality assurance policy.

In accordance with the defined strategic goals, the Faculty implements a series of concrete measures aimed at rationalizing costs and strengthening external funding sources, thereby ensuring long-term financial stability and business sustainability. Measures contributing to financial stability and sustainability include rationalizing space by assigning unused rooms to other University constituent units and establishing shared laboratories with NANORI, which has reduced overhead costs while keeping the total floor area available to the Faculty almost unchanged. At the same time, activities related to external funding sources that significantly contribute to financial sustainability have been intensified. The submission

and implementation of scientific and development projects are encouraged, and most employees participate in University projects financed through programme contracts and other sources. Since 2023, two Croatian Science Foundation projects have been obtained ([ASTRO-GAMMA](#) – EUR 194,844.69 and [MIMIQ.ME](#) – EUR 199,760.00 EUR), one project from the National Recovery and Resilience Plan ([POMERI](#) – EUR 742,822.70), one Interreg project ([BLUE RECHARGE](#) – EUR 257,810.00), while FIZRI employees participate in three COST projects ([BridgeQG](#), [QG-MM](#), and [COSMIC WISPerS](#)). One employee is a collaborator on the HRZZ project ([C-TRACK](#)). Within the call [UNIRI Experienced Researchers Projects 2023](#), the Faculty's researchers obtained 12 projects, securing funds in the amount of EUR 79,666.37. In 2025, two UNIRI projects for materially demanding research were approved (EUR 131,478.73), seven UNIRI projects for experienced researchers (EUR 295,361.14), and one UNIRI project for early-career researchers and returning researchers (EUR 27,756.43). These are [institutional research projects](#) financed from source 581 – the Recovery and Resilience Mechanism, linked to the programme contract concluded in 2025 by UNIRI and the Ministry of Science, Education and Youth. The Faculty's success in obtaining project funds is directly related to the continuous encouragement of scientific excellence, especially through publishing papers in top scientific journals and the Faculty's high ranking in UNIRI scientific performance tables, which is also reflected in stable programme-contract revenue. In addition, laboratory heads secured funds for the maintenance and upgrading of research equipment in FIZRI laboratories through calls for the (co-)financing of repairs and maintenance of research equipment at UNIRI in 2022, 2023 and 2024, and through the Ministry of Science and Education call for financing the repair, maintenance and upgrading of equipment for scientific research in 2022 ([MSE Decision – FIZRI funded equipment, items 8 and 9](#)) entered in the Šestar database. Analytical services and contracted projects with external partners also represent an important source of the Faculty's own income. The funds secured through the above projects and calls make it possible to maintain existing and acquire new scientific equipment, cover the costs of research, training, open access and the dissemination of results, employ doctoral students and postdoctoral researchers, provide administrative support for project management, and ensure the basic operating costs of the Faculty.

Furthermore, the system for delivering teaching at other constituent units of the University has been strategically organized, with the amounts and methods of payment for teaching activities defined by contract, and the number of external associates engaged in teaching has also been reduced by having FIZRI teachers take over part of these teaching activities. A strategic objective related to financial operations is also to increase the number of physics students. Although this objective has not been achieved to the desired extent at the undergraduate and graduate levels, by establishing the doctoral study programme in Physics, FIZRI generates a significant financial income through tuition fees (over eight years of operation, the doctoral programme has enrolled a total of 42 candidates). Despite the small number of students and the financial challenges of the last five years, FIZRI's financial position has improved, and the Faculty seeks to procure or renew teaching equipment for practical classes and laboratory teaching in line with its financial possibilities. Over the last three years, investment in teaching equipment has increased several times over (see [procurement of teaching equipment 2018–2025](#)). Funds are also being invested from the EU project "Development of Physics Studies through the Application of the Croatian Qualifications Framework – FizKO" (Principal Investigator: M. Petravić, University of Rijeka, Department of Physics), 2019–2022.

Additional funding sources are used purposefully and exclusively for the development and improvement of the Faculty's scientific and teaching activities, including the maintenance and modernization of equipment, the implementation of research, fieldwork, participation in scientific conferences, and the professional development of staff. As part of the purposeful management of financial resources, the Faculty also allocates part of its own and project funds to support student mobility and international exposure, including students' participation in international exchange programmes (e.g. Erasmus+ and YUFE) and the financing of professional study visits to relevant scientific institutions. In February 2024, a four-day visit of nine graduate students and one teacher to CERN was carried out, with FIZRI covering the accommodation costs. Cooperation with the economy, the local community and other external partners, as well as participation in domestic and international projects, represent an important element of the Faculty's financial stability and long-term development.

FIZRI manages financial resources transparently and purposefully through clearly defined procedures for planning, monitoring and reporting. The Faculty Administration submits annual financial reports to the Faculty Council, with a detailed presentation and explanations of the structure of income and expenditure. Programme contracting in 2025 was carried out transparently through multi-month continuous consultations on the proposed models with the University administration and by Senate decisions. During the preparation of the programme contract, the FIZRI Administration explained the preparation process and the proposed financing models at all Faculty Council sessions, and on 29 September 2025 the Faculty Council adopted the proposal for FIZRI programme financing for 2025–2029 within the programme contract of the University of Rijeka ([Summary of the FIZRI Programme Financing Plan 2025–2029](#), [Decision on the Adoption of the FIZRI Programme Financing Plan 2025–2029](#)).

In accounting terms, separate sub-accounts are maintained for each employee, recording project funds and funds from external sources, which may be spent only for their intended purpose. FIZRI accounting is handled by the [UNIRI Department of Finance and Accounting](#). Each employee is informed, where necessary or upon request, of the funds available. All major financial decisions are approved at Council sessions or in agreement with project leaders. The five-year income and expenditure financial plans showing the sources of funding and the structure of expenditure by purpose, the reports on amendments and supplements to the financial plans, the implementation of the income and expenditure financial plan for the same period, and the decisions of the Faculty Council on adopting the plans and accepting the reports are available at the links [Financial Documents of the Faculty of Physics 2021–2025](#) and [Report on the Operations of the Faculty of Physics 2021–2025](#).

The financial plans and financial reports of the University of Rijeka, which also include the financial operations of FIZRI, are published every year on the [University website](#), thereby ensuring full transparency of financing.

In the period 2021–2025, the internal audit did not carry out an audit of any process involving FIZRI. According to data from the Office for the Internal Audit of UNIRI constituent units, the University's internal audit covers faculties without legal personality and operates according to a work plan. FIZRI was not scheduled for audit in the period 2021–2025. In addition, there was no State Audit in the specified period.

1.3. The higher education institution collects, analyses and uses data relevant for the effective management of all activities, and publishes the information about its work.

1.3.1. Using a quality assurance system and available information systems, the higher education institution collects data (on employees, students, programmes, etc.) using various methods, analyses them and uses relevant information to monitor trends, report on its activities, plan its follow-up activities and make informed decisions. Students and other stakeholders are involved in these processes.

Within its quality assurance system, the Faculty systematically collects, analyses, and uses data on employees, students, study programmes, and other aspects of its work to monitor trends, report on activities, plan further development, and make evidence-based decisions. Data are collected and processed using the following information systems and records:

- Information System of Higher Education Institutions of the Republic of Croatia (ISVU) – the core system for maintaining data on study programmes, students, courses, examinations, grades, ECTS credits, pass rates, student surveys, and part of the data on teaching staff (Studomat, Teaching Staff Portal, Studies and Students, Examinations, Human Resources, Data Warehouse, etc.);
- University of Rijeka Information System, ISVURI – an upgrade to ISVU used by the constituent units of the University of Rijeka (ISVU-RI includes a module for entering percentage grades, a module for graduation completion, and a graduation ceremony module);
- National Information System for Applications to Higher Education Institutions (NISpVU), the Postani student portal – data on applicants, applications, secondary-school grades, and success in the state matura examination;
- ISPiK – Information System of Indicators and Quality in Science and Higher Education – a new system used in the third re-accreditation cycle, integrating data from ISVU, CroRIS, and the Register of Study Programmes;
- University of Rijeka systems (UNIRI portfolio and SharePoint portal) – information on employees, working bodies, documents, decisions, calls, and reports;
- Merlin – the e-learning system;
- Faculty website – publicly available information on studies, admissions, teaching and scientific activities, and the work of the Faculty;
- CroRIS (Croatian Research Information System) – records of researchers, scientific productivity, projects, and research equipment (including migrated data from CROSB, Šestar, and other earlier databases);
- DABAR – the national digital repository of undergraduate, graduate, and doctoral theses;
- CROLIST – the library management system;
- Turnitin – the system for checking the originality of student papers at all levels of study;
- COP – the system for the central calculation of salaries and compensation;
- Libusoft – the system for financial operations and the issuance of e-invoices;
- Ensolva – the system for conducting public procurement procedures;

- e-HR – the University of Rijeka system for keeping electronic personnel records of employees (personal and business data, annual leave, travel orders, and personal requests);
- Faros – the office administration system (electronic registry office).

Faculty and University strategies and financial reports define the key performance indicators. The report on the implementation of the Strategy includes monitoring of performance indicators in line with the indicators of the University of Rijeka Strategy. Financial reports are adopted at meetings of the Faculty Council (reports on the implementation of FIZRI's financial plans for 2021–2025 and all accompanying decisions on the adoption of these documents by the Faculty Council are available at the link [Financial documents of the Faculty of Physics 2021–2025](#) and [reports of the Faculty Quality Assurance Committee](#)). FIZRI collects and processes data in accordance with the University Strategy and the Faculty Strategy. The collected data are used to prepare annual analyses, evaluate the effectiveness of implemented activities, and support decision-making. In making management decisions at FIZRI, use is also made of data collected and analysed by the Committee for Quality Assurance and Improvement. The Centre for Quality Assurance and Enhancement of the University of Rijeka systematically conducts graduate satisfaction analyses, and these were also carried out for the Department of Physics, that is, the Faculty of Physics, for the academic years [2020/2021](#), [2021/2022](#), [2022/2023](#), [2023./2024.](#), and [2024./2025](#). From the FIZRI OOUK reports ([QA Committee Report 2020/2021, p. 3](#); [QA Committee Report 2021/2022, p. 2](#); [QA Committee Report 2022/2023, p. 1](#); [QA Committee Report 2024, p. 2](#); [QA Committee Report 2025](#)), it is evident that analyses of the results submitted by the University, as well as of raw data and student comments, are carried out every year.

Monitoring students' career paths

[Alumni Club of the Faculty of Physics](#) maintains contacts and sends notifications via the newsletter service. The database contains around 180 recipients, mostly alumni students and a smaller number of guests interested in the work of the Alumni Club. Monitoring the employability and careers of our alumni, as well as of all University alumni, is carried out by the University of Rijeka's Alumni UNIRI network through the Careers Office of the University Counselling Centre. We also obtain a large amount of information about our students through private contacts. FIZRI collects the contact details of its alumni after they complete their studies and involves them in activities to increase FIZRI's visibility (see [example of communication with alumni](#)). We estimate that 20% of our students continue their education in graduate and doctoral programmes abroad, which makes tracking their careers more difficult. The [Alumni Club of the Faculty of Physics](#) sends notifications about [new job openings](#) roughly once every two to three months via its newsletter service. These are mostly vacancies for work in schools, and less often for work on projects or doctoral scholarships at other institutions.

As part of the FizKO project, employers were surveyed with the aim of developing occupational standards and qualification standards for the profiles educated by FIZRI (see employer surveys: [Physics Engineer Surveys](#), [Environment Surveys](#)).

Data on student employability are collected and analysed, and the results of these analyses are used as a basis for planning revisions of study programmes ([Minutes of the thematic session of the Council, 22 November 2023](#)).

Collecting data from students

At the beginning of the 2023/2024 academic year, surveys were conducted among FIZRI students, and their results are used for strategic management, amendments to study programmes, and the improvement of teaching methods.

- A survey was conducted among students who enrolled in the first year of the undergraduate Physics programme in the 2023/2024 academic year in order to collect information on when and why they decided to study physics, why they chose to study physics in Rijeka, how they learned about FIZRI, and whether they are particularly interested in a specific field of physics.
- All FIZRI students were asked to complete a survey designed to examine whether they would enrol in the graduate Physics programme if it were accredited and delivered entirely in English. The survey was completed by 27% of enrolled students, around two thirds of whom stated that they would enrol in such a programme.

The survey results were presented at a thematic meeting of the Faculty Council ([Minutes of the thematic session of the Council, 22 November 2023](#)).

Following the recommendation of the 2019 internal review to further encourage technical staff at FIZRI to be informed about the importance of promoting a quality culture, FIZRI introduced the rule that a representative of the technical staff is appointed as a member of the Quality Assurance and Improvement Committee.

Examples of good practice:

- Direct surveying of students
- A representative of the technical staff is a member of the Quality Assurance and Enhancement Committee
- FIZRI collects contact details of its alumni ([Alumni database](#))

Strengths:

- New website
- Notifications about new job openings through the Alumni Club

Involvement of students and other stakeholders:

The Faculty's Quality Assurance and Improvement Committee is [structured](#) to ensure the representation of all relevant stakeholder groups. The Committee includes representatives of the Faculty Administration (as a rule, the Dean), teachers employed in scientific-teaching positions, associate staff, students, professional service staff, external stakeholders, and alumni (where the external stakeholder is not also an alumnus/alumna). Students and other stakeholders are actively involved in the processes of collecting, analysing, and using data, as well as in decision-making related to the enhancement of the quality of study programmes, the teaching process, and the Faculty's strategic development. Students also participate in the work of the Faculty Council through their representatives, thereby

actively contributing to discussions and decision-making on matters relevant to studying and the quality of teaching.

1.3.2. *The higher education institution uses information systems to monitor indicators on compliance with the legal requirements for the pursuit of higher education and scientific or artistic activities, where applicable.*

FIZRI uses national and university information systems to systematically monitor indicators relevant to fulfilling the legal requirements for carrying out higher education and scientific activities, in accordance with the applicable regulations of the Republic of Croatia and the internal acts of the University. The basic system for monitoring teaching activities and student indicators is the [ISVU](#) (Information System of Higher Education Institutions of the Republic of Croatia), through which data on study programmes, courses, students, enrolments, examinations, grades, ECTS credits, pass rates, teachers' workload, and the results of student surveys are recorded and analysed. The system includes the modules Studomat, Teaching Staff Portal, Studies and Students, Examinations, Human Resources, and Data Warehouse, thus ensuring a comprehensive overview of the implementation of the teaching process. FIZRI regularly monitors students' progress through their studies by analysing data from ISVU, including pass rates, study dynamics, and completion rates, and the resulting data are used to prepare periodic analyses and adopt measures to improve the quality of studying. The ISVU system has been upgraded by the [ISVU-RI](#) system, which is used at all UNIRI constituent units, including FIZRI, to enter and monitor the percentage points achieved by students in individual examination periods; it is also an integral part of the broader University information framework through which digital enrolment in the new academic year is carried out, as well as the issuance of digital diplomas and the preparation of printed diplomas and diploma supplements. Diplomas and diploma supplements are prepared by the Student Office in the ISVU-RI system, in accordance with regulations adopted at the University level. Applications for enrolment in the first year of undergraduate and graduate programmes are submitted through the National Information System for Applications to Higher Education Institutions ([NISpVU](#)) and the National Information System for Applications to Graduate Programmes ([NISpVU2](#)), through which data on applicants, prior educational achievement, and interest in study programmes are monitored, enabling the planning of enrolment quotas and the analysis of trends.

Until now, the MOZVAG information system has been used for the evaluation of study programmes, where the links between study-programme learning outcomes and individual courses were established and documented. These links were recorded in MOZVAG as a mandatory part of the Self-Analysis in the external evaluation procedure conducted at FIZRI in 2021, ensuring transparent and systematic verification of the alignment of study programmes with legal requirements and quality standards. As part of the external evaluation procedure and the preparation of the FIZRI Self-Analysis in 2021, the Faculty prepared an [Analytical Annex to the Self-Analysis](#), including Annex I – Evidence of Fulfilment of Quantitative Legal Requirements, in accordance with the guidelines of the Agency for Science and Higher Education (see [Analysis of Study Delivery Conditions 1](#), [Analysis of Study Delivery Conditions 2](#), [Analysis of Study Delivery Conditions 3](#)). Annex I includes tables related to the teaching process and student support (showing interest in the programmes and the structure of enrolled students, pass rates and completion rates in the study programmes, mobility, and the employment of graduates), teaching and institutional capacities (staff structure,

recruitment dynamics, a list of teachers in the study programmes with the number of publications, citations and projects, mobility of teaching and non-teaching staff, facilities, capital equipment, library resources, and financial evaluation), scientific and professional activity (bibliography, projects, organisation of conferences, editorial work in journals), the teacher-student ratio, contact teaching load, spatial capacities and equipment, and the number of teachers by scientific fields. In line with changes in the external evaluation system, the MOZVAG system was discontinued on 1 February 2025, and in the third re-accreditation cycle a new Information System of Quality Indicators ([ISPiK](#)) was introduced, which is also used in this self-evaluation procedure. ISPiK integrates data from national information systems, including ISVU, CroRIS, and the [Register of Study Programmes](#)), thereby ensuring a comprehensive, up-to-date, and comparable overview of indicators relevant to compliance with legal requirements and quality standards. The Register of Study Programmes, maintained by the [Ministry of Science, Education and Youth](#)), is the official register of all accredited study programmes in the Republic of Croatia. FIZRI study programmes are [recorded in the Register](#)), and data from the Register are used as one of the reference sources in the ISPiK system in procedures of external evaluation and monitoring of the lawful implementation of study programmes. At the Faculty, a professional adviser is continuously responsible for administering the teaching process and working in the relevant information systems (ISVU, ISPiK), thereby ensuring the accuracy, timeliness, and reliability of data.

Monitoring of scientific activity is carried out through [CroRIS](#), the Croatian Research Information System, which consolidates data on researchers, publications, projects, and research infrastructure, thus enabling the systematic monitoring of scientific productivity and fulfilment of the requirements for carrying out scientific activity. Undergraduate and graduate theses are stored in the digital repository [DABAR](#), while the [Turnitin](#) system is used to check the originality of student papers. Data from these information systems are also used in internal quality assurance procedures, including systematic analyses of student survey results and other indicators, which are discussed by the competent Faculty bodies, and the conclusions are used to improve teaching and scientific work. Through the integrated use of national and university information systems, FIZRI ensures transparent, reliable, and continuous monitoring of all key indicators required to meet the legal requirements for carrying out higher education and scientific activity.

1.3.3. The higher education institution has a strategy for the digital transformation of education that is integrated into the overall strategies for institutional development and quality enhancement.

FIZRI does not have a separate, independent strategy for digital transformation, but digital transformation is an integral part of the UNIRI strategic framework and is implemented at the constituent-unit level through concrete initiatives, governance, and the development of digital systems and processes. The key strategic document at the University level is the [UNIRI Development Strategy 2021–2025](#), which integrates digitalisation and information-technology development within its key guidelines for improving teaching, scientific, and administrative processes and for institutional development. Digital transformation is embedded in the Strategy through priorities related to the modernisation of learning and teaching systems, the development of digital competences, and the use of contemporary digital tools to support teaching and scientific work, including cooperation with global

platforms for online learning and digital services as part of the University's strategic partnership.

Within the implementation of these strategic guidelines, FIZRI devotes particular attention to the use of innovative and advanced technologies and methods to improve learning and teaching processes, with special emphasis on e-learning and digitally enhanced learning and teaching (DELT), in line with contemporary European Union aspirations operationalised through the [Digital Education Action Plan](#). In addition, the development of e-learning is particularly encouraged through the Framework for the Development and Evaluation of E-Learning Quality, adopted and intensively applied at the University level since 2020. The purpose of the Framework is to enable self-evaluation of e-courses to improve learning and teaching processes, assess the quality of the teaching process, assess the quality of course delivery in the context of e-learning, and assess the quality of teaching activity (see [Self-evaluation of e-courses 2023-2024](#)). As part of strengthening digital competences and support for digitally enhanced learning and teaching, UNIRI established a strategic partnership with the [Coursera platform](#) in 2021 through the [Coursera for Campus](#) programme, giving students, teachers, and non-teaching staff free access to a large number of online courses, specialisations, and professional certificates from leading world universities and industry partners, with the aim of developing digital, interdisciplinary, and professional competences and encouraging lifelong learning.

FIZRI also actively participates in the process of enhancing e-learning through the participation of its representative (who has also served as Chair since 2022) in the UNIRI Committee for Online Learning, as well as through active participation and professional development at the Days of E-Learning (see [Days of e-Learning 2025](#) and [Days of e-learning 2026](#)), which the Committee organises regularly and in which Faculty teachers [regularly participate actively](#). Through the development of e-learning, FIZRI also encourages stronger international integration and the internationalisation of the institution and its study programmes, especially through inclusion in the University's YUFE (Young Universities for the Future of Europe) network ([example of a course included in the YUFE network](#)), while promoting student mobility and greater opportunities for the professional and scientific development of students and teachers through the online delivery of courses within the network.

1.3.4. The higher education institution keeps electronic records and ensures access to and exchange of data in accordance with the national legislative framework.

FIZRI keeps all key records related to its teaching, scientific, staffing, and administrative activities electronically, in accordance with the applicable national legislative framework and the internal acts of the University of Rijeka. Records on students, study programmes, courses, enrolments, examinations, grades, ECTS credits, pass rates, and student evaluations are kept through the [ISVU](#) system. The system enables structured and centralised data management, as well as different levels of access for students, teachers, administrative staff, and the Faculty Administration through the relevant user modules (Studomat, Teaching Staff Portal, Studies and Students, Examinations, Human Resources, Data Warehouse). Data on applicants and enrolments in study programmes are maintained through the NISpVU system, that is, through the relevant national systems for applications to graduate programmes, thus ensuring transparency and consistency of enrolment procedures at the national level. Records on employees, their employment status, and related administrative procedures are kept electronically through the University's [e-HR](#) system, while financial records, payroll

calculation, public procurement, and office administration are managed through the University's central information systems (COP, Libusoft, Ensolva, Faros). The Faculty's scientific activity is recorded in the Croatian Research Information System ([CroRIS](#)), which consolidates data on researchers, publications, projects, research equipment, and events. Students' undergraduate, graduate, and doctoral theses are stored in the national digital repository [DABAR](#), while library operations are managed through the CROLIST system. The [Merlin e-learning system](#) is used for the electronic monitoring of teaching activities, the distribution of teaching materials, and communication with students, while [Turnitin](#) is used to check the originality of student papers. Access to data in all the above systems is regulated by clearly defined user authorisations and access levels, in accordance with personal data protection regulations and the University's internal rules. Data exchange with external institutions (e.g. the competent ministries, the Agency for Science and Higher Education, and other bodies) is carried out through official national information systems and according to predefined protocols.

Most records on students, teachers, and other segments of the Faculty's work are kept electronically in interoperable information systems (ISVU, NISpVU, ISPiK, CroRIS, e-HR, etc.), in accordance with the [Regulations on the Content and Use of Information Systems in Higher Education](#), which prescribe the obligation to keep, store, and exchange data electronically in central records and the interoperability of information systems in higher education. The legal basis for the collection, processing, and exchange of data derives from the [Act on Higher Education and Scientific Activity](#), together with the obligation to protect personal data in accordance with the [General Data Protection Regulation](#) (GDPR) and the [Act on the Implementation of the General Data Protection Regulation](#). The right of access to information is exercised in accordance with the [Act on the Right of Access to Information](#), while data exchange with national bodies (for example, the Ministry of Science and Education, the Agency for Science and Higher Education, etc.) is carried out through official national information systems and established protocols.

1.3.5. The higher education institution has prescribed measures to use the information systems and ensure information security, and implements them consistently.

FIZRI, as a constituent unit of UNIRI, uses and consistently applies the prescribed measures for the use of information systems and for ensuring information security adopted at the University level. This ensures uniform, systematic, and effective management of information systems and the protection of data in accordance with the applicable legislative and institutional framework. The management of information-system security is regulated by the [Regulations on the Security of Information Systems of the University of Rijeka](#), which define acceptable ways of using information systems, access levels, user responsibilities, and the roles of the competent bodies and services in the field of information security. FIZRI applies these Regulations in its day-to-day work, particularly in the use of the University's central information systems.

In accordance with the Act on the Right of Access to Information (Official Gazette 25/13, 85/15), UNIRI, as a public authority body, provides access to information that it possesses, disposes of, or supervises. The principles of the right of access to information, exceptions to that right, and the procedures for exercising and protecting it are publicly available on the University's website, and links to this information are also highlighted on the FIZRI website ([Access to Information](#)). The protection of personal data of employees and other

data subjects is regulated by the General Data Protection Regulation (EU 2016/679) and the Act on the Implementation of the General Data Protection Regulation (Official Gazette 42/2018). At the institutional level, the implementation of these regulations is ensured, among other things, by the [Regulations on the Establishment of the Collection of Employees' Personal Data at the University of Rijeka](#), which define the purpose of processing, the types of personal data, protection measures, and the rights of data subjects. FIZRI applies these measures in all procedures involving the processing of personal data within its responsibilities. The application of personal-data protection principles is additionally visible through daily practice and related documentation, including forms of informed consent, statements on data confidentiality, and statements on ethical conduct signed by employees and associates working with data (see [Informed Consent](#); [Statement on Data Confidentiality](#); [Statement on Ethical Conduct](#); [Statement on Data Confidentiality Obligations](#)). These documents confirm that data subjects are informed about the processing of personal data, that the data are processed in accordance with the applicable regulations, and that employees are aware of their obligation to protect data confidentiality and to handle information responsibly.

1.3.6. Clear, accurate, objective, and valid information on study programmes and on the work of a higher education institution is publicly available and easily accessible, in Croatian and in one of the world's languages.

On the FIZRI website, information about undergraduate, graduate, and doctoral study programmes can be found in [Croatian](#) and [English](#). In 2025, a new FIZRI website was launched based on the main template ("shell") used for the new websites of UNIRI constituent units. The structure of the website consists of six thematic sections: [About the Faculty](#), [Studies](#), [Teaching](#), [Scientific and Professional Work](#), [Visibility](#), and [Contact](#), enabling users to navigate easily and quickly access relevant information. On the [homepage](#) in Croatian, current announcements are regularly published, including event announcements, job vacancies, notices of doctoral thesis defences, information on teaching, published scientific papers, and other announcements distributed by the University administration. The website also contains basic institutional data (location, contact details, OIB, IBAN), general information on [access to information](#) and [personal data protection](#), as well as an overview of [FIZRI's media presence](#). A special part of the homepage is devoted to links to key resources for students, such as the student administration system, library services, the Merlin e-learning portal, the Student Office, and other relevant university information systems and services (Turnitin, Dabar, ISVU, the University Counselling Centre, etc.). In addition to content intended for students, the website also provides links important for the Faculty's day-to-day functioning and for its staff, including the Teaching Staff Portal, internal collaboration tools such as the SharePoint portal, personnel records, the room reservation system, and national and institutional scientific databases (CroRIS).

The ["About the Faculty" section](#) provides a short description of the [history of FIZRI](#) and information about the [Administration](#), [internal organisation](#), [staff](#) and their [duties](#), members of the [Faculty Council](#), [Doctoral Studies Council](#), [Collegium](#), and [FIZRI Council](#), as well as links to important [documents and regulations](#). A dedicated subpage is devoted to [Quality Assurance](#), where information is available on policy, meetings, regulations, documents of the Quality Assurance and Enhancement Committee, and its members. The part of the website devoted to [studies](#), in addition to descriptions of study programmes and course syllabi, also contains the curriculum with a list of courses by study track, as well as information on [lifelong](#)

[learning programmes](#) organised and delivered by FIZRI. Within the “[Teaching](#)” category, information is available on [admissions](#) and the documentation required for enrolment in the first and higher years of study, information related to teaching ([academic calendar](#), [timetable](#), [course delivery plans](#), [undergraduate and graduate theses](#)), and a dedicated section on [mobility](#) programmes (ERASMUS and YUFE). The “[Scientific and Professional Work](#)” page contains relevant information on scientific and professional activity, including information on current and completed scientific, developmental, and professional [projects](#) led by FIZRI or its staff, or in which they participate as collaborators. It also lists the [publications and professional papers](#) of FIZRI staff, [scientific and professional conferences](#) organised by FIZRI or its staff, [international cooperation](#) with institutions, scientists, and groups (for example, membership in international scientific collaborations, international projects, and cooperation with institutions, scientists, or groups), and [Faculty publications](#) (books and collections of solved problems). Information on the Faculty’s public activities is grouped under the “[Visibility](#)” section, which includes [popularisation activities](#) such as various [events](#) designed and prepared by staff, [Open Day and Tetragon](#), and the international MasterClass courses. In addition, dedicated subpages within “Visibility” are devoted to the Alumni Club, FIZRI’s presence in the [media](#), and [photographs](#) from all major events at the Faculty. The “[Contact](#)” section contains all FIZRI contact details, including the address and payment details, contacts for the [Dean’s Office](#) (the Dean, Vice-Dean, Head of the Dean’s Office, and Head of the Legal and Human Resources Service), [Heads of Study Programmes and Coordinators](#) (ECTS, ISVU, SmartX, ERASMUS, Knowledge Transfer, YUFE, etc.), [doctoral studies](#), [Student Office](#), and the [Student Council](#).

Following the recommendations of the 2018 internal review related to the English-language website, the new [FIZRI website in English](#) has been expanded in content compared with the previous version and includes a larger number of subpages and information. The new website is fully aligned with the content of the existing Croatian-language pages and includes all the same sections, information, and functionalities. The structure and scope of content are identical to the Croatian version, which means that all key information about the Faculty’s work is available to international users: from study programmes and doctoral studies to scientific activity, staff, departments, laboratories, and international cooperation. This ensures full transparency and equal access to information in both languages, with a consistent presentation of the Faculty’s organisation, activities, and resources.

1.3.7. The higher education institution is obligated to inform the public on admission criteria, enrolment quotas, study and educational programmes, learning outcomes and qualifications, forms of support available to students, procedures applied in teaching, learning, and assessment, pass rates, learning opportunities available to students, as well as information on the employment of students who have recently graduated.

Information on admission criteria for the first or higher years of study and admission quotas (links to calls for applications, enrolment instructions, enrolment forms, ranking lists, curricula, relevant decisions, admission quotas, study programme coordinators’ contact details, etc.) is published on the FIZRI website under [Admissions](#). Criteria for admission or continuation of studies are also often communicated to students individually by study programme or track coordinators, ECTS and ISVU coordinators, as well as other teaching and administrative staff. An individual approach to students is one of the advantages of the relatively small number of students, which has been recognized by students and confirmed by

student surveys. FIZRI, particularly through its website, informs the interested public about [study programmes](#) and [learning outcomes and qualifications](#). The FIZRI website also publicly provides information on procedures applied in teaching, learning, and assessment, including course syllabi, teaching methods, forms of teaching delivery, methods of monitoring student work, assessment criteria and methods, student obligations, examination periods, and examination rules. These procedures are further elaborated in course implementation plans, Faculty regulations and decisions, and are regularly communicated to students via the website, e-learning systems, and introductory and orientation meetings. In addition to the official Faculty website, up-to-date and structured information on admission requirements, the study programme, learning outcomes, employment opportunities, and student life at FIZRI is also available on the specialized secondary-school graduate portal srednja.hr, which is one of the key sources of information for prospective students about higher education in the Republic of Croatia. Besides the official website, information on FIZRI's activities is also available to the public through printed materials distributed at all outreach activities, fairs, and media publications ([brochure with QR code](#) 2023). In 2023, a professionally designed [new visual identity for FIZRI](#) and printed promotional materials with a FIZRI QR code (notepad, bookmark, calendar, sticker, roll-up banner) were produced for the presentation of FIZRI. To ensure enough qualified candidates for enrolment in the undergraduate Physics programme, FIZRI regularly carries out numerous activities aimed at increasing its visibility. Activities such as organizing the [Open Day](#) continue, during which FIZRI staff hold themed lectures, workshops, laboratory visits, and the TETRAGON team competition for secondary school students, while also actively participating in numerous science [popularization activities](#). For example, for more than eight years FIZRI has organized every year: Open Day, [CERN MasterClass](#), the Tetragon competition for secondary school students (as part of Open Day), and the Festival of Science.

FIZRI regularly responds to invitations to participate in presentations of faculties and study programmes intended for secondary school students, such as the Job Fair for final-year secondary school students in Labin (10 March 2023), the Education and Careers Fair Informativa in Ljubljana (19 and 20 January 2024), the Faculty Fair for students from Vukovar-Srijem County (15 March 2024), and Dubrovnik EXPO (through promotional materials available at the University of Rijeka stand only). A good practice example is also the organization of themed lectures by FIZRI staff, such as the lecture "Why Study Physics," delivered by Dr Mateo Paulišić on 20 March 2025 as part of the County Physics Competition for primary and secondary schools. [Media appearances](#) by FIZRI staff in all media formats are very frequent, and they always aim to present the Faculty's activities and study programmes. In addition, every year presentations by FIZRI staff and students are organized in secondary schools in order to present the Faculty and inform pupils about study and educational programmes, learning outcomes, admission criteria and quotas, and acquired qualifications, with the goal of increasing interest in studying physics and enrolling a larger number of students. During 2024 and 2025, more than ten presentations were held in secondary schools in this way, including at the First Sušak Croatian Gymnasium, Andrija Mohorovičić Gymnasium, Salesian Classical Gymnasium, Eugen Kumičić Gymnasium, Karlovac Gymnasium, Topusko, and the Secondary School in Delnice.

The Faculty uses official [Facebook](#) (639 followers, 17 February 2026), [LinkedIn](#) (218 followers, 17 February 2026), [YouTube](#) (92 followers, 17 February 2026), and [Instagram](#) (164 followers, 17 February 2026) profiles (links to the profiles are available on the FIZRI website in the page footer). Through social networks, the Faculty informs the interested public about

teaching, scientific, and outreach activities taking place at the Faculty. The Faculty's Facebook profile is additionally used for promotional purposes, especially for advertising physics studies. In this context, the promotional campaign "Study Physics at the University of Rijeka" was conducted in February 2023 and lasted 14 days. According to available analytics, the campaign reached 22,376 users and resulted in 416 visits to the Faculty website. The Student Union of the Faculty of Physics has its own [Facebook profile](#), and the profile content is edited and maintained by the students themselves. Based on experience to date and the recognized importance of digital communication channels in informing and attracting prospective students, systematic activities aimed at increasing FIZRI's visibility on social media were launched at the end of 2023. Younger employees of the Faculty of Physics, M. Paulišić, K. Mrakovčić, D. Jardas Babić and F. Reščić, are actively working on increasing FIZRI's visibility on social media with a focus on Instagram, Facebook, TikTok, and YouTube through short news items (24-hour stories, live event broadcasting, etc.), opportune content (clips from practicals and laboratories, campus lifestyle), and high-quality content lasting from 10 seconds to 1 minute (TikTok format). The goal is to spark younger audiences' interest in physics through very short posts, strengthen the Faculty's recognizability, and ensure timely and transparent public information about its teaching, scientific, and student activities. Heads of departments and laboratory leaders prepare video material/images monthly and contact editors for publication. In January 2024, the Instagram profile [@fizri_uniri](#) and the email address pr@phy.uniri.hr were opened so that FIZRI staff can send potential contributions and notices for social media posts.

Among the available forms of support, students have access to the University Counseling Center [SSC](#), which was established with the aim of providing various forms of support and assistance to students and staff of UNIRI. Communication between the SSC and students takes place through students contacting the SSC directly, and even more often through the FIZRI coordinator for vulnerable and underrepresented groups (see [Staff duties – FIZRI Coordinator for Vulnerable and Underrepresented Groups](#), [Recommendation for the adaptation of the academic environment](#) and [Proposals for adaptation](#)). A reception for first-year students is specially organized on the first day of the academic year. During this reception, freshmen are addressed by the Dean and Vice-Dean of FIZRI, the Head of the Dean's Office, the ECTS coordinator, the Chair of OOUK, the FIZRI coordinator for vulnerable and underrepresented groups, and representatives of the FIZRI Student Union, who inform students about the work of the Student Union, student organizations, and student associations. At the freshmen reception, staff of the [University Counseling Center](#) present the work of the SSC and the support it provides: [psychological](#) and [career counseling](#), as well as the [Counseling Service for Academic Adjustment](#) within the [University Counseling Center](#). First-year students are also introduced to the [Guide for Freshmen of the University of Rijeka](#). In addition, UNIRI organizes the [RIBROO](#) event, an educational social gathering for first-year students where, through informal interaction with senior students, they can obtain information about studying, student life, and the opportunities available to them during their studies. During the first semester of study, several hours of orientation meetings are held for newly arrived students with the Vice-Dean and the ECTS coordinator. At the beginning of the semester, students receive information on their rights and obligations, services, staff responsibilities, the ECTS, ISVU and LMS Merlin systems, and the channels through which they can submit comments related to studying. At the end of the first semester, meeting topics include exam registration, student evaluations, and their significance for quality assurance. Mentoring is an important aspect of student support, and the mentoring model is continually reviewed for improvement. Since

2015, first-year students had been assigned a senior student mentor as part of the university project “Support to the Mentoring System.” In the 2023/2024 academic year, a new mentoring model was introduced. Physics course teachers in the first year assumed the role of mentors and monitor and advise first-year students (see [Minutes of the Faculty Council meeting of 11 October 2023, Item 4, Vice-Dean’s Notices no. 2](#)). In 2025, this system was further strengthened by assigning each first-year student a [teacher-mentor](#), with whom the student meets regularly, allowing mentors direct insight into the student’s progress and problems.

The University Library Rijeka, [Campus Branch](#), specially equipped to meet the needs of students, teaching staff, and non-teaching staff, is in the FIZRI building. It occupies 246.50 m² of user space equipped with modern furniture and equipment and provides 44 workstations for study and work. It is open Monday to Friday from 9 a.m. to 7 p.m. Library services are listed under [services](#) and [research](#). Student support services (as well as other services — human resources, legal, technical) are shared by FIZRI with the other faculties without legal personality. The [Student Office](#) is available to all students and has office hours aligned with the obligations of all students. The services have their own web subpages within the FIZRI website ([Studomat](#), [Merlin e-learning system](#), [University Library](#), [UNIRI Student Office](#), [Turnitin](#), [DABAR](#), [University Counseling Center](#), [UNIRI IT support](#), [UNIRI technical support](#)). Studomats are available in the Faculty building as well as a web application. FIZRI encourages student mobility and defines conditions for recognizing competences acquired outside the home institution. Students receive support for participating in outgoing and incoming mobility programmes from the [ERASMUS and YUFE coordinators](#) appointed at FIZRI. In addition, the [FIZRI Student Union](#) is the representative body of FIZRI students that advocates for student rights and operates within the University of Rijeka.

At the end of each semester, students are invited to complete surveys on the courses they attended, in which they evaluate the course and all course instructors and may also provide their own comments. The surveys remain open for several months to give students enough time to complete them and to consider their current obligations. Survey results are available to teachers on the Teaching Portal. The survey results are reviewed by the [FIZRI Committee for Quality Assurance and Enhancement](#) (see [examples of student evaluation of teaching](#)). Based on the comments, a teacher may incorporate changes into the course implementation plan for the following year, and if necessary (and if possible), certain comments are discussed with students. One example is the course Environmental Physics, for which students indicated that the course requirements, that is, the student workload, were not aligned with the number of ECTS credits. In the following academic year, the number of ECTS credits was increased, as can be seen from the [amendments to the programme](#). After analyzing the satisfaction of students, teaching staff, and non-teaching staff, OOUK prepares proposals for measures to improve the lower-rated segments of work, and informs the interested public about this (see [OOUK pages – proposals for improvement measures](#)). FIZRI informs the interested public about the outcomes of evaluations to date, that is, internal and external reviews carried out over the past five years.

Monitoring of the employability of graduates of the Faculty of Physics in the period 2021–2025 is based on data from the Croatian Employment Service (CES), the national employability survey conducted by the Agency for Science and Higher Education, and the results of the FizKO project. According to annual CES records, the number of registered unemployed graduates of the Faculty remained very low throughout the period: between 2 and 5 persons per year, with a minimal share of those without work experience. These data

point to stable employability of physics graduates at all study levels. Participation of the Faculty in the [national employability survey of ASHE in 2023](#) showed that too few responses were collected to produce reliable indicators of employment outcomes. Although the available individual data are positive (the participants were employed at the time of the survey, some in the profession), the sample is insufficient for statistically relevant conclusions. Additional information on labour market needs was collected within the EU project Development of Physics Studies through the Application of the Croatian Qualifications Framework (FizKO, 2019–2023), within which [employer surveys for Physics Engineer](#) and [Environmental surveys](#) were conducted, along with analyses of competences required in practice. These results were used to improve study programmes, although they were not published as a separate employability analysis. In addition to these sources, the Faculty's Alumni Club contributes to monitoring the professional paths of former students through the [alumni database](#), while the University Counseling Center provides [support and counseling](#) in career development.

Monitoring of study success at the Faculty of Physics is carried out through a systematic analysis of the progression of students from the first to the second year of the undergraduate Physics programme, as well as through monitoring the number of enrolled students in all study programmes and tracks. At the end of each academic year, the number of ECTS credits earned by first-year students is monitored, which enables the timely identification of students at risk of dropping out and the planning of targeted support. The results of these analyses are regularly presented at Faculty Council meetings, including the meetings held on 16 July 2025 and 24 September 2025, at which enrolment trends and pass rates in undergraduate and graduate studies were discussed (see [Minutes of the 11th FIZRI Council meeting, 16 July 2025, Item 3](#) and [Minutes of the 13th FIZRI Council meeting, 24 September 2025, Item 4](#)).

Attention in the period in question is devoted to monitoring the number of graduated physics teachers, given the pronounced shortage of this profile in the education system. The results of the analysis of student progression in the Undergraduate Physics programme from the first to the second year were used to launch various activities aimed at increasing study success, i.e. student pass rates and completion rates (see [Analysis and measures for the sustainability of FIZRI studies](#)). Analysis of earned ECTS credits and pass rates by course enables timely identification of issues. Analyses of pass rates and ECTS achievement by course serve as the basis for adopting measures aimed at increasing study success. Based on these data, activities are implemented such as the mentoring system in the first year of study and the organization of demonstrations/tutorial support for courses with lower pass rates. Related decisions include the [Decision on compensation for demonstrators](#), the [Decision on the minimum amount of compensation for student work](#), and the [Decision appointing demonstrators](#). In recent years, demonstrations/tutorials have been organized for the courses Fundamentals of Mathematics, Mathematical Methods of Physics I, Physics I, Physics II, Physics III, and Classical Mechanics I. According to student feedback and the results of knowledge assessments, students who attended demonstrations achieved better results in midterm tests and final exams and rated the demonstrations as very useful. The results of the aforementioned analysis of student progression in the Undergraduate Physics programme from the 1st to the 2nd year were also used at the 8th thematic session of the FIZRI Council, held on 2 September 2020, in the discussion on measures to increase the number of students enrolled in the 1st year of the undergraduate Physics programme in the 2021/2022 academic year (see [Minutes of the Council meeting, 2 September 2020](#)).

Systematic analyses of the number of students enrolled in individual tracks of the undergraduate programme and in graduate programmes and tracks have resulted in various activities aimed at increasing study success (see subsection 2.2.3 for the recorded amendments to study programmes and the published current versions of study programmes). An indicator of the effectiveness of the measures undertaken is the high index of (i) student satisfaction with aspects of studying and (ii) overall satisfaction with the programme. In the 2024/2025 academic year, FIZRI was the highest-rated constituent of UNIRI according to the index of satisfaction with aspects of studying, while the index of overall satisfaction with the programme and the student satisfaction index were above the UNIRI average (see [Satisfaction of UNIRI graduates 2024/2025](#)).

1.4. The higher education institution supports ethics and transparency, academic integrity and freedom, and prevents all types of unethical behaviour, intolerance, and discrimination.

1.4.1. The higher education institution continuously promotes, supports and ensures ethical and transparent work, academic integrity and freedom among all stakeholders (in theory and practice) throughout the whole organisation, thus demonstrating its social responsibility.

FIZRI continuously promotes ethics and transparency in work, academic integrity, and academic freedom among all stakeholders (students, teachers, associates, and non-teaching staff), acting in accordance with the values and strategic direction of UNIRI. In the [UNIRI Strategy 2021–2025](#), the University’s core values include responsibility, openness, innovativeness, and connectedness. Within the value of responsibility, particular emphasis is placed on institutional autonomy, academic integrity, and academic freedoms, as well as on striving for excellence in scientific research and teaching. The Strategy also highlights the importance of openness, inclusiveness, freedom of thought, respect for diversity, and social responsibility, thereby further confirming the University’s commitment to developing a transparent and ethical academic environment. The [UNIRI Statute](#) further confirms these values and includes academic integrity and academic honesty of employees among the University’s integrated functions, thus ensuring a unified approach to key issues of academic responsibility.

As a constituent unit of UNIRI, FIZRI aligns its activities with these principles. The [FIZRI Development Strategy for the Period 2021–2025](#) emphasises the Faculty’s social responsibility through a mission focused on contributing to the resolution of scientific, technological, and social challenges, and on educating experts for the needs of society and the economy. The Strategy also foresees the active involvement of students in improving the quality of study programmes and the promotion of open access to scientific publications, thereby further encouraging transparency in scientific work and public accessibility of research results. This approach also builds on the Faculty’s earlier strategic commitments. For example, the [Development Strategy of the Department of Physics 2018–2020](#) explicitly states that “in its work, the Department actively promotes the principles of scientific honesty and professional ethics, academic freedom, and critical thinking, while remaining fully open to scientific, educational, and social change,” and that it advocates equal opportunities for all employees and students and accepts international quality standards in evaluating the institution’s work.

Ethics of work at the level of UNIRI and its constituent units, including the Faculty of Physics, is regulated by the [UNIRI Code of Ethics](#), which covers the principles of scientific and professional honesty (including the prohibition of plagiarism and manipulation of results), transparency of evaluation criteria and procedures, the resolution of conflicts of interest, and the right of members of the university community to appear in public and to freedom of expression while respecting professional standards. Students are additionally governed by the [Code of Ethics for Students](#), which emphasises intellectual honesty, free discussion, integrity, and respect for academic freedoms, and provides for disciplinary action in the event of violations. The Faculty has also established publicly visible institutional mechanisms for implementing ethical principles and protecting academic integrity (the FIZRI Disciplinary Committee under the UNIRI Regulations on Students' Disciplinary Responsibility, the FIZRI Disciplinary Committee under the UNIRI Regulations on Employees' Disciplinary Responsibility, the FIZRI Appeals Disciplinary Committee under the UNIRI Regulations on Students' Disciplinary Responsibility, and the FIZRI Ethics Committee). The Faculty's website also publishes a list of staff involved in the work of these committees (see [Staff Responsibilities – Composition of Committees](#)). Key documents (ethical acts and related regulations) are available on the Faculty's website under the section "Documents and Regulations," submenu [Regulations, Decisions and Documents of the University of Rijeka](#), thereby further ensuring transparency, accessibility of information, and responsible conduct.

1.4.2. The work of employees of the higher education institution, its students and external stakeholders, is based on ethical standards in higher education.

The work of employees, students, and external stakeholders of UNIRI is based on the principles of academic ethics, professional responsibility, and academic integrity. The general norms of ethics and professionalism for members of the academic community are defined by the [Code of Ethics of the University of Rijeka](#), its [amendments and supplements](#), and the [Code of Ethics for Students of the University of Rijeka](#), which regulate the fundamental principles of academic conduct, including scientific honesty, fairness in teaching and research work, respect for academic freedoms, and the prohibition of discrimination and intolerance. As a constituent unit of UNIRI, FIZRI applies these ethical norms in its daily work and ensures their implementation through the work of the Faculty's competent bodies. FIZRI uses these codes of ethics as the established set of ethical principles according to which the FIZRI Ethics Committee operates. It is responsible for considering issues related to the application of ethical principles, giving opinions on possible violations of ethical norms, and applying mechanisms for preventing and sanctioning unethical behaviour, intolerance, and discrimination. The establishment, scope of work, and mode of operation of the Ethics Committee are defined by the [Supplement to the Code of Ethics of the University of Rijeka](#). The composition of the Faculty's Ethics Committee is publicly available on the Faculty's website (see [Staff Responsibilities – Composition of Committees](#)), and its members are appointed by the Faculty Council by a decision on appointment (see [Decision on the Appointment of Members of the FIZRI Ethics Committee 2023](#), [Decision on the Appointment of Members of the FIZRI Ethics Committee 2026](#), [Decision on the Appointment of a Member of the FIZRI Ethics Committee from the Student Body](#)). As part of its responsibilities, the Ethics Committee also issues ethical approvals for conducting research involving ethical aspects (e.g. [Approval of the Ethics Committee for Research within a Project](#)). In this way, the transparent and institutionally regulated application of ethical principles in the Faculty's work is ensured.

1.4.3. The higher education institution effectively takes measures to prevent unethical behaviour, intolerance and discrimination.

To prevent unethical behaviour, intolerance, and discrimination, the FIZRI Ethics Committee operates at the Faculty, monitoring the application of ethical principles defined by the Code of Ethics of UNIRI and providing opinions and recommendations in cases relating to ethical issues in academic work. In the last five years, the Ethics Committee has not received a single request to initiate a procedure for issuing an opinion on a violation of the Code of Ethics in terms of unethical behaviour, intolerance, or discrimination. However, it did receive a request to assess the ethics of research involving human participants, and the Committee carried out the procedure for determining the ethical acceptability of the research. For example, at its 1st session in 2023, held electronically on 16 June, the FIZRI Ethics Committee considered the application of Associate Professor Nataša Erceg for approval to conduct the research “Causes of the Shortage of Physics Teachers in the Republic of Croatia,” in which the research sample consisted of respondents (people). Based on the submitted explanation of the research methodology, the Committee adopted a [conclusion](#) that the described research and the proposed methodology were not ethically questionable, and the research was approved. In an earlier case, the Committee also considered a request related to the assessment of the ethical acceptability of research within the doctoral work of staff member Marija Čargonja. It was determined that the procedures envisaged by that research were in line with the UNIRI Code of Ethics (see [Conclusion of the Ethics Committee – doctoral work of Marija Čargonja](#)). In doing so, the Ethics Committee was guided by the expert opinion issued by the Ethics Committee of the Faculty of Medicine of the University of Rijeka, which possesses the expertise in this area and follows its own defined [procedure and guidelines for determining ethical acceptability](#). The use of external expert opinion in the Committee’s decision-making is in accordance with Article 9 of the Supplement to the Code of Ethics of the University of Rijeka. Accordingly, the ratio of received to completed procedures related to determining ethical acceptability in research is 1. There were no cases referred to higher instances.

1.4.4. The higher education institution conducts activities related to the sanctioning of unethical behaviour, intolerance and discrimination, ensuring a fair and unbiased implementation of procedures.

FIZRI ensures clearly defined procedures for sanctioning unethical behaviour, intolerance, and discrimination, while respecting the principles of fair and impartial implementation of procedures. Procedures are carried out in accordance with the [Code of Ethics of the University of Rijeka](#), its [amendments and supplements](#), the [Code of Ethics for Students of the University of Rijeka](#), and the [Regulations on the Disciplinary Responsibility of FIZRI](#). In cases of possible violations of ethical principles, the matter is considered by the FIZRI Ethics Committee, which gives an opinion on whether a violation of the Code of Ethics has occurred. Violations of work obligations and other disciplinary offences are resolved through disciplinary procedures conducted in accordance with the applicable regulations of the Faculty and the University. Procedures are conducted in compliance with the principles of impartiality, protection of the rights of all parties involved, and the possibility for each party to present a statement. According to the available records of the Faculty Ethics Committee, in the last five years up to the present there have been no reports concerning violations of the Code of Ethics in the sense of unethical behaviour, intolerance, or discrimination. Likewise, during the

observed period there were no initiated disciplinary procedures and no cases referred to a higher instance. Accordingly, the ratio of received to completed procedures is 0 : 0.

1.4.5. *The system of resolving conflicts and irregularities is defined and it functions at all levels of the higher education institution.*

In cases of unethical behaviour, intolerance, or discrimination at FIZRI, institutional mechanisms are in place for initiating and conducting procedures to determine responsibility and for sanctioning irregularities, while respecting the principles of fair and impartial implementation of procedures. As stated above, the ethical principles governing the conduct of staff and students are defined by the [Code of Ethics of the University of Rijeka](#), its [amendments and supplements](#), and the [Code of Ethics for Students of the University of Rijeka](#), while the FIZRI Ethics Committee is responsible for issuing opinions in cases of possible violations of ethical norms. In the event of a violation of their rights, students may also contact the student ombudsperson (see [Decision on the Election of the FIZRI Student Ombudsperson](#)), who operates within the [Office of the Student Ombudsperson](#) and protects and promotes students' rights guaranteed by law and by the University's acts. At the University level, a "confidential person" has been appointed for internal reporting of irregularities (see [Confidential Person for Reporting Irregularities](#)), to whom any possible violation of the Code of Ethics may be reported anonymously and then forwarded to the competent committees.

Responsibility for offences that do not fall directly within the domain of academic ethics, the so-called disciplinary offences, is generally assumed by the employer itself, namely FIZRI represented by the Dean. If the employer considers it necessary, it may order that the examination procedure be conducted by the Disciplinary Committee (see [Regulations on the Disciplinary Responsibility of FIZRI](#); [Decision on the Amendment of the Regulations on the Disciplinary Responsibility of FIZRI](#); [Decision on the Appointment of the FIZRI Disciplinary Committee](#); [Authorisation to the Dean of FIZRI to Conduct Disciplinary Proceedings](#); [Decision on the Members of the FIZRI Disciplinary Committee from the Associate Staff](#)). Disciplinary proceedings are initiated if the culpable conduct of an employee or student falls within the list of disciplinary offences (see [Regulations on the Disciplinary Responsibility of Teachers and Associates](#), Art. 5; [Regulations on Students' Disciplinary Responsibility](#), Arts. 6 and 7). In this context, the term "employees" includes all teachers and associates referred to in paragraphs 1 to 4 of Article 3 of the Regulations on the Disciplinary Responsibility of Teachers: persons elected to scientific-teaching or teaching positions who are employed on the basis of an employment contract, a service contract, or another contract; persons elected to associate positions; and persons not elected to associate positions but employed at the constituent unit and participating in teaching, such as laboratory assistants and technicians.

According to the available records of the Faculty, in the last five years there have been no initiated disciplinary proceedings and no cases referred for consideration by the FIZRI Disciplinary Committee. Accordingly, the ratio of received to completed procedures is 0 : 0, and there have also been no procedures referred to a higher instance. This confirms that, to date, there have been no recorded cases requiring the initiation of formal disciplinary proceedings. It also confirms that the system of responsibilities and procedures in cases of conflicts and irregularities is clearly defined and functional at all levels of the institution.

1.4.6. *The higher education institution encourages research into the causes and consequences of unethical behaviour, the effectiveness of measures taken to prevent it, it reports on research results and monitors trends.*

At the level of UNIRI and FIZRI, initiatives and activities aimed at promoting academic ethics, integrity, and professional conduct within the academic community are encouraged. For example, at UNIRI there is a [Council for Gender Equality](#), which has produced the [Guidelines on Gender-Inclusive Communication](#). One of the members of this Council is also a FIZRI employee (see [Staff Responsibilities – Composition of Committees](#)), which means that the Faculty actively participates in the implementation of university policies on gender equality and inclusiveness. This encourages discussion of various aspects of inclusion, ethics, and respect for diversity within the academic community. FIZRI also systematically analyses the results of teaching quality surveys (see [Minutes of the OOUK Session of 2 March 2023, Item 6](#), [Minutes of the OOUK Session of 25 March 2024, Item 7](#), [Minutes of the OOUK Session of 21 March 2025, Item 5](#) and [Minutes of the OOUK Session of 19 February 2026, Item 4](#)), including questions relating to fairness and the professional attitude of teachers towards students. Members of the OOUK analyse quantitative indicators and students' comments from the surveys, considering grades for all categories from Part B of the survey and the statement "The teacher treated students with respect." Such analysis provides insight into perceptions of teachers' professional attitude towards students and contributes to identifying potential problems and planning further activities to improve the quality of study.

UNIRI has responded to new challenges related to the development of artificial intelligence by adopting the [Policy on the Use of Artificial Intelligence Tools at the University of Rijeka](#). The document was adopted after the University of Rijeka Council of Honour published in 2023 the [Statement on the Responsible Use of Artificial Intelligence Tools](#), thereby defining the fundamental principles of the responsible and ethical use of AI tools in teaching and research. This policy regulates the objectives and principles of the use of artificial intelligence in academic work and encourages the responsible and transparent application of new technologies while preserving academic integrity. [Guidelines for the responsible use of artificial intelligence tools](#) at UNIRI have also been adopted.

1.4.7. *The higher education institution applies new technologies to eradicate all forms of unethical behaviour. The higher education institution systematically addresses issues of plagiarism, cheating and falsification of results.*

For preventing and detecting unethical behaviour in academic work, FIZRI uses digital tools to check the originality of students' papers. The [Turnitin](#) plagiarism-detection software is used to check the originality of final, graduate, and seminar papers, and each FIZRI teacher has their own username and password for access to the Turnitin system. The Turnitin system enables comparison of submitted papers with many scientific publications, student papers, and internet sources, and generates a report on the degree of similarity with existing content. Based on the report obtained, the supervisor assesses the originality of the paper and any irregularities in citation or use of sources. One of the conditions for access to the defence of a final or graduate paper is verification of the paper's originality through the Turnitin system. In this process, the supervisor completes the form [Appendix C](#), which states the percentage similarity of the paper to the sources covered by the check and confirms that the paper meets the criteria of academic honesty. The use of such digital tools contributes to the systematic

prevention of plagiarism and other forms of unethical academic behaviour and ensures transparency and integrity in student work and in the academic process. In addition to using tools for checking the originality of papers, UNIRI has also recognised new challenges related to the development of artificial intelligence. In this context, the [Policy on the Use of Artificial Intelligence Tools at the University of Rijeka](#) was adopted, defining the principles of the responsible and transparent use of AI tools in teaching and research. This document promotes the ethical and responsible application of new technologies while preserving academic integrity and provides students and teachers with guidelines for their appropriate use (see [Guidelines for the responsible use of artificial intelligence tools](#)).

1.5. The quality assurance system is periodically improved and revised on the basis of the results of implementation of regular internal and external quality assurance procedures.

1.5.1. The higher education institution fosters the development of a quality culture that promotes the importance of active participation in internal and external quality assurance processes among all stakeholders of the higher education institution, so that they fulfil their purpose, act as a catalyst for change, and offer new perspectives to the higher education institution.

FIZRI's quality assurance policy is defined in accordance with the mission, vision, and goals of FIZRI set out in [the Development Strategy of the Faculty of Physics of the University of Rijeka 2021-2025](#) and is publicly available on the FIZRI website under "[Quality Assurance](#)". Through this policy, FIZRI actively commits itself to developing a quality culture through: (a) improving the quality assurance and improvement system (SOUK) at FIZRI, based on university criteria, that is, European and national quality assurance standards and guidelines, which will contribute to the acquisition of student competences in line with the needs of society; (b) the active involvement in SOUK of all FIZRI staff, that is, the management, teaching and non-teaching staff, students, and external associates; (c) encouraging scientific output and developing study programmes based on the innovative scientific research of FIZRI staff, in accordance with the principles of the [Croatian Qualifications Framework](#) (HKO), which will contribute to the active role of FIZRI in the development of the local economy and the community in which it operates; and (d) transparency in its work and responsible governance, as well as the creation of a stimulating environment for scientific work, learning, and teaching at FIZRI, together with the continuous monitoring of quality indicators and the periodic revision of FIZRI's quality assurance policy, objectives, and procedures accordingly.

The objective of FIZRI's quality assurance and improvement system is defined in [the Regulations on the Quality Assurance and Enhancement System of the Faculty of Physics](#) (hereinafter: the FIZRI SOUK Regulations) as follows: *The objective of the Faculty's quality system, which is based on standards, policies, and practices within the European Higher Education and Research Area, is to establish a comprehensive management approach aimed at assuring and enhancing quality. This approach ensures high quality, consistency, and transparency in all areas of activity, improves stakeholder satisfaction, and enhances efficiency.*

The purpose of the quality system is to meet high quality standards in all areas of the Faculty's activities. By [Decision of the Faculty Council](#) of FIZRI on the adoption of [the University](#)

[of Rijeka Study Quality Manual](#), the said manual is used as the Study Quality Manual at FIZRI. In this way, FIZRI has also adopted the quality policy of the University of Rijeka as the policy by which it actively commits itself to developing a quality culture.

[The FIZRI SOUK Regulations](#) prescribe the organisation and operation of the quality assurance and improvement system at FIZRI. Responsibility for quality assurance and enhancement in all areas of FIZRI's activities is shared by the OOUK and the Faculty's other advisory and expert bodies ([the Council for Science and Projects](#), [the Council for Teaching and Student Affairs](#), [the Council for Strengthening the Visibility of the Faculty and the Popularisation of Science](#), the [FIZRI Alumni Club](#), and [the Chair of Educational Physics](#)) responsible for quality assurance in the areas defined in Article 4 of the FIZRI SOUK Regulations. The OOUK operates independently. Under Article 5 of the FIZRI SOUK Regulations, all FIZRI staff are actively involved in SOUK: students, teachers, associates, professional services staff, and the Faculty management. External associates are also involved in SOUK, and their role is described in Article 5, paragraph 3 of the FIZRI SOUK Regulations. This is also reflected in the composition of the OOUK, defined by the same Regulations in Article 8, according to which the OOUK consists of: a representative of the FIZRI management; representatives from among teachers employed in scientific-teaching positions (responsible for the quality of the scientific and/or professional advancement of FIZRI staff and for the quality of their work in terms of the support they provide to students); a student representative (whose study experience and engagement in learning are monitored and used as a vital corrective element of SOUK); a representative of the associate staff (teaching assistants, senior teaching assistants); a representative of the professional services staff; one representative of external stakeholders; and one alumni representative (who may come from another level of the education system, the economy, local or state administration, culture, healthcare, and similar fields, and who, from their own perspective, evaluates the validity, purposefulness, and quality of FIZRI's work). The OOUK adheres to the rules on the election of members (method of election, term of office, early dismissal) defined in Articles 8 and 9 of the FIZRI SOUK Regulations, as evidenced by the recent appointment of a new representative of external stakeholders, who is also an alumnus (see [Decision on the Appointment of the External Stakeholder](#)), as well as the recent appointment of new representatives of the management (see [Decision on the Appointment of Management Representatives](#)), students (see [Decision on the Appointment of Student Representatives](#)), and associate staff (see [Decision on the Appointment of Associate Staff Representatives](#)).

The [Alumni Club of the Faculty of Physics](#), founded in 2018, is in continuous communication with the FIZRI management and the OOUK through providing information on possible jobs in schools, examining the employability of graduates, and similar activities (see [Minutes of the OOUK, 17 December 2020](#)), and in this way contributes to the quality assurance system. The work of the Alumni Club is governed by the [Alumni Club Regulations](#). FIZRI has also developed cooperation with civil society organisations. It participates in many science popularisation activities, a significant proportion of which relate to the Rijeka Science Festival, organised by the Zlatni rez association from Rijeka.

Internal and external quality assurance procedures are carried out regularly at the Faculty. External evaluation is conducted by the Agency for Science and Higher Education through reaccreditation procedures, while internal reviews are organised by the University of Rijeka within the university quality system. Documentation on the internal reviews and reaccreditations carried out is available on the FIZRI website under [Quality Assurance](#), in the section "Reaccreditations and Internal Reviews". The results of these procedures do not

remain at the level of formal reporting, but are systematically analysed and incorporated into concrete action plans and improvement measures. Recommendations obtained in the evaluation procedures are used in revising study programmes, improving teaching methods, strengthening student support systems, and developing human resources and organisational processes. All stakeholders of the system actively participate in these processes by reviewing self-evaluations, proposing additions and improvements, and taking part in discussions with evaluation committees.

1.5.2. The quality assurance system is periodically improved and revised on the basis of results of implementation of the regular internal and external quality assurance procedures in line with the ESG, and it is reported to stakeholders in a timely, clear, accurate and objective manner. *The higher education institution conducts an internal evaluation of the quality assurance system in a cycle that is shorter than the length of the external evaluation cycle.*

The FIZRI SOUK is periodically revised and improved based on the results of regular internal and external evaluation procedures, in accordance with the Standards and Guidelines for Quality Assurance in the European Higher Education Area (ESG). The ESG constitute the fundamental reference framework for the development of internal and external quality assurance systems and serve as guidance to higher education institutions and quality assurance agencies in establishing, implementing, and improving quality mechanisms.

The application of these principles is reflected in the Faculty's regular participation in periodic external quality assurance procedures with the aim of ensuring improvements and the effective achievement of high-quality educational and scientific outcomes. All forms of external accreditation operate within the legal framework, such as: the Act on Higher Education and Scientific Activity ([ZVOZD](#)), the [Act on Quality Assurance in Higher Education and Science](#), and the [Ordinance on the Content of the Licence and the Conditions for Issuing a Licence for Performing Higher Education Activities, Conducting Study Programmes, and Reaccreditation of Higher Education Institutions, and Others](#). The basis for self-evaluation at the Faculty consists of [documents](#) related to the quality assurance system, reports and action plans, including the University of Rijeka Development Strategies ([2014-2020](#) and [2021-2025](#)) and the FIZRI Strategies ([2018-2020](#) and [2021-2025](#)), reports from previously conducted evaluations of the quality assurance system and/or institutional reaccreditation, as well as the Faculty's current statute and regulations.

External quality assurance procedures at the Faculty are carried out by: (a) the Agency for Science and Higher Education (AZVO), and (b) the University of Rijeka as part of the internal review of quality assurance at the University of Rijeka.

(a) Reaccreditations in 2015 and 2021

The 2015 reaccreditation procedure of the Department of Physics (now FIZRI) by AZVO was conducted in such a way that an expert panel appointed by the Agency's Accreditation Council evaluated OFRI and its study programmes on the basis of OFRI's self-analysis, supporting documentation, and a site visit to OFRI. The expert panel then submitted the [Expert Panel Report on the Reaccreditation of OFRI](#) and the [AZVO Accreditation Recommendation of 23 November 2015](#). On 28 December 2015, the Ministry of Science, Education and Sports issued a certificate confirming that OFRI met the conditions for performing higher education activities, as well as a letter of expectation regarding scientific

activity at OFRI, with a three-year deadline for eliminating the identified deficiencies. After that period, a [statement](#) on the accreditation recommendation was submitted. The [AZVO response of 4 February 2019](#) includes a proposal to the competent minister to issue a certificate confirming that OFRI met the conditions for carrying out higher education and scientific activities. Within the prescribed six-month period, OFRI submitted to AZVO an [Action Plan](#) for quality improvement in the second cycle of reaccreditation of the Department of Physics for the period 2019-2024.

The 2021 reaccreditation procedure of the Department of Physics by AZVO was conducted in such a way that an expert panel appointed by the Agency's Accreditation Council evaluated OFRI and its study programmes based on OFRI's self-analysis, supporting documentation, and a site visit to OFRI. The expert panel then submitted the [Expert Panel Report on the Reaccreditation of the Department of Physics of the University of Rijeka of May 2021](#) and the [Accreditation Recommendation of the Agency for Science and Higher Education in the Reaccreditation Procedure of the University of Rijeka, Department of Physics, of 6 December 2021](#). On 31 December 2021, the Ministry of Science, Education and Sports issued a certificate confirming that the conditions for performing higher education and scientific activities had been met. OFRI submitted to AZVO the [Action Plan for Quality Improvement in the Second Cycle of Reaccreditation of the University of Rijeka, Department of Physics, for the Period from 2021 to 2026](#).

The results of the reaccreditation procedures were systematically considered at meetings of the Faculty Council and the OOUK of FIZRI. For example, already during the implementation of the 2021 reaccreditation procedure, the OOUK was actively involved in preparing the self-analysis, coordinating meetings with different stakeholder groups (teaching and non-teaching staff, students, associates), and organising the visit of the AZVO expert panel (see [Minutes of the OOUK meeting of 29 March 2021, Item 6](#)). The preliminary and final reports of the expert panel and the accreditation recommendation were considered at Faculty Council meetings (see [Minutes of the 5th Council Meeting of 5 May 2021, Item 3](#), [Minutes of the 9th Council Meeting of 15 September 2021, Item 3](#), and [Minutes of the 14th Council Meeting of 22 December 2021, Item 3](#)), where identified strengths (the quality of the doctoral programme, good cooperation with students and alumni, and the work of the OOUK) as well as areas for improvement (infrastructure, development of digital competences, strengthening cooperation with the economy, mobility, the mentoring system, and career development) were highlighted. Within the legal deadline, the Faculty submitted a [statement on the final report](#). In accordance with the expert panel's recommendations, a five-year Action Plan for Quality Improvement (2021-2026) was prepared, considered at OOUK meetings (see [Minutes of the OOUK meeting of 14 February 2022, Item 6](#)), and unanimously adopted at the Faculty Council meeting in May 2022 (see [Minutes of the 6th Council Meeting of 25 May 2022, Item 6](#)).

Details and documents relating to the reaccreditations carried out are available on the "[Quality Assurance](#)" webpage, under the heading "Reaccreditations and Internal Reviews".

(b) Internal reviews of the quality assurance system at UNIRI

The internal review procedure at constituent units falls within the competence of the UNIRI Quality Committee, in accordance with the [Regulations on the Quality Assurance and Improvement System at UNIRI](#). The institutional framework, responsibilities, and competences of the bodies involved, including the implementation of internal reviews, are

defined by the Regulations, while the operational procedure (planning, review, report, and follow-up) is elaborated in detail in the [Study Quality Manual](#). An internal review of the quality assurance system of a higher education institution is a systematic and periodic procedure that determines the effectiveness of the activities and results constituting the quality system and their alignment with university, national, and ESG standards. The level of development of the system is assessed according to the standards defined in the [Study Quality Manual](#), which is based on the ESG. In accordance with the Regulations, the UNIRI Quality Assurance and Improvement Committee adopts a plan for a three-year cycle of internal reviews of the UNIRI quality system, which is approved by the Expert Council of the Centre for Studies and adopted by the University Senate. The plan is delivered to the constituent units, thereby ensuring transparency and timely preparation of the procedure. The three-year cycle of internal reviews is shorter than the external evaluation cycle (reaccreditation), which enables continuous monitoring, timely recognition of the need for improvement, and systematic adjustment of the quality assurance system.

Internal reviews of the Faculty's quality system were conducted in 2014, 2019, and 2024:

- The internal review of OFRI's SOUK by the University of Rijeka in 2014 (see [Report on the Results of the Internal Review of the Quality Assurance System 2014](#)) consisted of four phases, in accordance with the [UNIRI Study Quality Manual](#): Phase I: Planning; Phase II: Review in the narrower sense; Phase III: Report; Phase IV: Follow-up.
- The internal review of OFRI's SOUK by the University of Rijeka in 2019 (see [Report on the Results of the Internal Review of the Quality Assurance System 2019](#)) was carried out based on the submitted self-analysis, and the OOUK prepared the [Plan of Activities of the OFRI Quality Assurance and Enhancement System for the Period 2019-2021](#).
- The internal review of FIZRI's SOUK by the University of Rijeka in 2024 (see [Report on the Results of the Internal Review of the Quality Assurance System 2024](#)) was carried out based on the submitted self-analysis, and the OOUK prepared the [Plan of Activities of the OFRI Quality Assurance and Enhancement System for the Period 2024-2027](#).

The results of the internal review of the quality assurance system at FIZRI are systematically presented, discussed, and institutionally adopted through the Faculty's governing bodies. For example, during 2024 the internal review procedure included the preparation and adoption of the document "Self-Evaluation of the Faculty of Physics (for the period 2019-2024)", which was unanimously accepted at the Faculty Council meeting on 28 February 2024 (see [Minutes of the 3rd Council Meeting, 28 February 2024, Item 7](#)). Before the visit of the Internal Review Committee, the document was submitted to the competent bodies of the University of Rijeka in accordance with the prescribed procedure. The preliminary and then final Report on the Results of the Internal Review were considered at OOUK meetings (see [Minutes of the OOUK Meeting, 22 May 2024, Item 3](#)) and at the Faculty Council meeting (see [Minutes of the 9th Council Meeting, 22 July 2024, Item 3](#)), where positive findings and recommendations for improvement were highlighted. Based on the recommendations received, an Action Plan for Quality Improvement in the Third Cycle of the Internal Review for the period 2024-2027 was prepared, first discussed by the Collegium (see [Minutes of the Collegium, 11 September 2024](#)), and then unanimously adopted at the Faculty Council meeting on 18 September 2024 (see [Minutes of the 10th Council Meeting, 18 September 2024, Item 8](#)). Summaries of the key conclusions and the relevant documents are available on

the FIZRI website in the section "Reaccreditations and Internal Reviews", thus ensuring transparency and timely information for all stakeholders.

1.5.3. The higher education institution ensures the competence of internal assessors, and encourages them and provides them with necessary knowledge and skills.

The procedure for the internal review of the quality assurance and enhancement system at UNIRI constituent units falls within the competence of the University Quality Committee, in accordance with the provisions of the [Regulations on the Quality Assurance and Enhancement System](#) at UNIRI. The said Regulations define the institutional framework of the quality system, including the responsibilities and competences of the bodies involved in the implementation of internal reviews. The operational procedure for internal review is elaborated in detail in the [Study Quality Manual](#) of UNIRI, which prescribes the phases of the procedure (planning, review, report, and follow-up), the evaluation criteria, and the method of carrying out peer review. The internal review panel is appointed by the UNIRI Quality Assurance and Enhancement Committee, considering the expertise and experience of its members in the field of quality assurance and enhancement. As a rule, members of the panel are teachers and other staff with experience of working in the quality system at their constituent units (most often members of the quality committees of other constituent units), with the mandatory participation of a student and a representative of the Centre for Quality Assurance and Enhancement. The University systematically invests in the development of the competences of panel members by organising targeted training sessions and workshops for participants in internal review procedures. During these training activities, reviewers become thoroughly familiar with the procedure methodology, evaluation criteria, methods of analysing documentation and indicators, and the preparation of reports with recommendations. In this way, consistency of approach, understanding of standards, and consistent application of criteria in all internal review procedures are ensured. The competence of internal reviewers is further ensured through institutionally organised professional development programmes. UNIRI regularly runs the lifelong learning programme "[Teaching Competences in Higher Education: Quality Assurance in Higher Education](#)", intended for teaching, associate, and administrative staff. The programme lasts 20 hours (4 ECTS credits) and is aimed at acquiring basic and advanced knowledge of the quality assurance and enhancement system in higher education. It covers topics such as the concept of quality and quality indicators in higher education, internal and external quality assurance, evaluation and self-evaluation procedures, organisational culture and its impact on the development of the quality system, the role of different stakeholders in internal and external evaluation processes, and the application of international guidelines and recommendations (ESG) in institutional practice. FIZRI systematically encourages its staff to participate in these formal professional development programmes. During the 2023/2024 academic year, two FIZRI staff members successfully completed the lifelong learning program (see [Certificate 1](#) and [Certificate 2](#)).

FIZRI also actively monitors other opportunities for professional development in the field of quality assurance, and staff apply for additional training and programmes whenever they are available. Certain planned programmes were not implemented due to insufficient interest at the University level, but the interest of FIZRI staff in participating in such activities remains continuous. In this way, members of review panels and other stakeholders involved in internal review procedures are ensured to possess the appropriate theoretical knowledge

and practical skills for carrying out evaluation procedures, to understand the national and European framework of quality assurance, and to actively contribute to the further development and enhancement of the quality system at the level of the constituent unit and the University.

1.5.4. The higher education institution ensures that the preparation for internal and external quality assurance processes considers the progress made since the last internal and external quality assurance processes, which form a continuous improvement cycle and contributes to accountability of the higher education institution.

FIZRI ensures the continuous development of the quality assurance system through systematic monitoring of the recommendations and findings arising from previous internal and external evaluation procedures. As described in detail in section 1.5.2., the results of AZVO reaccreditations and internal reviews of the SOUK by UNIRI are regularly analysed, discussed at meetings of the OOUK and the Faculty Council, and incorporated into the Faculty's strategic and operational documents. Recommendations from previous evaluation procedures serve as the basis for planning the Faculty's further development and are considered in the preparation of self-analyses, action plans, and strategic documents. Such an approach makes it possible to establish a continuous quality cycle (planning - implementation - evaluation - improvement) and contributes to the ongoing development and enhancement of the SOUK.

For example, in the process of drafting and monitoring the implementation of the [Action Plan for Quality Improvement in the Second Cycle of Reaccreditation of the Department of Physics \(2021-2026\)](#), as well as when drafting the [Action Plan for Quality Improvement in the Third Cycle of the Internal Review of the Quality Assurance System of the Faculty of Physics \(2024-2027\)](#), the findings and recommendations from previous evaluation procedures were taken into account, as is evident from the following documents:

1. [Expert Panel Report on the Reaccreditation of the Department of Physics of the University of Rijeka \(May 2021\)](#)
2. [Accreditation Recommendation of the Agency for Science and Higher Education in the Reaccreditation Procedure of the University of Rijeka - Department of Physics \(6 December 2021\)](#)
3. [Statement of the University of Rijeka, Department of Physics, on the Received Final Report of the Reaccreditation Procedure of the University of Rijeka - Department of Physics in the 2020/2021 Academic Year, dated 16 September 2021](#)
4. [Action Plan for Quality Improvement in the Second Cycle of Reaccreditation of the University of Rijeka, Department of Physics \(2021-2026\)](#)
5. [Report on the Implementation of the Action Plan for Quality Improvement in the Second Cycle of Reaccreditation for the Period from 2021 to 2026](#)
6. [FIZRI Development Strategy 2021-2025](#)
7. [Report on the Results of the Internal Review of the Quality Assurance System of the University of Rijeka \(2024\)](#)
8. [Action Plan for Quality Improvement in the Third Cycle of the Internal Review of the Quality Assurance System of the Faculty of Physics \(2024-2027\)](#)

The above documents are available on the Faculty website under the section "Quality Assurance", submenu "Reaccreditations and Internal Reviews". Based on the recommendations from reaccreditation and internal review procedures, concrete activities,

implementation deadlines, performance indicators, and responsible persons are defined, while progress in implementing the measures is regularly monitored through reports and discussions at meetings of the OOUK and the Faculty Council. In this way, it is ensured that the recommendations from previous evaluation procedures are systematically implemented in the Faculty's further development and that the quality assurance system functions as a cycle of continuous improvement contributing to the responsible and transparent governance of the institution.

1.5.5. The joint impact the internal and external quality assurance processes have on the development of the higher education institution is being analysed and monitored.

The combined impact of internal and external quality assurance procedures on the development of FIZRI is systematically analysed and monitored by linking the findings of internal reviews, student evaluations, self-evaluations, and other internal mechanisms with the findings of external evaluation procedures, especially reaccreditation. The FIZRI OOUK considers the conclusions and proposals from both sources, reports on them to the management and the Faculty Council, and implements them through action plans, while progress is regularly monitored through annual work plans and reports. Thus, for example, the [OOUK Activity Plan for 2022-2023](#) states that the activities derive from the recommendations of the 2019 internal review, but also that, at the same time, a five-year action plan is being prepared in response to the recommendations of the reaccreditation carried out in 2021. Furthermore, the [OOUK Work Report for 2024](#) confirms that the Committee's work was carried out in line with the 2021-2026 Reaccreditation Action Plan, but also that, during the same period, an Action Plan following the internal review for the period 2024-2027 was drafted and adopted. In this way, internal and external procedures are not viewed separately, but as interconnected sources for planning and monitoring the Faculty's development.

In addition to activities at the Faculty level, the impact of internal and external quality assurance procedures is also monitored at the UNIRI level through analyses and reports prepared by the UNIRI OOUK and the Centre for Quality Assurance and Enhancement. These documents systematically analyse the results of internal reviews and external evaluation procedures and assess the level of development of the SOUK at the University's constituent units. For example, the [Report on the Implementation of the Internal Review of the Quality Assurance System of the University of Rijeka for the Period 2022-2025](#) analysed the results of the third cycle of internal reviews carried out at 16 constituent units of the University, including FIZRI. The report assesses the level of development of the SOUK at individual constituent units, determined based on the results of the internal review, and identifies common strengths and areas for further improvement of the system at the University level. Analysis of the results of internal reviews also makes it possible to identify common strengths and weaknesses of the quality systems at constituent units. The most frequently identified strengths include a systematic approach to quality, stakeholder involvement in quality assurance processes, transparency and public availability of documents, and well-developed evaluation mechanisms. On the other hand, areas identified for further improvement include more systematic involvement of external stakeholders, more even support for students, and more structured monitoring of alumni careers. Similar conclusions also arise from the [Report on the Implementation of the Internal Review of the University of Rijeka Quality System for the 2017-2019 Cycle](#), which established that the constituent units had largely considered the

recommendations from the previous review cycle and that progress in the SOUK was visible at both the University and its constituent units. In addition, analyses of the results of external evaluation procedures are also carried out at the University level. Thus, the document [Analysis of Grades in the Accreditation Processes of the Constituent Units of the University of Rijeka 2010-2023](#) showed the development of the constituent units' grades across two accreditation cycles, with the University as a whole recording a general shift toward higher grades and a reduction in the number of the lowest grades in the second reaccreditation cycle. The analysis also showed that most constituent units had reached a satisfactory or high level of development of their quality systems in the field of internal quality assurance. The results of these analyses and reports are regularly presented and discussed at meetings of the UNIRI OOUK and the FIZRI OOUK (see [Minutes of the OOUK meeting of 19 February 2026, Item 3](#)). At these meetings, for example, an analysis of the grades in the first and second accreditation cycles was presented, according to which FIZRI improved its average overall grade from 2.6 in the first cycle to 3.6 in the second reaccreditation cycle, confirming progress in the development of the quality system and in overall institutional development. In the second accreditation cycle, 2018-2023, FIZRI was the highest-rated constituent unit of the University.

In this way, the results of internal and external quality assurance procedures are analysed at both the institutional and university levels and serve as the basis for the further planning and improvement of the SOUK.

1.5.6. The higher education institution publishes clear, accurate, objective, valid and easily accessible information on the internal and external evaluation procedures.

FIZRI ensures the transparency of internal and external quality assurance procedures by publishing relevant documents and information on the official Faculty website in the ["Quality Assurance"](#) section, submenu "Reaccreditations and Internal Reviews". Published documents include those relating to the reaccreditations and internal reviews carried out, including expert panel reports, accreditation recommendations, Faculty statements, action plans for quality improvement, and reports on their implementation. In addition to public publication on the website, information on evaluation results is also disseminated through institutional communication channels. The results of internal and external evaluations are presented and discussed at meetings of the Faculty Council and the OOUK, and the conclusions and adopted decisions are documented in meeting minutes, which are available to stakeholders. Internal communication with teachers also takes place through the SharePoint system, thereby ensuring that staff are informed in a timely and clear manner. A more detailed account of the actions taken in response to the recommendations from the 2021 reaccreditation, including analysis of the final report of the AZVO expert panel, the drafting and adoption of the Action Plan for Quality Improvement (2021-2026), and the monitoring of its implementation, as well as the 2024 internal review procedure of the quality assurance system and the adoption of the corresponding Action Plan (2024-2027), is set out in detail in section 1.5.2.

2. STUDY PROGRAMMES AND LIFELONG LEARNING PROGRAMMES

The Faculty of Physics of the University of Rijeka ensures high-quality and contemporary study programmes, as well as lifelong learning programmes aligned with labour market needs, the latest scientific achievements, and the national and European qualifications frameworks. Such an approach enables students to acquire relevant competences for professional development, employment in scientific and technological fields, and engagement in lifelong learning.

The Faculty offers accredited study programmes at the appropriate levels in accordance with the Croatian Qualifications Framework (CroQF):

- University study programmes:
 - [Undergraduate Study Programme in Physics](#) (Level 6),
 - [Graduate Study Programme in Physics](#) (Level 7),
 - [Graduate Study Programme in Physics and Mathematics](#) (Level 7),
 - [Graduate Study Programme in Physics and Computer Science](#) (Level 7),
 - [Graduate Study Programme in Physics and Philosophy](#) (Level 7),
 - [Graduate Study Programme in Engineering and Physics of Materials](#) (Level 7),
 - [Doctoral Study Programme in Physics](#) (Level 8).

The Faculty also offers accredited [lifelong learning](#) programmes:

- Programme for the acquisition of missing knowledge, skills and competences required for enrolment in the Graduate University Study Programme in Engineering and Physics of Materials,
- Specialised programme in natural sciences and mathematics for primary school teachers,
- [Recognition of Environmental Changes and Risk Management \(micro-credential\)](#), June 2025; the programme is led by the Faculty of Economics and Business (EFRI), with the Faculty of Physics (FIZRI) acting as a co-provider,
- [Advanced Laboratory Testing of Materials](#), led by the University of Rijeka Centre for Micro- and Nanosciences and Technologies; some members of the Faculty of Physics academic staff serve as course leaders within the programme.

2.1. The intended learning outcomes at the level of a study programme are aligned with the competences a student should gain by completing the study programme, as well as with the CroQF level (ESG 1.2.).

2.1.1. *The intended learning outcomes of the study programmes and all the elements of the study programmes (courses, modules, practicals, seminars, student practice, projects, etc.) are clearly defined and examples of good practice are used to define the intended learning outcomes (e.g. ECTS Users' Guide, 2015).*

The learning outcomes of FIZRI study programmes are clearly defined at all levels: from the level of the study programme, through the outcomes of individual courses, to the outcomes of practicums, laboratory exercises, seminars, professional and methodological practice, as well as final and master's theses. All learning outcomes form an integral part of the study programmes and are publicly available on the [Faculty's website](#).

In formulating the learning outcomes, guidelines and examples of good practice from the [ECTS Users' Guide \(2015\)](#), as well as national and European qualification frameworks (CroQF/EQF), were used. The learning outcomes at the level of study programmes are elaborated in detail within the outcomes of each course and are clearly presented in tables that link course outcomes with programme outcomes (see Appendix 2, Table 2.1.). These tables show a gradual increase in complexity, from acquiring fundamental knowledge and basic experimental and computational skills at the undergraduate level, to advanced specialist knowledge, modelling, complex experimental procedures, critical analysis, and independent research work at the graduate level, and finally to original scientific contribution and competencies at the doctoral level.

Up to 2024, numerous content-related and structural upgrades of the study programmes were carried out, which also included revisions of learning outcomes. In the past five years, five programme revisions have been implemented: two major ones (university graduate programmes in Physics and Mathematics, and Physics and Computer Science, with external reviews in 2023) and three minor revisions (university undergraduate and graduate programmes in Physics, and the graduate programme in Engineering and Physics of Materials, implemented in 2022). These revisions particularly considered recommendations for modernising course content and teaching methodology, as well as labour market requirements. In this context, several new specialised study components were developed, for example, content in computational physics, modern experiments, data analysis, and environmental physics, which were integrated into the learning outcomes of relevant courses (example: [Amendments to the graduate study programme in Physics, April 2022](#)).

Special attention was given to aligning learning outcomes with student workload. Regular revisions of ECTS credits ensured that student workload is appropriate and consistent, based on the principle that 30 hours of student work correspond to one ECTS credit. This resulted in clearer and more realistic expectations regarding the achievement of individual learning outcomes (example: [Amendments to the graduate study programme in Physics and Mathematics, May 2023](#)). In this context, the number of ECTS credits allocated to the Master's Thesis was increased to further encourage cooperation with schools (professional bases, training classrooms, etc.) and to enable higher-quality research orientation in the field of subject-specific education, with the aim of strengthening competencies and preparedness for professional work.

The quality of learning outcomes is monitored through student evaluations, analysis of success and pass rates, feedback from teachers and mentors, results of formal and informal discussions with students, monitoring of workload and adequacy of course content, as well as data on study completion rates. The results of these analyses are continuously used to improve the clarity, feasibility, and relevance of learning outcomes. For example, based on

student feedback, the number of ECTS credits was increased in courses where a disproportionate workload was identified relative to the defined learning outcomes.

The Faculty pays particular attention to constructive alignment, which is an integral part of every course implementation plan. Teaching content, teaching methods, and assessment methods are directly linked to learning outcomes, ensuring that all outcomes can be systematically and consistently monitored and objectively evaluated. This approach has been strengthened through additional teacher training on writing and aligning learning outcomes and on modern teaching methods ([Invitation to the constructive alignment workshop](#), [Constructive alignment workshop](#)).

Learning outcomes and course implementation plans are publicly available on the Faculty's website and through the ISVU system, providing insight into objectives, content, and assessment methods at all levels of study, including practicums, exercises, seminars, and final theses. The achievement of advanced experimental and research outcomes is enabled by modern laboratories and infrastructure acquired through EU and national projects. These conditions allow students to engage in research work and develop specialised practical skills ([Repository of the Faculty of Physics, University of Rijeka – final and master's theses](#)). Additionally, student mobility (e.g., Erasmus+ and YUFE programmes) and international cooperation confirm the alignment of learning outcomes with European standards and facilitate the recognition of acquired outcomes and ECTS credits.

2.1.2. The intended learning outcomes are aligned with the mission and objectives of the higher education institution.

The intended learning outcomes of all study programmes of the Faculty of Physics are fully aligned with the mission of the Faculty and the strategic objectives of the University of Rijeka. The mission emphasises pushing the boundaries of science and education through excellence in scientific research, as well as educating professionals capable of working in a wide range of economic and educational environments. The learning outcomes reflect this objective through the development of fundamental and advanced competences in physics, the acquisition of scientific research methods, and the preparation of students to address complex societal, technological and scientific challenges. These priorities are operationalised through clearly defined and publicly available learning outcomes at both programme and course levels, with consistent application of the [ECTS Users' Guide \(2015\)](#), the Dublin Descriptors, and the [CroQF/EQF](#) frameworks.

The alignment between programme learning outcomes and course learning outcomes is documented in internal and national information systems, ensuring transparent vertical and horizontal coherence of the curriculum with the institutional mission. At the same time, learning outcomes and [course implementation plans](#) are publicly available on the Faculty's website and through the ISVU system.

At the undergraduate level, learning outcomes focus on fundamental knowledge in physics and mathematics, the development of experimental and computational skills, and the solution of physical problems using modern methods, thereby directly supporting the University's strategic policies in the areas of open education and strengthening STEM disciplines. Student workload and ECTS credits are regularly aligned with the recommendations of the ECTS Users' Guide (typically 30 hours of student workload per 1 ECTS credit) and with findings from the quality assurance system, in order to ensure that learning outcomes remain achievable and measurable.

At the graduate level, learning outcomes foster advanced specialist competences, as well as teaching and methodological competences in teacher education tracks. The programmes include elective elements of professional practice with clearly defined learning outcomes and mentoring support, and they systematically expand cooperation with industrial, educational and healthcare environments, in line with the Faculty's objectives of enhancing practical competences, increasing the flexibility of study pathways (e.g. through micro-credentials), and promoting internationalisation (see Appendix 2, Table 2.1).

At the doctoral level, learning outcomes emphasise independence in research, original scientific contribution, international collaboration, and scientific communication, fully aligned with the objective of strengthening the University's research capacity and international visibility. The flexible structure of the programme, mentoring approach, and individualised selection of activities ensure that learning outcomes are achieved in direct connection with priority research areas and infrastructure, including modern laboratories and university HPC resources such as the Bura supercomputer.

In accordance with the vision of the Faculty as a modern institution oriented towards high-quality teaching, research excellence and the continuous development of study programmes, learning outcomes include the acquisition of practical and transferable skills, work in contemporary laboratories, and participation in research in fields such as advanced materials physics, environmental physics, medical physics and astrophysics. Furthermore, the learning outcomes support the Faculty's international dimension, including mobility, interdisciplinarity, and cooperation within the academic and research community.

In this way, the intended learning outcomes consistently follow the strategic objectives of the Faculty and ensure that students acquire competences aligned with its mission, vision and long-term development priorities.

2.1.3. The intended learning outcomes of the study programmes and all the elements of the study programmes are mutually aligned.

The intended learning outcomes of the study programmes of the Faculty of Physics, as well as the learning outcomes of all study elements, courses, laboratory and computer exercises, seminars, professional practice, and final and master's theses, are systematically, transparently, and formally aligned. A clear and formal connection has been established between course learning outcomes and the learning outcomes of the study programmes, as presented in the learning outcomes matrices (see Appendix 2, Table 2.1). These matrices precisely demonstrate the contribution of each course to the overall set of competencies that students are expected to acquire and enable effective monitoring of both vertical and horizontal alignment of content. This alignment is further confirmed through the mandatory recording of learning outcomes in the ISPIK system as part of external evaluation procedures, where the links between programme-level and course-level outcomes are clearly presented.

Vertical alignment is ensured through the gradual development of content and competencies. Horizontal alignment is achieved through coordination among teachers within the same year of study and through the integration of thematically related courses, thereby avoiding unnecessary content overlap and ensuring complementarity of teaching materials, methods, and activities. This approach is particularly evident in the alignment of mathematics, computing, and experimental courses, as well as in the coordination of student workload and course requirements.

All course implementation plans include constructive alignment tables that link learning outcomes with teaching methods and assessment forms. This ensures that teaching and assessment methods are directly connected to the intended outcomes and that their achievement can be reliably monitored. This approach has been further strengthened through university-level training on constructive alignment for teaching staff and through the implementation of systematic records of delivered teaching via the Teaching Portal since 2021/2022 ([example of one teacher's record for the academic year 2024/2025](#)), which provides a more detailed insight into the actual delivery of teaching activities and their alignment with planned outcomes.

2.1.4. The intended learning outcomes are used as a starting point for the development and revision of the study programme, the delivery of the study programme and the assessment and evaluation of the student's achievements. They are designed to allow students to progress through their studies without obstacles.

The intended learning outcomes at the Faculty of Physics represent a fundamental element in the planning, development, revision, and delivery of study programmes, as well as a key reference point for assessing and evaluating student achievement. They are designed to clearly follow the educational progression and to ensure smooth advancement of students through all levels of study, with consistent development of knowledge, skills, and competencies in accordance with the CROQF and European standards. In the processes of planning and revising study programmes, learning outcomes serve as the primary criterion for defining course content, selecting teaching methods, aligning student workload, and determining the sequence of learning. During the period 2021–2025, five formal revisions of study programmes were carried out, as described in more detail in Section 2.1.1.

Learning outcomes are systematically linked to curriculum elements through learning outcomes matrices that show the contribution of each course to the general outcomes of the study programme. This alignment is further operationalised in the [course implementation plans](#), where constructive alignment tables directly connect learning outcomes with teaching methods and assessment methods. Since the academic year 2021/2022, [mandatory recording of delivered teaching](#) through the [Teaching Portal](#) has been introduced, providing detailed insight into the alignment of course delivery with the intended outcomes.

In the process of assessing and evaluating student achievement, based on [university guidelines](#), learning outcomes serve as the reference basis for selecting appropriate forms of knowledge and skills assessment. Evaluation is carried out based on clearly defined criteria and includes written and oral examinations, mid-term tests, laboratory exercises, project assignments, seminar papers, and practical assessments, depending on the nature of the course. Owing to the exactness of physics and the structured nature of laboratory teaching, assessment methods allow for monitoring the achievement of each individual learning outcome, with clear feedback to students on their progress. Continuous assessment during the semester, which typically accounts for 50 – 70 % of the final grade, enables timely identification of difficulties and ensures steady student progression through the programme.

Learning outcomes are also actively used in annual analyses of student progression, pass rates, and overall performance. Results of student surveys (ISVU), workload analyses, pass rates, and student satisfaction serve as the basis for adjustments to course content, structure, and workload. Examples of such adjustments include revising ECTS values to ensure consistent application of the 30 hours = 1 ECTS rule, introducing new thematic units, and

strengthening the integration of theoretical and practical outcomes in laboratory and project-based courses (cf. Amendments and Supplements to Study Programmes in 2.2.3).

The system continuously monitors the achievement of learning outcomes and enables their adaptation. Through student evaluations, peer-review of teaching, performance analyses, and reports of the Committee for Quality Assurance and Enhancement, teachers and Programme Coordinators receive feedback that informs improvements to course implementation plans and the redefinition of outcomes where necessary. As a result, learning outcomes are not merely a declarative document but an operational tool that guides the development and modernisation of study programmes, structures teaching, ensures consistency in assessment, and enables a clearly organised, progressive, and achievable study pathway.

2.1.5. The intended learning outcomes of the study programmes are aligned with the descriptors of the relevant CroQF and EQF level. The qualifications gained upon completion of the study programmes are clearly described and presented.

The intended learning outcomes of the study programmes of the Faculty of Physics are fully aligned with the level descriptors of the Croatian Qualifications Framework (CROQF/CQF) and the European Qualifications Framework (EQF) for the respective levels at which the programmes are delivered. The learning outcomes of the undergraduate study programmes are aligned with CROQF/EQF level 6, those of the graduate study programmes with level 7, and those of the doctoral study programme with level 8 (8.2). This alignment is clearly demonstrated in the [descriptions of the study programmes](#) and in the matrices linking programme learning outcomes with course learning outcomes, which illustrate the progression of competencies across all levels of study (Annex II., Table 2.1.).

At the undergraduate level, learning outcomes encompass fundamental knowledge of physics and mathematics, basic experimental and computational skills, and the ability to apply the acquired knowledge in standard situations, in line with CROQF level 6. An example of good practice is the systematic alignment of student workload with the ECTS principle of 30 hours = 1 ECTS credit, including the adjustment of ECTS allocation for the course *Environmental Physics* following an analysis that revealed a higher actual student workload.

At the graduate level, learning outcomes build upon foundational competencies through the development of advanced theoretical, experimental and computational skills, independent modelling of complex physical systems, planning of experiments, and interpretation of results in new and complex contexts, corresponding to CROQF level 7. A highlighted example of good practice is the elective course [Professional Practice \(introduced in the academic year 2020/2021\)](#), which has so far been completed by 26 students and includes clearly defined practical learning outcomes, structured mentoring, and systematic evaluation.

The learning outcomes of the doctoral study programme in Physics are aligned with CROQF level 8.2 and EQF level 8, and include original scientific contribution, methodological excellence, a high degree of autonomy, and international research collaboration. Doctoral students achieve these learning outcomes through individualised research work, participation in international projects, and access to modern research infrastructure (e.g. the [Portfolio of the Doctoral Study Programme in Physics](#)). Study programme learning outcomes are aligned with labour market competence requirements through the results of the national project [FizKO](#) (22 March 2019 – 22 March 2022). Within the project, coordinated by the University of

Rijeka, Faculty of Physics, four occupational standards (Physics Engineer, Graduate Engineer of Computational Physics, Graduate Engineer of Environmental Physics, Medical Physicist) and three qualification standards (Bachelor of Physics, Master of Physics, Master of Research Physics) were developed in cooperation with employers. By the end of the project, two key guidelines were delivered and publicly published: one for more [transparent assessment of learning outcomes](#) and another for the [introduction of project-based learning](#), supported by a series of webinars and implementation materials for direct use in physics study programmes. Based on these standards, FIZRI systematically aligns its study programmes with registered CROQF qualifications.

The qualifications awarded upon completion of the study programmes are clearly described and publicly available in the official study programme descriptions, the ISVU information system, and on the websites of the Faculty and the University. The Diploma Supplement is issued in both [Croatian](#) and [English](#) and contains all key information on the level, content, purpose, and competencies of the qualification, ensuring full transparency and international recognition.

2.1.6. *The intended learning outcomes of the study programmes clearly reflect the competencies required for employment, education continuation, or other needs of the individual/society.*

The intended learning outcomes of the study programmes at the Faculty of Physics clearly reflect the competencies required for entry into the labour market, continuation of education, and the fulfilment of personal and societal needs. The learning outcomes are designed to encompass specialised physics competencies, advanced computational and experimental skills, analytical thinking, and generic competencies recognised as essential in the STEM field by employers and the education system.

At the undergraduate level, learning outcomes focus on fundamental knowledge of physics and mathematics, the development of basic experimental and computational skills, and the ability to solve standard physics problems. At the graduate level, learning outcomes are oriented towards the development of advanced specialist competencies in theoretical, experimental and computational physics, including independent modelling of complex systems, experiment planning, data analysis, and participation in research projects. Emphasis is placed on the elective course [Professional Practice](#), introduced in the academic year 2020/2021, which enables the acquisition of practical competencies in industry, education and research institutions. The learning outcomes of teacher-training study programmes are aligned with national occupational and qualification standards and include didactic and methodological competencies, digital teaching methods, and research-oriented teaching.

An example of good practice is the strong integration of digital competencies into the study programmes. Teaching incorporates a range of software tools for simulations and theoretical modelling of various physical processes, such as numerical codes for simulating high-energy atmospheric particle showers (CORSIKA), radiative transfer in stellar environments (Dusty), stellar interior structure (Tlusty), fitting of photoemission spectra (Unifit), simulations in natural and social sciences (epidemiological and economic models), as well as an instructional simulator of radio telescope operation. In addition, students acquire foundational knowledge of artificial intelligence applications in science through project-based assignments. In applying their theoretical knowledge, students use advanced programming tools, primarily scripting languages such as Python (in the Jupyter environment and via the

Anaconda distribution) and Mathematica, programming languages for numerical computation (FORTRAN and R), object-oriented programming languages such as C++ with numerous successfully implemented solutions and libraries, as well as graphical programming languages (LabVIEW).

Courses in which these tools are used include [Symbolic Programming](#), [Programming, Computational Physics](#), [Advanced Computational Physics](#), [Astronomy and Astrophysics I](#), [Astronomy and Astrophysics II](#), [Experimental Methods in Physics I](#), [Experimental Methods in Physics II](#), [Measurements in Physics](#), and [Advanced Laboratory Exercises](#). Furthermore, students with a strong aptitude for these skills and knowledge areas are offered the possibility to enrol in highly specialised Coursera courses as a substitute for attending and completing some of the above-mentioned elective courses at FIZRI (e.g. *Symbolic Programming*). This approach is aligned with employers' needs and the results of employer surveys conducted within the [FizKO project](#).

The learning outcomes of the doctoral study programme reflect the requirements of CROQF/EQF level 8 and include independent scientific research, development of original models, international collaboration, and responsible dissemination of research results. Doctoral students achieve these outcomes through work in state-of-the-art laboratories and the use of advanced research infrastructure, including the Prelog server and the Bura supercomputer.

The relevance of learning outcomes is further confirmed through systematic monitoring of the [employability](#) and career paths of FIZRI alumni. Career tracking is carried out through the University of Rijeka Alumni Network and the University Career Office within the University Counselling Centre, while additional information is obtained through direct contact with former students. FIZRI collects alumni contact information upon graduation and involves alumni in activities aimed at increasing the visibility of the FIZRI (e.g. [Alumni Visibility initiatives](#), [Alumni database](#)).

The learning outcomes of FIZRI study programmes reflect the competencies required for labour market integration and broader societal needs. Regional offices of the Croatian Employment Service have conducted analyses and forecasts of labour market demand and prepared [Recommendations for Education Policy and Scholarship Policy](#). Across almost the entire Republic of Croatia, including Primorje-Gorski Kotar County, physics study programmes are identified as educational programmes for which enrolment and scholarship support should be increased.

Employability data and alumni career paths confirm that learning outcomes correspond to labour market needs: graduates find employment in industry, information technology, education, research institutes, medical physics, and interdisciplinary fields related to data processing and modelling. A high proportion of graduates continuing their education at the doctoral level in Croatia and abroad (estimated at 20 %) further confirms the adequacy of the acquired competencies. The results of university-wide graduate satisfaction surveys indicate above-average satisfaction with preparedness for the labour market ([UNIRI Graduate Satisfaction Survey 2021–2022](#); [2024–2025](#)).

Collected data on student employability are systematically analysed, and the results of these analyses are used as a basis for planning revisions of study programmes ([Minutes of the Thematic Meeting of the Faculty Council, 22 November 2023](#)).

2.1.7. *The intended learning outcomes of the study programmes are comparable with the intended outcomes of comparable programmes in the Republic of Croatia and EU Member States.*

The intended learning outcomes of the study programmes at the Faculty of Physics are comparable to those of related programmes in the Republic of Croatia and EU member states, as demonstrated by multiple concrete indicators, formal mechanisms, and the results of external evaluations. In the processes of programme design and revision, the Faculty systematically benchmarks its physics programmes against those offered at the Universities of Zagreb, Split and Osijek. These analyses indicate full alignment regarding core physics domains, laboratory components, the level of mathematical and computational competencies, as well as the degree of student autonomy and responsibility. The project *Development of Physics Study Programmes through the Application of the CROQF – FizKO* developed occupational and qualification standards in cooperation with the Universities of Zagreb, Split and Osijek, thereby ensuring inter-institutional and national comparability of competencies and learning outcomes in physics. Student mobility between universities further confirms the comparability of learning outcomes, as it facilitates recognition of prior learning and smooth continuation of studies at another institution (e.g. [Recognition of Studies – Ljubljana](#); [Recognition of Studies – Zagreb](#)).

Alignment with European study programmes is further confirmed through the content and delivery of the programmes. The Faculty develops competencies that are standard in European physics programmes, including a strong experimental component (nine research laboratories and two departments), advanced computational methods (Python, C++, Mathematica, specialised simulation software), engagement in research projects, and the use of high-performance computing resources (the Prelog server and the Bura supercomputer). This infrastructure is comparable to that available at European universities and enables students to acquire competencies of an equivalent scope and level.

Additional evidence of alignment with European standards is provided by the Faculty's active participation in the YUFE alliance, within which five courses are delivered in an online format and students engage in mobility activities and earn ECTS credits that are fully recognised (e.g. [Learning Agreements](#); [Mobility 2023–2024](#)). Such participation is possible only where learning outcomes are compatible with those of partner universities across the EU.

In the field of teacher-training study programmes, learning outcomes are comparable with European educational standards through the inclusion of contemporary didactic approaches, research-oriented teaching, and digital teaching methods. Faculty staff regularly participate in international conferences such as the [GIREP-MPTL International Conference on Teaching and Learning Physics](#), enabling continuous benchmarking and alignment of learning outcomes with European trends in physics education.

Indicators of employability and student satisfaction further confirm the comparability of learning outcomes with European programmes. University-level analyses show that graduates of the Faculty of Physics report above-average satisfaction with their studies and competitiveness on the labour market, while a significant proportion continue their education in graduate and doctoral programmes within the EU (e.g. alumni communication with [FU Berlin](#), HR Radio Rijeka broadcasts; [Rakova djeca J.M.](#), [Rakova djeca M.B.](#)). This provides direct evidence of the compatibility and international relevance of the acquired competencies.

2.1.8. *The intended learning outcomes of the study programmes also include the development of generic (general/key/transferrable) and profession-specific competences.*

The intended learning outcomes of the study programmes at the Faculty of Physics clearly encompass both generic (transferable) and subject-specific competencies, as evidenced by official study programme descriptions and course implementation plans, in which competencies are systematically identified and linked to the learning outcomes of individual courses and study programmes. In accordance with the regulations of the University of Rijeka, the alignment of learning outcomes with CROQF/EQF level descriptors is documented through [Forms](#) TP-1 (proposal of a new study programme) and TP-2 (proposal of amendments and supplements to an existing study programme), thereby confirming the representation of various categories of competencies, including knowledge, skills, autonomy, responsibility, communication, and the application of knowledge in problem-solving contexts.

The development of subject-specific competencies is particularly evident through the strong experimental and research components of the study programmes. Teaching is conducted in modern, well-equipped laboratories and facilities of the Faculty of Physics, including equipment acquired through EU funds and national scientific research projects, enabling students to acquire advanced experimental and analytical skills as well as practical competencies relevant to physics and related fields (e.g. [Measurements in Physics](#)).

Generic competencies are developed through a wide range of curricular activities, including seminar papers, oral presentations, team-based project assignments, and the preparation of undergraduate and graduate theses (e.g. [Seminar in Physics in English – video lectures](#)). These competencies are further strengthened through international student mobility within the Erasmus+ and YUFE programmes, which support the development of intercultural, communication, organisational and academic skills and confirm the transferability and recognition of competencies at the European level.

In addition to formal curricular mechanisms, the faculty fosters the development of generic competencies by engaging students in scientific, outreach and educational activities, such as workshops, conferences and events regularly organised by the FIZRI in cooperation with stakeholders of the University of Rijeka and the local community. Through these activities, students develop skills in science communication, work organisation, public speaking and teamwork.

2.1.9. *The intended learning outcomes of the study programmes also include raising ethical awareness, as well as the ability to reflect ethically and to apply ethical principles in decision-making related to professional issues, and the issues related to the profession, arising in a multicultural context.*

The study programmes of the Faculty of Physics systematically promote the development of ethical awareness, professional responsibility and academic integrity, in line with the *Code of Ethics for Students of the University of Rijeka*. All course implementation plans clearly state that students are expected to adhere to general standards of ethical and professional conduct and to act in accordance with the [Code of Ethics](#) and the [Regulations on Disciplinary Responsibility of the University of Rijeka](#). This includes responsible behaviour in

both teaching and research contexts, respect for human rights, non-discrimination, and appreciation of diversity.

Ethical competencies are developed through teaching, project-based assignments, teamwork and mentoring relationships, whereby students are introduced to fundamental principles of academic integrity, objectivity, proper use of sources, and professional standards of scientific work. Ethical issues are integrated into various courses through discussions, analyses of real-life situations, case studies and reflective assignments, and in some courses they also form part of the assessment criteria, for example in the evaluation of responsibility, autonomy and the management of information.

Special attention is given to ethical conduct in diverse, interdisciplinary and international environments. The Faculty employs teaching staff from different academic and cultural backgrounds, and students participate in international mobility and cooperation programmes (Erasmus+ and YUFE), which contribute to the development of tolerance, intercultural understanding and the ability to make ethically grounded decisions in multicultural teams. In this way, ethical competencies are not taught solely at a theoretical level but are embedded in everyday academic practice.

In the context of digital transformation and in accordance with the [University of Rijeka Policy on the Use of Artificial Intelligence Tools](#) and the [Guidelines for the Responsible Use of Artificial Intelligence](#), the Faculty places particular emphasis on the responsible use of technology, including artificial intelligence tools. [Course implementation plans](#) clearly specify that any use of ChatGPT or other AI tools without clear and unambiguous attribution constitutes a serious breach of academic integrity and intellectual property rights and represents an offence sanctioned under the Regulations on Student Disciplinary Responsibility. Students are required to distinguish their own work from AI-generated content, to properly acknowledge the use of tools and sources, and to comply with intellectual property regulations. Written assignments are subject to originality checks (e.g. plagiarism detection tools such as Turnitin), and the results of these checks are used as integral evidence of the application of ethical standards in practice.

Examples of institutional inclusiveness at FIZRI include the employment of international staff, support for students from diverse socio-geographical backgrounds, and the systematic implementation of reasonable adjustments for students with disabilities or specific needs (e.g. [student L. Lulić, recipient of the Equal Opportunities Award in 2025](#)). FIZRI also operates in accordance with the [University of Rijeka Gender Equality Plan 2021–2025](#) and applied for the University Gender Equality Award in March 2023, thereby demonstrating institutional commitment to ethics, fairness and the creation of a supportive and inclusive academic environment for all members of the academic community.

2.2. The higher education institution determined the processes for planning and developing new study programmes, and for monitoring and periodically revising the existing ones. This ensures that the study programme is up-to-date, and that the content of study programmes is aligned with the latest scientific / artistic / professional knowledge (ESG 1.2. i 1.9.).

- 2.2.1. *Processes for the development of new study programmes, and continuous improvement of the existing ones are clearly defined, they involve internal and external stakeholders, they are consistently implemented, and undergo a formal approval process within the higher education institution.*

The Faculty of Physics has clearly defined, transparent and formalised procedures for the development of new study programmes and the continuous enhancement of existing ones, aligned with the regulations of the University of Rijeka and the Faculty, as well as with national legislation and the ESG principles. At the University level, updated quality assurance mechanisms were established in 2023 (the [Ordinance on Quality Assurance in the Evaluation of Study Programmes](#) and the appointment of a new Committee for the Evaluation of Study Programmes), thereby further standardising the process from the initial idea to programme adoption. In addition, in 2024 the University of Rijeka Committee prepared the [Guidelines for the Implementation of Quality Assurance Procedures in the Evaluation of Study Programmes at the University of Rijeka](#), a [Learning Outcomes Mapping Table](#), and published a [Frequently Asked Questions](#) document.

The procedures include the preparation of documentation within working groups, discussion and adoption by the Faculty Council, as well as university-level evaluation and decisions by the Senate. In the case of new study programmes or substantial modifications, an initial accreditation procedure is conducted. In accordance with the [Guidelines](#), the Faculty of Physics has developed an internal procedure for the evaluation of amendments to existing study programmes that are not subject to initial accreditation and are not related to changes in learning outcomes; such amendments are decided upon by the professional body. Within this procedure, course coordinators submit [Proposals for Amendments to Courses](#) to the Quality Assurance and Enhancement Committee; the proposals are consolidated and subsequently forwarded by the Committee to the Faculty Council for discussion and a decision on their adoption. Through this process, in 2024 the Faculty of Physics implemented amendments to the undergraduate study programme in Physics, the graduate study programme in Physics, and the graduate study programme in Engineering and Physics of Materials.

Continuous monitoring and revision of study programmes is carried out through regular internal quality assurance mechanisms and university-level internal evaluations conducted in three-year cycles. The analyses include student evaluations (ISVU), results of graduate satisfaction surveys (with multi-year trends above the University average), data on course completion and student progression, alignment of ECTS credits with actual student workload (the rule of 30 hours = 1 ECTS credit), as well as recommendations of relevant bodies and changes in regulations. Based on these insights, the Quality Assurance and Enhancement Committee of the Faculty of Physics proposes adjustments to content, learning outcomes, workload and modes of delivery, while the Management and the Faculty Council adopt decisions and, where required, forward them into the university-level procedure.

In the period 2021–2025, the FIZRI implemented eight amendments to study programmes, two of which were of a larger scope (exceeding 20 %). A micro-credential entitled [Recognition of Environmental Changes and Risk Management](#) was introduced (also accredited as a lifelong learning programme in 2025), and ECTS workloads were revised and aligned with the actual student workload (for example, adjustments to ECTS credits in

Environmental Physics or the *Master's Thesis* component in teacher education graduate programmes).

The processes involve both internal and external stakeholders. In addition to the Management, academic staff and students, the [Quality Assurance and Enhancement Committee](#) includes a representative of associate staff as well as an external stakeholder/alumnus from professional practice, thus systematically ensuring an external perspective. The faculty has actively cooperated with employers and partners through the national FizKO project (employer surveys, development of four occupational standards and three qualification standards), and development planning also takes into account the recommendations of the Croatian Employment Service (CES), which for Primorje-Gorski Kotar County and the wider area of the Republic of Croatia emphasise the need to increase enrolment in physics and related STEM qualifications. These inputs are used as relevance criteria and as a basis for substantive and structural changes to study programmes.

The entire process is documented and transparent: study programmes, amendments, syllabi and key regulations are publicly available on the [FIZRI website \(Study Programmes, Education\)](#).

2.2.2. *The key indicators for monitoring the quality of study delivery and the methods of gathering and analysing the necessary information resulting in reports with proposals for improvement of the programme have been defined. In order to create an effective learning environment and to support the students, there is an evaluation of the students' workload, progression, pass rates and completion of studies; as well as the effectiveness of student evaluation processes; the students' expectations, needs and satisfaction with the programmes, and the learning environment and fitness for purpose of the programme support services.*

The Faculty of Physics implements a clearly defined, systematic and multi-level approach to monitoring the quality of the delivery of study programmes, fully aligned with the quality assurance system of the University of Rijeka. The system is based on predefined quality indicators covering student workload, progression, pass rates and completion, the effectiveness of evaluation procedures, student satisfaction, and the quality of the learning environment and support services. Owing to the relatively small number of students, the faculty can apply a highly individualised approach, which has proven to be one of its key strengths. Prior to online enrolment into higher years of study, each student participates in an individual consultation with the Vice-Dean and the professional advisor, during which the student's interests, capacities and study plan are discussed ([Enrollment in higher years of undergraduate and graduate studies in the academic year 2025/2026](#)). This approach supports students in course selection and the design of individual study pathways and has resulted in documented cases of accelerated study and adaptations for [student athletes](#), in accordance with university regulations. Each study programme also has a Programme Coordinator whom students may contact at any time, and at the graduate level flexibility is ensured in the selection of courses across specialisations, including the option to enrol in joint courses from the UNIRI or YUFE offer. In certain cases, students are also allowed to change [study module](#).

The key instrument for monitoring quality is the ISVU student survey system, which is conducted after each semester for all courses. Course ratings, student comments, perceptions of workload and clarity of requirements are analysed, and the results are discussed at

meetings of the Quality Assurance and Enhancement Committee, the Faculty Management and the Faculty Council. The results are available to academic staff via the Teaching Staff Portal, with a particular emphasis on the implementation of corrective measures where outcomes deviate from the expected standards. Although the number of respondents among graduating students is limited, the University regularly conducts graduate satisfaction surveys, in which the faculty consistently achieves favourable results (University of Rijeka [Graduate Satisfaction Survey 2021–2022](#); [2024–2025](#)). The Quality Assurance and Enhancement Committee retrieves the raw survey data for detailed analysis and seeks to consider all constructive feedback.

During the winter semester of the academic year 2022/2023, an analysis of the results of student evaluations of teaching staff (ISVU surveys) for the academic years 2020/2021 and 2021/2022 was conducted ([Minutes of the Quality Assurance and Enhancement Committee, 2 March 2023, Item 6](#)). For two teaching staff members, the cumulative results across the two academic years revealed a significant number of survey items with scores below 3.00, albeit based on a very small number of respondents (fewer than five students). Given the small sample size and the low response rate, the academic staff concerned were not required to complete a formal self-evaluation; instead, an oral discussion was conducted. Further information on the implementation of self-evaluation procedures is provided in Subchapter 3.1.5.

The Quality Assurance and Enhancement Committee proposes candidates for the Teaching Excellence Award, in both teaching and associate positions, based on a comprehensive analysis of ISVU survey results and student comments across all courses and all teaching staff, as well as on additional University-level criteria ([Minutes of the Quality Assurance and Enhancement Committee, 29 March 2021, Item 7](#); [31 March 2022, Item 4](#); [3 April 2023, Item 2](#)). These proposals are adopted by the Faculty Council of the Faculty of Physics. Further details on the procedure for selecting candidates for the Teaching Excellence Award are provided in Subchapter 4.2.6.

The quality of study programmes is also monitored through statistical indicators such as course pass rates, the number of examination attempts, grade distributions, time required to complete studies, cohort trends, achievement of 60 ECTS credits in the first year, and indicators of student withdrawal and reorientation. Completion analyses for the period from 2009/2010 to 2023/2024 indicate that 80 % of students in graduate programmes successfully complete their studies, with a very low dropout rate, while completion rates at the undergraduate level during the same period are approximately 41 %. Challenges at the undergraduate level are addressed through additional preparatory content and course-level adjustments. Completion rates by study programme for the period 2014/2015–2023/2024 are presented in Appendix 3, Table 3.4.

Quantitative data are complemented by qualitative [student feedback](#), including meetings with the Student Council, focus groups, thematic discussions with first-year students, surveys on motivation and expectations, and feedback from students who have discontinued their studies. Attention is devoted to vulnerable and underrepresented student groups, through individual adjustments and cooperation with the University Counselling Centre. Furthermore, due to the specific context in which the faculty must coordinate timetables with several other University constituents, it has become established practice to provide maximum flexibility during the first week of teaching, with schedules adapted to students' individual needs, study pace and chosen specialisations.

2.2.3. *Changes to study programmes and current versions of study programmes have been recorded.*

The Faculty of Physics maintains a systematic, transparent and consistently documented record of all amendments to study programmes and ensures that the current, consolidated versions of programmes are publicly published and easily accessible on the [faculty's website](#). All amendments are implemented in accordance with the applicable regulations of the University of Rijeka and the Faculty's internal acts, including the Ordinances on Studies and the Quality Assurance System, as well as the University [Ordinance on Quality Assurance in the Evaluation of Study Programmes](#) adopted in 2023.

All amendments to study programmes are formally documented through decisions of the Faculty Council and the Quality Assurance and Enhancement Committee, accompanied by corresponding documentation including proposals for amendments, justifications, analyses of student workload and learning outcome alignment, and decisions of the competent bodies. The faculty maintains a comprehensive archive of all previous versions of study programmes, thereby ensuring full traceability of amendments (date, content and rationale for change).

In the period 2021–2025, a total of eight amendments to study programmes were recorded, two of which — *Physics and Mathematics* and *Physics and Computer Science* — were extensive (exceeding 20% of programme content) and therefore underwent a full university-level approval procedure, including peer review. All current versions of the programmes are publicly available in consolidated form and include a detailed description of the programme structure, a list of courses with ECTS credits, learning outcomes, teaching and assessment methods, required literature, and enrolment requirements:

- Undergraduate Programme in Physics: [Amendments 2024](#); [Amendments 2022](#)
- Graduate Programme in Physics: [Amendments 2024](#); [Amendments 2022](#)
- Graduate Programme in Engineering and Physics of Materials: [Amendments 2024](#); [Amendments 2022](#)
- Graduate Programme in Physics and Mathematics: [Amendments 2023](#)
- Graduate Programme in Physics and Computer Science: [Amendments 2023](#)

The implemented amendments included alignment of learning outcomes with national qualification standards (FizKO project), adjustments to ECTS credits based on analyses of actual student workload, modernisation of course content, strengthening of computational and interdisciplinary competencies, and the implementation of micro-credentials. The amendments were also partly based on the results of student surveys and pass-rate analyses, for example in the adjustment of workload in the course *Environmental Physics*.

2.2.4. *Study programme content enables the achievement of the intended learning outcomes.*

The content of the study programmes of the Faculty of Physics is designed to consistently enable the achievement of the intended learning outcomes at all levels of study, with a clearly established link between programme-level learning outcomes and the learning outcomes of each individual course. The principles of constructive alignment are systematically applied at the faculty, and their implementation was further strengthened through a workshop on syllabus design and [constructive alignment](#) held in 2023. Following the development of a [Learning Outcomes Mapping Table](#) by the University committee,

programme learning outcomes were mapped to course learning outcomes, thereby further confirming the horizontal and vertical coherence of the curriculum.

The structure of the programmes is based on a logical progression from fundamental physics and mathematics courses towards advanced content, experimental methods, computational physics, modelling and interdisciplinary fields. Core physics disciplines, mechanics, electromagnetism, thermodynamics and statistical physics, quantum physics and electrodynamics, form the foundation upon which compulsory and elective courses in later years are built, including computational physics, numerical modelling, data analysis and advanced experimental techniques. This curriculum structure enables a gradual progression through levels 6–8 of the Croatian Qualifications Framework / European Qualifications Framework (CROQF/EQF), from understanding and application to analysis, evaluation and creation, supported by explicitly documented learning outcome alignment matrices.

The experimental and practical components of the programmes have been significantly strengthened over the past five-year period, in line with the recommendations of the previous reaccreditation. The faculty operates nine laboratories and has access to the Prelog computing resources and the Bura supercomputer, enabling students to develop practical, experimental and computational competencies under authentic working conditions. Targeted curricular changes were introduced to address previously identified gaps in practical and digital competencies, including the strengthening of computational modules, modernisation of laboratory exercises, the introduction of new experimental content, and an increased share of project-based assignments.

Programme content is aligned with realistic student workload. The faculty has conducted revisions of ECTS credits in accordance with the rule of 30 hours = 1 ECTS credit, with targeted adjustments where student feedback indicated imbalance, such as the increase in ECTS credits for the course *Environmental Physics*. Continuous assessment accounts for 50 – 70 % of the final grade and is directly linked to learning outcomes through mid-term exams, problem-solving and project assignments, laboratory notebooks, practical assessments, seminars, and written and oral examinations. Final and master's theses provide an integrative assessment of the achievement of programme learning outcomes, including theoretical, experimental and computational competencies, through a written thesis and public defence.

In the period 2021–2025, eight substantive amendments to study programmes were implemented, including two extensive amendments (>20%), through which course content was modernised and learning outcomes further specified. An elective course *Professional Practice* was introduced at the graduate level (from the academic year 2020/2021 onwards, with 26 students enrolled to date); micro-credential courses such as [Recognition of Environmental Changes and Risk Management](#) were integrated; and modules in computational physics, data analysis and experimental methods were strengthened. All changes were documented through formal procedures and publicly published syllabi and course descriptions.

Digitally supported learning is integrated into programme delivery through the Merlin and DELT systems, and the [quality of e-courses](#) is assessed in accordance with the University e-learning quality framework. In the academic year 2024/2025, 80 % of courses were evaluated, exceeding the University average and confirming that digital content is aligned with learning outcomes and methodologically enhanced.

The alignment of programme content and learning outcomes is continuously verified through ISVU student surveys, analyses of pass rates and completion rates, course coordinator reports, and discussions within the Quality Assurance and Enhancement Committee. The

findings are regularly translated into operational measures, including adjustments to content, teaching methods, workload and ECTS credits, strengthening of laboratory and project components, and modernisation of teaching equipment, ensuring that programme content remains relevant, up to date and focused on achieving the intended learning outcomes. Graduate student surveys ([2021–2022](#); [2024–2025](#)) confirm that the intended learning outcomes have been achieved, further demonstrating the effectiveness of the curriculum and the implemented enhancements.

2.2.5. *The content of study programmes follows the latest scientific / artistic and professional research in a given discipline, ensuring that the programmes are up to date and compatible with the changed needs of society and the students' needs and expectations.*

The content of the study programmes of the Faculty of Physics is aligned with the latest scientific knowledge, technological developments and societal needs, thereby ensuring their currency and relevance. The programmes cover key contemporary fields of physics, with course content directly reflecting the research activities of the teaching staff. Academic staff actively participate in national and international research projects (Appendix 3, Tables 5.6.) and continuously transfer research outcomes into teaching through regular updates of course content, literature and laboratory exercises, as well as through the supervision of [final and master's theses](#).

Graduate and doctoral studies are strongly integrated with the faculty's research activities. Students participate in scientific projects and work on current research problems, and their theses often result in scientific publications in international journals, which constitutes direct evidence of the alignment of study programmes with contemporary developments in science.

The modernity of programme content is further ensured through participation in national qualification development projects (e.g. FizKO and STEMp) and through the continuous modernisation of experimental and computational infrastructure. Students make use of modern laboratory equipment and computing resources, including advanced methods of data processing and modelling, thereby acquiring competences relevant to contemporary scientific and professional environments.

Study programmes are also developed in line with the growth of interdisciplinary fields and labour market needs, considering [feedback from employers](#) and alumni. This ensures that programme content remains current, applicable and focused on the development of competences required in the scientific, educational and economic sectors.

2.2.6. *The content of study programmes allows students to acquire and perfect their digital skills, where applicable.*

The content of the study programmes of the Faculty of Physics enables the systematic acquisition and development of digital skills at all levels of study, in line with the requirements of contemporary physics and the labour market. Digital competences are integrated into courses ([Symbolic Programming](#); [Programming](#); [Computational Physics](#)), laboratory and computer-based exercises ([Experimental Methods in Physics I](#); [Experimental Methods in Physics II](#); [Instrumental Methods in Environmental Physics](#)), research projects, and final and Master's theses (e.g. [Angelo Zec – Master's thesis](#); [Lucija Črep – Master's thesis](#); [Karlo](#)

[Mrakovčić – Master’s thesis](#)). These activities encompass computational modelling, data processing, simulations, and work with digital and laboratory instrumentation.

The development of digital skills begins already in the first year through courses in programming and numerical methods and is further advanced through the application of standard and advanced tools (e.g., Python, C++, Mathematica) in courses in computational physics, modelling and experimental methods. Students also use specialised simulation tools and the faculty’s computing resources, including server systems and the *Bura* supercomputer, particularly at the graduate and doctoral levels.

Laboratory teaching includes the use of digital instruments, data acquisition systems and computer-based data analysis, enabling students to develop practical digital competences in experimental work ([Instrumental Methods in Environmental Physics](#), [Laboratory Project](#), [Advanced Laboratory Project](#), [Measurements in Physics](#)). Digitally supported learning is implemented through e-learning and online collaboration systems, further supporting the development of digital literacy.

Students also develop generic digital competences, including information literacy, data management, the use of scientific databases, and digital communication ([Physics Seminar](#), [Physics Seminar in English](#), [Master’s Thesis Seminar](#)). At higher levels of study, digital skills are further enhanced through work on complex computational models, the analysis of large data sets, and the application of modern methods, including elements of artificial intelligence. Final and master’s theses regularly include digital components, confirming their full integration into the intended learning outcomes.

Within the Research and Development Project of the University of Rijeka in Education (UNIRI CLASS – Programme Line A2: *Digital Citizenship – Innovations in Teaching and Learning*), the project [The digital repository for physics and science teaching](#) was implemented in the previous period (2022–2023), led by I. Poljančić Beljan. The project outcome—a collection of digital teaching materials—represents an example of support for and student involvement in the acquisition and development of digital skills. The collection consists of a digital repository with 96 experiments for physics and science education, prepared in a multimedia and methodologically structured format. Video materials for the experiments were produced by students as part of two courses, *Methodological Practicum in Physics Teaching* and *Extracurricular Science and Mathematics Activities* at the Faculty of Teacher Education (with course coordinators from the Faculty of Physics). It is also important to note that one of the co-authors of the collection is student L. Sutlović. The rich digital content is intended for physics students and enables the application of innovative teaching methods in a virtual environment. A Digital Teaching [Handbook of Mathematical Methods in Mechanics](#) has also been created, developed by student A. Jularić as part of her master’s thesis ([Dabar – Digital Academic Archives and Repositories](#)).

2.2.7. The study programmes content ensures horizontal and vertical student mobility in the national and European education area.

The content of the study programmes of the Faculty of Physics is structured in accordance with the principles of the Bologna Process and the level descriptors of the Croatian Qualifications Framework / European Qualifications Framework (CROQF/EQF), thereby ensuring comparability and transferability of learning outcomes as the basis for horizontal and vertical mobility (see Table 2.1.).

Vertical mobility is embedded in the structure of studies: the undergraduate programme provides a solid foundation for progression to the graduate level, while graduate programmes enable further specialisation and access to doctoral studies. The organisation of the final semester of graduate study further facilitates participation in mobility programmes or professional practice without delaying study progression. In addition to the *Master's Thesis* and the *Master's Thesis Seminar*, students enrol in only one elective course (e.g. [Curriculum with course list, semester 4](#)), which facilitates participation in international exchanges or professional practice and the acquisition of ECTS credits during mobility without postponing academic advancement. At the doctoral level, the programme is individualised and oriented towards international scientific collaboration, thereby extending vertical mobility into the research environment.

Horizontal mobility is enabled through elective options, modularity and clearly defined procedures for the recognition of prior learning, including the transition from course-level recognition to recognition based on learning outcomes. Recognition procedures are carried out through the ISVU system and the relevant documentation (e.g. [Decision on Recognition of Prior Learning](#)). In the period 2019/2020 – 2023/2024, a total of 19 recognition procedures were recorded, along with continuous enrolment of students from other higher education institutions. Through the University Mobility Programme, in the period from the academic year 2021/2022 to 2025/2026, ISVU records show eight outgoing and three incoming mobilities. These refer to enrolment in courses offered by other constituents of the University of Rijeka, which can be recognised as elective courses within the students' enrolled study programme.

International mobility is implemented through programmes such as Erasmus+ and YUFE, supported by standardised procedures (Learning Agreements) and institutional support. In the reported period, six outgoing mobilities were realised (see Table 3.5.). The faculty also offers five courses delivered online within the YUFE network, which further facilitates recognition of learning outcomes and the combination of study abroad with progression in the home programme. In addition, in 2024 the faculty organised a study visit to CERN (with accommodation costs covered), as a form of short-term international academic mobility and professional development for students, thereby further strengthening the international dimension of studies (see Table 3.5.).

Mobility is further supported through digitally assisted teaching and flexible modes of delivery, which reduce organisational barriers and facilitate the recognition of learning outcomes.

The faculty systematically informs and advises students on mobility opportunities (through appointed Erasmus and YUFE coordinators and the Merlin course *Referada* containing all relevant information). Administrative and academic procedures, from course selection and learning outcome alignment to formal recognition of ECTS credits, are conducted centrally and without delay.

2.2.8. It is ensured that the ECTS points are aligned with the actual student workload.

The Faculty of Physics systematically ensures that the ECTS credits awarded across all study programmes correspond to the actual student workload, fully in line with the principles of the Bologna Process, the standards of the University of Rijeka, and European guidelines for outcome-based learning. All study programmes are organised so that 60 ECTS credits correspond to 1,800 hours of student workload per academic year, while the allocation of

ECTS credits at the level of individual courses is based on an estimation of the time required to achieve the intended learning outcomes, as clearly stated in syllabi and course descriptions. The introduction, monitoring and adjustment of ECTS credits form an integral part of the formal quality assurance mechanisms of both the Faculty and the University, including the Quality Enhancement Action Plan and the annual reports of the Quality Assurance and Enhancement Committee.

Alignment between actual and planned student workload is monitored through several interconnected procedures. The most important instrument consists of anonymous ISVU student surveys, conducted after each semester for all courses, in which students directly assess whether teaching requirements, workload and the volume of assignments are aligned with the awarded ECTS credits. Analysis of available longitudinal data shows that students rate the alignment between ECTS credits and workload very highly, with average scores above 4.0 in the areas of material availability and ECTS-related workload. This is consistently reflected in student survey results and graduate satisfaction reports.

In addition to student surveys, the faculty conducts targeted analyses of student workload based on data on pass rates, the number of exam attempts, the time required to complete demanding courses, and cohort indicators. Such analyses have led to several ECTS adjustments, particularly in programmes where students and course coordinators identified imbalances in workload. A representative example is the course *Environmental Physics*, for which — based on student feedback and analyses conducted by the Quality Assurance and Enhancement Committee — the number of ECTS credits was increased to better reflect the actual workload and level of complexity ([Amendments 2022/2023](#)). Similar adjustments were implemented in other courses during the period 2019–2024, in accordance with the rule of 30 hours = 1 ECTS credit and University recommendations.

Corrective measures are introduced following discussions within the Quality Assurance and Enhancement Committee, consultations with students, and proposals submitted by teaching staff. The results of analyses and corresponding recommendations are regularly presented to the Faculty Council. In its annual reports, the Quality Assurance and Enhancement Committee systematically analyses University-level and student-generated data, including detailed survey comments and comparisons across academic years, and proposes programme amendments where necessary. This approach ensures that ECTS credits remain realistically aligned with student workload and that study programmes are continuously enhanced. The results of graduate satisfaction surveys have been discussed at meetings of the Quality Assurance and Enhancement Committee (e.g. [Minutes of the Committee dated 31 March 2022, Item 5](#); [2 March 2023, Item 6](#)) and at sessions of the Faculty Council (23 March 2022; 24 January 2024).

Students are actively involved in this process through participation in ISVU surveys, meetings with the Student Council, consultations with programme coordinators during enrolment, and through the participation of student representatives in the Quality Assurance and Enhancement Committee and the Faculty Council. This participatory structure ensures that adjustments are grounded in students' actual experiences and feedback, which the faculty consistently emphasises in its plans and reports (cf. [meetings with students](#)).

Transparency of the system is further ensured through the availability of updated course descriptions, [course implementation plans and ECTS allocations on the faculty's website](#), within the ISVU system, and in official study programme documentation. Students have full insight into all requirements and workload expectations prior to the start of the

semester, and by comparing actual workload with planned expectations in final evaluations, they further contribute to the continuous improvement of study programmes.

2.3. Student practice is an integral part of study programmes, where applicable.

2.3.1. Student practice allows acquisition of practical skills, in line with the intended learning outcomes, where applicable.

Student practical training at the Faculty of Physics (FIZRI) is designed to enable students to acquire practical skills aligned with the intended learning outcomes, where such practice is applicable and professionally relevant. Practical training has traditionally been strongly integrated into teacher education programmes; however, in recent years, based on formal analyses, recommendations and substantive curriculum modernisation, it has been significantly expanded to research-oriented and engineering study programmes. In this way, the faculty increasingly emphasises the importance of practical work for all student profiles. In teacher education graduate programmes (*Physics and Mathematics*, *Physics and Computer Science*, and *Physics and Philosophy*), practical training has from the outset been embedded in the curricula through compulsory methodological courses: *Methodological Practice in Physics* (0L+75P+0S, 5 ECTS), *Methodological Practice in Mathematics I* (0L+60P+0S, 4 ECTS), *Methodological Practice in Mathematics II* (0L+60P+0S, 4 ECTS), *Methodological Practice in Informatics* (0L+60P+0S, 5 ECTS), and *School Practice in Philosophy* (0L+60P+0S, 3 ECTS; programme currently inactive). This practical training is conducted in accredited teaching practice schools, primary and secondary schools authorised by the Ministry of Science, Education and Youth. Under the guidance of mentors, students prepare lesson plans, teach classes, maintain reflective journals, analyse their teaching performance and develop methodological, communication and didactic competences essential for the teaching profession. This approach is fully aligned with competence standards developed within national projects and is supported by a monitoring system involving both school mentors and Faculty staff, who assess the achievement of practice-related learning outcomes.

From the academic year 2020/2021 onwards, the elective course [Professional Traineeship](#) (0L+150P+0S, 6 ECTS) has been introduced, making practical training accessible to students of the graduate programme in Physics. Students of the graduate programme in *Engineering and Physics of Materials* may also enrol in *Professional Practice* as an elective course, as the programme allows the enrolment of electives from other study programmes, subject to agreement with the Programme Coordinator and the ECTS Coordinator ([Graduate University Programme in Engineering and Physics of Materials](#)).

Practical training is carried out in institutions serving as approved professional bases, with which the faculty has established formal cooperation (regulated by the University of Rijeka [Ordinance on Practice Bases](#)). Students work on real laboratory and research tasks. Currently, FIZRI has cooperation agreements with ten different Croatian institutions and companies ([Cooperation Agreements/Contracts](#)) for students of engineering programmes, with the number of partner institutions continuously increasing in line with students' interests.

Since its introduction in the academic year 2020/2021, the course *Professional Practice* has been taken by 26 students.

Practical skills are not limited to formal practice placements; they are integrated across many courses in all FIZRI study programmes. Practical and research-based teaching is

conducted in nine specialised laboratories equipped with modern instrumentation, which is actively used in research activities. The faculty continuously invests in laboratory equipment through EU-funded projects as well as University and Ministry of Science, Education and Youth funding schemes for equipment renewal and modernisation (see [Teaching Equipment Procurement 2018–2025](#)), thereby ensuring high-quality experimental teaching. This includes courses such as *Laboratory Project*, *Advanced Laboratory Exercises*, *Experimental Methods in Physics I*, *Experimental Methods in Physics II*, *Instrumental Methods in Environmental Physics*, *Measurements in Physics* and *Astrophysics Practicum*.

Practical work is further strongly emphasised through the computational and numerical components of the curricula—from programming and numerical simulations to the use of the *Prelog* computing servers and the *Bura* supercomputer, both of which are extensively used in final and master's theses. Through this, students acquire digital and computational skills essential for modern physics, data analysis, industrial modelling and analytical professions.

The majority of final and master's theses are carried out in Faculty laboratories or partner institutions and include substantial practical and research components, such as experiments, measurements, numerical modelling or project-based work. In this way, the faculty ensures that final and master's theses are not merely theoretical documents, but projects derived from current research activities and real professional needs.

A significant proportion of the learning outcomes of the study programmes—particularly at the graduate and doctoral levels—is inherently oriented towards the acquisition of practical competences, reflecting the nature of physics as an experimental and research-driven discipline. Throughout their studies, students regularly work with advanced experimental equipment and technologies, including laser and spectroscopic systems, material characterisation instruments, and tools for micro- and nanoscience. This enables the development of skills in independent measurement, data processing, result analysis and the use of specialised computational tools. Furthermore, specific study tracks, such as solid-state physics, astrophysics, particle physics, and physics and environmental science, further deepen specialised practical competences related to experimental work, large-scale data analysis or the application of physical methods in materials and environmental research. This educational approach also naturally incorporates student research within projects, collaboration with mentors, and the preparation of professional and scientific reports, as well as—within teacher education tracks—the development of practical pedagogical skills, such as conducting demonstration experiments and applying teaching methods in the classroom.

In this context, particular mention should be made of the project [The digital repository for physics and science teaching](#), implemented within the UNIRI CLASS programme (2022–2023). The collection represents a valuable example of the development of students' digital and practical skills: it comprises a repository of 96 multimedia- and methodologically prepared experiments for physics and science teaching. The video materials were produced by students within the courses *Methodological Practicum in Physics Teaching* and *Extracurricular Science and Mathematics Activities*, and one of the co-authors of the collection is student L. Sutlović. This digital resource further strengthens the competences of physics students and enables the application of innovative teaching methods in a virtual learning environment.

All the above confirms that, through the intended learning outcomes of the study programmes, students are systematically prepared for practical work in research, laboratory, industrial or educational contexts, even where this is not always explicitly highlighted in individual course syllabi.

2.3.2. *Student practice is conducted systematically and responsibly.*

Student practical training is implemented in a systematic, clearly structured and responsible manner, within the framework of appropriate courses of the study programmes. Course coordinators responsible for methodological practice courses prepare [syllabi and delivery plans](#) based on the official course descriptions (e.g. [Syllabus for Methodological Practice in Physics 2024](#)). These documents specify, inter alia, the intended learning outcomes related to student practice and provide a detailed assessment framework. In accordance with the approved syllabi and delivery plans, and with the regulations governing training schools, work plans are also prepared for mentors appointed by the Ministry of Science, Education and Youth. Based on certified [records of teaching hours delivered](#), mentors receive appropriate financial [compensation](#). Students keep Practice Diaries using a prescribed [template](#), within which methodological practice is evaluated both by the students and by the mentors.

Amendments to teacher education graduate study programmes were implemented in [2023](#). In order to better align with student workload and to increase opportunities for acquiring professional competences aimed at enhanced employability, the number of ECTS credits for the course *Methodological Practice in Physics* was increased from 4 to 5 ECTS, alongside an increase in contact hours (from 0L+45P+0S to 0L+75P+0S). These amendments are consistent with the relevant section of the Quality Enhancement Action Plan adopted in the second cycle of the reaccreditation of the Faculty of Physics for the period 2021–2026 ([Action Plan Second Reaccreditation Cycle.pdf](#)). This part of the Action Plan focuses on study programmes and is based on recommendations to strengthen transferable skills through their integration into a larger number of courses and to expand and reinforce the acquisition of research experience within final and master's theses.

The course [Professional Traineeship](#) also includes clearly defined learning outcomes and student obligations, as well as a structured student assessment procedure. The organisation of professional practice, student obligations, reporting requirements and related procedures are regulated by the [Ordinance on Professional Practice in the Graduate Programme in Physics](#) of FIZRI. Students are required to keep a *Professional Practice Diary* in the form of an e-portfolio ([sample available](#)) and to complete a [Professional Practice Satisfaction Questionnaire](#) upon completion. Mentors are required to guide and evaluate student work and to issue formal confirmation of completed professional practice using the prescribed form. Students may select an organisation from the list of approved professional bases of the faculty or, with the consent of the course coordinator, propose another suitable organisation. Professional practice may also be carried out during the summer months, allowing for greater temporal flexibility.

All documents relevant to student practice are available on the Merlin platform within the corresponding e-courses. The coordinator of the *Professional Practice* e-course grants access to students, coordinators of study tracks within the graduate programme in Physics, and mentors and coordinators, once the delivery plan and programme have been agreed. Quality monitoring ensuring the achievement of intended knowledge, skills and competences is also embedded within the established quality assurance system of FIZRI.

Operationally, practice begins with the preparation of an individual practice plan: the student, the mentor from the host organisation, and the practice coordinator jointly define objectives, intended learning outcomes, activities, duration and assessment methods, ensuring constructive alignment (outcomes–activities–assessment). This approach was

further strengthened by Faculty [training on syllabus design](#) conducted in 2023. During the practice period, students engage in activities appropriate to the work environment: handling instruments and data acquisition systems, performing measurements and procedure validation, conducting numerical simulations, processing and interpreting data, participating in projects, and preparing professional or research reports; in school settings, activities include lesson planning and delivery, classroom observation, reflection, and familiarisation with pedagogical and didactic standards. All activities are carried out in compliance with safety protocols, academic integrity principles and the ethical guidelines of the University.

Documentation and assessment of practice are multi-layered: students maintain a practice diary and submit a final report describing tasks performed, competences acquired and proposals for improvement; the mentor from the host organisation confirms completion and fills in an evaluation form; and the final grade is awarded by the practice coordinator after reviewing the documentation and conducting an interview with the student. In teacher training schools, the roles and responsibilities of mentors, as well as supervision procedures, are clearly prescribed, and student performance is also monitored by Faculty mentor-teachers. The implementation of professional practice follows a clearly defined workflow: introductory briefing, selection of a host organisation from the list of partner institutions (with the possibility of proposing an alternative organisation subject to approval), definition of objectives and intended outcomes, mentoring activities at the host institution, maintenance of the practice diary, and submission of a final report. Evaluation is carried out by the host institution mentor (confirmation and assessment of engagement, professionalism and technical skills), and the course is assessed on a pass/fail basis only.

For sustainable and responsible implementation, practice makes use of Faculty resources (nine laboratories, the *Prelog* computing resources and the *Bura* supercomputer), as well as the University's digital infrastructure (Merlin/e-learning) for preparation, communication and document submission. The quality of the e-learning environment and digitally supported teaching is assessed according to the University [Framework for the Development and Evaluation of E-Course Quality](#) (with 80 % of courses evaluated in the academic year 2024/2025), which facilitates logistics and monitoring of practice activities.

In line with its development priorities, the Faculty further strengthens the practical component of non-teacher education programmes and expands the research-professional dimension of final and Master's theses (extended presence in laboratories and partner organisations, increased share of project-based work), alongside the continuous expansion of the partner institution base as a [permanent quality enhancement measure](#). This system ensures that practice is implemented consistently, transparently and in accordance with intended learning outcomes and quality assurance regulations. The quality system also encompasses feedback from all involved stakeholders. Upon completion of practice, students' complete evaluation surveys, mentors provide structured evaluations, and findings are aggregated and analysed at the level of the Quality Assurance and Enhancement Committee and the Faculty Council. Based on these analyses, adjustments are regularly implemented (e.g. workload adjustments, expansion of partner bases, refinement of learning outcomes and tasks). This very mechanism led to the introduction and expansion of professional practice within non-teacher education programmes and to stronger links with industry and the public sector. Unfortunately, the Faculty was unable to apply for several highly attractive calls related to the further development of professional practice at higher education institutions due to eligibility restrictions linked to the small number of enrolled students ([email – ESF project for the development of professional practice](#)).

2.3.3. Student practice forms a part of the study programme, and is organised outside the higher education institution, in cooperation with the industry, where applicable.

Student practical training forms an integral part of the study programmes, as outlined in Section 2.3.1.

Methodological practice courses within teacher education graduate programmes are organised in training schools, in accordance with the relevant regulations ([Ordinance on Training Schools in Primary Education](#) and [Ordinance on Training Schools in Secondary Education](#)). These regulations define the conditions, modes of operation, staffing requirements, procedures for establishing the network of training schools, and the roles and responsibilities of training schools. The training schools of FIZRI are primary and secondary schools in the city of Rijeka approved by the Ministry of Science, Education and Youth of the Republic of Croatia (see [Decision of the Ministry on the Designation of GAM as a Training School](#) and [Decision of the Ministry on the Designation of OŠNT as a Training School](#)). In these institutions, teacher education faculties/departments conduct methodological exercises, i.e. organise, professionally supervise and assess teaching practice and other forms of methodological training for students. This framework ensures the professional, methodological, pedagogical and psychological practical education and training of students for educational work.

In contrast to methodological practice, professional practice may be carried out in institutions, companies, associations and other legal entities in Croatia and/or abroad (so-called host organisations for professional practice), with which FIZRI has established cooperation agreements relating to the organisation of professional practice (e.g. [Cooperation Agreement between OFRI and IF](#), [OFRI and the Institute of Public Health of Primorje-Gorski Kotar County](#), [OFRI and Ruđer Bošković Institute](#), [OFRI and IND-EKO](#), [OIKON](#), [PRINTEC CROATIA](#), [Istrian University of Applied Sciences](#), [Academic Astronomical Society](#), [Festival Opatija](#), [Metalska jezgra Čakovec](#)), in accordance with the [Ordinance on Professional Practice in the Graduate Programme in Physics](#). Through professional practice, students' theoretical knowledge is complemented with practical knowledge and/or additional preparation for the master's thesis is provided, thereby enabling more effective achievement of study programme objectives and smoother integration into professional work.

Practice may also be carried out in an international environment through university mobility programmes ([Erasmus+ /YUFE](#)), using standardised Learning Agreement procedures and subsequent recognition of ECTS credits upon return. This is supported by established University procedures and the work of the Erasmus and YUFE mobility coordinators. In the period from the academic year 2020/2021 to 2024/2025, a total of six FIZRI students participated in outgoing mobility within these programmes, of whom two took part in Erasmus+ professional practice placements (Table 3.5.).

2.3.4. The higher education institution provides support to student practice mentors and organisations in which the students conduct student practice, through guidance programmes and/or training programmes for mentoring students during student practice.

The Faculty of Physics provides systematic and sustained support to supervisors of professional practice and to host organisations through clear documentation, pre-practice

orientation, continuous communication channels during implementation, and standardised evaluation procedures upon completion.

Support begins prior to students' placement at the host organisation. Both the student and the mentor are provided with the objectives of the practice and the intended learning outcomes, an outline of planned activities, the required form of record-keeping (practice diary), and final deliverables, along with designated contact points at the Faculty (the practice coordinator and administrative support). This documentary and procedural preparation is directly embedded in the delivery of the *Professional Practice* course and is underpinned by formal cooperation agreements with host organisations.

During the implementation of practice, mentors at host institutions have continuous support from Faculty teaching staff and practice coordinators. The practice coordinator regularly responds to queries, clarifies expectations and, where necessary, adjusts schedules and tasks to ensure constructive alignment between intended learning outcomes, actual activities and assessment criteria. The frequency and quality of communication are further facilitated using institutional e-learning tools (Merlin) and standardised communication channels that the faculty has systematically developed and evaluated over several years, enabling mentors' quick access to instructions, templates and relevant contact points.

At host institutions, the mentor monitors the student's specific tasks and confirms their completion through signatures and records, while the student maintains a practice diary and prepares a final report. Upon completion, the faculty practice coordinator reviews the documentation (diary, report, confirmations), conducts an interview with the student and awards the final grade.

Mentor feedback is systematically collected (alongside student evaluations) and analysed at the level of the Quality Assurance and Enhancement Committee. The findings are used to improve guidelines, templates and the mentoring model, as well as to expand the base of partner institutions—a goal that the faculty has explicitly included among its continuous development measures. In this way, partner organisations receive structured feedback, and mentors are provided with clear criteria for future practice cycles.

Finally, the Faculty seeks to involve supervisors more broadly in the academic community through [guest lectures](#), joint workshops and participation in the defence procedures of final and master's theses, thereby strengthening their connection to the educational process and recognising their contribution.

At the University level, additional support is provided through activities such as [UNIRI Career Days](#) and cooperation with the [University Career Office](#). This ensures that mentors have access to all necessary information and support for the high-quality supervision of students during professional practice.

2.3.5. The processes for monitoring and improving the quality of student practice are clearly defined, continuously implemented, and they involve internal and external stakeholders.

The Faculty of Physics has a clearly defined, multi-layered and continuous system for monitoring and enhancing the quality of student practical training, which involves all relevant internal and external stakeholders and is integrated into the broader quality assurance system of the University. The quality of practice implementation is monitored through a combination of quantitative and qualitative data—student evaluations, evaluations by mentors from host organisations, reports by practice coordinators, student documentation (practice diaries and

final reports), as well as analyses conducted by the Quality Assurance and Enhancement Committee. This ensures comprehensive feedback loops among students, teaching staff, partner institutions and the faculty's governing bodies.

Student evaluation is conducted through structured [questionnaires](#) in which students assess the quality of mentoring, clarity of assigned tasks, the alignment of activities with intended learning outcomes, the level of practical skills acquired, professional communication, and the overall usefulness of the practice for their professional development. The questionnaires also collect suggestions for improving the organisation and content of practice placements. This feedback mechanism has been in place for several years and has proven to be a key factor in the introduction of professional practice within non-teacher education programmes and its subsequent expansion.

Evaluation by mentors at host organisations represents an equally important element of the system. Through evaluation forms, mentors assess student engagement, technical competence, professionalism, independence, teamwork skills and understanding of work tasks. These evaluations serve as a basis for assessing the quality of partner institutions, identifying highly effective mentors, and recognising areas where tasks need to be more clearly defined, student preparation improved or practice objectives refined. The collected evaluations also inform decisions on renewing or expanding cooperation with specific institutions.

The quality enhancement process also involves external stakeholders—research institutes (IF, IRB), public health institutions (NZJZ PGŽ), hospitals (medical physics departments), industrial laboratories, IT and technology companies, and accredited educational institutions. Ongoing dialogue, partner feedback and long-term cooperation enable the faculty to continuously improve the organisation of practice, develop new mentoring models, expand the network of host institutions and adapt practice content to current professional needs and technological trends.

In addition, the faculty actively works to strengthen the practical components of final and master's theses, with emphasis on longer student placements in partner laboratories and industrial environments, increased student involvement in research and development projects, and the integration of practical work into the final/master's examination process. In this context, substantial amendments to the university graduate programmes [Physics and Mathematics](#) and [Physics and Computer Science](#) were implemented in 2023. The number of ECTS credits allocated to the master's thesis in these programmes was increased from 5 to 10 ECTS. This increase encourages and enables cooperation with schools (professional bases, training schools and similar institutions) and research in the field of subject education, with the aim of improving professional preparedness and acquiring research experience. Such research frequently results in scientific or professional publications (e.g. [Adapting Teaching Practices for Students with Special Needs at the Faculty of Physics, University of Rijeka](#); [The digital repository for physics and science teaching](#); [Kinesthetics Experiments in Physics Teaching](#)). To better align with student workload and to increase opportunities for acquiring professional competences aimed at enhanced employability, the number of ECTS credits assigned to certain compulsory physics courses was also increased.

2.3.6. The collected and analysed information is used to promote good practice, and to initiate the actions needed for improvement.

The Faculty of Physics systematically collects and analyses information on the implementation of student practical training and uses these insights to promote good practice and initiate improvements in subsequent cycles. It was precisely based on student survey results that the need to strengthen practical competences and increase the share of professional practice within study programmes was identified. Structural and content-related changes were implemented at both the university undergraduate and graduate levels, alongside the parallel development of professional practice at multiple levels: through teaching activities, final and master's theses carried out in cooperation with companies, international mobility, and both institutional and individual initiatives. Analyses and updates of course syllabi are regularly conducted to more precisely quantify ECTS credits allocated to the development of practical competences ([Report on the Implementation of the Action Plan 2024](#)).

Regular data sources include student evaluations of practice placements, evaluation forms completed by mentors at host organisations, and reports and insights provided by practice coordinators and course coordinators. These findings are consolidated at the level of the Quality Assurance and Enhancement Committee, which formulates recommendations for improvement and reports to the Faculty Council; based on these inputs, operational decisions are taken (such as adjustments to the content and duration of practice, changes to documentation and evaluation forms, and the expansion of the list of partner institutions).

Based on reports and practice diaries, which students are required to maintain during their professional practice, the coordinator of professional practice determines the final grade and assesses whether the student has achieved the learning outcomes defined for the *Professional Practice* course within the study programme. In this process, practice coordinators evaluate not only the student's level of engagement but also the performance of the host company and the practice supervisor. Based on these evaluations and the student survey results, decisions are made on whether the company will be recommended to students for professional practice in the following academic year. After completing their professional practice and successfully passing the course, students complete surveys for the *Professional Practice* course in which they assess their experience and overall satisfaction with the practice placement. These surveys serve as a valuable indicator of the quality of practice organisation at the host company.

Based on survey results, the Quality Assurance and Enhancement Committee of FIZRI acts in relation to the coordinator of the *Professional Practice* course. In cases where the evaluation score falls below 3, the committee requests a formal response from the practice coordinator and the implementation of self-analysis measures aimed at addressing the shortcomings identified in the quality control process. The collected data are used both for prompt corrective actions and for the promotion of practices that function well. When student and mentor evaluations confirm above-average quality of cooperation with specific institutions, these organisations are highlighted as preferred practice bases for future cycles and recommended to students; conversely, if shortcomings are identified, the practice coordinator conducts discussions with students and mentors, defines corrective actions and, where necessary, proposes replacing the host institution or adjusting the workload.

In the period 2019–2024, the faculty implemented multiple curricular changes (including the introduction of the elective course *Professional Practice* at the graduate level and the integration of micro-credentials), with decisions grounded specifically in the analysis of practical needs and feedback from partners and students. The faculty also awards

[acknowledgements to schools and professional practice mentors](#) in recognition of their work and successful cooperation.

2.4. Quality assurance of lifelong learning programs is part of the internal quality assurance system of the higher education institution. This ensures that study programmes are relevant and up to date and that they meet the current social needs.

2.4.1. *The mission statement and strategic planning process are the starting points for the development of lifelong learning programmes aligned with them.*

[Lifelong learning programmes](#) at the Faculty of Physics, University of Rijeka, are fully aligned with the [Faculty's mission](#) and with the [University's strategic documents](#), which emphasise scientific excellence, knowledge transfer, interdisciplinarity, and the connection between science and society to foster innovation, a culture of knowledge and sustainable development. The strategic guidelines of the Faculty and the University for the period 2021–2030 are focused on strengthening STEM education, innovation capacity and open forms of learning.

Lifelong learning is recognised as a key instrument for achieving these objectives, as it enables contemporary scientific and technical knowledge to become accessible to a broad range of users, including teachers, researchers and professionals from industry, healthcare and education. The strategic planning process for lifelong learning is conducted in accordance with the [Ordinance on Lifelong Learning of the University of Rijeka](#) and the faculty's internal regulations, which define the stages of programme development—from the initial idea and assessment of professional and scientific justification, through alignment with institutional strategies, to continuous quality evaluation and enhancement. At the Faculty, the quality assurance system for lifelong learning is integrated with university mechanisms, including the regular evaluation of all forms of lifelong learning. In addition, the University has issued the [Guidelines for the Implementation of the Accreditation Procedure for Lifelong Learning Programmes at the University of Rijeka](#), which further detail the evaluation process, types of programme modifications, decision-making levels and the language of programme delivery. The [University Committee for Lifelong Learning](#) has also proposed [evaluation questionnaire](#) for assessing programme quality.

The Faculty of Physics offers two lifelong learning programmes:

[Programme for Acquiring Missing Knowledge, Skills, and Competences for Admission to the Master's Degree Programme in Engineering and Physics of Materials](#)

This lifelong learning programme, approved in 2012, remains aligned with the mission, vision, goals and strategy of FIZRI, with particular emphasis on the development of natural and technical sciences and on enabling vertical progression within the education system (see [Programme Description with Curriculum](#)). The programme is aligned with guidelines for the organisation and delivery of lifelong learning and has undergone a formal evaluation procedure (see [Reviewer Opinion A](#), [Reviewer Opinion B](#) and [the proposer's response](#)).

Specialised Programme in Natural Sciences and Mathematics for Primary School Teachers

This programme represents advanced professional development for primary school teachers, focusing on the application of active learning and teaching through the introduction and further development of new experimental activities in natural sciences and mathematics, suitable for classroom practice and aimed at enhancing their implementation in primary education. The upgrading and expansion of teachers' competences in natural sciences and mathematics, originally acquired during initial teacher education, can significantly contribute to increasing children's interest in STEM fields, which are recognised as socially high-deficit areas. This further underlines the importance of implementing such lifelong learning programmes.

The programme was originally developed and approved by the Senate of the University of Rijeka in 2013, in accordance with the mission of the former Department of Physics, which emphasised the promotion of natural sciences within the wider community and their role in sustainable development and the knowledge-based society. At the same time, it relied on the strategic objectives of the Department, now the faculty, and on the provisions of the University Ordinance on Lifelong Learning. Today, the content and objectives of the programme remain fully aligned with the current mission and strategic orientation of FIZRI and UNIRI, particularly regarding strengthening STEM competences in primary education, promoting innovative teaching approaches, improving educational quality, and reinforcing the connection between scientific knowledge and educational practice. The programme is therefore both relevant and contemporary, and it supports the long-term strategic objectives of the institution. The programme is delivered jointly by the Faculty of Physics and the Faculty of Mathematics of the University of Rijeka. It was inspired by the course [Extracurricular Science and Mathematics Activities](#) within the primary teacher education programme at the Faculty of Teacher Education, which has been taught by FIZRI staff to students of the Faculty of Teacher Education since 2009. Both the course and the lifelong learning programme further prepare teachers for science education, particularly through active learning and the use of experiments in teaching. This represents a successful example of long-standing inter-faculty cooperation within UNIRI and a strategic contribution to the development of future teachers' STEM competences.

In addition to these programmes, the Senate of the University of Rijeka has approved the lifelong learning programme [Advanced Laboratory Testing of Materials](#). The programme holder is the University of Rijeka, NANORI, while the programme is delivered by NANORI and the Faculty of Physics. The programme is aligned with the University's Strategy and with smart specialisation priorities, and as such supports the development of modern competences in the fields of materials science, physics and technology. Furthermore, the micro-credential [Recognition of Environmental Changes and Risk Management](#) was accredited as a lifelong learning programme in June 2025. The programme holder is the Faculty of Economics (EFRI), with FIZRI participating as a co-provider.

According to the University of Rijeka Ordinance on Lifelong Learning, lifelong learning programmes include various forms of professional development, workshops, seminars and similar activities that transfer specialised knowledge and skills outside formal study programmes. Accordingly, lifelong learning at the Faculty of Physics is not a separate activity, but an integral part of the faculty's educational, scientific and societal mission. Through participation in university initiatives, the strengthening of teachers' STEM competences, and the organisation of professional events, the faculty systematically contributes to the development of scientific and technological culture, the enhancement of individual and

community competences, and the broader social and economic development of the region and Croatia.

At the University level, *E-Learning Days* represent an important platform for the exchange of good practices, innovations and the development of digital competences among teaching staff and students. The Faculty of Physics continuously contributes to the development of e-learning at the University of Rijeka through staff participation as members of organising committees, lecturers and activity leaders (e.g. [UNIRI E-Learning Days Programme 2024](#)).

The Faculty and its teaching staff have for many years actively participated in the [University of the Third Age programme](#), through public lectures in physics that contribute to scientific literacy and promote a culture of lifelong learning in the wider community (delivered lectures include: *Life on Mars?* by T. Jurkić, PhD; *The Arrow of Time* by Prof. R. Jurdana Šepić, PhD; *Small Particles from Large Deserts* by B. Mifka, PhD; *Giant Telescopes and Tiny Particles* by Assoc. Prof. Marina Manganaro, PhD). The faculty also actively supports the strengthening of teachers' STEM competences through cooperation with primary and secondary schools and through regional and national projects aimed at competence development, including projects of regional competence centres. An example of such cooperation is the project [Be Prepared and Competent!](#) at the Vice Vlatković Vocational School in Zadar, as well as professional training activities jointly organised by the Faculty of Physics, the Faculty of Engineering in Rijeka and the Centre for Micro- and Nanosciences and Technologies, such as [a series of professional development courses in the field of micro- and nanotechnologies](#) (29–31 August 2023).

At county, inter-county and national levels, the Faculty [organises professional development events for physics teachers](#), which represent an important form of lifelong learning by promoting the exchange of experiences, familiarisation with recent scientific developments and contemporary teaching methods, and by contributing to the continuous improvement of physics education quality (*CroRIS Events*). Examples include the [inter-county professional conference Physics and Critical Thinking \(2024\)](#), as well as the activities of County Professional Councils of Physics Teachers for Primorje-Gorski Kotar, Lika-Senj and Istria Counties (2023 and 2024).

2.4.2. *Internal quality assurance system of the higher education institution includes the processes for quality assurance of lifelong learning programmes.*

The internal system of quality assurance and enhancement (IQAES) at the Faculty of Physics fully encompasses all activities related to lifelong learning. The system is regulated by the [Ordinance on Quality Assurance and Enhancement](#) and operates through the Quality Assurance and Enhancement Committee, the Faculty Management, academic and non-academic staff, students, alumni and external stakeholders. All processes of evaluation, monitoring and quality enhancement applied to study programmes and the teaching process are equally applied to lifelong learning programmes, as the IQAES covers the institution's entire range of activities, including professional and educational activities outside formal study programmes. Quality assurance procedures for these programmes are described in detail in Topic 1.

In addition, the University of Rijeka itself systematically ensures the quality of all lifelong learning programmes through the [University Committee for Lifelong Learning](#) and, in

2024, adopted a new ordinance specifying the steps and criteria for the accreditation of new lifelong learning programmes.

2.4.3. Processes for the development of new lifelong learning programmes and continuous improvement of the existing ones are clearly defined and involve internal and external stakeholders.

The processes for the development of new and the continuous enhancement of existing lifelong learning programmes at the University of Rijeka are clearly defined and implemented through an established sequence of steps at both the constituent unit and University levels, under the professional oversight of the [University Committee for Lifelong Learning](#). An initial programme proposal is developed at the level of the constituent unit, aligned with strategic documents and quality requirements, followed by internal evaluation by the faculty council and subsequent submission to the University-level procedure.

At the University level, the procedure includes peer review conducted by external experts and an opinion issued by the Committee, with the final decision taken by the competent University bodies. This approach systematically ensures the involvement of internal stakeholders (programme coordinators and contributors, faculty councils and management, quality assurance committees) and external stakeholders (independent reviewers, employers and professional representatives, and the University Senate), with clearly defined decision-making levels and procedures for amendments—ranging from minor curricular adjustments to changes requiring a new review procedure. In addition, in 2024 the University initiated a public consultation on an updated ordinance that further operationalises accreditation steps, types of programme modifications and decision-making levels, thereby strengthening transparency and stakeholder engagement in the development and improvement of lifelong learning programmes.

2.4.4. The key indicators for monitoring the quality of lifelong learning programmes' delivery, as well as methods of collecting and analysing the necessary information, resulting in reports with recommendations for improvement, are defined.

The Faculty of Physics applies a clearly defined and multi-level system for monitoring the quality of lifelong learning programmes, based on predefined indicators, standardised data collection methods and established analysis procedures. The system is implemented through the Quality Assurance and Enhancement Committee, programme coordinators and instructors, with the involvement of participants, external stakeholders and University committees. This ensures the continuous alignment of programmes with the needs of participants, the profession and the wider community, in accordance with the faculty's mission and contemporary quality standards.

Key indicators include: participant satisfaction with the quality of content, clarity and applicability of the programme, professional competence of instructors and organisation of delivery; achievement of the intended learning outcomes and their alignment with teaching methods; relevance for professional practice in physics and related STEM fields; logistical factors (laboratory and computing equipment, digital infrastructure, functionality of the online environment); as well as data on enrolment, completion and success rates, participant

engagement and application trends across repeated programme cycles. Data are collected through participant evaluation surveys following each programme delivery, reports by instructors and programme coordinators, feedback from partner institutions in programmes with practical components, and analyses of technical delivery and e-learning quality (particularly for hybrid and online formats). In addition, the University of Rijeka Committee for Lifelong Learning has proposed a standardised [evaluation questionnaire](#) for assessing programme quality.

Depending on the findings, proposed and implemented measures include content-related updates to modules and literature, strengthening of practical components (laboratory work and cooperation with industrial and clinical partners), development of additional digital learning materials and more flexible delivery models, schedule adjustments to better accommodate participants' professional obligations, and the inclusion of additional experts in areas of high-demand competences. Continuous monitoring results in concrete adjustments to curricula and teaching methods (e.g. expansion of content in experimental methods, reinforcement of computational modelling, and the introduction of interdisciplinary micro-credentials and specialised training programmes in cooperation with partner institutions).

2.4.5. *Lifelong learning programmes are aligned with the current economic and social needs.*

Alignment of the general objectives of the programmes with societal needs is confirmed by reviewers' opinions regarding the relevance of the programmes in relation to labour market needs, including their connection with the local community, alignment with the requirements of professional associations, and the identification of potential partners outside the higher education system who have expressed interest (see Programme 1: [Reviewer Opinion A](#), [Reviewer Opinion B and the proposer's response](#); Programme 2: [Reviewer Opinion A](#), [Reviewer Opinion B](#)).

The documentation confirms that the lifelong learning programmes of FIZRI are directly designed based on labour market needs, institutional recommendations and analyses of societal needs. Alignment with economic and social needs is reflected in the following:

- the programmes are based on the results of employer surveys and labour market analyses;
- existing programmes (the bridging programme for Engineering and Physics of Materials and the programme for primary school teachers) were developed in response to the shortage of qualified professionals in the STEM and education sectors, recognised as a national priority (Croatian Employment Service recommendations; teacher shortages);
- new programmes (e.g. *Advanced Laboratory Testing of Materials*, developed in cooperation with NANORI) are aligned with smart specialisation priorities, national development strategies and the needs of emerging industries;
- the programme *Recognition of Environmental Changes and Risk Management* is aligned with current economic and societal needs, as it develops competences essential for understanding climate change, sustainable resource management and risk analysis in contemporary contexts (it is based on an interdisciplinary approach combining economics, environmental physics and data processing methods, thereby addressing real labour market requirements and broader societal challenges);

- the overall system of strategic and operational planning is grounded in the development of competences required by the contemporary labour market and the knowledge-based society, including interdisciplinary competences, digital skills and the linkage of science with practice.

Furthermore, European strategic initiatives such as the [Quantum Europe Strategy](#) clearly confirm that quantum technologies, advanced materials and nanotechnologies, as well as medical physics and advanced diagnostic technologies, are priority areas for investment and development, both in terms of technological sovereignty and future labour market needs. Within this framework, the faculty plans to further orient its activities towards the development of new specialised programmes in quantum technologies, nanotechnologies and medical physics, areas highlighted in both national and European strategic documents. Such programmes will be developed once favourable staffing and organisational conditions are in place, particularly regarding the availability of a sufficient number of highly specialised experts to ensure high-quality delivery and implementation. This approach ensures that future lifelong learning programmes remain fully aligned with the strategic development priorities of the Republic of Croatia and the European Union, as well as with the needs of the contemporary labour market.

Regarding the professional development programme for primary school teachers, the minimum number of participants required to launch the programme (16) was not reached, despite implemented information and promotional activities. The programme coordinator presented the programme at professional councils of primary school teachers and made direct contact with interested candidates. The minimum number of participants was set due to the organisational complexity of the programme. The programme is delivered jointly by the Faculty of Physics and the Faculty of Mathematics and involves the participation of teaching staff from both faculties, practical and laboratory-based teaching, the engagement of laboratory technicians, and the organisation of teaching activities in afternoon and evening time slots as well as on weekends, given that the programme is primarily intended for employed teachers.

In addition, in recent years there have been developments that have significantly affected the continued relevance of this programme. On 1 July 2020, the Ministry of Science and Education adopted amendments to the [Ordinance on the Appropriate Type of Education for Teachers and Professional Associates in Primary Schools \(Official Gazette No. 75/2020\)](#), which allow individuals who have completed a different study programme but have obtained at least 55 ECTS credits in physics (or related fields specified in the ordinance) to meet the requirement of an appropriate educational background for teaching in primary schools, subject to confirmation by a higher education institution that the prescribed conditions have been fulfilled.

As a result, since the adoption of these amendments the faculty has received 22 requests for confirmation/recognition of 55 ECTS credits in physics, indicating increased interest in acquiring qualification prerequisites in physics through supplementary forms of education. It should be noted that 20 requests were resolved negatively, with only two confirmations/recognitions of 55 ECTS credits in physics issued. At the same time, the Faculty has initiated discussions with the competent authorities to propose refinements to the current requirements, with the aim of creating scope for a formally accredited lifelong learning programme as a standardised pathway for acquiring the missing competences for such interested candidates; to date, no response has been received ([Letter to the Ministry of Science and Education](#); [Letter to the Agency for Science and Higher Education](#)).

3. STUDENT-CENTRED LEARNING AND TEACHING – THE TEACHING PROCESS AND STUDENT SUPPORT

3.1. Learning and teaching are student-centred and ensure that all the intended learning outcomes are achieved.

3.1.1. The study programmes, and the way they are delivered, are designed to encourage motivation, self-reflection and engagement of students in the learning process.

Study programmes at FIZRI are designed in accordance with the principles of student-centred learning. The structure of the study programmes is based on clearly defined learning outcomes and is organised to encourage student motivation and allow flexibility in the organisation of study. At programme level, this flexibility is particularly evident at the graduate level, where students, in consultation with the heads of study tracks, participate in shaping their own course of study through the selection of study tracks and elective courses. Within this framework, students are also able to change study tracks during their studies in accordance with the development of their academic interests.

In the design and improvement of study programmes and their delivery, [student proposals and feedback](#) are considered, thereby contributing to the development of students' reflective approach to studying and responsibility for their own learning. For example, the student initiative to introduce an introductory mathematics course in the first year of the undergraduate study programme was considered, as were student proposals made during the planning of graduate-level study. Within individual courses, the teaching process is organised through activities that include active student participation and continuous interaction with teachers. The relatively small number of students enables an individualised approach to teaching, the monitoring of student progress, and the encouragement of self-reflection on their own learning throughout the teaching process.

3.1.2. The higher education institution encourages various ways of teaching delivery and flexible usage of various pedagogical methods, in accordance with the intended learning outcomes.

FIZRI promotes a diversity of teaching strategies and methods in accordance with the intended learning outcomes of study programmes and individual courses. Teaching is delivered through a combination of lectures, seminars, exercises (practical, numerical, and laboratory), fieldwork, and professional practice. Attention is paid to problem-oriented teaching, especially at the graduate level, where emphasis is placed on analytical thinking, independent work, and the application of knowledge acquired at the undergraduate level.

The Merlin e-learning system is used in teaching as support for different forms of course delivery, the availability of teaching materials, and communication between teachers and students. In accordance with course aims and learning outcomes, part of the teaching activities may also be delivered online, with up to 40% of contact hours in compulsory courses and up to 100% in elective courses. Flexibility in teaching delivery is further supported through

elective courses, student mobility opportunities (ERASMUS, YUFE, UNIRI), and the implementation of micro-qualification programmes.

3.1.3. The use of different pedagogical methods and techniques fosters interactive and research-based learning, problem solving, and creative and critical thinking.

At FIZRI, pedagogical methods and techniques used in teaching are aimed at interactive and inquiry-based learning, problem solving, and the development of students' creative and critical thinking. This approach is particularly evident in practical work, laboratory exercises, fieldwork, and professional practice, as well as in bachelor's and master's theses, which focus on concrete problem tasks and the application of acquired knowledge. [Faculty laboratory resources](#) enable students to work with measurement equipment, experimental procedures, and relevant research data, while professional practice allows knowledge to be acquired and applied in a professional environment. The relatively small number of students also makes it possible to organise interactive forms of work and problem-oriented teaching within individual courses. (See also: [Faculty of Physics Repository - Undergraduate and Master's theses](#)).

3.1.4. The various methods of teaching delivery, pedagogical methods, and techniques of working with students are regularly evaluated and adjusted according to evaluation results.

FIZRI systematically evaluates the ways teaching is delivered, the pedagogical methods used, and the techniques of working with students to improve them continuously. The principal evaluation mechanism consists of [student surveys](#) administered through the ISVU system and made available over an extended period so that students can participate in line with their academic obligations. The surveys collect feedback on different aspects of the teaching process, including the clarity of course learning outcomes and assessment criteria, methods of grading and feedback, the quality of content presentation, the encouragement of active student participation, teachers' attitudes towards students, and teachers' availability for communication.

Students also evaluate the alignment of different forms of teaching, the availability of learning resources, and their overall level of satisfaction with the course and the teacher. Survey results are used in the evaluation of both the teaching process and teachers' work and constitute one of the indicators of the appropriateness of the teaching methods used in relation to the intended learning outcomes. Teachers are encouraged, at the beginning of the next course cycle, to reflect on the results of the student surveys and to present to students any changes introduced into the course implementation plan based on the feedback received. The feedback collected is analysed by course teachers and the FIZRI Quality Assurance and Enhancement Committee, and, where necessary, adjustments are made to teaching delivery and course implementation plans. Examples include the adjustment of ECTS credits in the Environmental Physics course after a mismatch between student workload and allocated credits was identified, as well as amendments to the teacher-education graduate programmes Physics and Mathematics and Physics and Computer Science, in which several courses were increased by 1 ECTS and the Master's Thesis was increased from 5 to 10 ECTS. In addition to these evaluation mechanisms, FIZRI regularly monitors indicators of study success, including pass rates and completion rates (Table 3.4). The results are discussed at thematic meetings of

the Faculty Council and are used as a basis for decisions aimed at improving the teaching process. (See also: [Adjustment of ECTS credits for the courses Environmental Physics; Physics and Mathematics; Physics and Computer Science](#)).

3.1.5. Teachers regularly carry out the processes of revision of their own teaching practice to continuously improve the educational process.

At FIZRI, reflection on teaching practice is carried out as a continuous process at both the individual and the institutional level. Individually, teachers engage in professional development focused on contemporary pedagogical approaches and on reflecting on the relationship between learning outcomes, teaching activities, and assessment methods. In this context, teachers participate in targeted workshops on the constructive alignment of intended learning outcomes, teaching activities, and assessment methods, and the knowledge and experience gained are integrated into the planning and delivery of individual courses. (See also: [Invitation to the workshop on constructive alignment](#); [Workshop on constructive alignment](#); [Certificate of training](#))

According to Table 4.1.a for the 2024/2025 assessment year, 13 of the 26 members of the scientific-teaching and teaching staff, including teachers employed cumulatively, that is 50%, are by primary profession teachers of physics and mathematics, physics and chemistry, or physics and computer science, or they possess formal training in psychology, pedagogy, didactics, assessment, and physics methodology. The professional development of all teaching and associate staff is further supported through participation in workshops, courses, and other forms of training organised by the University of Rijeka, the Agency for Science and Higher Education, the Ministry of Science and Education, and other relevant institutions. Reflection on teaching also develops through participation in scientific and professional events dedicated to physics teaching and through the work of the Chair of Educational Physics, whose members study the processes of learning and teaching physics and disseminate good teaching practice.

Reflection on teaching practice is also achieved through the systematic evaluation of teachers' work, which includes student feedback, teacher self-evaluation, and peer review, in accordance with procedures developed at the University of Rijeka level. (See also: [Minutes of the OOUK Council held on 3 April 2023. Item 3](#); [Record of completed peer evaluations at FIZRI](#); [Template of a teacher self-assessment form](#); [Sample response to peer evaluation](#))

The insights gathered are used to consider the effectiveness of teaching approaches, to adjust the methods of course delivery, and to provide a basis for amendments to study programmes and for planning teachers' professional development.

3.1.6. The methods of teaching delivery are adjusted to a diverse student population (non-traditional student population, part-time students, senior students, students from under-represented and vulnerable** groups, etc.).*

FIZRI acknowledges the diversity of the student population and, through teaching delivery and the organisation of study, provides adjustments that enable all students to participate in the educational process on an equal basis. Attention is given to students from

vulnerable and under-represented groups, for whom, in accordance with individual needs, adjustments to the academic environment and academic obligations are implemented. For this purpose, a [coordinator for vulnerable and under-represented groups](#) has been appointed from among the teaching staff. Adjustments to teaching delivery and academic obligations are also implemented in line with recommendations of the University Counselling Centre, whose [Academic Adjustment Counselling Service](#) prepares individual guidelines for adapting the academic environment, teaching activities, and methods of assessment for individual students.

In practice, these adjustments are implemented through concrete measures tailored to individual needs. For example, a student with a visual impairment who underwent emergency surgery during the semester was granted extended deadlines and alternative ways of achieving learning outcomes. A student with dysgraphia was provided with extended exam time and an adapted seating arrangement. Students with visual impairments may, where necessary, receive enlarged examination materials and digital teaching materials, and the readability of teaching content is adjusted. A student with a severe physical disability was provided with a peer-support system, extended exam time, and the possibility of taking written exams by dictating answers, together with spatial adjustments. A student with an autoimmune disease received support in communication with teachers and in regulating her student status and in 2025 received an [award for academic success](#), while a pregnant student was offered individual arrangements and adapted assessment schedules. Students with [significant professional and family obligations](#) are offered alternative ways of fulfilling course requirements and agreed assessment dates, with an individualised approach to the organisation of their study obligations.

Students may, where necessary, borrow laptops, use shared spaces and classrooms for study, and benefit from other appropriate accommodations that facilitate attendance and the fulfilment of study obligations. Where possible, teaching delivery is also adapted to different modes of study and life circumstances, including part-time students, senior students, and students with additional professional or family responsibilities.

An individualised approach is further supported through the mentoring system. In the 2023/2024 academic year, a new mentoring model was introduced in which teachers of first-year courses take on the role of mentors to first-year students to support their adjustment to studying and the organisation of academic obligations. (See also: [Minutes of the Faculty Council meeting held on 11 October 2023, Item 4 - Announcements of the Vice-Dean No. 2.](#))

3.1.7. The higher education institution ensures the use of state-of-the-art technologies to modernise teaching and achievement of the intended learning outcomes.

FIZRI systematically ensures the use of advanced technologies in the teaching process to modernise teaching and support the achievement of intended learning outcomes, with particular emphasis on e-learning and digitally enhanced learning and teaching (DELTA), in line with current European Union priorities operationalised through the [Digital Education Action Plan](#).

Digital support for teaching is based on the Merlin e-learning system, which is used for the availability of teaching materials, communication between teachers and students, and the implementation of various digitally supported forms of learning and assessment, including collaborative learning, formative assessment, the flipped classroom, project-based approaches, peer assessment, and self-assessment. Teaching activities within Merlin are

further enriched using video and audio materials and interactive tools such as forums and chats.

Digital support for learning is also ensured through contemporary hardware and software resources necessary for practical, laboratory, and other forms of teaching, as well as through the institutional repository Dabar. The development of e-learning and digitally enhanced learning and teaching at FIZRI is carried out in accordance with the University of Rijeka Framework for the Development and Evaluation of E-learning Quality, which enables systematic self-evaluation and improvement of the quality of e-courses. Within this framework, the online component of learning and teaching was self-evaluated in the period 2020–2022: 24 courses were assessed in 2020/2021 and 135 in 2021/2022, representing approximately 75% of all Faculty courses. In 2024/2025, 80% of courses were assessed, which is above the University average. The administrative and implementation component of teaching is supported through the ISVU information system, where examination periods and grades are recorded, and through the teacher portal, which enables regular recording of teaching delivery.

Within the University of Rijeka research and development project in education, UNIRI CLASS, programme line A2: Digital citizenship – innovations in learning and teaching, the projects “Development of the digital form of the teaching process and introduction of innovative teaching methods in Environmental Physics”, led by D. Mance (2022–2023), and “Collection of digital content for teaching physics and natural sciences”, led by I. Poljančić Beljan (2022–2023), were implemented in the previous period and significantly contributed to the modernisation of teaching and the achievement of intended outcomes. The latter project resulted in a digital repository containing 96 experiments for teaching physics and natural sciences, created to organise e-content developed at the Faculty of Physics during the pandemic period within two courses, one intended for students of teacher education and the other for students in the teacher-training track in physics. The content supports innovative teaching methods in virtual environments, including station rotation and the flipped classroom, and is intended for pupils, students, and physics teachers in primary and secondary schools as well as in higher education. (See also: [The digital repository for physics and science teaching](#)).

As part of strengthening digital competences and supporting digitally enhanced learning and teaching, UNIRI established a strategic partnership with [Coursera](#) in 2021 through the [Coursera for Campus](#) programme, thereby enabling students, teachers, and non-teaching staff to access a large number of online courses, specialisations, and professional certificates from leading universities and industry partners free of charge, with the aim of developing digital, interdisciplinary, and professional competences and promoting lifelong learning.

Through the development of online learning, FIZRI also promotes stronger international integration and the internationalisation of the institution and its study programmes, especially through participation in the YUFE network of universities, while simultaneously encouraging student mobility and broader opportunities for the professional and scientific development of students and teachers through the online delivery of courses within the network. (See also: [an example of a course included in the YUFE network](#)).

3.2. The assessment and evaluation are objective and consistent, and they ensure that all the intended learning outcomes are achieved.

3.2.1. The criteria and methods of assessment and evaluation are clear and they are published before the beginning of each course. Students are familiar with them.

The examination methods and the criteria and methods of student assessment and evaluation are clearly defined in the course implementation plans of all courses, which are publicly available on the FIZRI website before the beginning of teaching. In the first introductory lecture of each course, the course leaders present these elements together with the description of semester obligations, the examination schedule, and the system of continuous assessment. In this way, students are provided with full clarity regarding expectations and the way individual components of the final grade are earned. (See also: [Course Implementation Plans](#)).

In addition, students receive information on issues related to assessment and the organisation of study obligations through regular meetings between the Faculty management and students, where identified challenges are discussed, support is provided, and advice for successful study is offered. Particular attention is paid to first-year students, who are systematically informed at orientation meetings organised at the beginning of the academic year, where the rules of assessment and the available forms of support are additionally explained. (See also: [Invitations to students to participate in support meetings](#); [Record of the meeting held between the Faculty administration and students on 3 May 2023](#); [Minutes of the Faculty Council meeting of 9 November 2023 Item 3 Announcements of the Vice-Dean No7](#)).

3.2.2. The criteria and methods of assessment and evaluation are aligned with the teaching methods and intended learning outcomes. They are being implemented in a consistent and objective manner. Mechanisms are in place to ensure that the assessments and evaluations are objective and reliable.

At FIZRI, systematic care is devoted to the constructive alignment of learning outcomes, teaching activities, and assessment methods. In doing so, the Faculty also relies on the University of Rijeka Guidelines for the Assessment of Learning Outcomes, which define the principles of high-quality, reliable, and transparent assessment and serve as a shared standard for all constituent units of the University. The objectivity and reliability of grading are ensured using predefined assessment criteria in course implementation plans, the involvement of more than one teacher in assessment in certain courses, and the possibility of appealing a grade in accordance with the [University of Rijeka Regulations on Studies](#). Assessment methods are selected in line with the expected level of learning outcomes, the type of teaching activities, and the teaching methods used. During the preparation and periodic review of course implementation plans, the alignment of teaching methods, learning outcomes, and assessment methods is analysed to ensure that knowledge testing enables a reliable evaluation of the extent to which intended learning outcomes have been achieved. (See also: [Invitation to the workshop on constructive alignment](#); [Workshop on constructive alignment](#); [University guidelines for the assessment of learning outcomes](#); [Instructions – course implementation plans, e-mail from the Vice-Dean](#)).

Consistency and objectivity in assessment are further ensured through continuous monitoring of student work during the semester and through the application of predefined and publicly available grading criteria. During the teaching process, students receive timely feedback on assessment results, which enables them to monitor their progress in relation to the intended learning outcomes. The teaching methods used and the assessment criteria applied are also regularly considered through standardised University-level student surveys, which represent one of the sources of insight into the appropriateness and consistency of assessment procedures. In addition to student surveys, analyses of pass rates, comments raised by students at meetings with the management, and regular discussions with the heads of individual study programmes or study tracks are also considered, thereby ensuring multiple checks on quality. (See also: [student surveys conducted at the University level](#)).

3.2.3. Everyone who evaluates students is supported in developing their knowledge and skills related to the methods of assessment and evaluation.

The Faculty of Physics provides continuous institutional support for teachers in developing knowledge and skills related to learning, teaching, and the assessment and evaluation of student achievement. Teachers involved in assessing student work have access to various forms of professional support aimed at strengthening competences in the area of assessment and evaluation methods.

Within this support framework, teachers can develop assessment competences through lifelong learning programmes offered by the University of Rijeka Teacher Education Centre, as well as through internal and external training focused on knowledge assessment and quality assurance in higher education. Professional development is further supported through participation in workshops, courses, and other forms of education organised by the University of Rijeka, the Agency for Science and Higher Education, the Ministry of Science and Education, and other relevant institutions. Teachers also have access to the lifelong learning programme Teaching Competences in Higher Education organised by the Teacher Education Centre of the Faculty of Humanities and Social Sciences of the University of Rijeka, as well as University training opportunities and courses provided through the University's IT Academy. (See also: [Center for Teacher Education](#); [Short training sessions for the enhancement of teaching competencies](#)).

The assessment quality of the teaching process at FIZRI is additionally strengthened by the structure of its teaching staff. According to Table 4.1.a for the 2024/2025 assessment year, 13 of the 26 members of the scientific-teaching and teaching staff, including teachers in cumulative employment, that is 50%, are by primary profession teachers of physics and mathematics, physics and chemistry, or physics and computer science, or have professional training in psychology, pedagogy, didactics, assessment, and physics methodology, which provides a strong pedagogical foundation for the teaching staff.

Beyond formal training, additional support is also provided through participation in project activities, including the FizKO project, within which teachers were trained in the application of transparent assessment methods and project-based teaching. Within these project activities, workshops were also organised on the preparation of course implementation plans and on the constructive alignment of learning outcomes, teaching activities, and assessment methods. (See also: [Invitation to the workshop on constructive alignment](#); [Workshop on constructive alignment](#))

The development of teachers' competences in assessment is further supported by the scientific and professional work of the Chair of Educational Physics, which studies the processes of learning and teaching physics and disseminates contemporary approaches to the assessment of student achievement. On this basis, the exchange of experience and good practice among teachers is encouraged through internal discussions and participation in scientific and professional events dedicated to assessment in higher education.

3.2.4. The assessment allows students to demonstrate the extent to which they have achieved the intended learning outcomes.

At FIZRI, continuous assessment of student achievement is implemented, with students earning between 50 % and 70 % of the overall grade during the teaching period. This form of assessment makes it possible to monitor student work and progress throughout the semester and to gain insight into the level of achievement of learning outcomes at different stages of the teaching process. Continuous assessment contributes to greater objectivity and student motivation, as it allows effort and engagement during the semester to be clearly reflected in the final grade.

In accordance with the learning outcomes of individual courses and study programmes, different assessment methods are used, including written and oral examinations, practical work, seminar and project assignments, and professional practice. By selecting appropriate assessment methods, students are enabled to demonstrate the knowledge, skills, and competences relevant to learning outcomes. Excellence in student work is further encouraged and recognised through the practice of awarding the best student papers at Faculty level. (See also: [Faculty-level awards for outstanding student papers](#)).

3.2.5. The students are given feedback on the assessment results, and if necessary, the guidelines and/or support in the process of learning based on these evaluations.

Various forms of continuous assessment are used in teaching at FIZRI throughout the semester, and students receive timely and clear feedback on the results of knowledge tests. Feedback is provided within the deadlines prescribed by the University of Rijeka Regulations on Studies and Studying, which define the maximum deadlines for grading written tests and publishing results, thereby ensuring consistency, timeliness, and equal treatment of all students. Timely feedback allows students to plan further learning effectively and prepare for subsequent obligations.

Where appropriate, preparatory online colloquia, surveys, and short tests following individual teaching units are used to provide additional formative feedback, enabling students to self-assess their achievement and recognise in a timely manner the areas in which further learning is needed. Based on assessment results, students are provided with additional advice and support in the learning process. Additional support is also ensured through the mentoring system, especially for first-year students, whereby teachers acting as mentors monitor students' academic progress and advise them on the organisation of study and effective learning strategies. (See also: [Minutes of the Faculty Council meeting held on 11 October 2023, Item 4 - Announcements of the Vice-Dean No. 2.](#)).

3.2.6. *The process of continuous assessment and monitoring of student achievements helps to identify students who are experiencing difficulties in the regular meeting of their academic obligations and to provide them with timely support and assistance in learning.*

At FIZRI, continuous monitoring of student achievement is used as a mechanism for the early identification of difficulties in fulfilling academic obligations. By analysing the results of knowledge tests, participation in teaching activities, and the fulfilment of obligations during the semester, it is possible to identify deviations in student progress that may indicate a need for additional support in the early stage of the semester, before such difficulties affect overall study success.

Support for students in whom such difficulties are identified is provided through individual consultations, guidance on adapting learning methods and planning academic obligations, and inclusion in the mentoring system, especially in the first year of study. (See also: [Minutes of the Faculty Council meeting held on 11 October 2023, Item 4 - Announcements of the Vice-Dean No. 2.](#)).

3.2.7. *There is a formally defined appeals procedure which is consistently implemented and students are informed about it in a timely manner.*

The procedure for appealing a grade is formally defined by the [University of Rijeka Regulations on Studies](#) and is implemented at FIZRI in accordance with the prescribed rules. Students are informed about this procedure in a timely manner through publicly available University and Faculty documents, as well as through information included in course implementation plans and presented at the beginning of teaching. Rules related to students' disciplinary responsibility and conduct considered unethical are also clearly defined and publicly available, thereby ensuring transparency and consistent implementation. In practice, grade appeals are rare and, when submitted, are resolved in accordance with the procedure prescribed by the University regulations, with the involvement of the course teacher and, where necessary, the competent Faculty bodies. (See also: [students' disciplinary responsibility; conduct considered unethical](#)).

3.2.8. *Procedures of assessment consider the specific circumstances of studying for particular groups of students (adaptation of test procedures, e.g. for students with disabilities), while ensuring that the intended learning outcomes are being achieved.*

FIZRI acknowledges the diversity of the student population and, where necessary, adapts assessment procedures for students from vulnerable and under-represented groups, including students with disabilities and other students with special needs. These adaptations concern the conduct of knowledge tests and the fulfilment of course obligations and are implemented to ensure students' equal participation in assessment procedures. In such cases, assessment procedures are carried out in accordance with the applicable regulations of the University of Rijeka and the recommendations of the University Counselling Centre, especially the [Academic Adjustment Counselling Service](#), while concrete solutions are agreed in cooperation with teachers.

The planning and implementation of adjustments involve the coordinator for vulnerable and under-represented groups, in cooperation with teachers and the Faculty

management, while safeguarding the intended learning outcomes of individual courses and study programmes. The Faculty also recognises and supports students who achieve significant accomplishments outside the academic environment, such as the Faculty recognition awarded to student Gabriel Barac for outstanding sporting achievements, thereby encouraging the alignment of sporting and study obligations. (See also: [an award from the Faculty to student G. Barac in recognition of his outstanding sporting achievements](#)).

3.2.9. The higher education institution has a system of assessment and evaluation in place, which provides information on study progress and completion of studies at an individual and group level, which presents the basis for decision-making on management of the study.

FIZRI has an established system for collecting and analysing data on student achievement, progression through study, and study completion at both the individual and cohort level. The data collected make it possible to monitor study success and provide relevant information for decision-making related to study management. Analyses include quantitative indicators such as the number of enrolled and active students, pass rates, duration of study, the number of students who complete or discontinue their studies, as well as data on further education and alumni employability, insofar as such data are available. Data are collected and analysed using the ISVU information system.

Data on student progression, study completion, and study duration are regularly analysed based on the indicators presented in Table 3.4. These analyses make it possible to monitor trends in student progression and to identify possible difficulties in mastering the study programme. The results are considered by the competent Faculty bodies, including thematic sessions of the Faculty Council, and are used as a basis for study management, planning teaching organisation, and the periodic revision of study programmes. Where necessary, improvement measures are introduced based on these analyses, such as adjustments to teaching activities, additional consultations, or mentor-guided student support. (See also: [thematic sessions of the Faculty Council](#)).

3.2.10. If possible, the higher education institution conducts the evaluation of assessment.

At FIZRI, the evaluation of assessment practices is carried out indirectly within the quality assurance system, primarily through student surveys on courses and teachers. In these surveys, students evaluate the clarity of assessment criteria, the objectivity and consistency of grading, and the implementation of assessment in accordance with the course implementation plan. Surveys also collect feedback on the fairness of grading and on the alignment of assessment methods with intended learning outcomes and student workload. (See also: [Student course evaluation form of the University of Rijeka](#)).

Additional insight into assessment practices is provided through the system for evaluating teachers' work, which includes teacher self-evaluation and peer review of teaching, as well as through the self-evaluation of e-courses within the Framework for the Development and Evaluation of E-learning Quality for courses delivered using e-learning. (See also: [Record of completed peer evaluations at FIZRI](#); [Template of a teacher self-assessment form](#); [Sample response to peer evaluation](#)).

3.3. The requirements for student enrolment and progress, recognition and certification are clear, publicly available, and consistently applied.

3.3.1. The higher education institution consistently implements predefined and published regulations covering all the study stages.

Students' rights and obligations at all stages of study, including enrolment, attendance, assessment, progression, and completion, are regulated by the University of Rijeka Regulations on Studies and Studying. FIZRI consistently implements these regulations in everyday practice, thereby ensuring a uniform approach to students throughout the entire study cycle. Information on study programmes and on enrolment and progression procedures and deadlines, including the required documentation, is publicly available on the official FIZRI website. The same framework also provides instructions related to the application, preparation, and defence of bachelor's and master's theses and to the conduct of final examinations. Procedures for the recognition of previously achieved learning outcomes, periods of study, and acquired ECTS credits are regulated by University of Rijeka bylaws and are implemented at Faculty level through established administrative and expert procedures. The Faculty has appointed a Commissioner for the Recognition and Validation of Prior Learning. (See also: [Officer for the recognition and validation of prior learning](#)).

Recognition covers, among other things, obligations completed during student mobility, previous formal education, and, in prescribed cases, prior learning outside the formal system, in accordance with applicable and publicly available regulations.

Certification is carried out through the issuance of appropriate public documents and certificates after the prescribed conditions have been fulfilled. Upon completion of studies, students are issued a diploma and a diploma supplement, while for lifelong learning programmes, professional training, and other educational activities, appropriate certificates are issued in accordance with the regulations of the University of Rijeka and the internal acts of the Faculty.

On the basis of the Act on the Recognition and Validation of Foreign Educational Qualifications (Official Gazette No. 69/2022) and the Regulations on the Recognition of Foreign Educational Qualifications, the University of Rijeka conducts procedures for the recognition of foreign educational qualifications for the purpose of enrolment in graduate, postgraduate, and foreign-language study programmes, automatic recognition, and the recognition of periods of education completed abroad at higher education level. The University has an [Office for the Academic Recognition of Foreign Higher Education Qualifications and Periods of Study](#), while the Faculty has an appointed [Academic Recognition Committee](#). (See also: [Act on the Recognition and Assessment of Foreign Educational Qualifications \(Official Gazette No. 69/2022\)](#); [Rulebook on the Recognition of Foreign Educational Qualifications](#)).

3.3.2. The enrolment policy is in line with the national legislative framework, the mission and strategy of the higher education institution and it considers the capacity of the higher education institution and the context in which the higher education institution operates.

Enrolment in FIZRI study programmes is carried out in accordance with the applicable national legislative framework and the regulations and procedures of the University of Rijeka, with the enrolment policy aligned with the mission and strategic goals of both the Faculty and the University. Enrolment quotas and the organisation of study programmes are determined in line with the Faculty's human-resource and organisational capacities, applicants' interest in individual study programmes, and the specific context in which the Faculty operates, including the complexity and demanding nature of its study programmes and interdisciplinary cooperation with other constituent units of the University of Rijeka. Relatively small enrolment quotas in relation to the number of teachers enable high-quality teaching, an individualised approach to students, and the development of mentoring, in line with FIZRI's educational goals.

The implementation of the Faculty's enrolment policy is carried out in accordance with the applicable acts of the University of Rijeka through the national information systems NISpVU and NISpDS. The use of these systems enables the centralised receipt of applications, the monitoring of applicant and enrolment data, and a uniform and transparent enrolment procedure. Information on entry requirements, criteria, quotas, and deadlines is published on the [Faculty website](#) in Croatian and [English](#).

3.3.3. The enrolment policy and the strategy to attract students are sensitive to the needs and difficulties of students from vulnerable and under-represented groups, and they both promote inclusion.

When shaping its enrolment policy, FIZRI takes into account the specific nature of its study programmes, including their level of difficulty and differences in the prior knowledge of applicants coming from different secondary-school educational pathways, while paying particular attention to applicants from vulnerable and under-represented groups who may face additional barriers when entering higher education.

The strategy for informing and attracting students is aimed at the timely and clear presentation of study programmes, admission requirements, and study opportunities. To this end, the Faculty uses its website, social media, printed promotional materials, and participation in education fairs, open days, and other activities intended for secondary-school pupils, to reach a wider pool of potential students and stimulate interest in its study programmes. As part of these information activities, students are also informed about the forms of counselling and expert support available through the [University Counselling Centre](#) and about the possibilities of mentoring support during study, especially in the initial phase.

3.3.4. The criteria and procedures for the selection and enrolment of students prevent discrimination and bias. They are publicly available, consistently applied and thoroughly revised.

The criteria and procedures for the selection and enrolment of students at FIZRI are regulated by the applicable regulations and bylaws of the University of Rijeka, which clearly define the conditions and manner of implementing the enrolment procedure. The application of these acts ensures equal treatment of all applicants at all stages of enrolment. Enrolment criteria and procedures are publicly available and are implemented consistently in practice. Based on experience gained from implementing enrolment procedures and monitoring study

success, their amendment and adjustment are considered, where necessary, within the competent University and Faculty bodies.

3.3.5. The criteria and procedures for the selection and enrolment of students ensures the selection of candidates with appropriate prior knowledge, in line with requirements of the study programme.

The criteria and procedures for enrolment are aimed at selecting candidates whose prior knowledge is appropriate for the successful achievement of the learning outcomes defined within FIZRI study programmes. Detailed entry requirements and enrolment criteria for individual study programmes are available on the website of the Faculty of Physics of the University of Rijeka. To align applicants' prior knowledge with the requirements of the study programmes, the Council decision of 7 November 2025 amended the admission requirements for the undergraduate study programme in Physics by introducing compulsory completion of the state matriculation exam in physics and changing the weighting of the remaining admission criteria. (See also: [Decision on enrolment requirements](#)).

3.3.6. The higher education institution has established adequate procedures for fair recognition of higher education qualifications, study periods and prior learning, including the recognition of non-formal and informal learning, based on:

- *compliance of recognition practices at the higher education institution with the principles of the Lisbon Recognition Convention;*
- *cooperation with other higher education institutions, quality assurance agencies and national ENIC/NARIC offices.*

FIZRI carries out the recognition of higher education qualifications, periods of study, and prior learning in accordance with the applicable regulations of the University of Rijeka. Procedures are conducted based on prescribed documentation and established criteria and are grounded in the recognition of learning outcomes and fair evaluation, in line with the principles of the Lisbon Recognition Convention, including the possibility of recognising non-formal and informal learning. In implementing these procedures, the Faculty operates within the University of Rijeka system, including cooperation with relevant national and international bodies for the recognition of qualifications and quality assurance, including the National ENIC/NARIC office of the Agency for Science and Higher Education.

An example of improved recognition procedures at the Faculty is the transition from the recognition of individual courses to the recognition of sets of learning outcomes together with the associated ECTS credits, thus ensuring a clearer connection between recognised competences and the requirements of the study programme. Recognition of study periods is also implemented through student mobility within the ERASMUS, YUFE, and SURI programmes, whereby achieved learning outcomes and ECTS credits are recognised based on previously agreed learning agreements and cooperation with partner higher education institutions.

At Faculty level, a [Commissioner for the Recognition and Validation of Prior Learning](#) has been appointed, while the academic recognition of foreign higher education qualifications and periods of study is carried out at University level through the Office for the Academic Recognition of Foreign Higher Education Qualifications and Periods of Study. For the recognition of ECTS credits and learning outcomes acquired through mobility, the Faculty

appoints a separate [Academic Recognition Committee](#). Recognition procedures are recorded in the ISVU system, enabling systematic monitoring and analysis of implementation. In the period from the 2020/2021 academic year to 2025/2026, a total of 21 students enrolled in study programmes had prior learning recognised, 19 at undergraduate and 2 at graduate level. In addition, two internal transfers at graduate level were recorded during the same period, with course recognition carried out. The experiences of students involved in recognition procedures are monitored through individual conversations with the Faculty management and regular communication with study programme heads. The feedback obtained is used for the further improvement of recognition procedures (See also: [Academic Recognition Qualification Office](#)).

3.3.7. The higher education institution monitors and analyses students' progression, and ensures study continuity and completion.

FIZRI systematically monitors and analyses student progression through indicators of achieved ECTS credits, successful completion of studies, and the number of active students and students who discontinue their studies (Table 3.4). Student progression is also monitored through individual meetings with students at the time of enrolment in a new academic year, involving study programme or study-track heads and ECTS coordinators. During these meetings, course enrolment is aligned, possible course repetitions are considered, and students are provided, where necessary, with counselling support in planning the continuation of their studies. (See also: [Invitation to a meeting regarding enrolment in higher years](#)).

Data on student progression and completion are discussed within expert discussions and thematic sessions of the Faculty, for example at the session held on 22 November 2023. The results of these analyses serve as a basis for the strategic planning of measures that may contribute to improved completion and continuity of study, as well as for decisions aimed at improving study programmes, teaching organisation, and forms of student support.

3.3.8. There are established mechanisms which allow the timely identification of students with difficulties in the regular fulfilment of their academic obligations. They are provided with a timely and continuous support and learning assistance.

FIZRI has established mechanisms that enable the early identification of difficulties in learning and in fulfilling study obligations, with the continuous assessment of student achievement during the semester serving as the main form of monitoring. Additional support for students, especially in the first year of study, is provided through orientation meetings during the first semester and through informal meetings between the Faculty management and students, where identified difficulties are discussed and advice related to the organisation of study is provided. When needed, students also have access to individual support through consultations with teachers, all of whom publish consultation times and locations in their course implementation plans. An important role in individual monitoring is also played by the mentoring system introduced in the 2023/2024 academic year, under which first-year course teachers take on mentoring roles and systematically monitor students' progress while providing advice on learning, the organisation of study obligations, and adjustment to university study. The best example of a successful individualised approach and of effective

support from both teachers and the Faculty is the successful graduation of a student with academic adjustment, who subsequently enrolled in the doctoral study programme in Physics (See also: [Minutes of the Faculty Council meeting held on 11 November 2023. Item 3 Announcement of the Vice-Dean No. 7](#); [Invitations to students to participate in support meetings](#); [Record of the meeting held between the Faculty administration and students on 3 May 2023.](#); [Course implementation plans](#); [Minutes of the Faculty Council meeting held on 11 October 2023, Item 4 - Announcements of the Vice-Dean No. 2.](#)).

3.3.9. The higher education institution provides conditions for student mobility in a national and international context.

FIZRI provides conditions for national and international student mobility through participation in the ERASMUS, YUFE, and SURI programmes and through cooperation with partner higher education institutions and institutions abroad. Within mobility programmes, students have access to ERASMUS and YUFE coordinators who provide information, counselling, and administrative support from the application stage through the recognition of achieved ECTS credits, while relevant information on programmes, participation conditions, and recognition procedures is consolidated on the Faculty website and the dedicated webpages of individual programmes. Mobility within UNIRI is less common due to the complexity of study programmes and the demanding organisation of teaching, but every student inquiry is considered individually, with efforts made to find solutions that allow participation in mobility without negatively affecting study continuity. (See also: [an example of a course included in the YUFE network](#)).

Student mobility is facilitated through the planning of study obligations so that a mobility period can be incorporated into the study path, for example through elective courses and activities that may be completed at a partner institution or within professional practice. Recognition of achieved learning outcomes and ECTS credits is based on a prior learning agreement, through which courses or activity plans and the associated ECTS credits are agreed before departure and recognition upon return is confirmed. In accordance with the Quality Assurance System Plan, the Faculty also occasionally co-finances student visits to scientific institutions of special interest, such as CERN.

In the period from the 2020/2021 to the 2024/2025 academic year, a total of 12 students participated in the above mobility programmes, 5 in outgoing and 7 in incoming mobility (Table 3.5).

3.3.10. The higher education institution issues a diploma and a diploma supplement (in Croatian and English, free of charge) in accordance with the relevant regulations.

Upon completion of studies, FIZRI issues a diploma and a [diploma supplement](#) in accordance with the applicable regulations of the University of Rijeka and the national legislative framework. Final documents are issued to students free of charge, in Croatian and English, and the issuance procedure is carried out according to clearly defined rules and deadlines, of which students are informed in a timely manner. (See also: [Bachelor's diploma](#); [Diploma Supplement](#)).

3.4. The higher education institution provides sufficient and easily accessible resources to support students.

3.4.1. The higher education institution provides the students with learning support and provides the necessary counselling to ensure an optimal studying experience (e.g. tutors, mentors and other counsellors, student services and other relevant career guidance services for students, psychological counselling, legal counselling, support for students from vulnerable and under-represented groups, support for students involved in international mobility programmes, library services, etc.) at the institutional level.

FIZRI provides students with support in learning and academic progression through a mentoring system, an individualised approach by teachers, and the availability of consultations throughout the entire course of study, which is further facilitated by the relatively small number of students in relation to the number of teachers. A mentoring model has been developed especially for first-year students, within which teachers monitor their progress and provide advice related to learning, the fulfilment of academic obligations, and adjustment to higher education. This approach also includes counselling support through regular individual meetings upon enrolment in a higher year of study, conducted by the Vice-Dean and the ISVU coordinator, focusing on student status, the planning of academic obligations, and the resolution of possible progression difficulties. Student support is also provided in cooperation with the expert and counselling services of the University of Rijeka. Students have access to [psychological](#) and [career counselling](#) through the [University Counselling Centre](#). Attention is paid to students from vulnerable and under-represented groups, for whom a coordinator from among the teaching staff has been appointed. In cooperation with teachers and the Faculty management, and with the support of the [Academic Adjustment Counselling Service](#) within the University Counselling Centre, this coordinator participates in ensuring appropriate forms of support in accordance with the applicable University regulations. The clearest example of successful individualised support for both students and teachers are the successful graduation of a student with academic adjustment who subsequently enrolled in the doctoral study programme in Physics. (See also: [coordinator for vulnerable and under-represented groups](#)).

For international and national mobility systems (ERASMUS, YUFE, and SURI), the Faculty has appointed [ERASMUS and YUFE coordinators](#) who provide students with advisory and administrative support before, during, and after participation in mobility programmes. The Faculty also supports the work of student organisations and, where possible, provides Faculty space for their activities.

Students of the Faculty of Physics also have access to the services of the [University Library Rijeka, including the Campus Branch](#) on the University campus in Trsat. The Library provides access to printed and electronic materials and scientific databases and offers informational and bibliographic support to students and teachers in their study and research work. Students also have access to digital repositories within the [DABAR](#) system, where bachelor's and master's theses and other scientific content are stored.

The building in which the Faculty of Physics is located was built recently and in accordance with modern standards and, in terms of physical accessibility, with many lifts, is fully adapted to students with disabilities.

3.4.2. Students are familiar with the various forms of support at their disposal.

FIZRI students are familiar with the various forms of support available to them through publicly available information on the websites of the Faculty and the University of Rijeka, including information about support services such as the Student Office and the Library, as well as through direct communication with teachers and mentors.

At the beginning of studies, and throughout their duration, students are informed about the mentoring system, consultation opportunities, mobility programmes, and procedures related to academic obligations, rights, and responsibilities. Communication is additionally carried out via e-mail and other official Faculty communication channels. Since 2023, student information has been further improved through the introduction of the Student Office e-course within the Merlin e-learning system, in which all FIZRI students are enrolled. This has enabled centralised, timely, and efficient communication on study-related matters and available forms of support.

Students are also informed directly through teachers' individual approach and the availability of consultations throughout study, as well as through regular meetings with the FIZRI management, which are made possible by the relatively small number of students in relation to the number of teachers. Students are further informed through counselling support in the form of individual meetings held with each student upon enrolment in a higher year of study, conducted by the Vice-Dean and the ISVU coordinator and focused on student status, planning study obligations, and resolving possible difficulties in progression. (See also: [Invitations to students to participate in support meetings](#);; [Record of the meeting held between the Faculty administration and students on 3 May 2023](#).)

3.4.3. The higher education institution supports the students in acquiring and developing digital skills.

FIZRI supports students in acquiring and developing digital skills through the integration of digital tools and technologies into the teaching process. For example, the Merlin e-learning system, digital teaching materials, and contemporary software and hardware tools are used in teaching, especially in practical and laboratory work. Students also have access to appropriate computing resources and software tools for teaching and research activities, data processing and analysis, and the preparation of seminar papers and bachelor's and master's theses, including advanced computing resources such as the Bura supercomputer and the Prelog server computers, and, until 2025, Kopernik. Digital support also includes the use of institutional systems such as the [DABAR](#) repository and the Turnitin tool for checking the originality of student work.

Within the University of Rijeka research and development project in education, UNIRI CLASS, programme line A2: Digital citizenship – innovations in learning and teaching, the project "Collection of digital content for teaching physics and natural sciences", led by I. Poljančić Beljan (2022–2023), was implemented in the previous period. The project outcome, the digital content collection, is an example of support for and student involvement in the acquisition and development of digital skills. It is a digital repository containing 96 experiments for teaching physics and natural sciences, prepared in multimedia and methodological form. The experiment videos were produced by students within two courses, Methodological Practicum in Physics Teaching and Extracurricular Natural Science and

Mathematics Activities at the Faculty of Teacher Education, both led by teachers from the Faculty of Physics. It is important to note that the collection also has a student co-author, L. Sutlović. This rich digital content is intended for physics students and supports the application of innovative teaching methods in virtual environments. (See also: [The digital repository for physics and science teaching](#))

In response to the challenges associated with the development of artificial intelligence, UNIRI adopted in 2023 a Statement on the Responsible Use of Artificial Intelligence Tools, which defines the basic principles of the responsible and ethical use of AI tools in teaching and research, and in 2024 the Policy on the Use of Artificial Intelligence Tools at the University of Rijeka, which regulates the goals and principles of the use of artificial intelligence in academic work and encourages the responsible and transparent application of new technologies while preserving academic integrity. Guidelines for the Responsible Use of Artificial Intelligence Tools at UNIRI were also adopted. (See also: [Statements on the responsible use of the AI tools](#); [Policies on the use of AI tools at the University of Rijeka](#); [Guidelines for the responsible use of the AI tools at UNIRI](#)).

3.4.4. Student support is tailored to a diverse student population (part-time students, senior students, foreign students, students from under-represented and vulnerable groups, students with learning difficulties and disabilities, etc.).

FIZRI considers the diversity of its student population and adapts forms of support to different study needs and circumstances relating to part-time and senior students, foreign students, students from under-represented and vulnerable groups, students experiencing difficulties in mastering coursework or progressing through study, and student athletes. Attention is paid to students from vulnerable and under-represented groups, for whom a coordinator from among the teaching staff has been appointed. In cooperation with teachers and the Faculty management, and with the help of the [Academic Adjustment Counselling Service](#) within the [University Counselling Centre](#), the coordinator participates in ensuring appropriate forms of support in accordance with the applicable regulations of the University of Rijeka. At University level, students also have access to [psychological](#) and [career counselling](#) through the University Counselling Centre. (See also: [coordinator for vulnerable and under-represented groups](#)).

Support for students with different study circumstances is further ensured through the availability of learning spaces, such as a larger-capacity computer classroom, and the possibility of attending teaching online or in hybrid form. Where necessary, students may also borrow laptops and arrange individual agreements with teachers concerning the organisation of study obligations.

Information on available forms of support is publicly available and is regularly communicated via the Faculty website and LMS Merlin.

3.4.5. The higher education institution systematically monitors the different needs of students, especially those from vulnerable and under-represented groups; it ensures conditions of studying and adapts the teaching methods and the test of knowledge and skills according to their individual needs.

FIZRI systematically monitors the different needs of students through continuous assessment of student achievement, mentoring, student surveys, and analyses of study success, with the aim of identifying in a timely manner the specific needs of students, including those from vulnerable and under-represented groups. Data on students from vulnerable and under-represented groups are collected and processed in accordance with personal data protection legislation.

Where difficulties are identified, students are referred to the available forms of support in accordance with the applicable regulations of the University of Rijeka. For students with health difficulties, disabilities, and chronic illnesses, a Care and Monitoring Protocol is applied, while adjustments to teaching and assessment are implemented on the basis of recommendations from the [Academic Adjustment Counselling Service](#) within the [University Counselling Centre](#) and in agreement between the coordinator for vulnerable and under-represented groups and teachers, with due regard for intended learning outcomes and academic standards. Within these procedures, eight cases of academic-environment adjustment have so far been implemented (e.g. low vision, dysgraphia, visual impairment), and in justified cases students may also be granted suspension of academic obligations (e.g. parental leave, bereavement, health reasons). Tuition-fee subsidy measures are also applied for students from vulnerable and under-represented groups in accordance with Senate decisions. (See also: [coordinator for vulnerable and under-represented groups](#))

Student feedback is used as a basis for adapting teaching methods, student workload, and the organisation of teaching, and, where necessary, for adjusting knowledge and skills assessment procedures. The special needs of students from vulnerable and under-represented groups are considered in cooperation among the coordinator, teachers, and the Faculty management, while feedback on the quality of information and the availability of support is regularly analysed and discussed at meetings of the Quality Assurance and Enhancement Committee and the Faculty Council. The clearest example of effective support from both teachers and the Faculty is the successful graduation of a student with academic adjustment who subsequently enrolled in the doctoral study programme in Physics.

3.4.6. The higher education institution employs an appropriate number of qualified and committed professional, administrative and technical staff.

FIZRI has an appropriate number of qualified teaching, professional, administrative, and technical staff who ensure the high-quality delivery of teaching, the provision of student support, and the efficient functioning of the Faculty.

Teaching in most courses is carried out by Faculty staff. In the assessment year, 24 teachers were employed full-time (22 in scientific-teaching positions and 2 in teaching positions), together with two senior assistants and four assistants. Two additional teachers were employed part-time: one full professor (50%) and one full professor (15%, working after retirement). A favourable student-to-teacher ratio enables an individualised approach to students and continuous academic and mentoring support.

Professional, administrative, and technical staff participate in the implementation of teaching activities, the maintenance of teaching and research infrastructure, and the provision of operational and advisory support to students during their studies. The number and educational structure of FIZRI's administrative and technical staff are as follows: M. Turina (chemical technician) – laboratory technician; Lj. Špirić (teacher of practical classes in electrical engineering) – senior laboratory technician; M. Majetić (bacc. ing. politechn.) – senior

laboratory technician; M. Musulin (mag. sanit. ing.) – senior laboratory technician; K. Veličan (mag. phys.) – Head of organisational unit 4 (Head of the Maintenance and Technical Services Office); I. Bjedov Keleković (mag. iur.) – Head of organisational unit 4 (Head of the Legal and Human Resources Office); and K. Benac Kružić (mag. oec.) – Head of organisational unit 3 (Head of the Dean's Office). One person is employed in a professional post as expert advisor in the science and higher education system (M. Sarta Deković, MSc, teacher of mathematics and physics).

The library employs three full-time staff members (one assistant librarian, one graduate librarian, and one senior librarian serving as head librarian), thereby ensuring expert support to users in finding, evaluating, and using information and in the provision of information literacy training.

According to surveys of the satisfaction of University of Rijeka graduates in the period from the 2018/2019 to the 2021/2022 academic year, FIZRI was rated above the University average in terms of advice and support from teachers and administrative staff, and in 2020/2021 and 2021/2022 it was ranked as the highest-rated constituent unit by this criterion.

3.5. The higher education institution provides favourable conditions and support for students entering international outgoing and incoming mobility programmes.

3.5.1. Croatian students are informed about the opportunities for completing a part of their studies abroad.

Students at all levels of study at FIZRI (undergraduate, graduate, and postgraduate) are systematically informed about opportunities to complete part of their studies abroad through various international mobility programmes. Information about available mobility programmes, especially [Erasmus+](#) and [YUFE](#), which enable study stays or professional practice abroad, is communicated to students through the main institutional communication channels. (See also: [Faculty website](#), [Erasmus call](#); [YUFE Minors](#); [Erasmus mobility calls - info days](#); [Teaching/Mobility](#)).

The Faculty website publishes key news on its homepage, including information about open calls and information events related to international mobility. In addition, the Teaching/Mobility section contains links to UNIRI webpages and information on the Erasmus and YUFE programmes. These data are based on the official and regularly updated information provided by the UNIRI Centre for International Mobility/Erasmus and the YUFE team. (See also: [Student Office notices in Merlin](#)).

Since 2023, the Merlin e-learning system has included a course called Student Office, which serves as a central place for publishing notices, calls, and other information relevant to students, including information on mobility opportunities. The Faculty has appointed [Erasmus and YUFE coordinators](#) who provide students with detailed information on available mobility opportunities, participation conditions, the application procedure, and the recognition of courses completed during time abroad. Students are encouraged to contact the coordinators directly for individual counselling and additional information about participation in mobility programmes.

FIZRI actively participates in numerous international collaborations and scientific projects. Mentors of bachelor's, master's, and doctoral theses, as well as teachers, therefore represent an important source of information for students on opportunities to spend time at

foreign institutions during study stays or professional development. Through their research networks and international collaborations, mentors and teachers often help establish contacts with partner institutions and research groups abroad. In such cases, student mobility may be financed through Erasmus professional practice, and in certain cases also through funds secured through scientific research projects. (See also: [international collaborations](#); [research projects](#))

These information mechanisms have resulted in student participation in the Erasmus and YUFE international mobility programmes. In the period from the 2020/2021 to the 2024/2025 academic year, a total of 6 undergraduate and graduate students participated in outgoing international mobility at universities and institutions in Italy, Spain, Slovenia, and the Netherlands. During the same period, the Faculty hosted 7 incoming students from Italy, France, Spain, and Cyprus.

At the same time, 6 doctoral students from FIZRI participated in Erasmus professional practice mobility at various institutions in Europe, including INFN Trieste, the Polytechnic University of Milan, the University of Zaragoza, the Institute of High Energy Physics in Barcelona, the University of Łódź, and Goethe University Frankfurt. Doctoral-student mobility is systematically recorded through individual doctoral-student records and later entered ISVU. Another funding opportunity for doctoral students and assistants is provided by Croatian Science Foundation outbound mobility projects for assistants ([MOBDOK](#)), published on the HRZZ and UNIRI websites; three FIZRI doctoral students participated in these programmes. (See also: [Individual records of PhD students](#); [D. Jardas Babić](#)).

Examples of competitive scientific projects at FIZRI that funded student mobility from their own resources include the HRZZ project [ASTRO-GAMMA](#) (July 2025), led by M. Manganaro, which enabled a graduate student, L. Lulić, to stay at the MAGIC telescopes and a doctoral student, K. Mrakovčić, at the LST telescope on La Palma, as well as the NPOO project [POMERI](#), led by I. Kavre Piltaver, which funded the professional training of doctoral student [M. Mačkić Jovanović at the University of Zaragoza in Spain](#).

3.5.2. The higher education institution encourages students to engage in outgoing mobility programmes by organizing various promotion campaigns and providing information and a regulated and flexible way of recognising ECTS credits acquired during mobility programmes.

[FIZRI](#) encourages students to engage in international mobility programmes through systematic information, the promotion of mobility programmes, and a clearly defined and flexible system for recognising ECTS credits acquired during mobility. These activities are aligned with the strategic goals of FIZRI and [UNIRI](#) in the area of internationalisation and the development of flexible forms of study. The FIZRI Development Strategy for 2021–2025 emphasises that work, learning, and teaching take place in an environment characterised by strong incoming and outgoing mobility of researchers, teachers, administrative and technical staff, and students, thereby recognising internationalisation as an important element of the Faculty's development. This approach is also aligned with the UNIRI Strategy, which promotes the internationalisation of study programmes, the mobility of students and teachers, and the development of international cooperation through mobility programmes.

Support in joining outgoing and incoming mobility programmes is provided by the [Erasmus+ and YUFE coordinators](#) appointed at FIZRI, who provide information on mobility opportunities, application conditions, and the procedure for recognising courses. More

broadly, FIZRI conducts extensive consultations with interested students and actively helps them choose an appropriate study programme or professional practice abroad, as the Faculty has developed international cooperation with numerous excellent scientific institutions and universities. Outgoing mobility is further encouraged in cooperation with the UNIRI Centre for International Mobility/Erasmus through the organisation of information events, the publication of calls, and regular communication with students via the Faculty website and the Student Office Merlin course. (See also: [international collaborations](#); [information events](#))

Activities completed within mobility programmes are recognised in accordance with the Learning Agreement signed before departure. Procedures for recognising ECTS credits and courses acquired during mobility are regulated at Faculty level through the Committee for the Recognition of ECTS Credits, Grades, Periods of Professional Practice, and Student Exchange within the Erasmus Programme. In recognition procedures, a contemporary approach based on the comparison of sets of learning outcomes and associated ECTS credits is applied, instead of the previous “one-to-one course recognition” model. This allows more flexible recognition of mobility and is in line with the recommendations of the European Commission and the principles of the European Higher Education Area. (See also: [sample documentation](#); [Decision on the appointment of the Committee for the recognition of ECTS credits, grades and periods of professional practice and student exchange within Erasmus programme](#); [Erasmus Charter for Higher Education 2021-2027 101005205-UNIRI](#)).

FIZRI also promotes mobility through concrete academic measures that enable the flexible organisation of study obligations. For example, students may have ECTS credits earned during mobility recognised through the Professional Practice course in graduate study programmes. The possibility of recognising ECTS credits acquired within YUFE mobility and micro-qualification programmes provides an additional incentive for participation in international educational activities. At doctoral level, it is important to note that, in addition to providing opportunities for professional practice and ECTS recognition for the Internationalisation of Research component, FIZRI also enables students to obtain a double doctoral degree with partner institutions within cotutelle arrangements (See also: [example of ECTS credit recognition within YUFE mobility](#); [obtaining a double doctoral degree](#)).

3.5.3. The higher education institution provides support to students in applying for and carrying out exchange programmes.

FIZRI provides students with continuous support throughout the process of application, preparation, and implementation of international mobility programmes. This support is primarily provided through the work of the [Erasmus+ and YUFE coordinators](#) appointed at the Faculty, who offer individual counselling on mobility opportunities, participation conditions, the selection of an appropriate partner institution, and the alignment of academic obligations to be completed during the stay abroad. FIZRI operates within UNIRI, which has concluded more than 900 Erasmus interinstitutional agreements. At Faculty level, Erasmus agreements have been concluded with higher education institutions in six countries (Italy, Slovenia, Poland, Spain, Norway, and Türkiye). The portfolio of agreements is continuously developed and aligned with the needs of study programmes and the interests of students and teachers to ensure the quality and availability of international mobility (See also: [Erasmus inter-institutional agreements](#)).

Student support is also provided through cooperation with the UNIRI Centre for International Mobility/Erasmus, which offers administrative and organisational support in the

application procedure, informs students about open calls and programme rules through its updated website, and organises information events related to mobility. At Faculty level, students are additionally informed about mobility opportunities via the FIZRI website, the Student Office Merlin course, and direct contact with coordinators (See also: [UNIRI Erasmus page; information events](#)).

Extensive consultations are held with interested students, considering their current study status, the possibilities of integrating mobility into their study plan, and the selection of an appropriate study programme or professional practice abroad. An important part of this support relates to planning study obligations before departure. This is done through the Learning Agreement, which aligns in advance the courses, learning outcomes, and associated ECTS credits between the home and partner institutions. During the preparation of the Learning Agreement, consultations are held with the ECTS coordinator (the Vice-Dean) and the ISVU coordinator, thereby ensuring clarity and security regarding the academic recognition of obligations completed during mobility. (See also: [ECTS coordinator, ISVU coordinator](#)).

FIZRI also supports students in finding mobility opportunities connected with scientific research and professional practice. Because the Faculty actively participates in scientific projects and international collaborations, mentors of graduate and doctoral theses often help students establish contacts with partner institutions and research groups abroad and direct them toward appropriate possibilities for study stays or professional development. In certain cases, mobility may be carried out through Erasmus+ professional practice or supported by scientific-research projects (See also: [international collaborations; research projects](#)).

Support continues after the completion of mobility, when the Faculty ensures the recognition of achieved ECTS credits and records mobility results in the relevant registers. In this way, FIZRI provides students with comprehensive academic, advisory, and administrative support throughout all phases of participation in exchange programmes.

3.5.4. The higher education institution ensures the recognition of ECTS credits gained at another higher education institution.

FIZRI ensures the recognition of ECTS credits and study obligations completed at other higher education institutions, especially within international mobility programmes. Procedures for the recognition of ECTS credits and courses are regulated at Faculty level through the Committee for the Recognition of ECTS Credits, Grades, Periods of Professional Practice, and Student Exchange within the Erasmus Programme, while also relying on the University normative framework, in particular the Regulations on the International Exchange of Students, Teaching and Non-teaching Staff within the Erasmus Programme, the Regulations on the Recognition and Validation of Prior Learning of the University of Rijeka, and the Senate decision on the recognition of extracurricular activities and their entry into the Diploma Supplement. (See also: [Decision on the appointment of the Committee for the recognition of ECTS credits, grades and periods of professional practice and student exchange within Erasmus programme; Ordinance on the international exchange of students, academic and non-academic staff within the Erasmus programme; Ordinance on the recognition and validation of prior learning of the University of Rijeka; Senate Decision on the recognition of extracurricular activities and their inclusion in the Diploma Supplement](#)).

The procedure for aligning courses before mobility is implemented through the Learning Agreement, which is prepared and approved before the student departs for mobility.

In the preparation of the Learning Agreement, courses and learning outcomes at the home and partner institutions are compared, thereby defining in advance the recognition of ECTS credits acquired during mobility. By completing and approving the Learning Agreement, transparent and pre-defined recognition of study obligations completed at the partner institution is ensured. An important advisory role in this process is also played by the ECTS coordinator (the Vice-Dean) and the ISVU coordinator, who help students assess the alignment of learning outcomes and choose appropriate courses or other activities during mobility. After successful completion of mobility, the achieved learning outcomes and associated ECTS credits are recognised, thereby exempting the student from the corresponding parts of the study programme at the home institution. After returning from mobility, the achieved ECTS credits and grades are recorded in the Faculty information system, that is, in ISVU, based on the official transcript from the partner institution. The original course titles from the host institution are entered into the records, and grades are converted into the national grading system and included in the student's grade average. Achieved learning outcomes and recognised activities are also entered into the Diploma Supplement (See also: [example of documentation, mobility ECTS and ISVU coordinator](#)).

In addition to courses completed at partner institutions, students are also granted ECTS credits for activities such as professional practice during mobility, as well as for mobility within the YUFE network and micro-qualification programmes. At University level, the recognition of extracurricular activities through which students acquire relevant competences, and their entry into the Diploma Supplement, is also regulated, including mobility activities that are not evaluated through ECTS credits. (See also: [Z. Vrčec - Diploma Supplement](#)).

3.5.5. Information on the opportunities for enrolment and studying is available to foreign students in a foreign language.

The Faculty website has recently been redesigned in Croatian and [English](#) in order to improve the accessibility and clarity of information for international students. Detailed information in English is available on study opportunities, admission procedures, and study programmes. The FIZRI website also contains all relevant information on the Faculty's work, the doctoral study programme, scientific activities, staff, departments, laboratories, and international cooperation. This ensures transparency of study programmes and the availability of key information relevant to international students. It is particularly important that all information on the [doctoral study programme in Physics is available in English](#), as the programme is delivered entirely in English. (See also: [Admissions](#); [Study programmes](#)).

Regarding Erasmus and YUFE mobility, interested international students can find information on the new English-language website, including contact details for Erasmus and YUFE coordinators and links to instructions provided by the UNIRI Centre for International Mobility/Erasmus for incoming students. International students are encouraged to contact the coordinators at FIZRI to obtain more detailed information on courses taught in English and to consider the possibility of consultative forms of teaching in agreement with course teachers. YUFE students may apply for courses offered by FIZRI or for YUFE Minor programmes through the [OpenYUFE](#) virtual campus platform. (See also: [Erasmus and YUFE mobility; Incoming student mobility; mobility coordinators FIZRI](#)).

In addition to information available at Faculty level, international students also have access to the University of Rijeka information package, available on the University website, which contains key information on studying at UNIRI, mobility programmes, administrative

procedures, accommodation, and student life. In this way, FIZRI and the University of Rijeka ensure that international students have timely access to all relevant information needed for making decisions about study and for successfully preparing for arrival. (See also: [International student guide for Erasmus students](#)).

3.5.6. The higher education institution is engaged in actively attracting foreign students to come to mobility programmes and/or enrol in a study programme and obtain a full qualification.

[FIZRI](#) is actively involved in attracting international students through the development and implementation of activities aimed at the internationalisation of study programmes, in line with the strategic framework of UNIRI. Within this framework, FIZRI promotes opportunities for incoming mobility and study through the Faculty website in Croatian and [English](#), where information is available on study programmes, the doctoral programme, international cooperation, mobility, and contacts for further enquiries. It is particularly important that all key information on the doctoral study programme in Physics is available in English, since the programme is delivered in English, making FIZRI open and recognisable to international doctoral students and visiting researchers (See also: [University Strategy - The European University of the Future](#); [mobility](#); [Doctoral Study Programme](#)).

FIZRI operates within UNIRI, which has concluded more than 900 Erasmus interinstitutional agreements. At Faculty level, Erasmus agreements have been concluded with higher education institutions in six countries. The portfolio of agreements is continuously developed and aligned with the needs of study programmes and the interests of incoming students and teachers to ensure the quality and availability of international mobility. It is also important to emphasise that, within the [YUFE virtual campus](#), FIZRI offers students 11 courses in English, delivered online and/or on site, with mandatory registration through the [OpenYUFE](#) platform. The courses cover a broad range of topics in modern physics and interdisciplinary studies, including experimental and theoretical physics, data analysis and programming, nuclear physics and astrophysics, as well as materials science and environmental science. The Faculty also participates in the [YUFE Minor Urban Ecology: Transdisciplinary Approaches to Climate Change](#) (See also: [Erasmus inter-institutional agreements](#); [example of a course included in the YUFE network](#)).

FIZRI attracts international students primarily through its scientific and professional work, including participation in publications, scientific projects, and international collaborations. Active participation in such initiatives contributes to the Faculty's visibility in the international academic space and stimulates interest in incoming mobility. In addition, Erasmus coordinators participate in online Erasmus events at which coordinators from physics-related institutions at different European universities present their institutions, thereby further strengthening international visibility and creating new contacts relevant to student mobility (See also: [International collaborations](#); [Erasmus Day at Physics organized by the University of Bari](#)).

Alongside the UNIRI Centre for International Mobility/Erasmus, international students can receive professional assistance in English in collecting and preparing the documentation required for application and arrival. In the process of adjustment and integration into the academic and local community, students themselves also play an important role, especially through ESN Rijeka and the support of the Student Union, which help students navigate the University, find accommodation, participate in orientation activities, and engage in student

life in Rijeka. International students also have access to the dedicated “[Studying at the University of Rijeka](#)” website, where information is consolidated on study opportunities at the University, including mobility periods, enrolment in full study programmes, and participation in research and visiting activities. (See also: [Incoming Erasmus students](#); [Erasmus Student Network](#)).

3.5.7. The higher education institution provides support to foreign students during enrolment, integration and studying at the Croatian higher education institution.

FIZRI and UNIRI provide international students with systematic support throughout the processes of application, arrival, integration, and study. At Faculty level, support is provided by the Erasmus and YUFE coordinators, the ECTS coordinator, the ISVU coordinator, and the heads of study programmes, who take part in the alignment of the Learning Agreement, provide the necessary academic information, and help students organise their study obligations during their stay at the Faculty. Course teachers also actively participate in the adaptation of international students to the new teaching environment. Teaching is delivered in English where needed, individual consultations are organised, teaching materials and literature in English are provided, and students are enabled to prepare seminar papers and take examinations in English (See also: [Erasmus and YUFE coordinator](#), [ECTS coordinator](#), [ISVU coordinator](#); [Head of study programme](#)).

At University level, support is provided by the UNIRI Centre for International Mobility/Erasmus, which coordinates the application process and administrative procedures and organises information activities for incoming students. At the beginning of each semester, a [Welcome Day](#) orientation programme is organised at which international students are introduced to the University, study programmes, administrative procedures, and practical information about studying and living in Rijeka. (See also: [Erasmus Centre](#)).

Students of FIZRI themselves, especially members of the Student Union, also play an important role in the integration process by helping international students find their way around the Faculty, the University, and student life in Rijeka. Additional support is provided by ESN Rijeka ([Erasmus Student Network](#)), which organises activities aimed at integrating international students into the academic community and local environment. International students also have access to administrative support through the Faculty’s Student Office, which provides information on study obligations, course records, and the issuance of required documentation. Students may also use the services of the [University Counselling Centre](#), which provides different forms of support at University level, including psychological and career counselling and counselling related to academic adjustment. In this way, FIZRI ensures academic, administrative, and social support for international students during their stay at the Faculty and promotes their successful integration into the UNIRI academic community.

3.5.8. Foreign students have the opportunity to attend classes delivered in a foreign language (English).

At FIZRI, international students have the possibility of attending classes and taking examinations in English. [Erasmus+ and YUFE coordinators](#) systematically inform incoming students about the possibilities for attending classes and consultations in English through individual counselling and support.

The doctoral study programme in Physics is delivered in English, which allows international doctoral students to be fully integrated into the study programme and the Faculty's research activities. At graduate level, courses may also be followed in English, and some courses are regularly delivered in English. Recently, the undergraduate course Symbolic Programming has also started to be delivered in English. In addition, the micro-qualification Recognising Changes in the Environment is offered in Croatian and English and includes three courses within the UNIRI CLASS A1 Open Personalised Education project (2022–2025), in cooperation with the Faculty of Economics in Rijeka. When incoming mobility students participate in teaching, classes are organised in English as needed to ensure their full inclusion in study activities (See also: [Doctoral Study in Physics](#); [Example of incoming mobility in the Master's programme in Physics](#)).

At undergraduate level, teaching is primarily delivered in Croatian, but for incoming mobility students a flexible consultative model in English is used in practice, whereby students follow the course content through individual consultations with teachers. Teachers provide teaching materials and literature in English and allow students to prepare seminar papers and presentations and to take examinations in English. Teaching materials, notices, and communication are also available through the Faculty website and the Merlin e-learning system, which enables the distribution of teaching content and communication with teachers and fellow students.

It is also important to note that, within the [YUFE virtual campus](#), FIZRI offers 11 courses in English, delivered online and/or on site with mandatory registration via the [OpenYUFE](#) platform. The Faculty also participates in the [YUFE Minor Urban Ecology: Transdisciplinary Approaches to Climate Change](#).

3.5.9. Croatian language courses are delivered for foreign students at an institutional level.

Incoming mobility students have the opportunity to attend free Croatian language courses within the [Rijeka School of Croatian Studies](#) at the UNIRI Faculty of Humanities and Social Sciences. Students may enrol in the courses "Croatian as a Second and Foreign Language 1, 2, or 3", after which they receive a certificate and earn 4 ECTS credits, provided that the course is included in the Learning Agreement. Mobility coordinators at FIZRI, as well as the UNIRI Centre for International Mobility/Erasmus, inform students about this possibility during [Erasmus Welcome Day](#) events. At present, one Erasmus+ student staying at FIZRI is also attending a Croatian language course (See also: [Croatian as a Second and Foreign Language 1, 2 ili 3](#); [Mobility coordinators at FIZRI](#)).

3.5.10. The higher education institution gathers and analyses feedback on the satisfaction of students involved in outgoing and incoming mobility with the quality of support provided by the higher education institution and actively informs students and other stakeholders about the interventions and improvements implemented.

FIZRI monitors the experiences of students involved in international mobility programmes through a feedback-collection system implemented at UNIRI level. The UNIRI Office for International Mobility/Erasmus keeps records of all incoming and outgoing Erasmus students and collects statistical data on mobility by country, constituent unit, and academic year. All students participating in mobility programmes, both incoming and outgoing, are required after mobility to complete a final report in the European Commission's Beneficiary

Module by filling in the Erasmus+ participant survey. These reports are used to produce statistics on student satisfaction with different aspects of mobility. The data are analysed at UNIRI level and used to monitor the quality of programme implementation and to improve procedures related to the international exchange of students. At present, the system does not allow the extraction of student-satisfaction statistics separately for each University constituent unit.

In addition, incoming students undertaking physical mobility at FIZRI are allowed to participate, under the same conditions as domestic students, in end-of-semester ISVU surveys evaluating teaching and teachers' work. However, the response rate of international students to these surveys is currently low, partly due to organisational circumstances connected with the completion of mobility. Therefore, additional feedback is collected through individual communication with mobility coordinators, thereby ensuring qualitative insight into students' experiences and needs. For example, the continuous interest in incoming and outgoing mobility among partner institutions, especially Italian universities with which the Faculty has established interinstitutional agreements and developed scientific cooperation, indicates a high level of student satisfaction.

The Faculty continuously invests effort in enhancing the international dimension of its study programmes, particularly by increasing the offer of courses in English and expanding the portfolio of interinstitutional agreements and international collaborations, with the aim of strengthening incoming and outgoing student mobility and ensuring its quality and sustainability.

4. TEACHING CAPACITIES AND INFRASTRUCTURE OF THE HIGHER EDUCATION INSTITUTION

4.1. *The higher education institution ensures adequate teaching capacities.*

4.1.1. *The higher education institution has an adequate number of teachers employed full time at the scientific-teaching or artistic-teaching positions (for universities or constituents of the university), or an adequate number of teachers employed full time at teaching positions (for polytechnics / universities of applied sciences), along with an appropriate number of teachers in the scientific field in which the programme is being delivered (21 teachers at universities, at least 3 of which are from said scientific field; at least 7 teachers at a faculty or arts academy, at least 3 of which are from said scientific field; and 7 teachers at polytechnics / universities of applied sciences, at least 3 of which are from said scientific field).*

The Faculty of Physics of the University of Rijeka provides sufficient and high-quality teaching capacities for the delivery of all its study programmes, with the core role performed by academic staff employed full-time at the Faculty. A total of 24 teachers are employed full-time at the Faculty, including 22 in scientific-teaching positions and two in teaching positions, with additional support from six assistants and senior assistants (Annex III, Table 4.1). Among the full-time teaching staff, 18 are elected in the scientific field of Physics, two in Geophysics, and two in Chemistry (Annex III, Table 4.2), thereby fully meeting the criteria regarding the minimum number of teachers elected in the field in which the study programmes are delivered. In addition, two teachers are engaged at the Faculty on a part-time basis: one full professor (50 %) and one full professor (15 %, retired but still active), both elected in the field of Physics.

Teachers from other constituent units of the University of Rijeka also participate in the delivery of study programmes, particularly those without legal personality (Annex III, Table 4.2). Teachers from the Faculty of Mathematics and the Faculty of Informatics and Digital Technologies teach mathematics and informatics courses that form part of the [undergraduate study programme in Physics](#) and the graduate study programmes [Physics and Mathematics](#) and [Physics and Computer Science](#). Due to the way teaching engagement is recorded in the CroRIS Persons module, their work is shown as cumulative and part-time employment, although this does not represent classical external collaboration but rather long-standing and established university-level cooperation among constituent units without legal personality that does not generate additional teaching workload for their home units. In the academic year 2024/2025, teaching delivery involved 16 teachers in scientific-teaching positions, one teacher in a teaching position, and six assistants and senior assistants from the constituent units.

A particularly important role in the delivery of study programmes is played by cooperation established through the joint graduate study programme [Engineering and Physics of Materials](#), which the Faculty of Physics implements together with the Faculty of Engineering of the University of Rijeka. In this programme, students from both constituent units attend classes jointly, and the teaching process is delivered in an integrated manner, without

separate groups for students from individual faculties. Due to this organisation of teaching, the 13 teachers from the Faculty of Engineering who participate in programme delivery are not considered external collaborators of the Faculty of Physics, but they are also not listed as employees in cumulative or part-time employment. The programme does not generate additional contact hours for teaching staff, as delivery is unified and stably organised.

A similar model is applied in the teacher-education study programmes Physics and Mathematics and Physics and Computer Science in which eight courses of the teacher-education module are delivered at the Faculty of Humanities and Social Sciences in Rijeka as part of the integrated teacher-education study programmes of the University of Rijeka. For these programmes, agreements are reached between constituent units at the institutional level rather than individual contracts with teachers (example: [agreement for the academic year 2023/2024](#)). These agreements regulate payment for teaching delivered depending on the number of students and enrolled ECTS credits in a given academic year. In the academic year 2024/2025, students of the Faculty of Physics were not enrolled in teacher-education module courses; therefore, teachers from the Faculty of Humanities and Social Sciences did not participate in teaching at the Faculty of Physics and are not recorded in the analytical tables.

In the category of external collaborators in the considered academic year, only those teachers engaged from outside the University of Rijeka system or outside established interinstitutional cooperation frameworks were recorded. In the undergraduate study programme Physics, one external collaborator was engaged for the course English for Specific Purposes (A. Bratulić). In the doctoral study programme Physics, two external collaborators (M. Kralj and I. Delač), researchers from the Institute of Physics in Zagreb, delivered teaching based on an existing cooperation agreement between the institutions. In the delivery of the joint micro-qualification Recognising Environmental Changes and Risk Management, implemented by the Faculty of Economics and the Faculty of Physics, one teacher from the Faculty of Economics (D. Mance) participated within the framework of the project under which the micro-qualification was delivered, without the need to conclude a separate contract.

All the described categories demonstrate that the Faculty of Physics ensures stable, sufficient, and professionally competent teaching capacities. The number and structure of full-time teaching staff fully in line with the relevant standards, while cooperation with other constituent units of the University is long-term, institutionally stable, and operationally efficient. Teachers from other constituent units participate in the delivery of study programmes without creating additional workload and without the need for special employment arrangements, confirming the sustainability and functionality of the teaching capacity system. External cooperation with individual experts is used only where justified by specific needs of study programmes, further confirming the rational organisation and university-level integration of the teaching system at the FIZRI.

4.1.2. *At philological studies, a maximum of half the teachers may be employed to teaching positions of language instructor, senior language instructor and language instructor advisor.*

Not applicable to the Faculty of Physics.

4.1.3. *The ratio between the total number of enrolled students and the total number of full-time teachers and those with nominal teaching titles does not exceed 30 : 1 (when calculating the ratio, the number of working hours of teachers who are not employed full time is added up to the number of working hours required of a full-time teacher).*

Table 1a (Annex I) presents the calculation of the student–staff ratio.

The ratio of the total number of enrolled students to full-time teaching staff and titular teachers does not exceed 30:1 (in calculating the ratio, the working-time share of staff employed part-time is added proportionally up to the equivalent of one full-time teacher).

The table includes:

- 24 members of the Faculty of Physics employed in scientific-teaching and teaching positions on a full-time basis (coefficient 1), and two members of staff in scientific-teaching positions employed on a cumulative (50%) and a part-time (15%) basis;
- two senior assistants (coefficient 0.75);
- four assistants (coefficient 0.5);
- two titular teachers (coefficient 0.5).

Based on the presented data, the student–staff ratio is 3.60, which is significantly below the prescribed maximum of 30:1.

It should be noted that several members of the Faculty of Physics also teach physics courses at six constituent units of the University of Rijeka: Faculty of Medicine, Faculty of Dental Medicine, Faculty of Civil Engineering, Faculty of Biotechnology and Drug Development, Faculty of Teacher Education, and Faculty of Engineering. In doing so, they actively contribute to the quality of physics teaching across the entire University. It is important to emphasise that this teaching activity is included in the overall teaching workload of the individual staff members. This collaboration involves constituent units with large student cohorts, meaning that staff from the Faculty of Physics cover a substantial portion of the University’s overall teaching needs in physics.

4.1.4. *The total annual teaching load of all teachers does not exceed 20% of the total annual teaching load (in the case of public higher education institutions).*

The total annual teaching workload of all teachers at the Faculty of Physics in the academic year 2024/2025 was fully aligned with Standard 4.1.4 and did not exceed the maximum permitted share of 20 % of the total annual teaching workload of the public higher education institution. The teaching workload of the Faculty of Physics teachers amounted to approximately 82 % of the planned teaching workload available at the institutional level. Considered separately, the workload of scientific-teaching positions was 80 %, while the workload of teaching and associate positions was 86 %. The reduced workload partly results from the fact that some study programmes were not delivered in this academic year because no students were enrolled in them.

The calculation of the teaching workload at the home institution includes the teaching that Faculty employees deliver within the Faculty’s study programmes, as well as the teaching they deliver in the study programmes of other constituents of the University (Faculty of Biotechnology and Drug Development, Faculty of Teacher Education, Faculty of Civil

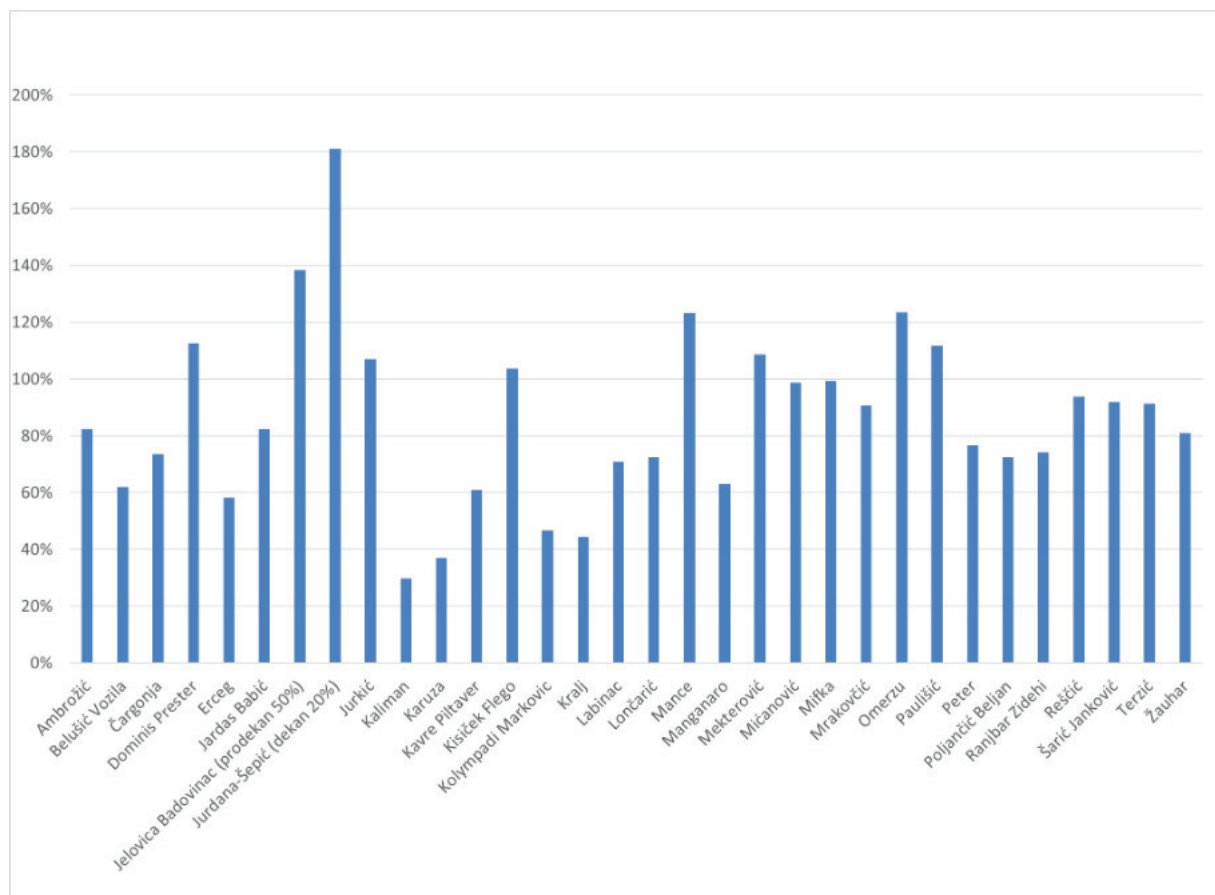
Engineering, Faculty of Engineering, Faculty of Medicine, and Faculty of Dental Medicine), when it is carried out within their regular teaching workload (Table 4.2, Appendix III).

In addition to the regular teaching workload, some teachers voluntarily take on additional teaching activities for which they receive separate compensation. This includes teaching in English and in part-time study programmes at the University of Rijeka (Faculty of Medicine and Faculty of Dental Medicine), teaching at other universities (Faculty of Natural Sciences in Pula and the Faculty of Science of the University of Split), as well as teaching in the doctoral programme of the Faculty of Physics. This workload is recorded separately and is not included in the teaching norm. When this segment is also taken into account, the total teaching workload of the Faculty's teachers in 2024/2025 amounted to approximately 92 %.

4.1.5. *Total annual teaching load of an individual teacher does not exceed 20% of the total annual standard teaching load.*

The total annual teaching workload of individual teachers is presented in Table 4.2 (Appendix III), where contact hours are listed according to the actual delivery of teaching within the study programmes of the Faculty of Physics. Since most teachers deliver different forms of teaching (lectures, exercises, seminars), the total teaching workload is additionally presented and calculated in working hours, in accordance with Articles 79 and 80 of the [Collective Agreement](#).

The graphical presentation below shows that the teaching workload of individual teachers in the academic year 2024/2025 does not exceed 20 % of the total annual teaching workload, as prescribed by this standard.



In the evaluation year, the teaching workload was somewhat lower than usual because certain study programmes were not delivered due to the absence of enrolled students, which consequently reduced the number of realized teaching hours.

Deviations for individual teachers result from specific circumstances prescribed by the Collective Agreement and the actual level of engagement in that academic year. For example, teachers who hold the positions of dean (R. Jurdana-Šepić) and vice-dean (I. Jelovica Badovinac) have a reduced teaching obligation in accordance with Article 72 of the Collective Agreement (20% of the full workload for the dean and 50% for the vice-dean).

One teacher (Z. Kaliman) is employed part-time (15% of working time after retirement), one was newly employed and therefore did not reach a full workload in the evaluation year (N. Kralj), while certain teachers did not teach courses because no students enrolled in the courses they were scheduled to teach in that academic year (e.g., M. Karuza).

In Table 4.2 (Appendix III), in addition to teachers from the Faculty of Physics, teachers from the Faculty of Mathematics and the Faculty of Informatics and Digital Technologies are also presented, as previously explained under Standard 4.1.1. For these teachers, only the contact hours they deliver within the study programmes of the Faculty of Physics are shown. It is important to emphasize that teachers from these faculties do not deliver separate classes exclusively for students of the Faculty of Physics; rather, physics students join the same courses offered within the core study programmes of mathematics and informatics. The table clearly indicates the faculty to which each teacher is affiliated, thereby ensuring transparency and the correct interpretation of the data on teaching workload.

4.1.6. Teachers' workload ensures appropriate distribution of teaching, scientific/artistic activities, professional and personal development and administrative duties.

The Faculty of Physics ensures an even distribution of teaching obligations (Appendix III, Table 4.2 and the graphical presentation of workload under 4.1.5), so that teachers can perform all aspects of their work with high quality, including scientific research, professional development, administrative duties, and participation in the work of Faculty bodies. The planning and distribution of teaching workload are carried out at the beginning of each academic year, considering academic rank, experience, course-specific requirements, individual project engagements, and institutional duties. The total teaching workload of each teacher is monitored through a system for recording teaching hours and is regularly aligned with the Collective Agreement. Consideration is given to teachers who hold managerial positions, whose share of teaching duties is reduced in accordance with the Collective Agreement; however, the graphical presentation in section 4.1.5 shows that this has been achieved only partially. In addition, administrative workloads are increasing, while the number of administrative staff remains unchanged (two employees). In general, the number of staff makes it difficult to cover all administrative requirements. On the positive side, institutional and university responsibilities of teachers are continuously monitored to distribute duties as evenly as possible among all employees. At the Faculty of Physics, there is no employee without at least one [administrative responsibility](#).

The distribution of workload also takes into account the requirements of scientific research projects (for example, M. Manganaro and I. Kavre Piltaver had somewhat lower teaching workloads in the evaluation year due to research project management), international

mobility (assistants K. Mrakovčić and F. Reščić were assigned teaching duties within a single semester so that they could dedicate the other semester to scientific research as part of their doctoral work), the preparation and defense of doctoral theses, and student supervision, in order to ensure that teachers have sufficient time for scientific productivity and professional advancement. Assistants are assigned workloads in accordance with their positions and development plans, with particular attention given to mentoring and involvement in research activities. [Administrative and professional duties](#), such as participation in committees, boards, and the preparation of accreditation documentation, are distributed evenly among teachers according to their experience and functions in order to avoid overburdening individuals. The model for distributing teaching and non-teaching duties is continuously monitored throughout the academic year and adjusted when necessary to ensure that each teacher can maintain a balanced execution of all responsibilities associated with their position.

4.1.7. All teachers, including external associates, are qualified for the courses they deliver, have relevant work experience and integrate the latest trends and knowledge from the labour market into the teaching process.

All teachers are qualified for the courses they deliver and possess relevant academic education and professional experience in the corresponding field ([CVs](#), [Decisions on appointments to academic titles and positions](#), Table 4.2, Appendix III). Through active participation in research activities, professional development, and cooperation with the economic sector, they ensure that the teaching process reflects the latest scientific knowledge and labour market trends, enabling students to acquire knowledge and skills applicable in a contemporary work environment. An overview of the scientific and professional achievements of all teachers and visiting staff, including publications in journals, books and conference proceedings, as well as authored and edited books, is presented in Table 4.3 (Appendix III).

The professional development of teachers takes place through participation in national and international scientific research and professional projects, conferences, and various forms of training. The development of teaching competences and the application of modern teaching methods are further encouraged through the Committee for Quality Assurance and Enhancement and through cooperation with the Centre for Teacher Education of the Faculty of Humanities and Social Sciences in Rijeka. The Faculty also cooperates with professional partners whose practical examples are regularly incorporated into teaching, while external experts contribute through lectures, mentoring, field teaching, and professional projects.

At the Faculty of Physics, reflection on teaching practice is carried out as a continuous and structured process encompassing both individual and institutional dimensions. At the individual level, teachers attend targeted workshops on constructive alignment of learning outcomes, teaching activities, and assessment methods, and the acquired knowledge is directly applied in the planning and delivery of individual courses ([Invitation to the workshop on constructive alignment](#), [Workshop on constructive alignment](#), example of a [Certificate of participation in training](#)).

According to Table 4.1.a (Appendix I), for the evaluation academic year 2024/2025, out of a total of 26 members of the scientific-teaching and teaching staff, including teachers in joint appointments, 13 (i.e., 50%) are by primary profession teachers of physics and mathematics, physics and chemistry, or physics and computer science, and therefore possess

formal professional training in psychology, pedagogy, didactics, and physics teaching methodology. Reflection on teaching is also fostered through the active participation of teachers in scientific and professional conferences dedicated to physics education, as well as through the work of the Chair of Educational Physics, which conducts research on the learning and teaching of physics and promotes the dissemination and exchange of good teaching practices.

At the institutional level, reflection on teaching practice is achieved through the systematic evaluation of teaching activities, which integrates student feedback, teacher self-evaluation, and peer review of teaching, all in accordance with procedures developed at the level of the University of Rijeka (examples: [Minutes of the Committee for Quality Assurance and Enhancement meeting of 3 April 2023, item 3](#); [List of implemented peer reviews at the Faculty of Physics](#); [Example of a teacher self-evaluation form](#); [Example of a statement regarding peer review](#)).

4.2. Teacher recruitment, advancement and re-appointment is based on objective and transparent procedures, which include the evaluation of excellence.

4.2.1. *The higher education institution has developed and regularly updates the staff recruitment policy and plan in order to ensure adequate teaching capacities. The overall process of attracting, applying selection methods, selecting and recruiting, as well as professional development and promotion of the teaching staff is based on professional, objective and transparent procedures and criteria which promote excellence and are consistently applied.*

The policy and plan for the employment of teaching staff are based on professional and transparent procedures and criteria, with the aim of ensuring adequate teaching capacities and promoting excellence in higher education. The criteria for the appointment of teachers, researchers, and associates to vacant positions, as well as for promotion to higher positions or reappointment to existing positions, are regulated by the Act on Higher Education and Scientific Activity ([Official Gazette 119/22](#)). [The Staff Employment and Promotion Plan](#) is regularly updated according to the needs of the study programmes, scientific priorities, and university and legal regulations. The Staff Employment and Promotion Plan for the following calendar year is adopted by the [Council of the Faculty of Physics](#) and [the Senate of the University of Rijeka](#). Appointments to positions for the period 2025–2029 are carried out in accordance with the Staff Employment and Promotion Plan for programme-based funding of the Faculty of Physics of the University of Rijeka, based on the Programme Agreement concluded between the Ministry of Science, Education and Youth and the University of Rijeka.

Appointments to higher positions and reappointments to existing positions are conducted according to a clearly defined and publicly available [protocol](#).

Articles 43(1) and 43(2) of the Act on Higher Education and Scientific Activity ([Official Gazette 119/22](#)) stipulate that a teacher who believes they meet the criteria for promotion to a higher position is required to submit and deliver [a request for promotion to a higher position](#) to the Dean's Office before the expiry of the term for which they were appointed or reappointed (before the expiration of 5 years from the last appointment/reappointment, i.e. from the date of signing the employment contract). The procedure for promotion to a higher position is initiated at the first meeting of the Faculty Council of the Faculty of Physics after

the expiry of the term for which the teacher was appointed or reappointed. Members of the expert committee are appointed by the Faculty Council of the Faculty of Physics. If the teacher has not submitted a request for promotion to a higher position before the expiry of the term for which they were appointed or reappointed, the administration initiates [a reappointment procedure to the existing position](#). The expert committee consists of at least three (3) members holding a position higher or equal to the one the candidate is being appointed to, within the same scientific area and field for which the appointment is being carried out. At least one member of the expert committee must be employed at another higher education institution (outside the University of Rijeka). Researchers who are not employed in scientific-teaching positions cannot be members of the committee. In the case of appointment/reappointment procedures in a scientific area or field not represented at the Faculty of Physics, committee members are appointed from among the teachers of the university constituent or higher education institution outside the University of Rijeka that offers a study programme in that area and field.

After the Faculty Council meeting at which the appointment/reappointment procedure is initiated and the committee is appointed, the teacher is required to submit [evidence of fulfilling the criteria for promotion to a higher position](#) or [reappointment](#) to the existing position in electronic form (ZIP file) to the email addresses of the committee members and to the email address of the Faculty of Physics (fizika@phy.uniri.hr), no later than 15 days from the initiation of the procedure, i.e. from the date of the Faculty Council meeting at which the procedure was initiated.

Until the adoption and entry into force of the National University, Scientific and Artistic Criteria, the teacher must submit evidence of fulfilling the criteria for promotion to a higher position or reappointment to the existing position, i.e. evidence of achievements attained after the last appointment or reappointment, in accordance with the [regulations](#) set out in Article 119(6) of the Act on Higher Education and Scientific Activity (Official Gazette 119/22). In the reappointment procedure, a teacher is reappointed to the existing position if, since the last appointment or reappointment, they have met at least half of the prescribed criteria for promotion to a higher position. The teacher is required to submit the following documentation (see [list of documentation](#)).

The expert committee assesses whether the teacher meets the prescribed criteria and submits a reasoned [Report on the fulfilment of criteria for appointment/reappointment](#) to the Faculty Council of the Faculty of Physics in written form, no later than 30 days from the receipt of evidence of fulfilment of the criteria. The Faculty Council of the Faculty of Physics adopts a [Decision on appointment](#) or a [Decision on reappointment](#), by which it accepts or rejects the opinion of the expert committee, within 30 days of receiving the opinion. [The decision confirming that the teacher meets the criteria for promotion to a higher position, together with the remaining documentation](#), or [the decision](#) confirming that the teacher meets the criteria for reappointment to the existing position, together with [the remaining documentation](#), is submitted to the competent Scientific Field Committee within 8 (eight) days from the date of adoption of the opinion.

If, in the promotion procedure, it is determined that the teacher does not meet the criteria for promotion to a higher position, a reappointment procedure to the existing position is initiated no later than 30 days thereafter.

The appointment of teachers or researchers to a position is carried out for a period of five (5) years. After the expiry of five (5) years, the teacher is either reappointed to the existing

position or appointed to a higher position in accordance with Articles 42 and 43 of the Act on Higher Education and Scientific Activity.

Upon receipt of a [positive decision from the competent Scientific Field Committee](#) for the appointment of a teacher to a higher position, an [employment contract for an indefinite period](#) is concluded with persons appointed to higher teaching positions, with the obligation of undergoing reappointment or promotion to a higher position every five (5) years. With the appointment of a teacher to the position of full professor in permanent tenure, the promotion or reappointment procedure is considered completed.

Upon receipt of a [positive decision from the competent Scientific Field Committee](#), an annex (addendum) to the employment contract or a [new employment contract](#) is concluded with persons appointed to a new position, while with persons reappointed to existing teaching positions, [an annex to the employment contract](#) is concluded with the obligation of undergoing reappointment or promotion to a higher position.

Promotion to a higher scientific-teaching position and reappointment to an existing position are carried out without a public call for applications, whereas for a new position (including [returning scientists](#)) or a vacant position (due to termination of employment or retirement), a public call must be issued.

The recruitment procedure for a new position is conducted based on a [public call](#) in accordance with Article 40 of the Act on Higher Education and Scientific Activity ([Official Gazette 119/22](#)). The Faculty Council of the Faculty of Physics adopts a [decision to initiate the procedure and appoint the committee](#). The expert committee consists of at least three (3) members holding a higher or the same position to which the candidate is being appointed, within the same scientific area and field for which the appointment is being carried out. At least one member of the expert committee must be employed at another higher education institution (outside the University of Rijeka). Researchers who are not employed in scientific-teaching positions cannot be members of the committee. The public call for the appointment of teachers and associates to vacant positions is published in [the Official Gazette](#), on [the website of the Faculty of Physics](#) and [the Croatian Employment Service](#) in Croatian, as well as on [the official European Research Area job portal](#) in English. The application deadline must not be shorter than 30 (thirty) days from the date of publication of the call in the Official Gazette. Applications and evidence of meeting the criteria are submitted in electronic form to the email address fizika@phy.uniri.hr, which is then [forwarded to the members of the expert committee](#).

Until the adoption and entry into force of the National University, Scientific and Artistic Criteria, the candidate must submit evidence of fulfilling the criteria for appointment to a position [in accordance with the propositions](#) set in Article 119(6) of the Act on Higher Education and Scientific Activity (Official Gazette 119/2022).

The expert committee analyses the documentation submitted by the candidates, assesses compliance with the prescribed criteria, and evaluates each candidate's previous activities, including scientific productivity, teaching competencies, and professional contributions.

Based on the conducted analysis, the expert committee, through a [reasoned written opinion](#) containing an evaluation of all applicants, proposes the best candidate to the Faculty Council of the Faculty of Physics, no later than 30 (thirty) days from the deadline for submitting applications to the call.

The report is uploaded to the Faculty Council's shared portal together with [the invitation to the meeting](#), enabling all Council members to review it and prepare for the

discussion. The Faculty Council of the Faculty of Physics adopts [a decision](#) to accept or reject the opinion of the expert committee within 30 (thirty) days of receiving the opinion. [The decision](#) accepting the expert committee's opinion is submitted to the competent Scientific Field Committee together with [the remaining documentation](#) no later than 8 (eight) days after the adoption of the opinion, except in the case of appointments to associate positions.

For the first appointment to a teaching or scientific-teaching position, the candidate must also deliver a positively evaluated [public lecture](#) (trial lecture).

The competent Scientific Field Committee determines by decision whether the proposed candidate meets the prescribed criteria, no later than 60 days from the submission of the decision. After the delivery of [the Scientific Field Committee's decision](#), an [employment contract](#) is concluded with the selected candidate.

In the case of appointment of associates to a vacant position, Article 40 of the Act on Higher Education and Scientific Activity (Official Gazette 119/2022) is applied in accordance with the procedure described above for the appointment of teachers to a vacant position, with the difference that the decision accepting the committee's opinion is not submitted to the competent Scientific Field Committee. Upon adoption of the decision accepting the expert committee's opinion, an employment contract for a fixed term is concluded with the selected candidate.

Employment contracts for persons appointed to teaching positions are concluded for an indefinite period, with the obligation of undergoing reappointment or promotion to a higher position.

Particular attention is devoted to the earliest phase of developing teaching capacities, namely the recruitment of young researchers. Since more than ten years may pass between the employment of a doctoral candidate and their first appointment to a scientific-teaching position, the initial selection of candidates for research positions evaluates not only research potential and previous achievements but also personal qualities indicating the ability to participate effectively in the teaching process. In this way, the higher education institution ensures, in the long term, a staff capable of meeting both the research and teaching demands of the academic community.

As an example of this approach, [the Minutes](#) of the candidate selection procedure for employment on a project funded by HRZZ from December 2025 are attached.

4.2.2. The procedures of teacher recruitment are aligned with the higher education institution's development goals, relevant legislation and internal regulations.

The processes of recruitment, promotion to higher positions, and reappointment to existing positions of teachers and associates are carried out based on objective and transparent procedures, in accordance with legal regulations and internal acts (see [Legal Basis](#)).

Until the adoption and entry into force of the National Criteria, the provisions of Article 119(6) of the Act on Higher Education and Scientific Activity (Official Gazette 119/2022), which have already been mentioned in section 4.2.1, are applied.

Each calendar year, the Faculty Council of the Faculty of Physics adopts a [Staff Employment and Promotion Plan](#). The plan is prepared considering the actual staffing needs of the Faculty and is based on the number of vacant positions resulting from retirement, mutual termination agreements, or other forms of termination of employment. It includes planned recruitments to scientific-teaching, teaching, and associate positions, as well as the

promotion of employees who have met the requirements for advancement to higher positions. After adoption by the Faculty Council of the Faculty of Physics, the Plan is submitted to the Senate of the University for confirmation. Based on the Senate's decision, the University of Rijeka issues the necessary approvals, while the Ministry of Science, Education and Youth grants prior approvals both for new recruitments and for promotions. Appointments to positions for the period 2025–2029 are carried out in accordance with the Staff Employment and Promotion Plan for programme-based funding of the Faculty of Physics of the University of Rijeka, based on the Programme Agreement concluded between the Ministry of Science, Education and Youth and the University of Rijeka.

The recruitment of candidates to vacant positions is carried out in accordance with the relevant acts that prescribe the conditions and procedures for appointment. After the employment contract has been concluded, the documentation of the newly employed staff member is submitted to the University of Rijeka Human Resources Office, which then performs the official registration of the employee with the Croatian Health Insurance Fund (HZZO) and the Croatian Pension Insurance Institute (HZMO).

4.2.3. In the selection, appointment and evaluation of teachers, the higher education institution takes their past activities (teaching activity, research activity, student feedback, etc.) into consideration.

The procedures for the selection, appointment, and evaluation of teaching staff are carried out in accordance with national criteria, taking into account relevant activities and [achievements in the fields of teaching](#) and [scientific research](#). Key indicators include published scientific and professional papers, participation in research projects, supervision of undergraduate and graduate theses, international contributions to the discipline, publications in prestigious journals, authorship of textbooks, and participation in science popularization activities (example: [Minutes](#) of the meeting of the Quality Committee of the Faculty of Physics). In addition, student feedback collected through [student surveys](#), as well as [confirmations of conducted institutional evaluations of teaching quality](#), are also taken into consideration.

Scientific productivity is monitored through the number and quality of publications indexed in relevant databases (Web of Science, Scopus), the citation rate of publications, active participation in national and international projects (HRZZ, Horizon, Interreg, NPOO), as well as through patents, technical solutions, and professional studies (Table 4.3, Appendix III, examples of reports for appointments to the positions of [Senior Lecturer](#), [Assistant Professor](#), [Associate Professor](#), [Full Professor](#), and [Full Professor with tenure](#)).

4.2.4. The higher education institution has appropriate methods of selection of the best candidates for each position and uses competitive, excellence-based recruitment criteria in addition to the minimum requirements prescribed by the national legislation.

The Faculty conducts recruitment procedures in accordance with the applicable legal framework and internal regulations, while ensuring openness and a high level of quality. [Advertisements for new positions](#) are publicly available and include the required qualifications as well as a list of the necessary documentation. Applicants must meet the legally prescribed

requirements, which include appropriate scientific, teaching, and professional competences. Submitted applications are reviewed by an expert committee, which may, if necessary, organize additional knowledge assessments or interviews with candidates. Based on the criteria of excellence, the committee proposes the most suitable candidates, while the final decision is made by the Faculty Council. All applicants are informed of the results of the recruitment procedure in a timely manner.

FIZRI applies rigorous candidate selection methods and fully respects the national minimum requirements prescribed by the current [Ordinance](#) on Amendments to the Ordinance on the Conditions for Election to Scientific Titles. At present, the institution has not adopted additional competitive criteria beyond the national minimum requirements for two closely related reasons:

(1) The national minimum requirements prescribed for the field of natural sciences (physics, chemistry, and geophysics) are the most demanding in the entire Croatian system of scientific advancement. Moreover, the Ordinance on Amendments to the Ordinance on the Conditions for Election to Scientific Titles ([Official Gazette 111/22](#)) further tightened these requirements compared with the previous ordinance. For example, according to Article 2 of the aforementioned [Ordinance](#), for the title of Scientific Advisor in the fields of physics, chemistry, biology, geophysics, and interdisciplinary natural sciences, a total of 30 publications is required (of which at least 9 must be published after the previous appointment), while for the permanent title 34 publications are required, with the condition that at least 4 publications produced after the appointment to the title of Scientific Advisor must be published in journals whose impact factor is ranked within the first two quartiles. For comparison, in the field of geology the threshold is lower (21 and 24 publications respectively), in biomedical fields it amounts to 18 and 24 publications, while in the social sciences and humanities point-based systems start from significantly lower quantitative thresholds. Therefore, physics, chemistry, and geophysics already have the highest requirements at the national level among all scientific fields and disciplines in the Republic of Croatia, which means that the national minimum in these fields simultaneously represents a high competitive standard.

This significant imbalance in the criteria applied across different scientific fields in the Republic of Croatia has existed for decades and represents a form of indirect discrimination ([Code of Ethics of the University of Rijeka](#), Art. 4.4). A detailed elaboration of this issue, discussed within the governing bodies of the Faculty of Physics, was formulated in the document [Comments on the Criteria of the Rectors' Conference](#). Namely, during 2023 the Senate of the University of Rijeka was presented with a working version of the proposed teaching and professional elements of the National University, Scientific and Artistic Criteria for appointment to scientific-teaching positions. During the process of adopting these criteria, a public consultation was conducted at the national level. Discussions on the working version of the proposal were held at meetings of the Collegium and the Faculty Council of FIZRI. The conclusions of these discussions were compiled into the document [Comments on the Criteria of the Rectors' Conference](#), which was submitted to the management of the University of Rijeka and forwarded as part of the public consultation on the National Criteria. The public consultation prompted numerous reactions from the broader academic community, and some of the comments were partially incorporated into the final formulation of the National Criteria.

(2) The institution is facing a pronounced shortage of candidates, both at the level of students and at the level of teaching and research staff. Due to the limited supply of qualified candidates on the domestic labour market, a certain proportion of employees are recruited from abroad. Under such circumstances, the introduction of additional institution-specific criteria beyond the already high national minimum requirements would not contribute to the quality of the selection process; rather, it would further narrow the already limited pool of potential applicants and jeopardize the staffing sustainability of the institution.

For this reason, we consider that the existing national requirements, when applied consistently and transparently, represent a sufficient and appropriate instrument for ensuring excellence in this specific scientific context.

4.2.5. *The procedures for advancement of teachers to higher ranks are based on the evaluation and rewarding of excellence and important achievements (such as international contribution to the scientific discipline, high-impact publications, significant scientific discoveries, successful projects, success in securing additional funds, mentoring, supervision of final and graduation theses, authorship of textbooks and study materials, popular lectures, etc.) are considered.*

Procedures for the promotion of teaching staff to higher academic ranks are conducted in accordance with the Act on Higher Education and Scientific Activity ([Official Gazette 119/22](#)), the applicable regulations of the higher education institution, and the criteria established by the National Council for Higher Education, Science and Technological Development, upon the proposal of the Rectors' Conference and the competent field committees. The requirements relating to teaching and professional activities are prescribed by the Decision on the Necessary Conditions for the Evaluation of Teaching and Professional Activities in the Procedure for Election to Scientific-Teaching Titles (Official Gazette No. 106/2006), as well as by the Decisions on Amendments and Supplements to that Decision (Official Gazette [122/2017](#) and [120/2021](#)).

These regulations govern the evaluation of three fundamental components of the academic activities of teaching staff:

1. **Teaching contribution** is evaluated according to the following criteria: (1) supervision or co-supervision of undergraduate or graduate theses; (2) publication of a paper co-authored with a student on the topic of the undergraduate or graduate thesis; (3) a period of stay abroad; (4) publication of a scientific book, university textbook, or university handbook; (5) innovation of teaching content; (6) supervision of doctoral dissertations; (7) publication of a paper co-authored with a student on the topic of the doctoral dissertation; (8) reviewing study programmes or membership in a committee for the reaccreditation of study programmes; (9) reviewing a scientific book, university textbook, or university handbook; and (10) coordination of cooperation with teaching bases.
2. **Scientific and professional contribution** is evaluated according to: (1) presentation of papers at scientific or professional conferences (national and international); (2) invited lectures at international scientific or professional conferences; (3) leadership or participation in the implementation of scientific research projects of the Ministry of Science and Education and other research projects; (4) leadership or participation in

the implementation of scientific programmes of Centres of Excellence, European and international competitive projects, and projects of the Croatian Science Foundation; (5) editing conference proceedings; (6) reviewing articles in journals and conference proceedings; (7) reviewing research projects; (8) membership in the organizing or programme committee of a scientific conference; (9) publication of professional papers; (10) receiving an international or prominent national award or recognition for scientific, teaching, or professional work; and (11) participation in science popularization programmes.

3. **Institutional contribution** is evaluated according to the following criteria: (1) holding a senior leadership position at a higher education institution; (2) holding a managerial position within an organizational unit of a higher education institution; (3) membership in university governing bodies and leadership roles within bodies at the faculty level; (4) leadership or participation in the implementation of university development projects or other professional projects; (5) participation in the management of alumni associations; (6) participation in the development and/or delivery of lifelong learning programmes; (7) participation in the development and implementation of knowledge and technology transfer programmes; (8) membership in international or national bodies related to science and higher education; (9) membership on the editorial board of scientific or professional journals; and (10) receiving awards or recognitions from academic institutions and professional associations.

The promotion system is designed on the principle of gradually increasing requirements: for each higher scientific-teaching rank (from Assistant Professor, Associate Professor, to Full Professor, and Full Professor with tenure), the number of criteria that a candidate must fulfil increases. In this way, promotion to higher ranks genuinely reflects the cumulative achievement of excellence in all relevant components of academic activity, rather than merely meeting a minimum threshold, as is evident from the attached [Decision of the Rectors' Conference on the Necessary Conditions](#).

The promotion of teaching staff to higher scientific-teaching ranks is based on the evaluation and recognition of scientific excellence. In the field of natural sciences—specifically physics, chemistry, and geophysics—this is operationalized through a quality factor system ([Official Gazette 111/22](#)), by which exceptionally high-quality publications receive additional weighting: a paper published in a journal ranked within the top 10% of the relevant subject category is multiplied by a factor of 2.0, while a paper published in a first-quartile (Q1) journal is multiplied by a factor of 1.5. Both factors apply only to publications in which the candidate is the main author (i.e., first author or corresponding author). Through the application of quality factors, the total number of publications required for promotion to a higher rank may be reduced by up to one third. This mechanism explicitly recognizes and rewards publication in the most influential international journals as an indicator of scientific excellence.

4.2.6. Indicators of excellence include scientific/artistic, teaching and professional activities and contribution to the development of the higher education institution.

The Faculty monitors and evaluates the achievements of its teaching staff through a range of indicators covering scientific, teaching, and professional contributions.

In the field of research, particular attention is paid to publications indexed in internationally recognized databases such as Scopus and Web of Science, the level of the H-

index, and the leadership of or active participation in research projects. The Dean of the Faculty awards teaching staff who go beyond their regular duties and who, through their active contributions (e.g., participation in international projects, publishing in relevant journals, successful cooperation with industry, the local community, and international partners, etc.), raise the level of scientific excellence, the quality of teaching, and the reputation of the institution in the broader environment. [Awards for scientific work](#) are presented at the ceremonial session of the Faculty Council on the occasion of the Faculty Day, upon the proposal of the [Faculty Council for Science and Projects](#).

For many years, the Faculty has implemented a highly detailed procedure for selecting candidates for the Teaching Excellence Award. The procedure is conducted by the Committee for Quality Assurance and Enhancement (OOUK) through a meticulously developed scoring system that encourages teachers and associates to be actively engaged in various aspects of the organization and delivery of teaching and work with students. Two awards are granted annually: one for teaching staff in associate positions and one for teaching staff in scientific-teaching positions. The awards are presented by the Rector of the University. The first selection round for the Teaching Excellence Award is based on the results of student surveys, with the Faculty of Physics applying the most stringent guidelines of the University of Rijeka (for example, no individual survey item across all evaluated student surveys for a candidate may receive a score lower than 3.0). In the second selection round, additional criteria are applied to the shortlisted candidates, covering a wide range of activities related to all aspects of teaching work: professional development, activities related to internationalization and mobility, publications, authored and peer-reviewed teaching materials, the use of online learning, presentations at professional conferences, mentoring of students, etc. (see example: [Minutes of the OOUK meeting of 25 March 2024, Item 2](#); [Example of additional criteria for the Teaching Excellence Award](#); [Example of scoring of candidates for the Teaching Excellence Award](#)).

Within the area of professional activities, cooperation with the business sector is encouraged, including knowledge transfer. In addition, the popularization of science is valued through public lectures, media appearances, participation in and organization of thematic workshops, and similar activities (see example: [Certificate of Appreciation for Visibility and Science Popularization](#)).

4.2.7. Additional criteria for the promotion of teachers reflect the strategic goals of the higher education institution.

The promotion of staff at FIZRI is based on clearly defined criteria that integrate scientific productivity, the quality of teaching, and contributions to the development of the institution, all in accordance with the strategic objectives of the University of Rijeka defined in the University of Rijeka Development Strategy 2021–2025. By encouraging the publication of papers in top-tier journals (Q1 and Excellence), participation in competitive project calls, and the development of international collaborations, the Faculty seeks to strengthen its research potential and visibility within the international academic community. This is directly aligned with the objective of increasing scientific impact and attracting project funding ([UNIRI Strategy 2021–2025](#), Table 2, Objectives 2 and 3).

The quality of teaching is assessed based on student evaluations, mentoring activities, the quality of teaching materials, and the application of modern pedagogical approaches, including teaching in English and the use of digital technologies ([UNIRI Strategy 2021–2025](#),

Table 1, Objectives 1 and 5; Appendix A, Measures 1.4, 1.5 and 1.10). The professional development of staff is supported through the organization of training programmes, a mentoring system, and involvement in the strategic activities of the Faculty.

Promotion procedures are conducted transparently through the work of expert committees, with criteria that are known in advance and publicly available, and through the objective evaluation of each individual candidate. This corresponds to the University principle of transparent and merit-based promotion procedures (UNIRI Strategy 2021–2025, Appendix B – Strength of Integration, Policies). Additional recognition is given to engagement in faculty bodies, international mobility, and project activities (UNIRI Strategy 2021–2025, Table 4, Objectives 3 and 5), thereby aligning the individual professional development of teaching staff with the institutional development priorities. Scientific contribution is monitored through citation indicators, the scope of publication activity, and leadership in research projects. The inclusion of doctoral and postdoctoral researchers in research activities contributes to the long-term sustainability of scientific work (UNIRI Strategy 2021–2025, Table 2, Objectives 4 and 5). The evaluation criteria in the field of research are aligned with the strategic objectives of the University of Rijeka (UNIRI Strategy 2021–2025, Table 2).

The professional development of staff is further supported through the organization of [training programmes](#), [seminars delivered by eminent scientists](#), and participation in [key strategic activities of the Faculty and the University](#).

4.3. The higher education institution ensures support to teachers in their professional development.

4.3.1. The higher education institution has a teacher development plan with defined performance indicators. It sets the priorities for teachers' professional development annually. The criteria for promotion and rewarding of excellence are clear, transparent and consistently applied.

The Faculty systematically plans, organizes, and financially supports the continuous professional development of teaching staff in teaching competences, the design of the teaching and learning process, the use of new technologies and teaching methods, and work with vulnerable and underrepresented student groups. According to Table 4.1.a for the 2024/2025 academic year under evaluation, out of a total of 26 members of scientific-teaching and teaching staff, including those employed in joint appointments, 13 (i.e., 50%) are, by primary qualification, teachers of physics and mathematics, physics and chemistry, or physics and computer science, or possess formal professional training in psychology, pedagogy, didactics, assessment (docimology), and physics teaching methodology. This constitutes a strong pedagogical foundation of the teaching staff.

The Faculty includes the Chair of Physics Education, whose objective is to develop and enhance all activities related to learning and teaching, as well as to plan and monitor the professional development of staff. The professional development of all teaching and associate staff is further supported through participation in workshops, courses, and other forms of training organized by the University of Rijeka, the Agency for Science and Higher Education, the Ministry of Science and Education, and other relevant institutions. Teaching staff also have access to lifelong learning programmes in Teaching Competences for Higher Education

organized by the Centre for Teacher Education (CON) of the Faculty of Humanities and Social Sciences of the University of Rijeka, as well as training programmes within UNIRI and courses offered by the UNIRI IT Academy. On an annual basis, the Faculty determines professional development priorities by considering the needs of study programmes, the results of student surveys, and the strategic objectives of the institution.

The promotion criteria for teaching staff are clearly defined, aligned with national legislation, elaborated in the Faculty's internal regulations, and consistently implemented. Excellence is recognized and rewarded in two key areas: teaching and research. The Faculty implements a highly detailed procedure for selecting candidates for the Teaching Excellence Award. The procedure is conducted by the Committee for Quality Assurance and Enhancement (OOUK) through a meticulously developed scoring system that encourages teaching staff and associates to engage in various aspects of the organization and delivery of teaching and work with students (see Section 4.2.6 for details).

The Faculty also rewards authors for publishing scientific papers in prestigious international journals, thereby promoting and recognizing the scientific productivity of teaching staff. [Awards for scientific work](#) are presented at the ceremonial session of the Faculty Council on the occasion of Faculty Day, upon the proposal of the Faculty [Advisory Board for Science and Projects](#). In this way, the Faculty creates a stimulating environment that supports individual advancement, collegial cooperation, and the continuous improvement of the academic community.

Regular student surveys conducted for all courses held during the semester provide teaching staff with feedback on how potential changes in teaching methods affect student satisfaction and performance, thereby ensuring the continuous enhancement of teaching practice.

4.3.2. The higher education institution has clearly defined the way it supports the teachers in their professional and career development. The higher education institution encourages the transfer of knowledge within the organisation.

The Faculty provides support to teaching staff in their professional and career development, based on the Faculty of Physics Development Strategy for the period 2021–2025, which is aligned in terms of timeframe and indicators with the University of Rijeka Development Strategy and has been approved by the Senate of UNIRI.

One of the four key institutional objectives of the Strategy is Knowledge Transfer and Regional Engagement, demonstrating that the Faculty approaches this area systematically and strategically. The Faculty recognizes the strategy as an effective tool for improving the higher education institution, which is reflected in regular reports on the implementation of the strategy and in action plans prepared for each year from 2015 to the present.

Within the framework of legal provisions, teaching staff are provided with opportunities for promotion to higher scientific-teaching and teaching positions, and promotion procedures are initiated regularly and in a timely manner with the establishment of expert committees. Teaching staff are encouraged to engage in interinstitutional cooperation, particularly through teaching and research mobility, thereby strengthening their international visibility and expanding their professional networks. In order to ensure the systematic and coordinated implementation of knowledge transfer activities, the Faculty has

appointed a dedicated [Knowledge Transfer Coordinator](#), thereby clearly defining institutional responsibility for this area.

Knowledge transfer within the organization and towards external partners is achieved through several complementary channels. The Chair of Physics Education functions as an internal expert and advisory body for the development of teaching competences and the application of modern teaching methods, bringing together teaching staff around shared pedagogical objectives and the exchange of experience.

The Faculty regularly organizes [physics seminars](#) featuring guest lecturers from Croatia and abroad who present the latest scientific and professional knowledge. In this way, the exchange of ideas is encouraged, connections with the international academic community are strengthened, and both teaching and research activities are refreshed and enriched.

Teaching staff of the Faculty actively participate in projects that directly link research and teaching activities (e.g., through the EU projects STeMp and FizKO), while the Faculty systematically encourages the submission of [projects in cooperation with industry](#), enabling teaching staff to gain practical experience relevant to the quality of teaching and the development of applied research. A special contribution to knowledge transfer is also provided through the Faculty's representation in the [Committee for Online Learning](#) (POU) of the University of Rijeka, through which teaching staff actively participate in the development of e-learning at the level of the entire University and share the knowledge and experience gained with colleagues within the institution.

4.3.3. The higher education institution promotes and provides opportunities for the improvement of teaching competencies at the institutional level.

The Faculty encourages and provides opportunities for the development of the competences of teaching and associate staff by fostering a culture of lifelong learning and academic excellence. Teaching staff have the opportunity to participate in organized professional development programmes aimed at improving teaching competences, both within the framework of programmes offered by the University of Rijeka and outside it (through workshops, seminars, and other forms of training organized by the Agency for Science and Higher Education, the Ministry of Science and Education, and other relevant institutions). Teaching staff also have access to the lifelong learning programme Teaching Competences for Higher Education, organized by the Centre for Teacher Education (CON) at the Faculty of Humanities and Social Sciences of the University of Rijeka, which covers key areas of learning and teaching in higher education.

Teaching staff and associates of the Faculty actively participate in various forms of professional development through workshops, seminars, and courses, ranging from international scientific schools and workshops to professional meetings of physics teachers and training in teaching competences and e-learning. In 2025 alone, more than 30 such activities were recorded, involving 15 members of teaching and associate staff, demonstrating a high level of engagement and a strong culture of continuous professional development. The Faculty also supports the professional development of teaching staff through financial assistance ([the Faculty finances professional development activities for teaching staff](#)).

Upon request, an employee may be granted paid or unpaid leave for scientific or professional development, participation in the work of scientific institutions or international organizations, as well as paid leave for becoming acquainted with new techniques and methods of work and for collaboration on projects. Teaching staff holding scientific-teaching

positions may also be granted the right to a sabbatical year with compensation equal to their base salary, in accordance with Article 46 of the Act on Higher Education and Scientific Activity (Official Gazette 119/2022) and the internal regulations of the Faculty, thereby providing staff with the opportunity for in-depth scientific and professional development.

An additional incentive for improving teaching competences is the annual Teaching Excellence Award granted at the level of the University of Rijeka, the purpose of which is to encourage high-quality teaching and to recognize teachers who have contributed to improving the quality of study through their work in teaching and with students. Accordingly, the Faculty annually nominates one teacher and one associate to the University who have demonstrated outstanding quality in teaching (see Sections 4.2.6 and 4.3.1).

4.3.4. The higher education institution ensures and encourages the development of teaching skills.

The Faculty encourages and provides opportunities for the development of digital skills among teaching and associate staff, recognizing digital transformation as a key component of contemporary education. Teachers are regularly informed about seminars and training programs aimed at improving digital competencies, and special attention is devoted to the use of innovative and advanced technologies to enhance the learning and teaching process, with a particular emphasis on e-learning and digitally enhanced learning and teaching (DELTA), in line with current European Union initiatives operationalized through the Digital Education Action Plan.

The Faculty is represented in the University of Rijeka's Online Learning Committee through its representative, Assis. Prof. Tomislav Jurkić, PhD, who has also served as the Committee's Chair since 2022. Through this role, the Faculty directly participates in shaping the University's policies and practices in digital education. Faculty teachers regularly participate in the University of Rijeka E-learning Days, both through presentations and workshops. Assis. Prof. Ivana Poljančić Beljan, PhD, presented at the [2023 E-learning Days](#), Assoc. Prof. Diana Mance, PhD, in [2024](#), and Prof. Rajka Jurdana Šepić, PhD, at the E-learning Day held on 20 February 2025 with the presentation "[Examples of learning support in hybrid courses in physics and natural sciences.](#)" Participation of teachers in activities within the E-learning Days results in [certificates of participation](#).

Faculty staff regularly participate in training programs within the e-University initiative, and the development of digital competencies is also recognized as a research and teaching activity. Several teachers have successfully applied for projects within the UNIRI Class call, particularly within line A2 "[Digital Citizenship – Innovations in Learning and Teaching](#)," confirming investment in digital competencies through competitive funding (see [example of training certificates](#)).

Technical and advisory support for teachers is provided by the University Computing Centre (SIC), while the development of e-learning is further encouraged through the Framework for the Development and Evaluation of E-learning Quality, adopted at the University level in 2020. This framework enables teachers to conduct self-assessment of e-courses and improve the quality of the teaching process.

The responsible and transparent use of new technologies is encouraged while preserving academic integrity, and [Guidelines for the Responsible Use of Artificial Intelligence Tools at UNIRI](#) have been adopted.

4.3.5. *The higher education institution encourages improvements of teachers' competences based on gathered and analysed feedback on the effectiveness and efficiency of their work (teacher self-assessment, peer observation, student surveys, focus groups, etc.).*

The Faculty of Physics encourages the improvement of teaching competencies based on collected and analyzed feedback on the effectiveness and efficiency of teaching performance. For this purpose, several evaluation methods are used: student surveys, teacher self-evaluation, peer review of teaching, and other forms of interaction with students and staff.

Student surveys are conducted regularly, and their results are processed and delivered to teachers in the form of reports that contain specific recommendations for improving teaching methods and the way courses are delivered.

Teacher self-evaluation is conducted in accordance with procedures developed at the level of the University of Rijeka and represents an important element of the overall process of monitoring and improving the quality of teaching. Peer review is conducted as part of the promotion procedure, and when necessary more frequently, and includes structured classroom observation and feedback among colleagues ([Minutes of the OOUK session of 3 April 2023](#), Item 3; [List of implemented peer reviews at FIZRI](#); [Example of a teacher self-evaluation form](#); [Example of a statement on peer review](#)).

A special contribution to the improvement of teaching competencies is achieved through the development of e-learning and digitally enhanced teaching in accordance with the Framework for the Development and Evaluation of E-learning Quality at the University of Rijeka. In the period 2020–2022, a self-evaluation of the online component of learning and teaching was carried out. In the academic year 2020/2021, 24 courses were evaluated, and in 2021/2022, 135 courses were evaluated, representing approximately 75% of all courses at the Faculty. In the evaluation academic year 2024/2025, around 80% of courses were assessed. The Framework enables teachers to conduct systematic self-assessment of e-courses with the aim of improving the learning and teaching process, evaluating the quality of teaching in the context of the use of e-learning, and assessing their own teaching activity. At the same time, the Faculty faces practical limitations in accessing external professional development programs at the University. Despite regularly monitoring available opportunities and applying teachers to relevant courses and workshops related to teaching competencies, a significant number of such programs are cancelled due to an insufficient number of participants from other University constituents. This represents a structural challenge at the level of the broader educational community and indicates the need to develop more sustainable and institutionally stable models of professional development for teachers, for example through programs organized at the University level or through interinstitutional cooperation.

4.3.6. *The higher education institution encourages the participation of teachers in international mobility programmes, collaborative networks, etc.*

The Faculty of Physics actively encourages the participation of teaching staff in international mobility programs and collaborative networks. Coordination of activities related to the ERASMUS+ and YUFE programs is entrusted to the appointed [ERASMUS+ and YUFE coordinator](#), who regularly informs teaching and associate staff about available calls, invitations, and opportunities for participation in mobility programs.

In the past five academic years, teaching staff and associates of the Faculty have achieved the mobilities shown in Table 4.4 (Annex III). A total of 34 outgoing mobilities were recorded, of which 29 were short-term research mobilities (up to 3 months), one was a long-term research mobility (3 months or more), and five were short-term professional mobilities. Additionally, 14 incoming short-term research mobilities were recorded. In order to further encourage and facilitate staff mobility, the Faculty strives to accommodate staff members undertaking longer stays abroad by adjusting teaching organization—for example, by concentrating teaching obligations within a single semester—thus enabling their absence without disrupting the continuity of study programmes (see: [Leave requests by F. Reščić](#); [Leave request by K. Mrakovčić](#)).

Regarding the possibility of sabbatical leave, the Faculty recognizes its value as an instrument of professional development for teaching staff; however, its implementation has so far not been possible due to specific structural constraints. During the 2021 reaccreditation process, excessive teaching workload was identified as a key issue, which prevents the planning of extended absences of individual staff members without additionally burdening colleagues who remain. Furthermore, the Faculty's financial situation does not allow for the hiring of replacement teaching staff or covering the costs of incoming replacements from other institutions. Over the past five years, teaching workload has decreased to some extent, but still not to a level that would enable the systematic implementation of sabbatical leave. The Faculty continues to monitor conditions and possibilities for introducing this instrument in the future.

4.3.7. The higher education institution encourages and supports the participation of teachers in international and national competitive projects.

The Faculty of Physics encourages and supports the participation of teaching staff in international and national competitive projects. Faculty teachers and associates participate in competitive projects both as principal investigators and as partners in projects led by other domestic or international institutions, thereby establishing a broad network of scientific collaboration.

In the observed period, Faculty staff have led or participated as principal investigators in [projects funded from various competitive sources](#): the Croatian Science Foundation (HRZZ), the Horizon Europe programme, the Interreg cross-border cooperation programme, the National Recovery and Resilience Plan (NPOO), as well as internal calls of the University of Rijeka co-financed through European Union funds (UNIRI – NextGenerationEU). A list of projects led by Faculty staff, as well as projects in which the Faculty participates as a partner institution, is provided in Table 5.6 (Annex III).

A particularly notable increase in project activity has been observed in the last two years. In 2025, ten competitive projects in which the Faculty of Physics is either a coordinator or a partner were contracted, while an additional twelve projects are currently under evaluation. These applications include calls from the Croatian Science Foundation, European programmes such as Horizon Europe (HORIZON-CL4) and M-ERA-NET, Interreg programmes (Italy–Croatia, IPA Adrion), as well as projects under ESIF funds and the NPOO. These data demonstrate strong engagement of teaching and research staff in competitive project funding at both national and international levels.

Support for staff in project applications and implementation is provided in cooperation with the Pre-award Research Support Centre ([CPP](#)) of the University of Rijeka, which offers

advisory and administrative assistance, [organizes workshops](#) and information days, and enables access to successful project applications through the Project Reading Room. The Faculty regularly informs staff about open calls and encourages them to actively use all available forms of support.

An additional incentive for participation in international and national competitive projects is provided by the Faculty through efforts to reduce the teaching workload of principal investigators of such projects, to the extent possible.

4.4. The premises, equipment and the complete infrastructure is suitable for teaching, scientific/artistic and professional activities.

4.4.1. The higher education institution plans and improves the infrastructure development in line with the strategic goals.

The Faculty of Physics is located in a building on the University of Rijeka campus in Trsat. The spatial capacities of the Faculty are described in Table 4.5. The Faculty has 6 lecture halls (358.85 m²), 18 teaching laboratories and practical classrooms (770.45 m²), 4 workshops (38.95 m²), and one additional space used for teaching activities (53.38 m²). The total space used for teaching amounts to 1,221.63 m². Teaching staff have access to 23 offices (371.75 m²), while the Faculty's professional services are located in 6 offices (106.85 m²), as shown in Table 4.5 (Annex III).

Spaces for student activities include areas for studying, project work, student associations, the student council, and similar activities (84 m², Table 4.5, Annex III). Students and student organizations may submit specific requests to the Faculty for additional space, which is allocated in accordance with available capacities.

The Faculty continuously invests in the improvement of infrastructure and equipment. A significant contribution to the development of research infrastructure was achieved through a project funded under the National Recovery and Resilience Plan (NPOO) titled "[Increasing the international visibility of the Rijeka Laboratory for Scanning Electron Microscopy \(POMERI\)](#)" (2023–2026, principal investigator: I. Kavre Piltaver), which upgraded laboratory equipment of key importance for the Faculty's research activities. Capital laboratory equipment of higher acquisition value is mainly procured with co-financing from competitive research projects. The Faculty has significantly increased investments in teaching equipment over the past three years ([procurement of teaching equipment 2018–2025](#)).

The procurement and maintenance of computer equipment, including desktop and laptop computers, projectors, and other equipment necessary for teaching and administrative work, is carried out continuously from the Faculty's own funds. The Faculty of Physics also receives donations of computer equipment ([donation from the Faculty of Informatics and Digital Technologies in 2024](#), [donation from Navis Consult d.o.o. in 2025](#)). Technical and user IT support is provided by the University Computing Centre (SIC), which maintains the Faculty's computer network and systems and ensures the smooth operation of teaching and research activities.

The infrastructure development of the Faculty is planned and implemented in accordance with the strategic objectives defined in the Faculty Development Strategy, with the aim of ensuring optimal conditions for teaching, scientific research, and professional work.

4.4.2. *The higher education institution ensures a minimum of 1 m² of space per student.*

The total space of the Faculty of Physics designated for teaching amounts to 1,221.63 m². In the evaluation academic year, the Faculty had 111 enrolled students: 99 in regular status (coefficient 1) and 12 in part-time status (coefficient 0.5), corresponding to a total of 105 equivalent students. Based on these data, the space per student is calculated as:

$$1,221.63 \text{ m}^2 / 105 \text{ students} = 11.63 \text{ m}^2 \text{ per student.}$$

This means that the Faculty provides more than 11 m² of space per student, which significantly exceeds the minimum requirement prescribed by this standard (Table 1c, Annex I). It is therefore evident that the Faculty not only meets but substantially surpasses the spatial criteria required for the high-quality delivery of study programmes.

4.4.3. *The higher education institution has available classrooms, laboratories, i.e. spaces where practical teaching is conducted, a library, an information technology (IT) classroom, offices for teaching staff and offices for employees in professional services.*

The Faculty of Physics has facilities that enable the comprehensive execution of all teaching and scientific research activities at a single location within the building on the University of Rijeka campus in Trsat. The spatial capacities of the Faculty are presented in Table 4.5 (Annex III).

For teaching purposes, students and staff have access to 6 lecture halls (358.85 m²), 18 teaching laboratories and practical classrooms (770.45 m²), 4 workshops (38.95 m²), and one additional space designated for teaching activities (53.38 m²). The total space allocated for teaching amounts to 1,221.63 m². All lecture halls are equipped with appropriate presentation equipment (computer, projector, and screen) and internet access. The Faculty also has a computer classroom equipped with student computers, used for computer-assisted teaching and independent student work.

Students have access to a reading room that operates as a branch of the University Library of the University of Rijeka, where they can access professional and scientific literature as well as other library services.

Teaching staff and associates of the Faculty have a total of 23 offices (371.75 m²). The six offices of professional services (106.85 m²) include working spaces for laboratory staff, heads of administrative and legal affairs, the Dean, an expert advisor, a project associate, and a technician. Other administrative services, such as accounting, human resources, procurement, and other shared services, are organized jointly with other faculties without legal personality within the University of Rijeka and are mostly located in the Rectorate building. The student administration office, the University Computing Centre (SIC), and technical services are also shared services, but are in the same building as the Faculty of Physics.

4.4.4. *Classrooms are equipped with seats for students, a lectern and the equipment necessary to present instructional content. Laboratories are equipped with adequate laboratory equipment necessary for research to be conducted for universities and for teaching practical classes. Offices of teaching staff and offices of employees in professional services are equipped with office equipment necessary for the work of teaching staff and professional services.*

Lecture halls at the Faculty of Physics are equipped with student seating, a lectern with a computer and connection points for a laptop, a digital projector with a screen, a board, and all necessary teaching aids. The lecture halls are connected to the internet, enabling teaching to be conducted using digital learning resources, videoconferencing, and synchronized translation.

The Faculty has 18 laboratories and teaching practicums with a total area of 770.45 m² and 4 workshops with an area of 38.95 m², distributed according to the Faculty's scientific and teaching areas. The laboratories are equipped with scientific and educational equipment ranging from instructional laboratory instruments to major research infrastructure (Table 4.6, Appendix III). [The laboratories](#) are used not only for teaching exercises but also for student research for bachelor's and master's theses, as well as for the scientific research work of academic staff. This laboratory-based approach to teaching provides students with valuable hands-on experience working with instruments and prepares them for further scientific or professional work. Major laboratory equipment is acquired with co-funding from competitive research projects, with the most significant contribution in the observed period achieved through the project "Increasing the international visibility of the Rijeka Laboratory for Scanning Electron Microscopy (POMERI)," funded under the NPOO. A list of major equipment is provided in Table 4.6 (Appendix III).

Faculty offices for academic staff and administrative service offices are equipped with all necessary office equipment: desktop computers, printers, internet access, telephones, appropriate furniture, as well as heating and cooling systems.

Administrative service offices are equipped with computers, scanners, printers, air-conditioning units, and internet access, ensuring appropriate conditions for the uninterrupted performance of all administrative tasks.

4.4.5. *The higher education institution has ensured that an adequate supply of computers is available to students, as well as wireless internet access in all rooms intended for students.*

The Faculty has a computer classroom with 16 desktop computers intended for computer-assisted teaching and for students' independent work outside classes. The computers are equipped with software required for the implementation of physics study programmes. In addition to the computer classroom, the reading room of the University Library at the Faculty is equipped with computers for students. The Faculty of Physics has also provided a certain number of laptop computers for students of lower socioeconomic status. Students may use laptops for teaching purposes, for carrying out student projects, for participation in workshops, etc. The loan procedure is carried out based on a student's request

to the Faculty administration, after which, with the consent of both parties, a [loan agreement](#) is concluded.

The Faculty premises (lecture halls, laboratories, corridors, and other student areas) are covered by wireless internet access via the eduroam network, which is accessible to all students and staff using their AAI@EduHr digital identity. The CARNET network provides the University of Rijeka with internet access speeds of up to 10 Gb/s, ensuring stable and fast internet connectivity across all key Faculty spaces.

4.4.6. The higher education institution uses appropriate technologies that support all teaching and scientific needs.

All lecture halls at the Faculty of Physics are equipped with digital projectors with screens, boards, and lectern computers with connection points for laptops, ensuring the technological foundation for modern teaching delivery. The Faculty uses the Merlin system to support e-learning and digitally enhanced teaching, which has been implemented at the University of Rijeka level and has been in intensive use since 2020.

The Faculty laboratories are equipped with research and educational equipment ranging from instructional instruments to major research infrastructure, thereby ensuring support for both teaching activities and scientific research.

All computer equipment, including computers in the computer classroom, at lecture hall lecterns, and in staff offices, is regularly maintained and upgraded. The procurement of computer equipment and licensed software required for teaching and research is financed from Faculty funds, and in some cases also from project resources. Technical and user IT support is provided by the University Computing Centre (SIC).

As a unit of the University of Rijeka without separate legal personality, the Faculty has direct access to university infrastructure, including the Bura supercomputer, which is available to staff and researchers for performing computational simulations and processing large datasets without additional cost.

4.4.7. The space, equipment and the entire infrastructure (laboratories, IT services, work facilities, libraries, reading rooms, studios, galleries, multimedia halls, teachers' offices, warehouse, etc.) are appropriate for the delivery of study programmes, and they ensure the achievement of the intended learning outcomes.

The space, equipment, and overall infrastructure of the Faculty of Physics are appropriate for the implementation of all study programmes and ensure the achievement of the intended learning outcomes. The total area designated for teaching amounts to 1,221.63 m² and includes 6 lecture halls (358.85 m²), 18 teaching laboratories and practicums (770.45 m²), 4 workshops (38.95 m²), and one additional teaching space (53.38 m²). Teaching spaces are sized according to the current number of students and enrolment quotas and fully meet the requirements for the delivery of all planned teaching activities.

Lecture halls are equipped with projectors, boards, and lectern computers, and all rooms are covered by the eduroam wireless internet network. The Merlin system is used for digitally supported teaching; it is implemented at the University of Rijeka level and enables students and teachers to access teaching materials, follow classes, and communicate outside

class time. The computer classroom with 16 computers is intended for computer-assisted teaching and students' independent work.

The Faculty laboratories are equipped with educational and research equipment tailored to the teaching and scientific needs of individual study programmes. In addition to regular teaching exercises, laboratories are also used for scientific research activities, and students have the opportunity to gain practical experience through work on bachelor's and major's theses and participation in research projects. In this way, laboratory work directly contributes to the achievement of learning outcomes and the development of competencies that increase students' competitiveness on the labour market.

Faculty premises are accessible to persons with disabilities and meet all basic hygiene and health requirements: natural lighting, ventilation, access to running water, and adequate heating and cooling are ensured.

Students also have access to reading room facilities operating as a branch of the University Library, with access to scientific and professional literature as well as user computers. Spaces for student activities are provided according to the expressed needs of student organisations and associations, which may submit specific requests to the Faculty, and available space is allocated in line with capacity.

The Faculty infrastructure is continuously improved in line with strategic goals and available resources, with the aim of ensuring optimal conditions for teaching, research, and student life. Technical and IT support for the entire infrastructure is provided by the University Computing Centre (SIC).

4.4.8. The space, equipment and the entire infrastructure (laboratories, IT services, work facilities, etc.) are appropriate for the implementation of scientific/artistic and professional activities.

The space, equipment, and infrastructure of the Faculty of Physics are appropriate for the implementation of scientific and professional activities. [The allocation of financial resources](#) is aligned with the priorities of teaching and scientific activity, thereby ensuring the long-term sustainability and quality of the Faculty's work. Scientific research activities are carried out primarily in the Faculty's laboratory spaces, which include 18 laboratories and practicums with a total area of 770.45 m² and 4 workshops with an area of 38.95 m². The laboratories are equipped with research infrastructure tailored to specific scientific fields, and in most cases the same spaces are used for both teaching and research activities. Laboratory equipment is continuously upgraded, with the procurement of high-value capital equipment largely depending on researchers' participation in competitive projects. A significant contribution in the observed period was achieved through the NRRP project "[Increasing the international visibility of the Rijeka Laboratory for Scanning Electron Microscopy \(POMERI\)](#)," which improved research infrastructure of key importance for the Faculty's scientific work (a list of capital equipment is provided in Table 4.6, Appendix III).

For research requiring advanced computing and modelling, Faculty teachers and researchers have access to the University of Rijeka's Bura supercomputer, as the Faculty is a constituent part of the University without separate legal personality. The Bura supercomputer, located at the Centre for Advanced Computing and Modelling, enables complex computational simulations and the processing of large datasets, which is particularly

relevant for research in astrophysics, materials physics, and related disciplines represented at the Faculty.

Academic staff offices are equipped with all necessary IT equipment and infrastructure for scientific and professional work, while technical and IT support is provided by the University Computing Centre (SIC). Access to scientific literature is ensured through the reading room, which operates as a branch of the University Library, including access to digital databases and interlibrary loan services, thereby enabling researchers to access relevant global scientific literature.

4.5. *The library and library equipment, including access to additional resources, ensure the availability of literature and other resources necessary for a high-quality of study and scientific-teaching/artistic-teaching activities.*

4.5.1. The library, its equipment and access to additional facilities ensure the availability of literature and library services for the purpose of conducting the study programmes and scientific/artistic and professional work (availability of teaching literature and literature for scientific/artistic and professional work, availability of ICT facilities, access to the library holdings in print and/or in electronic form).

The University Departments building houses the [University of Rijeka Library, Campus Branch](#), which is specially equipped to meet the needs of students, teaching staff, and non-teaching personnel of the faculties and centers located in the building, including FIZRI. Quantitative data on the library's resources are presented in the Analytical Appendix, Table 4.7.

The library is furnished with modern equipment and information and communication infrastructure and provides 44 workstations for study and research. Users have access to wired and wireless internet via the Eduroam system, seven desktop computers intended for academic work, and a multifunction device for printing, photocopying, and free self-service scanning for academic purposes. In this way, the technical prerequisites are ensured for accessing electronic resources, preparing seminar papers, final and graduate theses, and conducting scientific research.

The development of library collections is carried out in accordance with the [Guidelines for Collection Development of the University of Rijeka Library at the Campus Branch](#), which define the purpose, scope, and content of the collection in line with teaching and research needs. Library materials are selected in cooperation with teaching staff, considering required and supplementary reading lists as well as the existing availability of titles in the Campus Branch. This acquisition model ensures the timely availability of teaching materials for all levels of study, as well as specialized literature necessary for scientific and professional work. Each year, if there are changes in required or supplementary reading lists, teaching staff submit requests to the library to update the titles. Proposals for acquisitions may also be submitted by both staff and students via an [online form](#) available on the library's website.

As of December 31, 2025, the Campus Branch library collection comprised a total of 10,745 physical units: 10,534 volumes of books, 141 volumes of journals, 9 volumes of newspapers, 42 units of electronic materials on portable media, and 19 units of other library materials. Within the collection, 258 textbook titles of required literature for the Faculty of

Physics study programmes were recorded, with a total of 1,031 copies, ensuring the availability of core teaching materials. Printed materials are available to users in open access.

Printed materials that the library does not hold in sufficient quantities for all students may, in agreement with the instructor, be digitized by chapters in accordance with copyright regulations. After digitization, the content is prepared in a read-only format and delivered to the instructor, who can then share it with students via the e-learning system.

In addition to printed materials, users are provided access to electronic books and databases. Through the ProQuest Ebook Central platform, access is available to subscribed scholarly and professional e-books from various publishers, as well as to open access titles. Access is provided from IP addresses of the University of Rijeka constituents and via remote access using the AAI@EduHr identity, ensuring continuous availability of literature regardless of physical presence in the library.

Students and staff are provided access to a total of 11,933 electronic journals. This number includes titles available through national-level subscriptions, ensuring broad access to current scholarly and professional literature in electronic form. Staff and students also have access to 16 bibliographic databases through national subscriptions. Data on electronic journals and databases available via national subscriptions are based on information provided by the National and University Library in Zagreb to the University of Rijeka Library.

Additionally, the analytical tools InCites and SciVal are available through subscriptions funded by the University of Rijeka, enabling bibliometric analysis of the scientific productivity of researchers and University constituents, thereby supporting strategic planning of scientific activities and evaluation of research results.

The entire collection of printed and electronic materials can be searched via the Primo VE online library catalog, available on the Campus Branch website. This integrated search system enables simple and quick access to information on the availability of materials and links to electronic resources.

These indicators confirm that the library ensures the availability of teaching materials, scientific journals, and bibliographic resources in both printed and electronic formats for the needs of study programmes and scientific and professional activities.

The library collection is continuously updated through the purchase of books funded by internal projects or through donations. For example, in 2024 FIZRI received two book donations: one from Professor Emeritus Ratko Zelenika and another comprising the [private collection of the eminent physicist and academician Predrag Cvitanović](#), containing more than 650 books in physics and mathematics (see [Donation Agreement](#) and [List of Donated Books](#)).

4.5.2. The library premises and resources, including additional resources, meet the conditions for a high-quality study in accordance with, among other things, the conditions stipulated by the Standard for Higher Education, University and Scientific Libraries (Official Gazette, 81/22).

The library, through its equipment, organization of work, and additional services, ensures that students have conditions for high-quality and efficient study, in accordance with applicable regulations, including those prescribed by the Standard for Higher Education, University, and Research Libraries ([Official Gazette 81/22](#)). The conditions for the regular operation of the Campus Branch are defined by the [Library Act](#) and include the provision of an appropriate library collection, space and equipment, qualified library staff, and financial

resources necessary for the uninterrupted delivery of library services. In 2025, the financing of the Campus Branch was secured through regular funds from the budget of the University of Rijeka, including funding for extended working hours, equipment, and acquisition of literature. The library's opening hours, Monday to Friday from 9:00 a.m. to 7:00 p.m., ensure service availability throughout the working day.

The library is located in the communication hub of the institution and occupies a total area of 354.60 m², of which 246.50 m² is intended for users. The user area is fully accessible and supports both individual and group work.

Appropriate spatial conditions are ensured for the storage and protection of library materials in open access, as well as for the work of library staff, supported by suitable information and communication infrastructure that enables efficient and uninterrupted library operations and access to electronic information resources.

The library employs three full-time staff members (a library assistant, a graduate librarian, and a senior librarian serving as head), ensuring professional support to users in finding, evaluating, and using information, as well as in the implementation of information literacy programs. Professional development of library staff is carried out continuously through seminars, courses, workshops, professional conferences in Croatia and abroad, and formal education programs, including online training. Staff advance to higher professional titles in accordance with applicable regulations.

The core activities of the library include providing information and reference services, guiding and assisting users, participating in the teaching and educational process, and organizing and delivering educational programs and information literacy training for students as well as scientific and teaching staff.

The library actively supports the evaluation of scientific activities, prepares bibliometric and other analyses, and provides indicators of the scientific productivity of researchers and the institution. It also supports open science initiatives through the development and maintenance of an institutional repository for the storage, long-term preservation, and open access to publications and research data.

The library systematically monitors the use of its services and user satisfaction. On an annual basis, it collects statistical data and measures indicators necessary for assessing the quality of its activities, based on the [Guidelines for Measuring and Applying Quality Indicators of Library Activities](#) at the University of Rijeka Library. The data, together with those of the University of Rijeka Library, are entered into the national System for the Unified Electronic Collection of Library Statistics maintained by the National and University Library in Zagreb.

User satisfaction is measured within a three-year cycle in accordance with [ISO 11620](#) and [ISO 2789](#) standards and in line with the Guidelines for the Application of Quality Indicators of Library Activities at the University of Rijeka Library. The two most recent analyses of user satisfaction with the Campus Branch (for [2021](#) and [2024](#)) are available on the Campus Branch website. The aim of the survey was to determine the degree of user satisfaction with library services, opening hours, and facilities. Users completed a simple questionnaire consisting of five elements evaluating specific library services: availability of required course literature, availability of materials in users' fields of interest, library opening hours, helpfulness and courtesy of staff, and library space. Each item was rated on a scale from 1 to 5. The survey covered two target user groups: teaching and research staff and students.

The library regularly monitors physical visits by students and staff. In 2025, the number of physical visits reached 6,613, comparable to 6,658 visits in 2024, and representing a 47%

increase compared to 2023 (4,489 visits), indicating increased use of library space and services due to the availability of literature, quality of services, and diverse offerings.

The library continuously invests in the development and modernization of its website and digital services, enabling students and staff flexible, timely, and equitable access to all resources necessary for high-quality study and academic work.

[The Rules of Procedure of the Campus Branch](#) are available on the website and regulate the activities and organizational structure of the Campus Branch of the University of Rijeka Library. The Rules ensure clear procedures and standards of operation, enabling transparent and efficient provision of library services in accordance with applicable regulations and higher education standards.

4.5.3. The higher education institution ensured literature needed for teaching as well as research and professional activity.

The library ensures the availability of teaching materials as well as literature required for scientific and professional work, which is acquired based on proposals from academic and teaching staff. Literature that is not available through subscribed databases is obtained via interlibrary loan services, including the RapidILL service. RapidILL is a service that enables the rapid digital delivery of journal articles and book chapters and is available free of charge to all library users.

This system ensures the timely and efficient access to literature not available within the library, thereby supporting the high-quality delivery of the teaching process, scientific research, and professional activities.

4.5.4. Students and teachers have access to ICT resources.

The library provides students and teaching staff with systematic information and communication support, ensuring access to digital resources and the competencies necessary for high-quality teaching and scientific research activities. Students and staff have access in the library to computers with internet connectivity, the [Primo VE](#) online catalog, bibliographic databases, e-books via the ProQuest platform, and the institutional repository.

Through the Primo VE online catalog and the AAI@EduHr system, users can monitor their personal library accounts, loans and overdue items, reserve materials online, and use interlibrary loan services.

A multifunctional device for free self-service scanning of study materials is available within the library premises. In addition, the library provides professional support, online instructions, and training for the effective use of all available resources.

[Library services](#) and [online requests](#) for library services are available via the modern website of the Campus Branch. News and announcements are regularly published on the [Campus Branch's Facebook page](#). The library also maintains a [You Tube channel](#) where it publishes educational video content.

Within the national infrastructure of [Digital Academic Archives and Repositories \(Dabar\)](#), the library is responsible for managing, maintaining, and improving the institutional [repository of the Faculty of Physics](#), thereby ensuring the permanent storage, accessibility, and visibility of academic works at the institutional level. The library performs data entry and updates, quality control and record completeness checks, content monitoring, and the

development of new repository functionalities. Students and staff are enabled to self-archive all types of papers and research data, with continuous professional and advisory support.

In cooperation with the student administration office, regular checks are conducted to ensure alignment between the number of deposited theses (final, graduate, and doctoral) and the number of students who have completed their studies, thereby ensuring complete records and timely archiving of all academic works. In cases where a work has not been self-archived, the library, in agreement with the mentor and the student, carries out its deposit in the repository. The library also provides training and professional support to students and staff on the self-archiving process, in accordance with [documents](#) supporting the [Open Science Policy of the University of Rijeka](#), including the Guidelines for the [Implementation of the Open Science Policy](#) and the [Decision on Mandatory Deposit of Works in Repositories](#).

The library is strongly oriented toward the development of digital and online services, continuously following modern trends and developments in higher education. In doing so, it ensures efficient, modern, and user-friendly access to information, as well as reliable support for teaching and scientific research activities.

4.5.5. Students and teachers have access to library materials in print and/or electronic form.

The library ensures continuous and uninterrupted access to library materials in both print and electronic formats for all students and faculty. Availability of the collection includes the physical holdings as well as electronic resources through appropriate databases and digital repositories. By maintaining extended daily opening hours, the library supports the quality of the teaching process and scientific research activities.

Printed materials are available in open access, allowing users to directly consult items from the library shelves. Electronic resources are accessible through the [library's website](#), the [Primo VE](#) online catalog, and the [ProQuest Ebook Central](#) platform. Access to electronic sources is also provided remotely via the AAI@EduHr authentication system.

The library website provides the Primo VE catalog, which allows searching the entire library collection, including printed and electronic books, as well as the collections of all libraries at the University of Rijeka. The catalog also provides access to open-access scientific articles from nationally available databases and institutional repositories within the [Dabar](#) system, the Directory of Open Access Journals, and other open-access sources. Primo VE features advanced functionalities, including the use of generative AI tools, rapid digital document delivery via RapidILL, and interlibrary loan services. User login to Primo VE is done through the AAI@EduHr system, enabling off-campus access to subscription resources and management of personal library accounts. For easier navigation and use of the Primo VE catalog and services, the library has created instructional [videos](#) available on its website.

Students and faculty have access to the [Faculty of Physics Repository](#) and the [University of Rijeka Repository](#), which integrates repositories from all University units. This ensures permanent storage, visibility, and accessibility of undergraduate and graduate theses, dissertations, and other scientific and professional works, in accordance with the principles of open science and transparency in academic work.

4.5.6. The library and library equipment, including the additional resources, meet the conditions for a high-quality study.

The multifunctional device in the library allows faculty and students to [scan teaching materials](#) free of charge, facilitating the digitization of content needed for teaching and online learning. At the request of instructors, educational materials are digitized for study purposes in compliance with applicable copyright regulations. The library has also created [Guidelines for Selecting and Uploading Materials to E-Courses](#).

The library continuously conducts information literacy activities to serve as an active partner for students, faculty, and researchers in studying, teaching, and scientific research, providing support for the effective and independent use of information resources. These activities include expert assistance in literature searching, supporting the preparation of seminar papers, undergraduate and graduate theses, and other academic and scientific works.

Special attention is given to educating new library users on using library services, the online catalog, and efficient literature search strategies. Librarians regularly organize information literacy workshops and, for many years, have been invited by instructors to teach within courses such as *Methodology of Professional and Scientific Work Presentation* at both undergraduate and graduate physics programs. In these courses, students receive training in information literacy, including evaluation and searching of scientific information, use of library services and catalogs, depositing work in institutional repositories, using databases, and understanding citation styles and bibliographic reference management software. This ensures students receive systematic support in developing academic and research competencies.

4.5.7. The library and library equipment, including the additional resources, ensure a high quality of scientific-teaching / artistic-teaching activities.

The Library, through its equipment, services, and additional resources, provides support for high-quality scientific and teaching activities. Academic, teaching, and professional staff have access to the [Kotobee Author](#) tool for creating interactive e-books at the University of Rijeka. For this purpose, the Library has provided two laptops available for free loan and use of the tool. The tool enables users to add interactive content to text (images, audio and video recordings, links, 3D models, quizzes, etc.). E-books can be exported in standard formats such as EPUB and PDF, as well as in formats suitable for web, desktop, or mobile applications, and can be integrated into learning management systems.

As part of its activities, the Library prepares bibliometric reports upon request for academic and teaching staff. These reports are used in promotion procedures, applications for competitions and projects, award nominations, and in the preparation of reports on the scientific productivity of authors and the Faculty, as well as reports on publication metrics.

In cooperation with the University Library Rijeka, the Library organizes a lifelong learning program titled *Information Tools for Researchers*, delivered by lecturers and librarians from the Campus Branch. The program is intended for academic staff and doctoral students and is conducted in two cycles per year. It consists of five thematically connected modules covering the entire process of creating, publishing, and evaluating scientific work: Information services and tools for researchers and author visibility; Tools for searching scientific sources; Tools for managing scientific information; Tools for publishing scientific papers; and Tools for evaluating scientific publications. Through this program, the Library contributes to the information literacy of researchers and supports their effective and responsible use of tools and resources necessary for high-quality scientific work.

The Library also organizes additional workshops for researchers and teaching staff, conducted as both group and individual training sessions. These workshops cover topics

related to the creation and management of unique author identifier profiles, including ORCID and profiles in relevant databases. Special emphasis in individual training and consultations is placed on selecting appropriate scientific journals for publication, understanding journal metrics, and identifying predatory journals. The Library also provides training and professional support in searching citation databases such as Web of Science and Scopus, assistance with depositing papers in the institutional repository, and the Croatian Scientific Bibliography (CROSBI).

A librarian from the Campus Branch is a member of the [Centre for Open Science and Research Information Management](#), thereby systematically supporting academic staff in implementing open science practices. The Library provides support for publishing in open access, including guidance and assistance in publishing in open access journals. The Centre also offers expert support in research data management and copyright issues.

Through its collaboration with the Centre, the Library develops skills and raises awareness of open science through workshops, training sessions, and updates on current developments in open access and research information management. The Centre organizes the Open Science Café – short thematic online meetings that encourage knowledge exchange, discussion, and consideration of current topics in open science.

In addition, the Library actively participates in research information management. This includes structuring data on scientific productivity and editing affiliations of the Faculty of Physics in the Croatian Scientific Bibliography (CROSBI) and in the Web of Science Core Collection and Scopus databases. Structured data serve as the basis for preparing accurate reports on the scientific productivity of the Faculty, including reports for reaccreditation, the University of Rijeka strategy, and other purposes.

Library services and important information for teaching staff and researchers are available on the Campus Branch website, under the section "[Research](#)."

In conclusion, through its resources, professional staff, and educational activities, the Library actively supports scientific and research work, confirming its role as a key partner in the development of academic excellence.

4.6. The higher education institution provides the necessary financial resources to conduct teaching, scientific and professional activities.

4.6.1. The higher education institution has prepared a financial plan which includes the planned income and expenses to conduct higher education activity and professional activity over a three-year period (the financial plan of a university or a faculty, or an arts academy or a polytechnic/university of applied sciences should comprise the planned income and expenses to conduct research activity, or artistic and professional activity).

The financial operations of the Faculty over the past five years have been characterized by stable and balanced trends in revenues and expenditures, as well as transparent management of financial resources. Operations are conducted in accordance with applicable legal regulations and the financial rules of the University, with regular planning and monitoring of budget execution.

The Faculty of Physics has financial plans that include projected revenues and expenditures for carrying out its higher education, scientific, and professional activities.

Financial plans of revenues and expenditures for a five-year period, together with reports on amendments to the plans and their execution, are available via the link [Financial Documents of the Faculty of Physics 2021–2025](#). These documents also include Faculty Council decisions on adopting the plans and approving the reports. The *Report on the Financial Operations of the Faculty*, which contains an overview of the Faculty's financial operations for 2021–2025, [data on revenues and expenditures](#), the structure of funding sources, and a brief explanation of the Faculty's financial operations, is available via the link [Report on the Operations of the Faculty of Physics 2021–2025](#). The Faculty prepares a financial plan for the following year and projections for the next two years in accordance with allocated limits and deadlines, in line with the Instructions for the Preparation of the State Budget Proposal.

Since the Faculty of Physics does not have separate legal personality, its financial operations are an integral part of the consolidated financial operations of the University of Rijeka. The financial plans and financial reports of the University of Rijeka, which include the financial operations of the Faculty, are published annually on [the University's website](#), thereby ensuring full transparency of funding.

4.6.2. The public higher education institution has provided evidence of sufficient funds to deliver the study programme, in the form of a signed programme agreement or a projection of income from tuition fees or other sources.

FIZRI concluded a program agreement within the framework of UNIRI program-based funding in 2025, which was carried out transparently through several months of continuous consultations on the proposed models with the University administration and decisions of the Senate. During the preparation of the program agreement, the FIZRI administration presented and explained the preparation process and the proposed funding models at all Faculty Council meetings. On 29 September 2025, the Faculty Council accepted the proposal for FIZRI program funding for 2025–2029 within the program agreement of the University of Rijeka ([Summary of the Financial Plan for FIZRI Program Funding 2025–2029](#), Decision on the [Adoption of the FIZRI Program Funding Plan 2025–2029](#)).

4.6.3. Financial sustainability and efficiency are evident in all aspects of the higher education institution's activity.

The Faculty of Physics has been operating with a positive financial balance since 2018, when numerous rationalization and cost-saving measures were implemented, which also enabled the complete elimination of the total debt from previous years. The successful implementation of the [FizKO](#) project further strengthened the Faculty's financial sustainability.

External funding sources significantly contribute to stability, and the encouragement of project applications over the past five years has resulted in a large number of successful [competitive projects](#), including the [NPOO project POMERI](#) worth €700,000.00. Most staff members participate in university projects funded through program agreements, while additional resources are also generated from analytical services.

In optimizing teaching activities, the number of external collaborators has been reduced by taking over part of the teaching load by internal staff, while strategic activities in publishing scientific papers ensure additional funding through program agreements.

Financial sustainability and efficiency are also evident from the financial evaluation for the last two calendar years (Table 4.8, Appendix III).

4.6.4. The higher education institution manages its financial resources transparently, efficiently and appropriately.

FIZRI manages financial resources transparently through clearly defined procedures for planning, monitoring, and reporting, in accordance with the [Rulebook on the Realization and Use of Designated and Own Revenues and Non-Designated Donations of the University of Rijeka](#). The Faculty administration submits annual financial reports to the Faculty Council, providing detailed overviews and explanations of the structure of revenues and expenditures. From an accounting perspective, separate sub-accounts are maintained for each staff member, where project funds and externally sourced funds are recorded; these funds may only be used for designated purposes. The accounting for FIZRI is managed by the Finance and Accounting Department at the University of Rijeka Rectorate. Each staff member is informed about available funds when necessary or upon request. All major financial decisions are approved at Council meetings or in agreement with project leaders.

The Faculty Council adopts financial plans and financial reports, after which they are approved by the University Senate. The FIZRI revenue and expenditure financial plans for 2021–2025, showing funding sources and expenditure structure by purpose, amendments to the 2021–2025 financial plans, reports on the implementation of the 2021–2025 financial plans, as well as all corresponding Faculty Council decisions on adopting these documents, are available at the link [Financial Documents of the Faculty of Physics 2021–2025](#).

The financial plans and financial reports of the University of Rijeka, which include the financial operations of FIZRI (a faculty without legal personality), are published annually on [the University's website](#), thereby ensuring full transparency of funding.

4.6.5. Additional funding sources are used for institutional development and improvement.

The Faculty has significantly increased its investment in the procurement of teaching equipment over the past three years (see [Procurement of Teaching Equipment 2018–2025](#)).

FIZRI promotes scientific productivity through earmarked financial resources allocated to departments, research laboratories, and chairs from program agreement funds intended for scientific excellence (see example: [Allocation of Financial Resources](#) to Departments, Laboratories, and Chairs). Efforts are also made to the greatest possible extent to invest in staff development (example: [The Faculty funds staff professional development](#)).

4.6.6. Additional funding sources are secured through national and international projects, cooperation with the economy, local community, etc.

In addition to budgetary funds, the Faculty also generates additional own revenues (student tuition fees, [teaching activities at other University units](#), [commercial measurements](#),

[donations](#), etc.), as well as income from national and international projects and [other forms of project-based funding](#).

Financial plans of revenues and expenditures for a five-year period, showing funding sources and expenditure structure by purpose, as well as reports on amendments to financial plans and the execution of financial plans for the same period, along with Faculty Council decisions on adopting plans and approving reports, are available via the link [Financial Documents of the Faculty of Physics 2021–2025](#). The *Report on the Financial Operations of the Faculty*, which contains an overview of the Faculty's financial operations for 2021–2025, [data on revenues and expenditures](#), the structure of funding sources, and a brief explanation of the Faculty's financial operations, is available via the link [Report on the Operations of the Faculty of Physics 2021–2025](#).

The Faculty prepares a financial plan for the following year and projections for the next two years in accordance with allocated limits and deadlines, in line with the Instructions for the Preparation of the State Budget Proposal.

The financial plans and financial reports of the University of Rijeka, which also include the financial operations of FIZRI (a faculty without legal personality), are published annually on [the University's website](#), thereby ensuring full transparency of funding.

5. RESEARCH/ ARTISTIC AND PROFESSIONAL ACTIVITY

5.1. *The higher education institution is recognisable by scientific research and/or artistic achievements in all the scientific fields in which it conducts studies.*

5.1.1. *The scientific work of the higher education institution is grounded in original ideas and an original scientific approach.*

The Faculty of Physics of the University of Rijeka bases its scientific work on clearly defined and original research areas in which its teachers and researchers achieve internationally recognized results. The main research areas, that is, research groups, include:

- quantum and nonlinear optics, including the experimental control of quantum systems and optomechanics as an active line of research, pursued by laboratory heads within the Division of Experimental and Applied Physics;
- material surface analysis (XPS, SIMS, SEM), research into the properties of thin films of semiconducting metal oxides and analysis of their physicochemical properties;
- elemental microanalysis and environmental physics, including the application of nuclear analytical techniques in monitoring airborne particles and environmental pollution;
- astrophysics and astroparticle physics through the work of the Laboratory for Astroparticle Physics and a series of international research projects with partners from other universities and research organizations;
- the development of advanced functional materials and new synthetic methods, such as the deposition of photocatalytic thin films using the ALD technique, which researchers pursue through projects funded by national and European sources as well as through interdisciplinary collaborations;
- research in the fields of gravitation and elementary particle physics, conducted at the theoretical, phenomenological, and experimental levels;
- medical physics, environmental physics, and atmospheric processes, whose research is carried out within the Laboratory for Medical and Environmental Physics and the Chair of Environmental Sciences, established in 2024 in response to the increasingly intensive scientific, professional, and teaching activities related to environmental research;
- educational physics through the work of the Chair of Educational Physics.

Examples of original scientific achievements include publications by Faculty staff in international journals and conference proceedings, as well as participation in projects relevant to the development of new materials, the study of water system dynamics, and research in the fields of astrophysics, gravitational physics, and quantum field theory, thereby confirming the originality and scientific contribution of the research itself.

Such a broad spectrum of fields, ranging from fundamental physical phenomena to applied systems, reflects the clear originality of the Faculty's scientific approach and the innovative thematic breadth of its scientific activities.

5.1.2. *The number and quality of the higher education teachers' published papers is at the highest level.*

In the last five years, the teaching staff and associates of FIZRI have published a total of 192 scientific papers based on research conducted within FIZRI. The vast majority were published in recognized international scientific journals of the highest category. A total of 126 papers were published in first quartile (Q1) journals, of which 21 were published in journals classified as Exc. (the top 10% highest-ranked journals in the field). In addition, there were three chapters published in scientific books, 135 scientific papers published in conference proceedings, one authored book, and three edited books. The cumulative bibliographic data of members of the FIZRI teaching staff and associates over the last five years are presented in Table 5.1 of the analytical appendix from CRORIS, which also contains the bibliographies of individual FIZRI teaching staff and associates.

Scientific articles published by FIZRI staff over the last five years have been cited an average of 14 times, and the H-index is 25 (calculated based on 205 articles; see [Appendix 6. Citation Report – 205 – Web of Science Core Collection.pdf](#) and [Appendix 5. Citation Report.xlsx](#)). The distribution of articles published by FIZRI teaching staff and associates according to scientific fields is shown in the figure below (source: WoS; see also [Appendix 8. WoS – All Subject Categories.pdf](#) for all categories in which publications appear).



5.1.3. Results of research conducted by the teachers significantly contribute to the development of the scientific and/or artistic field in which they are active.

The scientific activities of the teaching staff of the FIZRI are focused on several clearly profiled research areas in which they achieve internationally relevant results and actively contribute to the development of physics as a scientific field.

In the field of astrophysics and cosmology, this contribution is reflected through the participation of FIZRI researchers in international collaborations and projects such as the PLANET network, the [MAGIC](#) and [CTA](#) experiments in gamma-ray astronomy, and [LSST](#) (Legacy Survey of Space and Time), one of the world's most important projects for the systematic observation of the sky. Participation in these collaborations enables a direct contribution to the development of new observational methods and to the interpretation of astrophysical phenomena.

In the field of elementary particle physics, FIZRI researchers participate in experiments at leading global research infrastructures, including CERN (the CAST experiment, the results of which had laid the foundations for a new generation of experiments such as IAXO), Fermilab ([Muon g-2](#)), and collaborations with the Italian [INFN](#) institute. Participation in such projects confirms the scientific relevance and competitiveness of the research groups, as involvement in these experiments requires a high level of specialized knowledge and recognized scientific excellence.

In the field of condensed matter physics and materials physics, the Faculty achieves significant results through international collaborations with research centres such as [CIC nanoGUNE](#) and with research groups in Ljubljana, Belgrade, and Switzerland. The research encompasses topics in nanoscience, surface physics, and the development of new materials, thereby contributing to the understanding of the physical properties of materials and their potential applications.

The development of research activities has been further strengthened through systematic investments in research infrastructure, including advanced experimental and computational equipment acquired through national and European projects. Particularly noteworthy is the collaboration with the Centre for Micro- and Nanosciences and Technologies, which enables the implementation of contemporary experimental research.

The contribution to the development of the scientific field is also reflected in the highly [developed international collaboration](#) with leading scientific institutions, the continuous publication of papers in internationally relevant scientific journals, their citation impact, and the participation of Faculty staff in international projects, editorial boards of scientific journals, peer-review processes, and as invited speakers at international scientific conferences.

5.1.4. The higher education institution has a satisfactory number of scientific papers in prestigious primary scientific outlets in its area/field.

As shown in Section [5.1.2](#), most papers published during the last five-year period appeared in Q1 journals, accounting for almost 66% of all published papers. Articles published in journals classified as Exc. represent almost 11% of the total number of papers published during this period. A list of the most distinguished papers can be found in Table 5.2 of the analytical appendix from CRORIS.

Since 2018, FIZRI has annually [awarded the most distinguished scientific papers](#) of its teaching staff and associates. FIZRI also actively nominates its teaching staff and associates for awards in the field of scientific excellence at both the University and national levels. FIZRI encourages scientific productivity through dedicated financial support for departments, research laboratories, and chairs, financed from programme agreement funds intended for scientific excellence (see, for example, the [Distribution of Financial Resources](#) for Departments, Laboratories, and Chairs).

5.1.5. There is a satisfactory number of papers of the higher education institution presented at prestigious conferences.

Over the last five years, FIZRI staff have actively promoted their scientific and professional achievements, presenting them at 258 scientific conferences (see [FIZRI konferencije 2026-03-27.docx](#)), including 15 invited lectures. Invited lectures further highlight the visibility and recognition of the teaching staff within the international community. Doctoral students and early-career researchers also actively participate in presenting papers, thereby encouraging their professional development and integration into the international scientific community.

A significant number of papers were also presented by collaborators of FIZRI staff from other institutions in Croatia and from foreign institutions. The figures stated above refer only to presentations given by FIZRI staff.

5.1.6. The higher education institution is involved in a satisfactory number of competitive projects.

The staff of FIZRI continuously participate in competitive scientific and professional projects at the university, national, and international levels. Applications are regularly submitted to calls issued by the University of Rijeka, the Croatian Science Foundation (HRZZ), the Ministry of Science and Education, and European programmes (e.g. ERC and MSCA), thereby ensuring the Faculty's continuous involvement in competitively funded research.

During the period 2021–2025, FIZRI staff participated in a total of 48 scientific research projects, three professional projects, one Croatian Qualifications Framework (HKO) implementation project, and two mobility projects (see Table 5.6 and the [Projects](#) webpage).

Of these, FIZRI staff acted as principal investigators for 41 scientific research projects, two professional projects, and one HKO implementation project. In addition to national and international projects, staff members were also principal investigators for 24 University of Rijeka (UNIRI) projects during the same period, which play an important role in the development of research ideas, student involvement, and the strengthening of research capacities.

Participation in projects in which FIZRI is not the lead institution is also highly significant, as it enables involvement in international research networks, access to research infrastructure, and the funding of part of the research costs through partner institutions.

The Faculty's total income generated through scientific and professional projects and related professional activities during the observed period amounted to EUR 2,422,562.15. This confirms the importance of project funding for the sustainability and development of FIZRI's scientific activities.

Compared with the previous reaccreditation period (2015–2020), during which staff participated in 9 scientific and 9 professional projects, with the institution acting as lead institution in 2 scientific and 6 professional projects, there has been a significant increase in overall project activity, particularly in the segment of projects led by FIZRI and in the segment of competitive projects.

Looking at project activities, almost all teaching staff and researchers of the Faculty are involved in project work, confirming the institution's high level of research activity and competitiveness.

5.1.7. The higher education institution organizes scientific conferences that are recognized at the national and international level.

The Faculty of Physics organizes and co-organizes scientific conferences that are recognized at the national and international levels. These conferences cover various fields of physics and chemistry and bring together Croatian and international scientists, thereby contributing to the Faculty's visibility, the development of scientific networks, and the strengthening of cooperation with partner institutions.

[An overview of the scientific and professional conferences](#) organized or co-organized by the Faculty is publicly available on the Faculty's website. By organizing such events, the Faculty actively contributes to the exchange of scientific ideas, the development of the research community, and the international recognition of its research areas.

5.1.8. The higher education institution teachers participate in the work of committees and other bodies in higher education and science.

The teaching staff of the Faculty of Physics participate in the work of national and university bodies in higher education and science, thereby contributing to the development of the profession and of the scientific system.

The Faculty is an institutional member of the [Croatian Physical Society](#), and the Dean of the Faculty serves ex officio as a member of the Supervisory Board of the Croatian Physical Society. In this way, the Faculty participates in the governing structures of the central professional organization of physicists in the Republic of Croatia.

Assist. Prof. T. Jurkić and Assist. Prof. I. Poljančić Beljan are members of the [Governing Board of the Croatian Astronomical Society](#), while Assist. Prof. T. Jurkić is also the head of its Scientific Section. Assoc. Prof. R. Peter is a member of the board of the [Croatian Vacuum Society](#). Assist. Prof. A. Belušić Vozila is a member of the [Governing Board of the Croatian Meteorological Society](#). Prof. R. Jurdana-Šepić served as President of the [Croatian Astronomical Society](#) during the 2020–2022 term.

Prof. G. Žauhar is a member of the [Field Committee for Physics and Geophysics](#), the national expert body responsible for matters relating to academic appointments, the evaluation of scientific activities, and the development of standards in the field of physics.

Faculty teaching staff also participate in the work of numerous [university committees and bodies](#) in accordance with their duties and functions, which is in line with the practice across all constituent units of the University.

5.1.9. External collaborators are recognized as experts in their fields, they have published adequate scientific or professional papers, and have the appropriate work experience.

The Faculty of Physics involves external associates in teaching and research activities who are recognized scientists and experts in their respective fields. They participate in the delivery of individual courses, student supervision, and doctoral studies, thereby contributing to the quality of study programmes and their alignment with current scientific and professional developments in physics and related disciplines.

External associates are internationally recognized scientists working at distinguished universities and research institutions.

In the academic year 2024/2025, external associates included [Dr. Marko Kralj](#) and [Dr. Ida Delač](#) in the doctoral study programme in Physics, [Dr. Davor Mance](#) in the graduate study programme in Physics (through a course within a micro-qualification programme), and [Ana](#)

[Bratulić](#), who teaches English for Specific Purposes in the undergraduate study programme in Physics (Table 4.1).

In addition to the external associates listed in Table 4.1, FIZRI engaged other external associates between 2021 and 2025. For example, [Prof. Igor Žutić](#), a leading expert in spintronics and quantum materials and a member of the International Advisory Board of the Rector of the University of Rijeka, participates in the Faculty's scientific and teaching activities. [Prof. Bojan Resan](#) is also involved in the activities of the doctoral study programme, while [Assist. Prof. Marko Jusup](#) contributes to interdisciplinary topics related to complex systems and the application of physical methods in other scientific fields. The Faculty's teaching and research activities also involve [Prof. Željko Ivezić](#), an internationally recognized astrophysicist involved in major international astronomy projects, and [Prof. Giovanni Cantatore](#), an experimental physicist involved in international experiments in elementary particle physics and dark matter searches, including projects associated with CERN and precision measurements of the muon anomalous magnetic moment.

Teaching activities have also included external associates from Croatian scientific and higher education institutions. Among them are [Prof. Hrvoje Štefančić](#), a full professor with tenure and an expert in theoretical physics and cosmology, and [Prof. Nastenjka Supić](#). Since the last reaccreditation period, teaching activities have also involved [Prof. Emmeritus Zdravko Lenac](#), whose extensive experience contributes to core teaching content such as quantum mechanics. External associates also include [Prof. Darija Vukić Lušić](#) and [Assist. Prof. Maja Oštrić](#), whose expertise contributes to interdisciplinary topics at the intersection of physics, environmental sciences, and biomedicine.

The Faculty's external associates are appointed to honorary teaching titles, which requires meeting strict national criteria for appointment to scientific-teaching positions, including an appropriate scientific and professional record. Their home institutions – which include distinguished international universities and leading Croatian scientific institutions – further confirm their high level of expertise and relevance for participation in teaching within physics study programmes.

The participation of international and domestic experts in teaching and doctoral studies provides students with direct contact with researchers actively involved in contemporary scientific projects and contributes to the international visibility and academic connectedness of the Faculty of Physics.

5.1.10. The higher education institution teachers participate in the editorial boards of scientific journals.

The teaching staff of the Faculty of Physics (FIZRI) participate in the editorial boards of international scientific journals and special issues of scientific publications, which confirms their scientific expertise, international recognition, and active involvement in the development of scientific communication in the fields of physics and physics education.

Prof. R. Jurdana-Šepić is a member of the editorial board of the international scientific journal [Open Astronomy](#) (publisher De Gruyter Brill), which publishes papers in the fields of astronomy and astrophysics. She is also a member of the editorial board of the international scientific journal [Frontiers in Astronomy and Space Sciences](#), which publishes papers in astronomy, space sciences, and astrophysics.

Assoc. Prof. T. Terzić served as editor of a special issue of the scientific journal *Classical and Quantum Gravity* (IOP Science), one of the leading international journals in the fields of

gravitation and theoretical physics. The special issue, entitled [Focus on Quantum Gravity Phenomenology in the Multi-Messenger Era: Challenges and Perspectives](#), was devoted to advances in theoretical and experimental research in quantum gravity phenomenology. He also served as Chair of the Editorial Board for the [Lecture Notes](#) editions from international schools organized within COST Action CA18108, published in Proceedings of Science (PoS).

Assist. Prof. N. Kralj served as guest co-editor of a special issue of Applied Physics Letters (AIP Publishing) entitled [Special Issue on Advances in Quantum Metrology](#), devoted to recent research in the field of quantum metrology.

Assoc. Prof. N. Erceg is a member of the editorial board of the international scientific journals [Journal of Research in Didactical Sciences \(JORIDS\)](#) and [Trends in Higher Education](#), which publish papers in the fields of didactics and higher education.

The participation of Faculty teaching staff in the editorial boards of scientific journals and conference proceedings confirms their scientific relevance, international visibility, and contribution to the development of scientific publishing in the fields of physics, astronomy, and educational sciences.

5.1.11. The higher education institution has an organised publishing activity and it is the publisher of scientific publications that are nationally and internationally significant and recognisable

The Faculty of Physics, University of Rijeka, does not have its own institutional publishing house and does not publish a scientific journal. The scientific output of Faculty staff is primarily published in international high-impact and highly visible scientific journals, which is consistent with the practice in the field of physics, where internationally peer-reviewed journal publishing is the dominant form of scientific communication.

Scientific papers by Faculty staff are regularly published in leading international journals in physics and related disciplines, with a significant proportion of papers published in top-tier journals (66 % of papers are published in Q1 journals), according to relevant bibliometric databases. Such a publishing model ensures high international visibility and citation impact of research, and contributes to the international recognition of the Faculty.

In Croatia, there is no internationally recognized scientific journal in the field of physics, and establishing a local journal without adequate international impact would not significantly contribute to the scientific visibility of the Faculty. For this reason, Faculty staff publish their research in established international publishing platforms.

Faculty members also have the opportunity to publish scientific monographs and university textbooks through the [publishing activity of the University of Rijeka](#) and other relevant academic publishers (e.g. Springer International Publishing – Carlos Pérez de los Heros and T. Terzić, Cosmic Searches for Lorentz Invariance Violation in [Modified and Quantum Gravity: From Theory to Experimental Searches on All Scales](#)), thereby further ensuring the dissemination of scientific results and teaching materials.

5.2. The higher education institution is distinguished by its professional achievements in all fields in which the professional study programme is delivered.

The Faculty of Physics does not offer professional study programmes. Nevertheless, due to the specific nature of its research and study fields, it achieves significant professional

accomplishments and maintains exceptionally strong links with professional practice, primarily with schools, teachers, the Education and Teacher Training Agency, as well as county and city education departments. The Faculty's professional activities are of particular importance for strengthening and supporting the development of the understaffed STEM field within the local and broader community, through training sessions, professional development programmes, public lectures, science popularization activities, and other forms of professional engagement.

5.2.1. The quality of the published professional publications of higher education institution's teachers is at the highest level.

The teaching staff of the Faculty of Physics primarily conduct scientific research, which results in high-quality scientific publications (see Section 5.1.2). [Professional works](#) are mostly presented at conferences and published in conference proceedings.

5.2.2. The results of teachers' professional research contribute significantly to the development of the profession.

[The Chair of Educational Physics](#) builds on the experience and responsibility of a long-standing tradition of higher education in physics teacher training in Rijeka. It develops and improves all activities related to learning and teaching physics through teaching, scientific and professional work and projects, organization of conferences and professional meetings, cooperation with schools and kindergartens, and the development of educational and science popularization content, as well as lifelong learning programmes.

Within the Research and Development Project of the University of Rijeka in Education UNIRI CLASS – programme line A2: Digital Citizenship – Innovations in Learning and Teaching – the project „[The digital repository for physics and science teaching](#)“ was implemented in the previous period, led by I. Poljančić Beljan (2022–2023), which significantly contributes to the development of the profession. This is a valuable digital repository containing 96 experiments for teaching physics and natural sciences, created with the aim of organizing e-content produced at the Faculty of Physics during the pandemic period, within two courses: one intended for students of teacher education studies and the other for students of the physics teacher education programme. The content enables the application of innovative teaching methods in a virtual environment, such as the *station rotation* model – involving all students in rotation between online and in-person activities – and the *flipped classroom* model. The repository is intended for pupils, university students, and physics teachers in primary and secondary schools, as well as in higher education. In addition, it has strong potential for the professional development of primary and secondary school teachers by providing them with *know-how*. The collection also contributes to addressing the frequent lack of experimental resources in primary and secondary schools.

5.2.3. The higher education institution has a satisfactory number of professional publications in prestigious professional journals.

The activities of FIZRI staff are predominantly focused on scientific research (see Section 5.1), with results published in high-quality scientific journals (Q1–Q3, see Section

5.1.4). This is consistent with international practice in physics and with national criteria for advancement in academic scientific ranks. Despite this primarily scientific focus, FIZRI also has a well-developed and important activity dedicated to the education of future physics teachers, which is both organisationally and substantively reflected through the Chair of Educational Physics and the implementation of teacher education study programmes. For this reason, the Faculty's professional work naturally addresses topics related to the improvement of physics teaching, innovative teaching methods, the development of teaching materials and laboratory exercises, the assessment of conceptual understanding among pupils and students, and the popularization of physics and STEM education.

During the observed period (2021–2025), FIZRI achieved continuous professional output (eight papers), with all but one directly related to the improvement of physics teaching. [Professional papers](#) are typically published in relevant professional outlets in the field of physics education, primarily in the proceedings of the Croatian Symposium on Physics Teaching (Croatian Symposium on Physics Teaching, organized by the Croatian Physical Society) and in international conference proceedings, including invited presentations. The share of papers published in international proceedings is approximately 25 %, while the remainder is published in domestic professional journals and proceedings. These results confirm that the Faculty maintains a satisfactory level of professional output with a direct contribution to the quality of teaching. Some papers extend beyond the scope of educational physics (e.g. a paper in a mathematical journal), indicating openness to collaboration and transferability of professional competencies (e.g. measurements, analysis, methodology). The diversity of co-authorship further indicates intra-institutional collaboration and the involvement of younger generations in the development of teaching innovations.

5.2.4. There is a satisfactory number of papers of the higher education institution presented at prestigious professional conferences and symposia.

FIZRI staff regularly participate in professional conferences such as the Croatian Symposium on Physics Teaching, e.g. the [17th Croatian Symposium on Physics Education, Days of Educational Sciences, Challenges in Meteorology](#), the [International Conference on Physical Aspects of Environment](#), and other scientific and professional meetings and conferences. The presented works are typically published in [conference proceedings](#).

In addition, FIZRI members frequently participate as invited speakers. For example, R. Jurdana-Šepić has delivered invited lectures at events such as the [17th Croatian Symposium on Physics Education](#), the [Inter-county Professional Council of Physics Teachers "Science in Full-Day Teaching"](#) (Prirodoslovlje u cjelodnevnoj nastavi), and the [Croatian Symposium on History Teaching](#). Faculty members also contribute as members of organizing and programme committees—for instance, N. Erceg served on the programme committee of the [12th International Conference on Physics Teaching in Secondary Schools](#), while R. Jurdana-Šepić was a member of the programme committee of the Days of Educational Sciences ([2022](#), [2024](#)).

It is important to note that such participation is not limited to members of the Chair of Educational Physics, but also includes other members of FIZRI.

5.2.5. The higher education institution is involved in a satisfactory number of professional projects.

The teaching staff of the Faculty of Physics actively participate in the implementation

of professional and development projects aimed at improving study programmes, developing teaching methods and digital educational content, and strengthening the connection between higher education and societal needs.

FIZRI was the lead institution of the EU project Development of physics studies with the application of the Croatian Qualifications Framework – [FizKO](#), coordinated by Mladen Petravić. The project focused on aligning physics study programmes with the principles of the Croatian Qualifications Framework, modernizing curricula, and defining competencies required for the labour market and further academic development of physics students.

Within the framework of institutional development projects of the University of Rijeka, several projects under the UNIRI CLASS programme have been implemented. For example, Diana Mance led the project [Development of digital forms of the teaching process and introduction of innovative teaching methods in environmental physics education](#) (2022 - 2023), aimed at developing digital teaching materials and applying modern teaching methods in the field of environmental physics.

In addition, I. Poljančić Beljan led the project „[The digital repository for physics and science teaching](#)“ (2022 - 2023), within which digital educational materials and interactive content for teaching physics and natural sciences at different levels of education were developed.

The Faculty also actively contributes to strengthening STEM competencies among teachers by cooperating with primary and secondary schools, as well as through regional and national projects aimed at enhancing teacher competencies, including projects of regional centres of competence. An example of such cooperation is the project [Be Prepared and Competent!](#), as well as professional training programmes organized by the Faculty of Physics, the UNIRI Faculty of Engineering, and the Centre for Micro- and Nanosciences and Technologies, such as a [series of professional trainings in micro- and nanotechnologies](#) (29–31 August 2023). Ivana Jelovica Badovinac served as the University of Rijeka representative in the project [STEM BAJKA](#), aimed at strengthening the capacities of civil society organizations for STEM popularization, led by the Society of Technical Culture Pedagogues Ogulin.

Through participation in these projects, the Faculty of Physics contributes to the development of innovative educational approaches, the digitalization of the teaching process, and the improvement of the quality of study programmes and their alignment with the needs of the modern educational and societal environment.

5.2.6. The higher education institution organizes professional conferences that are recognized at the national and international level.

The Faculty of Physics actively participates in the organization of numerous professional and scientific-professional events intended for physics teachers, students, and the wider educational community, thereby contributing to the development of physics teaching and the popularization of science at the national level.

FIZRI teaching staff are involved in the organization of relevant professional events. For example, Andreina Belušić Vozila was a member of the organizing committee of the scientific-professional conference [Challenges in Meteorology 10](#), held in Zagreb in 2025, which brings together experts in meteorology, climatology, and education in atmospheric sciences.

FIZRI also regularly participates in the organization of [professional meetings for physics teachers at the regional level](#). Examples include the [inter-county professional meeting Physics and Critical Thinking](#) (2024), as well as activities of the County Professional Councils of physics

teachers for the Primorje-Gorski Kotar, Lika-Senj, and Istria counties (2023 and 2024), through which the Faculty contributes to the continuous professional development of physics teachers.

In addition to professional events for teachers, FIZRI organizes activities aimed at students and the popularization of science. For instance, in cooperation with the Education and Teacher Training Agency, the [First Meeting of Students and Scientists](#) was held on 17 January 2025 in Topusko, with the support of Sisak-Moslavina County, featuring a multi-hour programme of lectures and workshops. A similar event, [1st Meeting of High School Students and Teachers of Karlovac County with Scientists from the Faculty of Physics, University of Rijeka](#), took place on 1 April 2025 in Karlovac, organized with the support of Karlovac County.

It is also important to highlight the international conference [Physics Education Challenges 2024](#), organized by FIZRI, which brought together an international community of researchers and educators in physics. Although primarily a scientific conference, a significant part of the programme was devoted to professional topics related to improving physics teaching and the application of contemporary educational approaches.

FIZRI is also a partner in the organization of the national professional meeting *Does Physics Teaching Meet the Challenges of Modern Society*, to be held in July 2026 in Rijeka. The event is organized in cooperation with the Education and Teacher Training Agency and brings together physics teachers from across Croatia, representing an important platform for the exchange of experiences on modern teaching methods and challenges in the education system.

Through the continuous organization and co-organization of such events, the Faculty of Physics confirms its active role in the development of the profession, the improvement of physics teaching, and the connection of the scientific community, teachers, and students at the regional, national, and international levels.

5.2.7. The higher education institution teachers participate in editorial boards of professional and popular journals.

The teaching staff of the Faculty of Physics participate in the editing of professional and science-popularization content through which scientific knowledge is communicated to the parties of the educational system and the wider public.

For example, R. Jurdana-Šepić is the editor of the [science-popularization radio programme Baltazar](#), broadcast on the Croatian Radio – Radio Rijeka since 1 February 2009. The programme is dedicated to the popularization of natural sciences and mathematics and regularly features content on current scientific topics.

As part of this project, 10 audio editions with selected broadcasts were produced and distributed to schools in the Primorje-Gorski Kotar County as a resource for teachers of natural sciences and mathematics. In this way, long-term accessibility of science-popularization content for teachers and students has been ensured.

Faculty staff also participate in the editing and preparation of proceedings from professional and scientific-professional conferences in the field of physics and science education, such as those presented at the Croatian Symposium on Physics Teaching (see, for example, the [17th Croatian Symposium on Physics Teaching](#)), as well as at international and regional conferences dedicated to physics education. Participation in programme and organizing committees of such events also includes involvement in editorial processes related to the preparation of conference publications.

5.2.8. *The higher education institution has an organised publishing activity and it is the publisher of professional publications relevant to the development of the profession.*

The Faculty of Physics makes use of and actively participates in the [publishing activities of the University of Rijeka](#), primarily oriented towards professional and teaching publications that contribute to the development of physics education and the training of students and teachers within the school system.

Within this framework, Faculty staff are authors of professional publications such as university textbooks and collections of physics problems. Examples include textbooks and problem collections prepared by Faculty staff, including publications by I. Jelovica Badovinac and Zoran Kaliman, as well as a problem collection authored by I. Kavre Piltaver and V. Labinac. Although some of these publications were issued more than five years ago, they are still used in teaching and represent a valuable professional contribution to the development of physics education.

An overview of publications authored by Faculty staff is publicly available on the [Faculty's website](#), where the editions and information on their availability are listed. The same platform also supports the distribution and sale of certain publications, thereby ensuring the accessibility of professional materials to students and the wider professional community.

In addition to these publications, students also have access to peer-reviewed teaching materials published on the personal webpages of staff members. For example, K. Lončarić has published exercises for the course *Physics IV: Thermodynamics and Basic Statistical Physics* on the [course webpage](#), while Velimir Labinac has published exercises for several courses on his [personal webpage](#).

Through such publishing activities, the Faculty contributes to the development of physics teaching materials, supports teachers within the school system, and enhances the quality of education in the STEM field.

5.2.9. *The higher education institution teachers participate in the work of committees and other bodies relevant to development of the profession.*

The teaching staff of the Faculty of Physics actively participate in the work of various professional committees and bodies that contribute to the development of physics and related fields, as well as to higher education and the popularization of science.

Faculty staff regularly serve on programme and organizing committees of professional and scientific-professional conferences mentioned in Section 5.2.4, thereby contributing to the design of conference programmes and to the development of professional and scientific communication in the fields of physics and the natural sciences.

Faculty members are also involved in the work of professional societies and their governing bodies, including the [Croatian Physical Society](#), [Society of Mathematicians and Physicists Rijeka](#), [Croatian Astronomical Society](#), [Croatian Vacuum Society](#), [Croatian Microscopy Society](#), and other related associations. The Faculty's chemists, Prof. G. Ambrožić and Assist. Prof. M. Kolymjadi Marković, are active in the [Croatian Chemical Society](#) – Rijeka Branch. Through related activities, they contribute to the organization of professional initiatives, the development of education in physics, and the popularization of science.

Faculty staff also participate in the work of other relevant bodies, such as the

Governing Board of the [Croatian Meteorological Society](#), the Council of the [Centre for Childhood Research](#), Faculty of Teacher Education in Rijeka, and the [Universitas](#) – Association for the Development of Higher Education. In this way, they contribute to the development of the profession, interdisciplinary collaboration, and the advancement of the higher education system.

5.2.10. External collaborators are recognized as experts in their fields, they have published adequate professional papers and have the appropriate work experience.

External associates of FIZRI are recognized experts in their respective fields, some of whom are internationally renowned and highly distinguished scientists (see Section 5.1.9). In line with disciplinary standards, they publish the results of their research in leading scientific journals.

5.3. The higher education institution influences the economy and society in general through the scientific and/or artistic work of its teachers.

5.3.1. The higher education institution has appropriate mechanisms in place to disseminate its activities to society.

FIZRI systematically carries out the dissemination of its scientific, teaching, and professional activities to the wider public through various formal and informal mechanisms. These include the Faculty's publicly available website, social media posts, media appearances by teaching staff and researchers, as well as participation in public events aimed at the popularization of science (e.g. [Vera C. Rubin Observatory First Light](#), [CTAO Large-Sized Telescopes \(LST\) observational results](#), [observations of GRB 221009A](#), [research at rain gauge stations](#), [the Faculty hosting a regional LSST workshop](#), and [lectures within the "University for the Third Age" programme](#)).

Special emphasis is placed on outreach activities aimed at popularization of physics and science in general, such as public lectures, workshops for primary and secondary school pupils, and participation in events including the [European Researchers' Night](#), the [Science Festival](#), [Pint of Science \(Pint of Science Croatia](#) was initiated by FIZRI staff), and Open Days. Faculty staff also regularly participate in public discussions, [panels](#), and [provide expert commentary in the media](#), thereby contributing to public understanding of topics in physics, technology, and science (e.g. contributions featured in the American magazine [Quanta Magazine](#)).

At the University level, an additional channel of dissemination is provided through institutional support for scientific communication and open science, including open access to scientific publications and theses.

The activities of members of the Department of Theoretical Physics and Astrophysics (ZTFA) are regularly published in the monthly [ZTFA Bulletin](#), which is publicly available on the Department's website.

Dissemination of the Faculty's research activities to the wider community is also supported by the project [Science Wednesdays at the Moho Centre](#), launched in 2024 in cooperation between the Faculty of Physics and the Opatija Festival, within which science-

popularization lectures are held at the Andrija Mohorovičić Interpretation Centre in Volosko, and which receive [strong media coverage](#).

The Faculty also undertakes activities and invests in increasing its media visibility, in which students are actively involved (see numerous [media publications](#)).

5.3.2. The higher education institution develops cooperation with external stakeholders.

FIZRI maintains well-developed and continuous cooperation with a range of external stakeholders from the public, educational, scientific, and broader societal sectors. This cooperation is realized through formal agreements and contracts, participation in joint projects, professional support, and advisory activities.

The Faculty collaborates with educational institutions and bodies within the education system, including the Agency for Education and Training, in the context of the professional development of teachers, curriculum development, and the improvement of physics teaching. It also maintains cooperation with other scientific and higher education institutions, public institutions, and select industry partners within research, development, and advisory activities.

Since 2021, Faculty staff have participated in monitoring radon concentrations in speleological sites in Croatia, in cooperation with Priroda Public Institution and the speleological association Estavela Speleological Society. Measurements have so far been conducted in several sites, including Šparožna Cave, Biserujka Cave, Zamet Cave, and Vrelo Cave. The results of these measurements have been published in a [scientific paper](#).

Documentation of cooperation with external stakeholders is maintained at both the Faculty and University levels. Examples relevant to professional and scientific collaboration, submitted as evidence of compliance with standards, encompass cooperation agreements between the Faculty and external stakeholders from the educational, cultural, and scientific sectors, as well as from industry. These include [Metal Center Čakovec](#), [Festival Opatija – MOHO Centre](#), [Istrian University of Applied Sciences](#), [Center for the Promotion of Science Belgrade](#), [Academic Astronomical Society Rijeka](#), and the [Education and Teacher Training Agency](#). Official cooperation agreements and contracts are available on the Faculty's website under [Documents and Regulations](#).

5.3.3. The higher education institution is involved in the formulation of public policies in the context of the scientific and/or artistic field and area in which it operates.

The Faculty of Physics actively participates in the design and shaping of public policies by applying its scientific and professional expertise to support informed decision-making. One of the ways it contributes is through providing expert opinions and advisory services in areas that require an understanding of physical principles and the application of technology, such as climate change.

In addition to its advisory role, the Faculty contributes through research projects that provide data and evidence serving as a foundation for public policy (e.g. the [BLUE RECHARGE](#) project). Scientific research in areas such as environmental modelling and the development of new materials for industry and medicine enables the formulation of policies based on robust scientific knowledge. The Faculty participates in various working groups and committees at both national and international levels, where its experts contribute to the development of

legislation, regulations, and strategies in line with technical and scientific standards (e.g. the [4th Scientific-expert conference Adaptations to climate change and preservation of marine ecosystems of the Adriatic Sea with international participation](#), [The travelling climate action](#), and the [International 6th scientific-expert conference on Climate change and preservation of marine ecosystems in the Adriatic Sea](#)).

An important component of the Faculty's contribution to public policy is its educational role. Through the organization of public lectures, workshops, and seminars, the Faculty raises public awareness of issues of scientific and societal importance, such as climate change. The Faculty of Physics contributes to the development of public policies by ensuring that decisions are based on scientific evidence, expert knowledge, and innovative technologies, thereby enabling improved quality of life and sustainable societal development. For example, in 2022, measurements and analysis of air quality were conducted in five metal-processing workshops at a shipyard in Rijeka. Students are often involved in such research activities, and this particular study resulted in one [master's thesis](#) and one [scientific publication](#).

5.3.4. Higher education institution teachers are involved in different scientific or management bodies, both national and international.

The teaching staff of the Faculty are actively involved in national and international scientific and governance bodies. The Faculty is an institutional member of the [Croatian Physical Society](#), with the Dean of the Faculty serving ex officio as a member of the Society's Supervisory Board.

In addition, individual Faculty members hold important positions in professional and scientific bodies, including membership in the [Committee for Physics and Geophysics](#) and participation in review panels for evaluating project proposals within calls of the Croatian Science Foundation. Faculty staff are also members of governing boards of professional associations (see Section 5.1.8) or hold coordination roles and participate in governance structures of international scientific experiments. Assoc. Prof. M. Manganaro serves as [Deputy Coordinator for Outreach and for Diversity, Equity and Inclusion \(DEI\)](#) and is [a member of the Executive Board of the international scientific collaboration MAGIC](#). Assoc. Prof. T. Terzić is [Deputy Physics Coordinator](#) and a member of the Executive Board of the international scientific collaboration Cherenkov Telescope Array Observatory – Large-Sized Telescopes (CTAO-LST). Prof. M. Karuza is the head of the University of Rijeka research unit for the Einstein Telescope. Through such engagement, they actively contribute to the development of the profession at the national level and further confirm the visibility and recognition of the Faculty within the scientific community.

5.3.5. Higher education institution teachers participate in national and international reviews of projects, programmes and scientific papers.

The teaching staff of the Faculty regularly participate in national and international peer-review processes of scientific projects, programmes, and publications. This includes peer review of scientific articles for international journals (e.g. Nature, Physical Review Letters, Astronomy & Astrophysics, Monthly Notices of the Royal Astronomical Society, The European Physical Journal, Universe, Metals, Materials, Molecules, Crystals, Coatings, Water, Applied Surface Science Advances, International Journal of Molecular Sciences, Results in Surfaces and

Interfaces, Chemistry of Materials, Journal of Marine Science and Engineering, and Cellulose), participation in the evaluation of research projects, and peer review of project proposals within national and international calls (e.g. calls of the Croatian Science Foundation). FIZRI staff reviewed over 40 papers in international journals in 2024, as well as 4 projects from the HRZZ and SMASH panels. In 2025, they reviewed more than 50 papers in international journals and 10 projects and programmes within panels such as NPOO, HRZZ, DOK-2025-02, and ARIA-RIANA.

This level of engagement confirms their expertise and international recognition, while also contributing to the overall quality of the scientific system. At the same time, experience gained through peer-review activities is transferred into the teaching and research activities of the Faculty.

5.4. *Doctoral studies of the higher education institutions are aligned with the higher education institution's strategic programme, state-of-the-art scientific/artistic achievements, or professional standards and internationally accepted standards of high-quality doctoral education, where applicable.*

5.4.1. *Planning and proposing doctoral study programmes is in line with the mission and strategic goals of the higher education institution.*

The doctoral programme in Physics at the Faculty of Physics, University of Rijeka, was established in 2017. The Faculty of Physics, University of Rijeka is both the holder and provider of the programme, while partner institutions include the Institute of Physics Zagreb and the Clinical Hospital Centre Rijeka (see: [Decision on the Establishment of the PhD Programme in Physics](#), [Agreement with the Institute of Physics](#), [Agreement with the Clinical Hospital Centre Rijeka](#), and the [University of Rijeka Regulations on Doctoral Studies](#)). The doctoral programme is directly aligned with the mission and strategic goals of the Faculty as defined in the Development Strategy for the period 2021–2025. The Faculty's mission emphasizes advancing the frontiers of science and education through high-quality research, training experts for a wide range of professions, and educating new generations of physics teachers. The doctoral programme represents a key instrument for achieving these goals, as it directly contributes to student involvement in scientific research and to the strengthening of mentoring capacities, as outlined in the strategic objective "Learning and Teaching".

[The PhD programme in Physics](#) is designed in a way that encourages the doctoral candidates' active participation in the Faculty's research projects. The candidates are currently involved in projects funded by the Croatian Science Foundation, University of Rijeka projects, the International Atomic Energy Agency, COST Actions, and the National Recovery and Resilience Plan, thereby directly contributing to the strategic objective of increasing the number of scientific projects and research productivity (strategic objective "Research"). Alignment is further reflected in the strategic goal of internationalization: doctoral candidates achieve significant international mobility, including collaboration with institutions such as the University of Zaragoza, IMDEA Nanociencia, Lund University, University at Buffalo, Jožef Stefan Institute, and the Abdus Salam International Centre for Theoretical Physics, as well as participation in major international collaborations and experiments (e.g. CERN, MAGIC, CTAO, and LSST). This supports the objectives of encouraging both incoming and outgoing mobility and the involvement of international researchers in the Faculty's projects.

5.4.2. Planning and proposing doctoral study programmes contributes to the national development of higher education and science.

The PhD programme in Physics makes a significant contribution to the national development of higher education and science in the Republic of Croatia. The programme educates highly specialized experts in areas of strategic importance for the national scientific system, including the physics and chemistry of advanced materials (such as nanomaterials, 2D materials, and thin films), astrophysics and astroparticle physics (including work on international projects such as the CTAO-LST and MAGIC telescopes, as well as Rubin/LSST sky surveys), medical physics (nuclear medicine, SPECT reconstruction, dosimetry), and particle physics.

From the launch of the doctoral programme in the academic year 2018/2019 until 2024/2025, a total of 39 students have enrolled, of whom 16 enrolled during the evaluation period 2021/2022–2024/2025. By the end of 2025, a total of 8 doctoral theses were defended (see Annex 3, Tables 3.4).

A significant number of doctoral candidates conduct their research in collaboration with national institutions such as the Institute of Physics Zagreb and the Josip Juraj Strossmayer University of Osijek, thereby strengthening the national research network in physics. Doctoral candidates participate in projects funded by national sources (such as the Croatian Science Foundation and the Ministry of Science and Education) as well as international programmes (including the International Atomic Energy Agency, COST Actions, and Interreg Programme). Their research results have been published in leading international journals such as *Physical Review B*, *Journal of Chemical Physics*, *Solar Physics*, *Applied Surface Science Advances*, *Astronomy and Astrophysics*, and *Journal of Physical Chemistry Letters*. The programme also contributes at the national level through the education of future physics teachers at the doctoral level, as well as through the popularization of science and STEM fields, in line with national priorities for human resource development.

5.4.3. Doctoral studies and doctoral theses reflect the scientific and/or artistic research and achievements of the higher education institution.

Doctoral theses and research activities of PhD candidates directly reflect the scientific research and achievements of the Faculty of Physics. The topics of doctoral research cover all key research areas of the Faculty as defined by the institution's vision: the physics and chemistry of advanced materials, astrophysics, medical physics, and environmental physics. In the field of condensed matter physics, doctoral students research the synthesis and characterisation of 2D materials (MoS_2 , WS_2 , graphene), nanocomposites for photovoltaic applications, thin films of metal oxides for photocatalytic applications, and antibacterial composites produced using plasma techniques. In astrophysics and astroparticle physics, research includes the phenomenology and experimental testing of Lorentz symmetry violation, multi-messenger astronomy, characterization of active galactic nuclei, photometric distance estimation of stars using neural networks, and observations of dust rings around gamma-ray bursts. In medical physics, doctoral candidates conduct Monte Carlo simulations of SPECT systems in collaboration with Lund University and develop methods for determining bone tissue quality from MRI data using neural networks. Research in spintronics includes the

modelling of birefringent spin lasers in collaboration with the University at Buffalo.

All these research directions directly stem from projects in which Faculty staff participate as principal investigators or collaborators, including projects such as SpinDataCom, POMERI, projects funded by the Croatian Science Foundation, German Academic Exchange Service programmes, as well as numerous University of Rijeka initiatives. This ensures a direct link between the doctoral programme and the scientific research activities of the institution.

5.4.4. The higher education institution's doctoral studies follow the latest scientific and/or artistic knowledge and skills.

The PhD programme in Physics continuously follows the latest scientific developments, which is reflected both in the course content and in the research activities of doctoral candidates. [The programme](#) offers 16 elective courses covering contemporary areas of physics, ranging from nanomaterials and plasma technologies to black hole physics and experimental methods in astroparticle physics.

Data analysis skills are developed using software packages such as ROOT, Python, and machine learning methods (including neural networks for segmentation, photometric estimation, and classification). Doctoral candidates regularly participate in international conferences and summer schools—such as the European School on Nanosciences and Nanotechnologies (ESONN), the Psi-k Conference, the International Conference on Strongly Correlated Systems and Quantum Materials (ICSCQM) on the island of Hvar, and the Alpe-Adria Medical Physics Meeting in Trieste — ensuring continuous exposure to the latest scientific advances. A system of annual reporting through DrS4 forms enables systematic monitoring of each doctoral candidate's progress and ensures that research activities remain aligned with contemporary scientific standards (e.g. [doctoral theses](#)).

5.4.5. Doctoral study programmes of the higher education institutions are aligned with professional standards and recent achievements in the respective field.

The PhD programme in Physics is aligned with professional standards and contemporary developments in the field of physics. The programme is classified at level 8.2 of the Croatian Qualifications Framework (postgraduate doctoral level), and its learning outcomes encompass six key competencies (described in more detail in Annex 2, Table 2.1, and linked to individual courses): acquisition of new knowledge in physics (IS-1), cognitive skills for developing new methods and integrating STEM fields (IS-2), psychomotor skills related to experimental methods (IS-3), social skills for communication within the scientific community (IS-4), independence in managing research activities (IS-5), and ethical and social responsibility (IS-6).

The Learning Outcomes Mapping Table ([TP-1](#)) documents the systematic coverage of all programme learning outcomes across the curriculum. The compulsory course *Seminar in Physics* covers outcomes IS-1, IS-2, IS-4, and IS-5 with the highest intensity (level 3), while elective courses address specific areas with an appropriate level of intensity (level 1). Alignment with professional standards is further demonstrated through doctoral candidates' achievements, including publications in peer-reviewed journals indexed in Web of Science and Scopus, participation in international collaborations (CTAO-LST, MAGIC, Rubin/LSST, and IAEA projects) as well as the acquisition of practical skills using advanced instruments through

professional training abroad. Most doctoral candidates rate the quality of the study programme as “very good” or “excellent” in annual evaluations (DrS4 form, question 4.1), confirming the programme’s recognized quality from the perspective of its participants.

5.4.6. The higher education institution encourages creativity in the design of doctoral study programmes.

The Faculty of Physics actively fosters creativity and innovation in the development of its doctoral programme. This orientation is reflected through several mechanisms. First, the programme provides a high degree of flexibility in course selection. Out of a total of 16 elective courses, doctoral candidates choose three in accordance with their research focus, enabling them to create an individualized educational pathway tailored to their specific doctoral research area. Second, the mentorship model includes collaboration with international co-mentors from renowned institutions such as the University of Zaragoza, Lund University, University at Buffalo, and the Institute of Physics in Zagreb, ensuring an interdisciplinary and international approach to research topics. Third, doctoral candidates are encouraged to participate in a wide range of research projects, spanning from fundamental research in particle physics and astrophysics, through applied research in medical physics and nanotechnology, to interdisciplinary projects such as plasma applications in biomedicine and photocatalysis for water purification.

Such an approach ensures that the doctoral programme not only follows but actively contributes to the creation of new knowledge and innovative approaches in physics and related STEM fields, in line with the Faculty’s vision as a modern institution equally oriented towards scientific research and education.

5.5. The higher education institution applies the principles of open science in its activities, processes and acts.

5.5.1. The higher education institution adopted an open science policy encouraging the application of principles of open science at an institutional level and ensuring open access to student theses (bachelor and master theses and doctoral dissertations), scientific and professional publications, educational resources and research data from its staff and students.

At the University level, the higher education institution has adopted the [University of Rijeka Open Science Policy](#), which promotes the application of the principles of open, reproducible, and responsible science, with a particular emphasis on open access to the results of scientific and research work, allowing for exceptions in specific cases (e.g. protection of personal data or intellectual property). The policy was first adopted in 2021, and a revised and updated version is available in the University’s official documents. The policy document also explicitly calls for alignment with key national and European standards and initiatives in open science.

At the level of University constituents (including FIZRI), this University policy serves as an institutional framework for encouraging the development of individual open science practices, including the self-archiving of publications and research data. Within the scope of the [University’s Open Science Policy](#), Guidelines for the Implementation of the Open Science

Policy of the University of Rijeka (Croatian version only: [Upute za provedbu politike otvorene znanosti Sveučilišta u Rijeci](#)) have also been established, providing detailed definitions of self-archiving procedures, open access publishing using Creative Commons licences, the mandatory use of persistent identifiers (e.g. ORCID), and support for researchers in publishing in open access.

Both the policy documents and institutional practice emphasize that scientific information and research data generated through public funding should be made openly accessible, except in justified cases, thereby adhering to the FAIR principles (Findable, Accessible, Interoperable, Reusable); see, e. g. <https://hrcak.srce.hr/en/clanak/472276>.

5.5.2. The higher education institution has its own institutional repository allowing its staff and students to store their graded theses, scientific and professional publications, educational content and research data, and it ensures open access to them.

FIZRI provides its staff and students with the possibility to store and openly access the results of scientific, professional, and educational work through the institutional [Repository of the University of Rijeka, Faculty of Physics](#). This repository enables the storage and ensures availability of the following types of materials:

- undergraduate and graduate theses;
- doctoral dissertations;
- scientific and professional publications (journal articles, conference proceedings, book chapters);
- conference presentations;
- books, as well as image, audio, and audiovisual materials;
- research data sets, data management plans, and educational content.

According to available data, a portion of the repository content is available in open access, while another portion is subject to access restrictions in accordance with repository rules and personal data protection requirements (e.g. access limited to higher education institutions).

The repository is integrated into the national [DABAR](#) infrastructure, which ensures interoperability, dissemination of metadata, and increased visibility of repository items through European and global indexing services such as OpenDOAR, OpenAIRE, and Google Scholar.

The repository currently contains 446 items, of which 61.7% are available in open access, clearly demonstrating the implementation of open science principles in practice. The repository includes various types of documents (theses, publications, datasets), and the open science policy, along with support through training and evaluation, further strengthening this practice. Works that are not openly accessible mainly consist of 170 theses. It is important to note that following the adoption of the [Open Science Policy](#) and its accompanying documents, students have increasingly begun to self-archive their theses in open access.

5.5.3. *The higher education institution encourages and evaluates the application of open science principles through different in-house and/or institution validation processes.*

FIZRI makes use of the practices and resources of the University of Rijeka (UNIRI) to actively promote the implementation of open science principles through:

- educational workshops and programmes on open science for teachers, researchers, and students (also organized through the Centre for Open Science and Management of Scientific Information at the University Library Rijeka, <https://hrcak.srce.hr/en/clanak/451410>);
- obligations and recommendations for depositing publications and research data in repositories, as defined in the Guidelines for the Implementation of the Open Science Policy of the University of Rijeka ([Upute za provedbu politike otvorene znanosti Sveučilišta u Rijeci](#));
- support for the use of open licences (e.g. CC BY) and author identifiers such as ORCID (https://www.svkri.uniri.hr/images/upute_otvorena_znanost_mem.pdf).

Within the implementation of the Open Science Policy, the evaluation of open science practices is also promoted through institutional processes. This includes encouraging open access publishing, the storage of data in accordance with the FAIR principles, and raising awareness of the benefits of open science in the evaluation of research outputs, in line with national frameworks ([Ministry of Science and Education Open Science Plan](#)).

5.5.4. *If the higher education institution has an organised publishing activity, the publications (books, journals and other types) are available in open access.*

Although FIZRI does not publish its own scientific journals, the University of Rijeka and its library actively support open access through repositories and collaboration with publishing bodies. Within the framework of institutional publishing policies, the University promotes the accessibility of scientific publications through education and tools such as Google Scholar and ORCID (see <https://hrcak.srce.hr/en/clanak/472276>).

The Faculty of Physics, University of Rijeka implements the principles of open science through its infrastructure (institutional repository), a harmonized open access policy at the University level, educational programmes, and support for the storage of scientific and student works, as well as by encouraging the broader adoption of open science practices among its staff and students. This also includes synergy with the national repository system [DABAR](#) and the activities of the University Library Rijeka in promoting and implementing open science (<https://hrcak.srce.hr/en/clanak/472276>).