agency for science and higher education

REPORT
OF THE EXPERT PANEL
ON THE
RE-ACCREDITATION OF
Department of Physics
Josip Juraj Strossmayer University of Osijek

Date of online re-accreditation:
from 12 till 14 April 2021

May 2021

CONTENTS

INTRODUCTION

The Agency for Science and Higher Education (the Agency) is an independent legal entity with public authority, registered in the court register, and a full member of the European Quality Assurance Register for Higher Education (EQAR) and European Association for Quality Assurance in Higher Education (ENQA).

All public and private higher education institutions are subject to re-accreditation, which is conducted in five-year cycles by the Agency, in accordance with the Act on Quality Assurance in Science and Higher Education (Official Gazette 45/09) and subordinate regulations, and by following *Standards and Guidelines for Quality Assurance in the European Higher Education Area* (ESG) and good international practice in quality assurance of higher education and science.

The Agency's Accreditation Council appointed an independent Expert Panel for the evaluation of Department of Physics Josip Juraj Strossmayer University of Osijek.

Members of the Expert Panel:
1. Prof. Jorge Colomer Feliu, PhD, University of Girona, Spain, Chair
2. Prof. John Paul Doran, PhD, Technological University Dublin, Ireland
3. Prof. dr. sc. Amir Hamzić, Department of Physics, Faculty of Science, University of Zagreb, Republic of Croatia
4. Prof. dr. sc. Mile Dželalija, Department of Physics, Faculty of Science, University of Split, Republic of Croatia,
5. Luka Cavaliere Lokas, student, Department of Physics, Faculty of Science, University of Zagreb, Republic of Croatia.

During the online re-accreditation, the Expert Panel held meetings with the following stakeholders:
- Management,
- Self-evaluation Report Committee,
- Students,
- Heads of departments,
- Full-time teaching staff,
- Assistants and junior researchers,
- Leadres of research projects,
- Representatives of the business sector, potential employers.

The Expert Panel drafted this Report on the re-accreditation of Department of Physics Josip Juraj Strossmayer University of Osijek on the basis of Department of Physics Josip Juraj Strossmayer University of Osijek self-evaluation report, other relevant documents and online meetings.

The Report contains the following elements:

- Short description of the evaluated higher education institution,
- Brief analysis of the institutional advantages and disadvantages,
- List of institutional good practices,
- Analysis of each assessment area, recommendations for improvement and quality grade for each assessment area,
- Detailed analysis of each standard, recommendations for improvement and quality grade for each standard,
- Appendices (quality assessment summary by each assessment area and standard, and protocol),
- Summary.

In the analysis of the documentation, online meetings with representatives of Department of Physics Josip Juraj Strossmayer University of Osijek and writing of the Report, the Expert Panel was supported by:

- Emita Blagdan, coordinator, ASHE
- Katarina Šimić Jagunić, assistant coordinator, ASHE
- Goran Briški, interpreter during the online meetings, ASHE
- Igor Opć, translator of the Report.

On the basis of the re-accreditation procedure conducted, and with the prior opinion of the Accreditation Council, the Agency issues a following accreditation recommendation to the Minister for Higher Education and Science:

1. **issuance of a confirmation on compliance with the requirements** for performing the activities, or parts of the activities
2. **denial of license** for performing the activities, or parts of the activities
3. **issuance of a letter of expectation** with the deadline for resolving deficiencies of up to three years. A letter of expectation can include the suspension of student enrolment within a set period.

The accreditation recommendation also includes a quality grade of a higher education institution, and recommendations for quality improvement.

SHORT DESCRIPTION OF THE EVALUATED HIGHER EDUCATION INSTITUTION

NAME OF HIGHER EDUCATION INSTITUTION:

Department of Physics, Josip Juraj Strossmayer University of Osijek

ADDRESS:

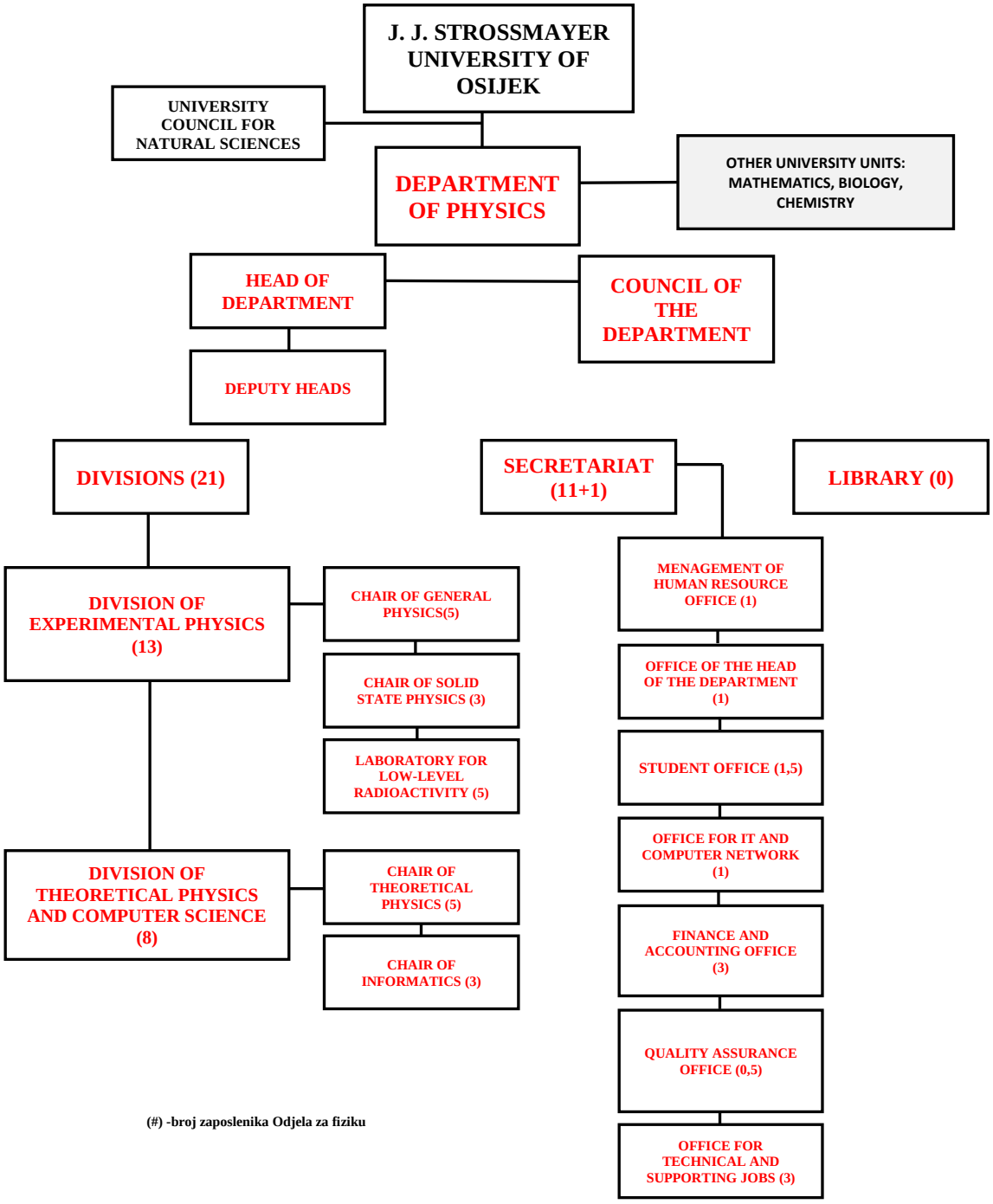
Trg Ljudevita Gaja 6, 31 000 Osijek

HEAD OF DEPRARTMENT:

Vanja Radolić, Associate Professor

ORGANISATIONAL STRUCTURE:

Organizational units of the Department are: Chairs, Library, Laboratory and the Secretariat. The bodies of the Department are the Head and the Council of the Department, and the organizational units are the Institutes (with Departments and Laboratory), the Secretariat and the Library. The Council of the Department determines the organization of the Departmet by its decision in accordance with the Decision of the Senate of the University on the composition of organizational units on scientific-teaching and artistic-teaching components.



The organizational structure of the Department of Physics, Josip Juraj Strossmayer University of Osijek.

STUDY PROGRAMMES:

- Three-year university undergraduate study of physics (180 ECTS; academic title University Bachelor (baccalaureus/baccalaurea physics)
- Two-year university graduate study of physics and Computer Science (120 ECTS; academic title Master of Education in Physics and Computer Science)

NUMBER OF STUDENTS:

Academic year	Total enroled
2019-2020	15
2018-2019	22
2017-2018	19
2016-2017	51
2015-2016	50

NUMBER OF TEACHERS:

Staff*	Full-time staff		Cumulative employment		External associates	
	Number	Average age	Number	Average age	Number	Average age
Full professors with tenure	-	-	-	-	-	-
Full professors	1	50	-	-	1	44
Associate professors	3	52	4	46,25	2	43,5
Assistant professors	9	45,56	5	38,2	1	37
Scientific advisor (permanent/ with tenure)	-	-	-	-	-	-
Scientific advisor	-	-	-	-	-	-
Senior Research Associate	-	-	-	-	-	-
Research Associate	-	-	-	-	-	-
Teaching grades	4	49,75	1	34	1	51
Assistants	2	30,5	1	33	1	32
Postdoctoral researcher	1	31	-	-	1	40
Employees on projects	-	-	-	-	-	-
Expert assistants	-	-	-	-	-	-
Technical staff	1	30	-	-	-	-
Administrative staff	9	44,33	-	-	-	-
Support staff	3	54,33	-	-	-	-

SHORT DESCRIPTION OF THE EVALUATED HIGHER EDUCATION INSTITUTION

The Senate of the Josip Juraj Strossmayer University in Osijek established in 2004 the Department of Physics as a scientific-educational component of the University. The Department opened its doors on April 1st, 2005, and today it takes part in the performance of university undergraduate and graduate studies as well as the development of scientific and technical work in the scientific field of physics. The establishment of the Department of Physics has ensured the continuity of university teaching in natural sciences, in the field of physics, as well as the training of teachers of physics and computer science, for teaching at primary and secondary schools in the Republic of Croatia.

BRIEF ANALYSIS OF THE INSTITUTIONAL ADVANTAGES AND DISADVANTAGES

ADVANTAGES OF THE INSTITUTION

I. The institution shows a significant progress in research that can benefit teaching. The institution provides a good supportive atmosphere to students and teachers, some of them who are very committed and enthusiastic, which bodes well for the future of the department. The panel is aware that the study programme prepares students well for careers in research and also for teaching in primary and secondary institutions, which is very positive.

II. The institution is well-sized in terms of teachers, staff and students. That promotes the implication and the commitment of teachers in the institution. As a result, the commitment of students, during the last years of the bachelor, is high. The programme outputs are clear and students benefit for this information.

III. The instititution has a properly defined environment for students and teachers, with good communication between the teachers and students. The participation of stakeholders in the study programme is high. The variety and the implication of stakeholders is significant. The programme thus benefits from various inputs of society.

DISADVANTAGES OF THE INSTITUTION

I. There is one undergraduate study programme and one graduate programme. There are possibilities for the Department to develop an additional study programme in order to increase the number of students. The institution is not fully aware of the alignment between its capacities and the market and society needs.

II. A need for clarification of the teachers' individual activity (in terms of ECTS) that should include the prospective research activities carried out by the individuals and also their time dedicated to administration issues. No strategy is reported towards knowledge of teachers' needs.

III. The panel sees a need for introduction of a closer link between teaching and research, since the feedbacks between them can foster the commitment, the motivation of students that can reinforce the already good atmosphere of the study program, that has reported by all actors. But the panel agrees that the institution should focus to elaborate strategies to reduce the dropout and to increase financial resources.

LIST OF INSTITUTIONAL GOOD PRACTICES

EXAMPLES OF GOOD PRACTICE

1. The Institution provides popular activities for secondary school students.
2. The Institution accounts for the feedback provided by stakeholder.
3. The study programm has a structural tutoring program that is well considered by the students.
4. Significant quality scientiipapers are reported by the teachers in the Department.
5. Involvement of second cycle students into common research activities, resulting in relevant indexed publications
6. Collaborations with research and higher education institutions in Croatia and abroad, including key stakeholders, regarding the establishment of common quality standards to study programmes in physics.

ANALYSIS OF EACH ASSESSMENT AREA, RECOMMENDATIONS FOR IMPROVEMENT AND QUALITY GRADE FOR EACH ASSESSMENT AREA

I. Internal quality assurance and the social role of the higher education institution

Analysis

The interviews provided during the accreditation process report somehow a dual purpose of the study program, that is, an effort of the institution towards increasing its social role but with the reported difficulties to define clear expectations for students to be enroled in the industry. The internal quality assurance provides enough analysis of the links between the institution and the education domains, although again, the curricula is somehow biased towards basic physics and not much on physics education.

The internal quality assurance is not enough focussing on determining the roles of teachers in the institution, in terms of teachers implied in organisational duties, quality outputs of research and dedication to teaching. Research seems to be concentrated in a few numer of teachers that posits the issue on assuring the teacher quality of the rest of the teachers.

The internal quality assurance should also be focusing on optimising the space for laboratories, space for new teachers, space for students to study and spaces for communcition between teachers and students.

Recommendations for improvement

- The quality assurance committee should assess on the need of continuous analysis of post-gradute students in order to produce a reorientation of curricula, and the effective organisation of optative classes that aligned with the analysis. The assessment should include key analysis of the needs of 1st year students to design better strategies to fulfil their needs.
- The institution should design a more transparent procedure for individuals' promotion within the department.

Quality grade

Minimum Level of Quality

II. Study programmes

Analysis

Both study programmes at the Department of Physics, in general, are defined in a satisfactory level of quality and aligned to the mission and strategic goals of the Department of Physics in Osijek. Learning outcomes written at the level of both study programmes are relevant for the related profiles of qualifications, as well as well aligned with the Dublin descriptors and the Croatian Qualifications Framework. Qualification of Bachelor in Physics consists of all core and relevant learning outcomes, comparable to programmes at many other universities in Bologna Process countries. The Master of Physics and Informatics has all relevant learning outcomes to cover two key parts of that qualification – physics at the second cycle and education of physics and informatics. For presentation of major in informatics at the second cycle, there should be additional learning outcomes and courses in informatics.

The interviews with students revealed that students find the most of courses relevant and well aligned to the undergraduate study programme. But they find some weaknesses at the Graduate Study Programme of Physics and Informatics – mostly related to missing laboratory and research competences, not enough IT courses (such as Python programming, robotics, modelling of real complex systems) and specialised courses in mathematics and applied physics, which could be used for development of carrier in sectors other that teaching in primary and secondary schools.
Thus, there is a space for improvement by further analysis of relationship of given courses and learning outcomes at the level of study programmes, specifically to Graduate Study Programme in Physics and Informatics, of course, according to potentials and further development of the Department of Physics in Osijek.
Regarding ECTS credits, Department of Physics in Osijek has initially allocated quite well the ECTS credits to all courses according to common standards. But, in addition of expertise of teaching staff on ECTS credits, there should be regularly analyses of ECTS allocation in cooperation with students, alumni, and even in collaboration with other higher education institutions.

The student workload in terms of ECTS is well documented in syllabi and detailed teaching plans. It is evident that the Department has established a relevant communications and feedback from students and in some cases from alumni, but an establishment of a systematic continues communication with students and alumni for better allocation of ECTS credits should be better established.

At the Department there is good working academic atmosphere, which motivates students for additional learning and their involvement in the work of the Department.

But still, there is a space for further improvement regarding the involvement of key stakeholders into activities on modernisation of study programmes. That could bring better picture on various external opportunities, nationally and internationally, which should be integrated into strategic elements of the Department of Physics and general objectives of study programmes. Department of Physics has enough internal potentials to create stronger and project strategic international research and teaching collaborations, which is possible to integrate it into the study programmes and student and staff mobilities.

Recommendations for improvement

- Strategic involvement of key external stakeholders, alumni, students and partner HEIs in revision/modernisation of study programmes.
- Create balanced and optimised entry criteria and procedures for new students to graduate study programme.
- The Department of Physics should take an opportunity from participation in the FiZKO project and by using resulting standards and also standards from the previous project for graduate study programme in physics and informatics. These standards should be used in order to analyse intended learning outcomes at the level of study programmes and courses.
- Continuous survey with students and alumni on relevant interests and needs of individuals, labour market and the society and how to reflect those interests and needs into the study programmes.
- Department of Physics should strategically develop its research profile and to integrate partly into study programme (second cycle), if possible, in collaboration with other research and higher education institutions in Croatia and abroad.
- Nevertheless, it seems that the allocations of ECTS credits have been well allocated to all courses, but still it should be dynamic process. It is recommended to systematically analyse the ECTS allocation by using student surveys and analyses of ECTS at other higher education institutions for similar courses.

Quality grade

Satisfactory Level of Quality

III. Teaching process and student support

Analysis

The analysis of the narratives produced by teachers, alumni and students is directed towards the need of the Institution to define an effective mechanism to improve the level of the first-year students' prior learning. Although some preparatory courses are reported, they seem not to be very efficient. In order to reduce the number of drop-out students and to increase a better assessment on students, a tutoring program is established, with good consideration from the students' side.

Recommendations for improvement

- The Department should carry out an extensive, well argumented and profound analysis justifying the change of the entrance criteria to the study program, and evaluate not only the external but also the internal conditions ofr the established decision.
- The tutoring program can effectively be promoted by the introduction of more specialized tutors or by introducing older students or young staff members in the tutoring process. The Institution may favour form a tutoring program that both focusses on acquisition of competences in a centered-domain eduational ecosystem and on the still to determine relationships of learning students' outcomes with industry and all type of organisations, including the secondary and tertiary education system.

Quality grade

Minimum Level of Quality

IV. Teaching and institutional capacities

Analysis

In relation to the teaching capacities of the the Department, the situation is satisfactory. The recent trend in recruitment of teaching staff has been positive, with an increase of teaching staff over the past five years, and the current ratio of students to staff is at a good level. Nevertheless, there are opportunities for the development of additional study programmes and the Department will need to recruit additional staff in order to allow the realisation of this.

All the evidence available to the panel, including documentation provided and the meeting conducted by the panel, suggests that the recruitment and promotional processes carried out by the Department are done in a fair and transparent manner with due regard to the evaluation of excellence.

The support provided to teaching staff for their professional development is at a satisfactory level. Staff reported that they are satisfied with responses to requests for financial support in this area, mainly in the areas of support for travelling to conferences and workshops. The ability of staff to travel for research collaboration for a more extended period of time is limited by the difficulties of getting replacement staff. This issue should be addressed by the Department in order to facilitate greater international research collaboration.

The physical infrastructure of the Department is at a basic level. Greater space resources are needed to address the further development of research and also the development of better undergraduate laboratory facilities. Students who are academically weaker may benefit from greater time spent in the laboratory situation. There is also a shortage of suitable space for students to carry out study and work – the number of library spaces are limited. Student and staff reported satisfaction with the library resources (other than space).

The Department is sensibly managed from the financial perspective, but it would benefit greatly from finding additional sources of funding which could be used to support teaching and research functions.

Recommendations for improvement

- The Department should seek to increase the number of teaching staffing, which would allow the development of additional study programmes.
- The Department should continue to recruit staff who will advance the continued growth of research/scientific activity.

- The Department should put in place procedures that will allow replacement of staff who have an opportunity to travel for an extended period, when the purpose of the travel will advance the strategic goals of the Department.
- The Department would benefit from additional space for undergraduate laboratories. The undergraduate students would benefit from the opportunity to spend additional time in a laboratory setting, especially students who struggle to be motivated for their studies.
- Additional research laboratories and equipment are needed for the full realisation of the research potential of the staff of the school. The Department has identified potential space into which the Department could expand. This should be pursued vigorously.
- The Department should find additional desk spaces at which students can work.
- The Department should ensure that Year 1 students are provided with suitable notes for physics courses in Croatian, which is of particular importance for students whose English is not strong.
- In order to develop the Department should identify external sources of funding that would allow the procurement of new equipment (for teaching and research). In this regard, the Department should further explore all the possibilities for funding at European level.

Quality grade

Minimum Level of Quality

V. Scientific/artistic activity

Analysis

It is evident that the research staff and associates at the Department and associates published 109 papers during the period 2016-2020. Most of articles are published in higher level of journals and in collaboration with other national and foreign research institutions. The staff of the Department are active with presentations at conferences in Croatia and abroad. Also, Department has organised several conferences, about 1 per year. Teaching staff at the Department of Physics in Osijek involve undergraduate and graduate students into research projects, which gives a base for students to be competent further in their education and work.

Comparing to the previous period of reaccreditation, there is a visible progress regarding the quantity and quality of scientific achievement of teaching staff and associates at the Department.

It is evident that the Department of Physics has relevant activities in popularisation of physics and wider science. Teachers are engaged in popularisation activities of physics and science as whole. There also a transfer of knowledge in the field of low-level radioactivity.

It is evident that teaching staff of the Department of Physics by their competent and hard work have established individual collaborations with researchers from other institutions and participated into some projects and collaborative activities.

Still, the Department of Physics has enough internal human capacity to bring their institution more visible and recognised in the international context.

But the Department of Physics still is lacking relevant sustained project funding and strategic partnerships, including modern experimental set-ups.

As stated in the strategic goals for the next period, new strategic sustained collaborations with new strategic EU partners would bring a new dimension for improvement of all scientific and teaching activities and better recognition at all levels.

Recommendations for improvement

- Consider finding and establishing strategic partnerships with research instituions and/or universities in EU, by using one of various opportunities of EU project funding instruments.

- Consider supporting small-scale student-led scientific projects in physics and interdisciplinary, if possible, in collaboration with students from other national and universities from other EU countries.

Quality grade

Minimum Level of Quality

DETAILED ANALYSIS OF EACH STANDARD, RECOMMENDATIONS FOR IMPROVEMENT AND QUALITY GRADE FOR EACH STANDARD

I. Internal quality assurance and the social role of the higher education institution

1.1. The higher education institution has established a functional internal quality assurance system.

Analysis

There is a lack of institutional evaluation processes, as for the teachers' teaching and teachers' research.

There are not detected vulnerable students in the study program.

The internal quality assurance system should produce a key analysis of the needs of 1st year students (in terms of contents needs, learning outcomes, competencies, motivation, pertinence to the institution, etc.)

There are insufficient criteria for developing a strategic research agenda. The stakeholders recognise steps for improvement.

Recommendations for improvement

- The institution reports yearly evaluation of teachers by students, although it is obligatory. A more transparent process is recommended.
- Professional activity by teachers should be better aligned with teaching, specialy for those activities that can initiate students with professionalism.

Quality grade

Minimum Level of Quality

1.2. The higher education institution implements recommendations for quality improvement from previous evaluations.

Analysis

The institution should report solid steps for improvement based on accreditation evaluation.

The plans for improvement are not reported to be structural and are based too much on teachers' individual motivation.

The applied suggestions and opinions, but not significant advance in duble evaluation and enrollemnt problems.

Recommendations for improvement

- The institution should provide structural changes based on evaluation, especially to enrole new students and to establish the strategies to descrease the dropout.

Quality grade

Minimum Level of Quality

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

Analysis

Students, alumni, and teachers report a good atmosphere within all the actors, with no discriminatory or unethical processes.

Recommendations for improvement

- The institution should provide communication channels to teachers in front of students' information on personal integrity and all types of unethical cases reported by students.

Quality grade

High Level of Quality

1.4. The higher education institution ensures the availability of information on important aspects of its activities (teaching, scientific/artistic and social).

Analysis

The institution provides excellent communication between the teaching staff and the students, specially via the mentoring program, wich is recognised at all levels.

The stakeholders report participation in the mentoring activities, with a high level of activity.

There is an internal available online information and communication for each class, for additional communication between teachers and students.

The web site of the department provides information on structure, teachers, students and alumni. The information is available on English.

Recommendations for improvement

- It is likely recommended to a set a curriculum closely adapted to educational primary and secondary institutions, and to report all activities where students participate.

Quality grade
Satisfactory Level of Quality

1.5. The higher education institution understands and encourages the development of its social role.

Analysis
The institution presents a high development of its social roel by providing scientific seminars from different specialists.
The study program aligns with the needs of the educational sectors (both primary and secondary education).

Recommendations for improvement
- The institution should implement activities to promote physics (open days, science demostrations, nigth research, etc.)

Quality grade
High Level of Quality

1.6. Lifelong learning programmes delivered by the higher education institution are aligned with the strategic goals and the mission of the higher education institution, and social needs.

Analysis
Procedures for monitoring student satisfaction at lifelong learning programmes are not defined, although they report future teachers and computers. The awareness of the institution is low.
The study provides enough learning outcomes based on graduate students' capacities for carrying out research.

Recommendations for improvement
- Further development of strategic goals is recommended.

Quality grade
Minimum Level of Quality

II. Study programmes

2.1. The general objectives of all study programmes are in line with the mission and strategic goals of the higher education institution and the needs of the society.

Analysis

The evidence for this standard was gathered from the following sources:

- The Self-evaluation Report (SER) (pages 24-38)
- Website of the Department of Physics, study programmes
- Strategic development of the Department of Physics for 2018-2022 and other strategic documents
- Online meetings and interviews with various representatives of the Department of Physics and stakeholders.

The mission and strategic goals of the Department of Physics are presented in the publicly available documents that are referenced in the SER.

There are two related study programmes of the Department of Physics, one undergraduate (the first cycle) and one graduate study programme (the second cycle) – Undergraduate Study of Physics and Graduate Study of Physics and Informatics. Both study programmes are publicly available on the official websites. The Undergraduate Study of Physics is a programme with a major profile in physics at the first cycle. The Graduate Study of Physics and Informatics, basically consists of two parts – a major profile in physics at the second cycle, and in education of physics and informatics (for teacher professions at primary and secondary schools).

The general objectives of both study programmes (undergraduate and graduate) are in line with the written statement on the mission and strategic goals of the Department of Physics. Both study programmes nominally belong to the STEM fields, which in general gives an attractive picture on societal needs to the related competences, thus to those study programmes. According to the analysis of the practices at the Department of Physics in Osijek, most of undergraduate students continue their education at the graduate study at the same department or to continue their studies at some graduate study programmes at other universities in Croatia or abroad with a high level of success. The graduate students usually go to the labour market (employing as teachers in local primary and secondary schools or at IT companies). Some of graduates

successfully continue their education at the doctoral level at other universities in Croatia or abroad.
From the available documents, discussions and presented practices, it is visible that the Department of Physics in Osijek has established a good communication with students and external stakeholders regarding the strategic goals and modernisation of existing study programmes, but there is still a space for further improvement regarding the involvement of key stakeholders into activities on modernisation of study programmes. That could bring better picture on various external opportunities, nationally and internationally, which should be integrated into strategic elements of the Department of Physics and general objectives of study programmes. Department of Physics has enough internal potentials to create stronger and project strategic international research and teaching collaborations, which should be integrated into the study programmes and student mobilities.

Recommendations for improvement

- Take best from the activities and outcomes within the FiZKO project for the strategic orientations and modernisation of study programmes
- Analyse new strategic local, national and international opportunities in order to establish project-oriented collaborations with various partners in research, teaching and other missions, which could be further used to modernise study programmes and mobilities for students and staff
- Strategic involvement of key external stakeholders, alumni, students and partner universities in revision/modernisation of study programmes.
- Create balanced and optimised entry criteria and procedures for new students to graduate study programme

Quality grade

Satisfactory Level of Quality

2.2. The intended learning outcomes at the level of study programmes delivered by the higher education institution are aligned with the level and profile of qualifications gained.

Analysis

The evidence for this standard was gathered from the following sources:

- The Self-evaluation Report (SER) (pages 24-38)
- Website of the Department of Physics, study programmes
- Strategic development of the Department of Physics for 2018-2022 and other strategic documents

- Online meetings and interviews with various representatives of the Department of Physics and stakeholders.

Learning outcomes written at the level of both study programmes at the Department of Physics in Osijek are relevant for the related profiles of qualifications, as well as well aligned with the Dublin descriptors and the Croatian Qualifications Framework. Qualification of Bachelor in Physics consists of all core and relevant learning outcomes, comparable as it is possible to find at many other universities in Bologna Process countries. The Master of Physics and Informatics has all relevant learning outcomes to cover two key parts of that qualification – physics at the second cycle and education of physics and informatics. For presentation of major in informatics at the second cycle, there should be additional learning outcomes and courses in informatics.

Courses within the study programmes are well balanced and are harmonised with the learning outcomes at the level of study programmes. The interviews with students revealed that students find the most of courses relevant and well aligned to the undergraduate study programme. But they find some weaknesses at Graduate Study Programme of Physics and Informatics – mostly related to laboratory and research competences, not enough IT courses (such as Python programming, robotics, modelling of real complex systems) and specialised courses in mathematics and applied physics, which could be used for development of carrier in sectors other that teaching in primary and secondary schools.

Thus, there is a space for improvement by further analysis of relationship of given courses and learning outcomes at the level of study programmes.
The new project activities of the Department of Physics include collaborations and survey with employers, alumni and students, which should be integrated in resulting qualifications standards within the FiZKO and the previous project. Thus, standards create relevant base for the analysis of relationship of courses and learning outcomes at the level of study programmes.

Recommendations for improvement

- The Department of Physics should take an opportunity from participation in the FiZKO project and by using resulting standards and also standards from the previous project for graduate study programme in physics and informatics. These standards should be used in order to analyse intended learning outcomes at the level of study programmes and courses.

Quality grade

Satisfactory Level of Quality

2.3. The higher education institution provides evidence of the achievement of intended learning outcomes of the study programmes it delivers.

Analysis

The evidence for this standard was gathered from the following sources:

- The Self-evaluation Report (SER) (pages 24-38)
- Website of the Department of Physics, study programmes
- Strategic development of the Department of Physics for 2018-2022 and other strategic documents
- Online meetings and interviews with various representatives of the Department of Physics and stakeholders.

Department of Physics provides evidence on the achievement of stated learning outcomes for courses in both study programmes. At the Department of Physics in Osijek there are various types of assessment of students' achievement of learning outcomes, including colloquium, written exams, oral exams, seminars, projects and laboratory tasks. In addition to assessments related to courses, there are also assessment tools at the level of study programmes, such as graduate exam, and of course final and diploma thesis.

At the online meeting and discussions with students and alumni, they expressed their satisfaction with the assessment procedures and in general with the working atmosphere at the Department. Only, in some cases, some students expressed their needs for additional supports in learning and better results at the examinations.

Presented examples on evidence for various types of assessment are relevant. They present usual and commonly accepted assessment tools in higher education. Questions, tasks, projects are at relevant levels of complexity as well its relevance to the physics profile and the profile in education of physics and informatics, at undergraduate and graduate levels.

Recommendations for improvement

- Nevertheless, assessment of students' achievements of learning outcomes are quite relevant, well presented to students and represent commonly accepted assessment tools within the wider community, still it is recommended to continue with development of assessment tools and procedures in order to be continuously

relevant to related learning outcomes. Keeping even the best assessment tools for a long period unchanged could destroy their representations on achievement of related learning outcomes. We acknowledge final assessment of key learning outcomes at the level of study programmes in addition to final and diploma thesis.

- Continuous survey with students and alumni on assessment tools and how to improve them for better reflection of intended learning outcomes should be in place.

Quality grade

Satisfactory Level of Quality

2.4. The HEI uses feedback from students, employers, professional organisations and alumni in the procedures of planning, proposing and approving new programmes, and revising or closing the existing programmes.

Analysis

The evidence for this standard was gathered from the following sources:

- The Self-evaluation Report (SER) (pages 24-38)
- Strategic development of the Department of Physics for 2018-2022 and other strategic documents
- Online meetings and interviews with various representatives of the Department of Physics and stakeholders.

Recently, Department of Physics in Osijek collaborates with other universities in Croatia within FiZKO project. Within the FiZKO project there are presented activities on feedback from key stakeholders in planning and revising existing study programmes, based on deep analysis of labour market needs and other relevant interests and visions related to qualifications in physics profile.

The Department of Physics in the strategic documents clearly stated that the improvement of study programmes is one of key goals of the Department, development of relevant survays with key stakeholders, even involving pupils from high schools, their interests and interests of the society. But, according to the evidence and discussion during meetings with the Department of Physics as well as other groups and stakeholders, it is evident that there were no relevant contacts and feedbacks, systematically collected from key stakeholders. Very recent activities bring better picture and new perspective to the study programmes at the Department of Physics. Those recent activities should be used in order to establish sustained and strategic collaborations with key stakeholders and partners in order to establish the

system for continueos analysis and modernisation of study programmes at the Department.

Recommendations for improvement

- In addition to recent activities within the FiZKO project, there should be established better and strategic partnership with key stakeholders in order to analyse interests and needs of youth and the society. That should be reflected to the modernisation of study programmes. Physics is a fundamental basic science which has its inherent and a very slow changing structure, but there are many related courses which could be developed and integrated into the study programmes in order to prepare students for wider spectrum of their potential interests, such as applied courses to various real complex systems. This is possible to prepare and develop in collaborative projects with local stakeholders as well as with other research institutes and universities in Croatia and abroad.
- Continuous survey with students and alumni on relevant interests and needs of individuals, labour market and the society and how to reflect those interests and needs into the study programmes
- Department of Physics should strategically develop its research profile and to integrate it partly into the study programme (second cycle), if possible, in collaboration with other research and higher education institutions in Croatia and abroad.

Quality grade

Minimum Level of Quality

2.5. The higher education institution ensures that ECTS allocation is adequate.

Analysis

The evidence for this standard was gathered from the following sources:

- The Self-evaluation Report (SER) (pages 24-38)
- Online meetings and interviews with various representatives of the Department of Physics and stakeholders.

ECTS (European Credit Transfer and Accumulation System) represents one of key characteristics of achieved learning outcomes – their workload, which should be measured by an average student time spent for learning in order to achieve related learning outcomes.

Initially, Department of Physics in Osijek has allocated quite well the ECTS credits to all courses according to common standards. It means that the allocation of ECTS credits to

all courses are still based on expertise at that time of teaching staff. That is the reason way the ECTS credits should be regularly analysed in cooperation with students, alumni, and even in collaboration with other universities.

At the Department of Physics, the student workload in terms of ECTS is well documented in syllabi and detailed teaching plans adopted by competent Councils.

According to available documents and interviews, it is clear that the Department of Physics in Osijek has a relevant communications and feedback from students and in some cases from alumni, but, an establishment of a systematic continues communication with students and alumni for better allocation of ECTS credits should be better established.

Recommendations for improvement

- From a perspective of an expert, it seems that the allocation of ECTS credits in study programmes at the Department of Physics have been well allocated to all courses, but, still it should be a dynamic process. Thus, it is recommended to systematically analyse that by using student surveys and analyses of ECTS allocation at other universities for similar courses. the ECTS allocation should be carefully redefined. It should not be based just on results of any surveys, but rather to careful analyses of results.

Quality grade

Minimum Level of Quality

2.6. Student practice is an integral part of study programmes (where applicable).

Analysis

The evidence for this standard was gathered from the following sources:

- The Self-evaluation Report (SER) (pages 24-38)
- Online meetings and interviews with various representatives of the Department of Physics and stakeholders.

It is well evident that there are organised relevant student practices within the graduate study programme only oriented to education of physics and informatics in primary and secondary schools. In addition to the practices within primary and secondary schools the graduate study programme has also preparatory activities within the following courses – Physics teaching methodologies and Practicum in the methodology of teaching informatics. It is evident that the student practice is an integral part of graduate study programmes according to the national legislation on

requirements on teaching in primary and secondary schools. Student practices are obligatory parts of a comprehensive education related to didactics and teaching methodologies in specific disciplines.

According to discussions with students, alumni and employers, another types of practices would be welcomed by all stakeholders, such as practices within IT sector.

Recommendations for improvement

- Consider, if relevant for some students at graduate level, to create elective courses with student practices in other sector than teaching in primary and secondary schools. From the available data it is evident that within each generation there are a relevant number of students which do not willing to continue their employment in teaching of physics and informatics, but rather to find an appropriate job in other sectors. Within an elective group of courses consider creating also a student practices at various relevant sectors (where applicable, and if there are interests by students).

Quality grade

High Level of Quality

III. Teaching process and student support

3.1. Admission criteria or criteria for the continuation of studies are in line with the requirements of the study programme, clearly defined, published and consistently applied.

Analysis

All the criteria for admission or continuation of studies are publicly available, well defined and are consistently applied. Evaluation of State Matura level, as well as the application and enrolment process for the first year of undergraduate study is carried out through "Postani student" (Become a student) portal, at a national level. Physics and informatics as elective subjects at the State Matura level are not necessary conditions for enrolment, but if passed, they give additional credit(s). In the last 5 years, about 80-100% of the total number of enroled students also passed the Matura Physics exam, and between 30-40% of them passed Matura Informatics exam as well. In the cases of the transfer of students from other related study programmes to the studies at the Department of Physics an evaluation and recognition of the passed exam and corresponding ECTS credits is done, with decision on the difference in courses that the student should enroll at the Department of Physics. SER gives an example of such decision. The criteria for the enrolment to the graduate study of Physics and Informatics can be found on the website of the Department. For students who finished undergraduate study of physics at the Department, ranking on the classification list depends on their success during that study. The classification exam is mandatory for applicants who have completed another appropriate undergraduate university study (no case of the enrolment of the students from other universities to graduate level is mentioned).

Table 3.1 (from MOZVAG database) shows that in the academic year 2020/2021 there are 71 full time students at the undergraduate level and 30 students at the graduate level. However, in addition there is also about 50 students in the status "person in completion" (osoba u dovršenju) who have lost their student rights due to insufficient number of ECTS credits but are left with the option of completing their studies by paying the full amount of tuition fees. The number of students with this status is significant, and this will be also discussed in Standard 3.2.

As for the interest in first level study programme in the last three academic year, the number of applicants for the undergraduate study has been much higher then the enrolling quota (51), but final number of the enrolled students is between 30 and 40% of the quota. (Table 3.2 from MOZVAG database). For the graduate study the quota is 21, while the number of first-time enrolled students has been only between 5 and 8 (Table 3.3 from MOZVAG database).

During the meetings with teachers and students, a question was raised whether the Department has an effective mechanism to improve the level of the first-year students'prior learning, and bring the students to the same level of knowledge. The overall impression was that this preparatory course formally exists, but they are short and more in the form of the recapitulation, which proved not to be very efficient.

One of the elements of this key Standard is that the criteria for admission or continuation of studies ensure the selection of candidates with appropriate prior knowledge, which is aligned with the requirements of the study programme. This issue was already evoked during the reaccreditation process in 2015, when it was concluded that the enrolment criteria (in that time) for the Matura exam in mathematics should be changed from the (lower) level B (judged insufficient for the study of physics) to (higher) level A. After adopting the Action Plan for Quality Improvement, two reports on its implementation for the academic years 2018/19 (in which the change of critea was listed) and 2019/20 were sent to ASHE, and Ministry of Science and Education issued a final Certificate to the Department in February 2019.

The modified criteria (level A) was applied for the enrolment from the academic year 2017/18 on. However, in December 2019, the Department has suggested to the Senat of the University of Osijek (which accepted this suggestion) that starting from academic year 2020/21 the enrolment critera for mathematics is changed back to level B (evidence D3.1.7). The justification for such decision was that the "introduction of level A criteria did not produce expected effects of improving the efficiency and quality of the study, but, on the contrary, it discriminated an excessive number of potential students and consequently the number of enrolled students decreased from year to year".

SER (p. 40) gives just a short comment on this issue, trying to justify such a decision, by correlating the number of enrolled students and the pass-rate to a second year. Unfortunatelly, (a) it states wrongly that already for 2019/20. the criteria was B (because the decision was made in December 2019, i.e. after the end of enrolment!) (b) the return to (lower) level B is further relativized by the statement in SER "It can be concluded that the interest of high school graduates in the study of physics is not so

much dependent on a higher or lower level of mathematics, as on other social circumstances that the decisions of the Department of Physics cannot influence".

The Expert Panel has discussed the question "A or B" in several occasions; formaly, the Department staff support B level, while the students indicate that the level B enables more students to enroll simply to benefit the student rights. The increased number of students also means a higher income of the Department (first year' tuition of 7370,00 kn is paid by the Ministry). The pass-rate will be discussed in Standard 3.2. Here, the main points are: (a) the Department modified the reaccreditation decision only several months after they received the Cerificat from the Ministry in 2019. (b) such a decision should have been supported by more serious arguments and analysis and not just by stating that a low pass-rate of the level A generation 2018/19. shows that level B is better, (c) the interest of the Department should be to have students with (at least nominally) better prior knowledge. Finally, last but not least: as shown in Table 3.1.1. of SER, the number of enrolled students with level B in 2020/21. is not much different from the numbers in previous three academic years (with level A).

Recommendations for improvement

- The Department should carry out an extensive, well argumented and profound analysis justifying the change of the entrance criteria, and evaluate not only the external but also the internal conditions, parameters and consequences of such decision.
- The Department could consider an extend preparatory period (during first week at the beginning of the first year). Also, some surveys should be conducted to determine the necessary level of these preparation.

Quality grade

Unsatisfactory

3.2. The higher education institution gathers and analyses information on student progress and uses it to ensure the continuity and completion of study.

Analysis

SER lists the criteria for the transitions of students to a higher year, which is based on the achieved number of ECTS credits. The list of measures that the Department applies to monitor the success of students and encourages an increase in passing and graduation (SER p. 46-47). Is a rather general one; it includes for instance "changes in the offer of elective course" (in reality adding new ones some of which are either not available or with ECTS credits that are difficult to adjust), or measures that are not

crucially relevant (”refreshing the literature within each individual course, periodic acquisition of library materials”) or even not necessary to to be listed (“holding classes in groups of the prescribed size” – with the present number of students this is already achieved!). One of them is also ”changes of enrolment requirements”, which has been also discussed in Standard 3.1. However, no specific example is given on how any of these measures influenced the passing rate and drop-out. Table 2 (SER, p.44) gives the numbers of students enrolled in each study year of the undergraduate and graduate study programmes between 2015/16 and 2020/21. Students are divided into 2 groups (first enrolment and total number of enrolled students). The passing rate from 1st to 2nd and from 2nd to 3rd year of the undergraduate program is fairly constant (between 25% and 35%), with a striking case of the generation 2018/19., where only 6% of the total number of students in 1st year passed to the 2nd year in 2019/20. and 62% of total student in 2nd year in 2018/19. passed to 3rd year in 2019/20. It should be pointed out that in some cases the real number of students is low and consequently changing initial or final number for just 1 person, drastically changes the percentage. In this sense, such table could be misleading. More important is that there are no comments or analysis neither for the “standard” passing rate (between 25% and 35%) nor for the above mentioned extreme percentages. The passing rate of, on average, 30% is a rather low rate and it would be self-evident that the Department gives some, albeit brief, analysis of it. As for the influence of the changed enrolment requirements, it is not correct to attribute the expreme cases to this change, as those student generations also have ”standard” passing rates.

The other, significant feature in Table 2 (which directly results from the ”standard” passing rate) is that for each study year of the undergraduate program, there is a high percentage of students who enrol the same study year for the second time. Even worse is that, on average, nearly 50% of the total number of enrolled sudents finish the first year without any ECTS credit – evidently, they enrolled just to have student rights! One should nevertheless bear in mind that for them the Ministry has paid for the tuition! Finally, Table 3.5 (from MOZVAG database) gives rather worrying numbers. For the generations 2015. and 2016. only 15% of the students graduated in 4 years; such a low percentage raises at least the question whether there is a need for a self-evaluation of the study programme by the Department. The same Table 3.5 shows that in the period between 2015. and 2019. 109 students have lost the right to study. Such a total drop-out is indeed big. SER also mentions that about 50 students are in the status “person in completion” (osoba u dovršenju), who have lost their student rights due to insufficient number of ECTS credits but are left with the option of completing their studies by paying the full amount of tuition fees. Without proper explanation given, we can only suppose that they belong to this group of 109 students.

For the graduate study program, the number of first-time enrolled students for each of the two years is less then 10; with such small numbers it is not reasonable to calculate the passing rate. On the other hand, the total number of enrolled students in the 2nd year is surprisingly high. Table 3.6 (from MOZVAG database) shows much better percentages of the graduated students and very small number of students who have lost the right to study.

All these data were exposed here in an extensive way in order to show that (and in particular for the undergraduate study) such low pass-rates, number of students that enrol for the 2nd time in a given study year, percentage of students who have no intention to study, low percentage of graduates and a big drop-out would require a serious analysis and changes, which, unfortunately, are not given in SER. The Panel therefore thinks that the Department does not ensure adequate mechanisms for analysing student performances and pass rates, and does not initiate special actions accordingly.

Recommendations for improvement

- The Department should clearly determine mechanisms for explaining the reasons for low pass-rates, number of students that enrol for the 2nd time in a given study year, percentage of students that do not have any intention to study, low percentage of graduates and a big drop-out, and implement the measures to improve them.
- A rather low percentage of the students who graduate in the regular period raises the need for a self-evaluation of the study programme by the Department.
- In particular, the Department should assess student motivation before enrolment and after the first study year and thus gain information on very low interest of new students in the study process.
- The internal student surveys should be properly prepared having questions that would require precise answers and then action taken accordingly. One should avoid situations that is described in one survey as" Information for improvement is collected 2-3 times a year, but nothing has been done about these issues".
- In order to reduce the number of drop-out students and to increase pass rates and completion rates, tutoring could be introduced. Older students or young staff members could be the tutors to the new students and could introduce them to the study process and life at the Department.

Quality grade

Minimum Level of Quality

3.3. The higher education institution ensures student-centred learning.

Analysis

SER points out that both Study Programmes at the Department of Physics are conducted in accordance with the Curriculum for the current academic year, that the implementation plan is adopted each year before the beginning of the academic year and that the course tables are one of the most important parts of this plan. Inspection of these tables reveals that teaching methods in most cases are "lectures and auditorial excercises" or "theoretical lectures, numerical problems and seminars" and in some cases "Power Point presentations, interactive simulations, experiments, solving numerical examples". Only few, more specialized courses offer wide options. Basically, not much is said to prove that the teachers use various teaching methods, encourage interactive and research-based learning, or problem-solving and creative and critical thinking. All course tables state that the students will express their opinion about the teaching methods in a survey at the end of the course. However, SER does not give examples of any critical student feedback nor evidences on continuous evaluation and adaption of teaching methods or different modes of programme delivery.

Recommendations for improvement

- Conduct assesments of teaching methods used; establish an internal system for a peer review process which will include all teaching staff.
- Analyse whether the teaching methods and different modes of delivery can be adapted and improved according to the nature of each course and its intended learning outcomes.
- Analyse the structure of the grades for each course to see whether the modes of programme delivery are in accordance with the intended learning outcomes.
- Increase the number of courses on different e-learning systems (some courses exist in Newton e-learning system; only two courses of General physics 1 and 2 are on the Merlin system for e-learning)

Quality grade

Satisfactory Level of Quality

3.4. The higher education institution ensures adequate student support.

Analysis

For the students of the Department of Physics functional procedures and support for their psychological and legal counselling, support in case of disabilities and support in outgoing and incoming mobility is established at the level of the University through its Offices and Centers. For each of these activities there is also a person in charge on the level of the Department to whom the students can address their initial questions and

concerns. Department has also appointed its coordinator for the collaboration with CISOK (an organization which provides information on the competences and skills that are needed in the labour market for young people).

Students are acquainted to the existence of a quality assurance and improvement system at the Department as well as to the mentoring system. Each teacher is assigned as a mentor to certain number of students (usually 5-6), and has with them at least two meetings during each semester. The topics cover problems that the students encounter during their studies: students' suggestions on improving the study, (organization of lectures, colloquia and exams, course content, literature), grades and dynamics of exams, selection of elective courses plans after graduation. Students can also turn to mentors for help outside of mentoring meetings. According to SER, the reports from mentoring meetings are analysed as they represent an additional valuable feedback on the quality of teaching at the Department.

The Panel did not encounter from students any critics or objection on the work of the administrative or technical staff.

Recommendations for improvement

- The Department should find additional options which would enable more active and specific contribution of the students to the quality assurance system.

Quality grade

Satisfactory Level of Quality

3.5. The higher education institution ensures support to students from vulnerable and under-represented groups.

Analysis

The Department pays attention to the vulnerable and under-represented groups as mentioned in SER, and the main contact is the Deputy Head of Teaching and Students, to whom students turn if they have non-standard problems (such as health and financial problems with tuitions or issues related to social status). The Office for Students with Disabilities (at the University level) provides information and support to students with disabilities and seeks to address the particular needs of individual students. They also provide appropriate technical help and equipment which facilitates participation in classes. The constituents of the University can equally independently hire students' assistants. The registred students with disabilities can obtain modified conditions for attending classes and taking exams. SER gives example for only one student with disability (at the Department) to whom the adjustment of studies was

granted. The Department also provides support to students of a lower socio-economic status who are not able to pay tuition fees, but the copies of the appropriate decisions (mentioned in SER) were not enclosed.

Recommendations for improvement

- Due to the epidemiological situation in the period of the evaluation, the Panel members could not visit the Department of Physics in Osijek. Instead, the Department submitted a virtual tour (https://youtu.be/CxoCH3CFNmM) of their premises, which are located on the first floor of a former military baracks. Judging from the video, there is no available access to students with disabilities. Although the need for such an access has not so far arisen, and the Expert panel members are aware of the technical difficulties for its construction, this should be nevertheless emphasized.

Quality grade

Satisfactory Level of Quality

3.6. The higher education institution allows students to gain international experience.

Analysis

The Department of Physics encourages students to get involved in mobility programmes (ERASMUS, CEEPUS). The informations on the possibilities of attending part of the study abroad for students is available through the website of the University, and Office for International Cooperation and Projects (at the University) provides support to students in applying to the calls and helps students before, during and after the mobility program. The appointed ERASMUS coordinator and administrative coordinator at the Department level are available to students for all technical and professional issues. However, the list of the foreign partner universities and Erasmus+ contacts (at the unios.hr website) includes a rather limited offer for physics, informatics or teacher training.

Students also receive information about mobility programmes from their mentors. Nevertheless, the number of outgoing students is small, and they have applied only to the CEEPUS program. In the last five years, six students have achieved outgoing mobility (Table 3.6 from the MOZVAG database), and in one case (according to evidence given in SER) the results obtained during such a visit were presented in a graduate thesis. The Panel could not determine the main reason why outgoing mobility is not bigger; one cause could be the unsufficient knowledge of foreign language (the realized CEEPUS exchange was with one university in the neighboring state). On the other hand,

alumni examples confirm that at the Department of Physics students gain competences required for the studies or employement in an international envirement.

Recommendations for improvement

- Although all the necessary support exists, students should be encouraged to take mobility opportunities and they should recognize the benefits of mobility. In the same time the outgoing mobility would expand the visibility of the Department (much more than any presentation on the website). We are aware that this task (in which the teachers should play an important role) it is not an easy one to accomplish.

Quality grade

Satisfactory Level of Quality

3.7. The higher education institution ensures adequate study conditions for foreign students.

Analysis

Although the enrolment quotas of the Department include each year one enrolment place at the undergraduate and one at the graduate studies for foreign citizens, there has been no enrolled foreign citizen in the last five years. Incoming student mobility, within the ERASMUS, CEEPUS and IAESTE programmes, is coordinated on the University level. The University also organizes the course of Croatian language. University web lists three courses offered in English at the Department of Physics. There were no incoming students within the ERASMUS program in the last five years. The incoming mobility (Table 3.6 from the MOZVAG database) refers to the foreign students who were engaged in the professional internships through the IAESTE programme and participated in the work of scientific groups. SER does not give additional details concerning these visits.

Recommendations for improvement

- As discussed in 3.6., the Department should try to increase its international visibility in order to attract more incoming students. In this sense, a lot could be achieved by stimulating the outgoing mobility of its students and teachers (who would then be ambassadors of the Department) as well as by developing collaborations with similar foreign faculties and departments.

Quality grade

Satisfactory Level of Quality

3.8. The higher education institution ensures an objective and consistent evaluation and assessment of student achievements.

Analysis

Criteria and methods of evaluation and assessment are clear and published as a part of the Curriculum (in Croatian: Izvedbeni plan nastave), which is available on the website of the Department of Physics. For each course, listed are the prerequisites for enrolment, expected learning outcomes, teaching activities, methods of evaluating activities and number of ECTS.

All the teachers have to pass pedagogical, didactical and methodological courses in order to be allowed to teach.

Assessment and implementation of the exam is carried out in accordance with the Regulations on Studies and Studying at the University of Josip Juraj Strossmayer in Osijek. Students have the right to inspect and analyse as well to expresss comments and complains of the assessment of the corrected written exams. For the oral exam, the teacher is obliged to provide the presence of public, or the student has right not to take the exam. If the students are not satisfied with the grade of the oral exam, they can request an examination in front of a commission, to be held 48 hours after the first exam. The teacher may attend the re-examination, without the right to ask questions and assess the student. SER states that there have not been any officially complain about the grading process from students, from which the Department concludes that students' oral complaints have been successfully resolved. A student feedback on objectivity and consistency in the assessment process is collected through the Unified University Student Survey, which is conducted once a year and individual surveys conducted by teachers at the end of the semester. The first one is anonymous but also with only few rather general questions, the second one is not anonymous and thus not too objective. Both surveys give very high notes to teachers.

Recommendations for improvement

- The anonymous survey for each course at the end of the semester (different courses could be evaluated in different ways) should be correlated with the passing-rate for each course.
- The Department should carry out the evaluation of the grading for each course at the end of each academic year. The introduction of the student surveys on the satisfaction of studying after graduation is strongly supported.

Quality grade

Satisfactory Level of Quality

3.9. The higher education institution issues diplomas and Diploma Supplements in accordance with the relevant regulations.

Analysis

Upon the completion of their studies, students are issued appropried Diploma and Diploma Supplement which describe qualifications, achieved learning outcomes and the level, content and status of the studies. Their content and form are determined by the official regulations on the national level as well as by the Ordinance on Studies and Studying at the University of Josip Juraj Strossmayer in Osijek and the Ordinance on the Form of Diplomas and Supplementary Documents on the Study, Content and Form of Certificates and Certificates of the University of Josip Juraj Strossmayer in Osijek. The Diploma (in Croatian) is issued by the University of Osijek, and The Diploma Supplement (in Croatian and English) is issued free of charge by the Department of Physics. SER provides examples of these documents.

Recommendations for improvement

- None (high level grade)

Quality grade

High Level of Quality

3.10. The higher education institution is committed to the employability of graduates.

Analysis

The Department of Physics continuously and systematically analyses the employability of graduates through data from the Croatian Employment Service (data presented in SER and Table 3.7 from the MOZVAG database). The Department also maintains strong and frequent contacts with schools (in which graduates are primarily employed), as well as with other possible employeers (p.ex. private company ORQA). Students are informed about employment opportunities through a mentoring system. The Panel was also informed that the personal engagement of one professor enabled several alumnis to enroll abroad for a PhD thesis and to pursue the scientific careers.

Recommendations for improvement

- None (high level grade)

Quality grade

High Level of Quality

IV. Teaching and institutional capacities

4.1. The higher education institution ensures adequate teaching capacities.

Analysis

The self-evaluation sets out the number and qualifications of staff involved in teaching, including 13 full-time teachers (1 full professor, 3 associate professors, 9 associate professors) and various other staff involved with teaching (1 postdoctoral researcher, 2 assistants, 4 lecturers and 1 senior laboratory assistant).
96.7% of the undergraduate programme is delivered by teaching staff of the university, and 86.4% of the postgraduate programme.

The number of teachers and associates at the Department of Physics has increased from 11 to 15 over the past 12 years.

The self-evaluation document makes it clear that the teaching capacity of the available staff is adequate for the teaching requirements on these programmes and that the teaching load on staff is at an appropriate level to allow staff to be also involved with scientific research. The staff are suitably qualified for their teaching activity. The student: staff ratio is currently 8:1, which is at a good level. However, the implementation of new programmes of study would require additional teaching staff.

Recommendations for improvement

- The Department should seek to increase the number of teaching staffing, which would allow the development of additional study programmes.

Quality grade

Satisfactory Level of Quality

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

Analysis

The Department implements the procedures of the university in its recruitment, advancement and re-appointment processes. The self-evaluation document identifies in detail the relevant procedures and legal regulations that are followed.

Recruitment of teachers follows a detailed process of evaluation of the relevant experience of applicants. Recruitment over the past five years was clearly oriented

towards increasing the research capacity of the Department and this is in line with the strategic plans for the Department.

Promotion of staff is based on the full range of their activities, including scientific activity.

Detailed actual examples of recruitment, election and re-election are provided.

Staff reported satisfaction with the objectivity and transparency of these processes within the Department.

Recommendations for improvement

- The Department should continue to recruit staff who will advance the continued growth of research/scientific activity.

Quality grade

High Level of Quality

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

Analysis

The self-evaluation states that the professional development of staff is a key goal of the Department. This includes teaching, professional, and non-professional staff. The financial resources to support staff development are allocated from the funds for scientific research and most of this relates to participation in conferences, workshops and to collaborating institutions.

The staff of the school are well qualified in the area of pedagogy and education.

Staff of the Department confirmed to the panel that a good level of support is available within the Department for professional development. This included financial support for travelling to conferences and summer schools each year, and support for the purchasing of literatures (e.g. books) required for their research activities.

Detailed documentation on staff development and how it is aligned with the strategic goals of the Department is provided in Appendix D4.3.1 (in Croatian only), and also on the sabbatical process, with concrete examples.

Staff identified that it is difficult to get replacement for staff if they wish to travel for an extended period.

Recommendations for improvement

- The Department should put in place procedures that will allow replacement of staff who have an opportunity to travel for an extended period, when the purpose of the travel will advance the strategic goals of the Department.

Quality grade

Satisfactory Level of Quality

4.4. The space, equipment and the entire infrastructure (laboratories, IT services, work facilities etc.) are appropriate for the delivery of study programmes, ensuring the achievement of the intended learning outcomes and the implementation of scientific/artistic activity.

Analysis

The self-evaluation report describes the physical infrastructure of the Department, including lecture rooms, laboratories, computer rooms, staff offices, library, and other facilities within the school. As the re-accreditation event took place on-line it was not possible to view the facilities but a video containing a walk-through of the Department was made available to panel and this video confirmed the facilities as described in the self-evaluation document.

The classroom and laboratory facilities are adequate for the delivery of the study programmes offered by the Department.

The Department includes a Laboratory for Low Radioactivity and this is the primary research laboratory within the Department. Students get an opportunity to use the facilities of the research laboratory.

Recommendations for improvement

- The Department would benefit from additional space for undergraduate laboratories. The undergraduate students would benefit from the opportunity to spend additional time in a laboratory setting, especially students who struggle to be motivated for their studies.
- Additional research laboratories and equipment are needed for the full realisation of the research potential of the staff of the school. The Department has identified

potential space into which the Department could expand. This should be pursued vigorously.

Quality grade
Minimum Level of Quality

4.5. The library and library equipment, including the access to additional resources, ensure the availability of literature and other resources necessary for a high-quality study, research and teaching.

Analysis
The Library and reading room are located within the Department. These facilities were viewed on the video made available by the Department. The self-evaluation document details the size of the library and precise facilities available for students, and for research and teaching staff.

The library contains 2315 items and databases are also available.

Students reported to the panel that they were satisfied with the opening hours of the library but that it is sometimes difficult for them to find a desk at which to work, and so additional student desks are needed. Students also identified a need for appropriate textbooks for physics at Year 1 level in the Croatian language.

Staff (teaching and research) reported to the panel that they are satisfied with the library resources available to them.

Recommendations for improvement
- The Department should find additional desk spaces at which students can work.
- The Department should ensure that Year 1 students are provided with suitable notes for physics courses in Croatian, which is of particular importance for students whose English is not strong.

Quality grade
Minimum Level of Quality

4.6. The higher education institution rationally manages its financial resources.

Analysis

The income of the Department is largely from the Ministry of Science and Education, which is distributed by the universities and governed by national legislation. The detailed financial statements of the Department were available to the panel (Table 4.11) and show that the Department currently balances its finances.

The Department has a defined process for the use of its funding, which is agreed by the management of the Department in agreement with the Heads of Division.

The Department believes that the level of scientific activity should be a determining factor in the distribution of funding by the university, in addition to the number of staff employed in the Department.

Recommendations for improvement

- In order to develop the Department should identify external sources of funding that would allow the procurement of new equipment (for teaching and research). In this regard, the Department should further explore all the possibilities for funding at European level.

Quality grade

Minimum Level of Quality

V. Scientific/artistic activity

5.1. Teachers and associates employed at the higher education institution are committed to the achievement of high quality and quantity of scientific research.

Analysis

The evidence for this standard was gathered from the following sources:

- The Self-evaluation Report (SER) (pages 75-83) and supplementary materials
- Strategic development of the Department of Physics for 2018-2022 and other strategic documents and reports
- Online meetings and interviews with various representatives of the Department of Physics.

According to national regulations on promotion/advancement in research sector, all research and teaching staff at research institutes and universities in Croatia follow necessary conditions in order to have scientific titles and promotion through the system. It is the same for the staff at the Department of Physics in Osijek. The conditions are related to a minimally required quantity and quality of published scientific articles in relevant peer-reviewed journals.

According to the reports and evidence, research staff at the Department and associates published 109 papers during the period 2016-2020, which is about 1 published article per researcher per year. Most of articles are published in higher level of journals and in collaboration with other national and foreign research institutions. In addition to publication in indexed journals, teaching staff of the Department are active with presentations at conferences in Croatia and abroad. Also, Department has organised several conferences, about 1 per year.

Comparing to the previous period of reaccreditation, there is a visible progress regarding the quantity and quality of scientific achievement of teaching staff and associates at the Department. Possible difficulties in further sustained improvements could be related to the limitations of the current experimental set-ups at the Departments.

Recommendations for improvement

- Consider finding and establishing strategic partnerships with research institutions and universities in EU, by using one of various opportunities of EU project funding instruments.

Quality grade
Satisfactory Level of Quality

5.2. The higher education institution provides evidence for the social relevance of its scientific / artistic / professional research and transfer of knowledge.

Analysis
The evidence for this standard was gathered from the following sources:

- The Self-evaluation Report (SER) (pages 75-83)
- Strategic development of the Department of Physics for 2018-2022 and other strategic documents and reports
- Online meetings and interviews with various representatives of the Department of Physics and stakeholders.

It is evident that the Department of Physics has relevant activities in popularisation of physics and wider science. Teachers are engaged in popularisation activities of physics and science as whole. There also a transfer of knowledge in the field of low-level radioactivity. But still, the internal human potentials of the Department of Physics and external opportunities could be better used in order to create additional relevance of all activities for the society.

Recommendations for improvement

- As published in the strategic goals of the Department, consider establishing better conections with the economy and public and private institutions in various sectors.

Quality grade
Minimum Level of Quality

5.3. Scientific/artistic and professional achievements of the higher education institution are recognized in the regional, national and international context.

Analysis
The evidence for this standard was gathered from the following sources:

- The Self-evaluation Report (SER) (pages 75-83)
- Strategic development of the Department of Physics for 2018-2022 and other strategic documents and reports
- Online meetings and interviews with various representatives of the Department of Physics and stakeholders.

It is evident that teaching staff of the Department of Physics by their competent and hard work have established individual collaborations with researchers from other institutions and participated into some projects and collaborative activities. Scientists from the Department have presented their results at international conferences, participated in organisation of relevant international events. In addition, the Department of Physics in Osijek is known in measurement of low-level radiation in Croatia, which makes the Department competitive for small-scale applied projects.
Still, the Department of Physics has enough internal human capacity to bring their institution more visible and recognised in the international context. As stated in the strategic goals for the next period, new strategic sustained collaborations with new strategic EU partners would bring a new dimension for improvement of all scientific and teaching activities and better recognition at all levels.

Recommendations for improvement

- Consider finding and to establishing strategic partnerships with universities in EU, by using one of various opportunities of EU project funding instruments.

Quality grade

Minimum Level of Quality

5.4. The scientific / artistic activity of the higher education institution is both sustainable and developmental.

Analysis

The evidence for this standard was gathered from the following sources:

- The Self-evaluation Report (SER) (pages 75-83)
- Strategic development of the Department of Physics for 2018-2022 and other strategic documents and reports
- Online meetings and interviews with various representatives of the Department of Physics and stakeholders.

It is evident that the Department of Physics in Osijek has defined a very optimistic strategic goals regarding the scientific research. In addition, last 5 years the Department of Physics significantly increased the number of scientific papers published in relevant peer-reviewed journals. The Department has also participated in research activities with international collaborations. But the Department of Physics still is lacking relevant sustained project funding and strategic partnerships, including modern experimental set-ups.

Recommendations for improvement

- Consider finding and establishing strategic partnerships with research instituions and/or universities in EU, by using one of various opportunities of EU project funding instruments

Quality grade

Minimum Level of Quality

5.5. Scientific/artistic and professional activities and achievements of the higher education institution improve the teaching process.

Analysis

The evidence for this standard was gathered from the following sources:

- The Self-evaluation Report (SER) (pages 75-83)
- Strategic development of the Department of Physics for 2018-2022 and other strategic documents and reports
- Online meetings and interviews with various representatives of the Department of Physics and stakeholders.

Teaching staff at the Department of Physics in Osijek involve undergraduate and graduate students into research projects, which gives a base for students to be competent further in their education and work. It is evident that the involvement of students into research activities together with teaching staff has resulted in 8 scientific articles published in peer-reviewed journals indexed in Web of Science. Creating additional opportunities by new strategic project collaborations with other national and especially with relevant universities in other EU countries would bring a very new and attractive picture of the Department of Physics.

Recommendations for improvement

- Consider supporting small-scale student-led scientific projects in physics and interdisciplinary, if possible, in collaboration with students from other national and universities from other Eu countries.

Quality grade

Satisfactory Level of Quality

APPENDICES

1. Quality assessment summary - tables

2. Site visit protocol

Quality grade by assessment area				
Assessment area	Unsatisfactory level of quality	Minimum level of quality	Satisfactory level of quality	High level of quality
I. Internal quality assurance and the social role of the higher education institution		X		
II. Study programmes			X	
III. Teaching process and student support		X		
IV. Teaching and institutional capacities		X		
V. Scientific/artistic activity		X		

Quality grade by standard				
I. Internal quality assurance and the social role of the higher education institution	*Unsatisfactory level of quality*	*Minimum level of quality*	*Satisfactory level of quality*	*High level of quality*
1.1. The higher education institution has established a functional internal quality assurance system.		X		
1.2. The higher education institution implements recommendations for quality improvement from previous evaluations.		X		
1.3. The higher education institution supports academic integrity and freedom, prevents all types of unethical behaviour, intolerance and discrimination.				X
1.4. The higher education institution ensures the availability of information on important aspects of its activities (teaching, scientific/artistic and social).			X	
1.5. The higher education institution understands and encourages the development of its social role.				X
1.6. Lifelong learning programmes delivered by the higher education institution are aligned with the strategic goals and the mission of the higher education institution, and social needs.		X		

Quality grade by standard				
II. Study programmes	*Unsatisfactory level of quality*	*Minimum level of quality*	*Satisfactory level of quality*	*High level of quality*
2.1. The general objectives of all study programmes are in line with the mission and strategic goals of the higher education institution and the needs of the society.			X	
2.2. The intended learning outcomes at the level of study programmes delivered by the higher education institution are aligned with the level and profile of qualifications gained.			X	
2.3. The higher education institution provides evidence of the achievement of intended learning outcomes of the study programmes it delivers.			X	
2.4. The HEI uses feedback from students, employers, professional organisations and alumni in the procedures of planning, proposing and approving new programmes, and revising or closing the existing programmes.		X		
2.5. The higher education institution ensures that ECTS allocation is adequate.		X		
2.6. Student practice is an integral part of study programmes (where applicable).				X

Quality grade by standard				
III. Teaching process and student support	*Unsatisfactory level of quality*	*Minimum level of quality*	*Satisfactory level of quality*	*High level of quality*
3.1. Admission criteria or criteria for the continuation of studies are in line with the requirements of the study programme, clearly defined, published and consistently applied.	X			
3.2. The higher education institution gathers and analyses information on student progress and uses it to ensure the continuity and completion of study.		X		
3.3. The higher education institution ensures student-centred learning.			X	
3.4. The higher education institution ensures adequate student support.			X	
3.5. The higher education institution ensures support to students from vulnerable and under-represented groups.			X	
3.6. The higher education institution allows students to gain international experience.			X	
3.7. The higher education institution ensures adequate study conditions for foreign students.			X	
3.8. The higher education institution ensures an objective and consistent evaluation and assessment of student achievements.			X	
3.9. The higher education institution issues diplomas and Diploma Supplements in accordance with the relevant regulations.				X
3.10. The higher education institution is committed to the employability of graduates.				X

Quality grade by standard				
IV. Teaching and institutional capacities	*Unsatisfactory level of quality*	*Minimum level of quality*	*Satisfactory level of quality*	*High level of quality*
4.1. The higher education institution ensures adequate teaching capacities.			X	
4.2. Teacher recruitment, advancement and re-appointment is based on objective and transparent procedures which include the evaluation of exellence.				X
4.3. The higher education institution provides support to teachers in their professional development.			X	
4.4. The space, equipment and the entire infrastructure (laboratories, IT services, work facilities etc.) are appropriate for the delivery of study programmes, ensuring the achievement of the intended learning outcomes and the implementation of scientific/artistic activity.		X		
4.5. The library and library equipment, including the access to additional resources, ensure the availability of literature and other resources necessary for a high-quality study, research and teaching.		X		
4.6. The higher education institution rationally manages its financial resources.		X		

Quality grade by standard				
V. Scientific/artistic activity	*Unsatisfactory level of quality*	*Minimum level of quality*	*Satisfactory level of quality*	*High level of quality*
5.1. Teachers and associates employed at the higher education institution are committed to the achievement of high quality and quantity of scientific research.			X	
5.2. The higher education institution provides evidence for the social relevance of its scientific / artistic / professional research and transfer of knowledge.		X		
5.3. Scientific/artistic and professional achievements of the higher education institution are recognized in the regional, national and international context.		X		
5.4. The scientific / artistic activity of the higher education institution is both sustainable and developmental.		X		
5.5. Scientific/artistic and professional activities and achievements of the higher education institution improve the teaching process.			X	

agency for science and higher education

Reakreditacija *Odjela za fiziku* *Sveučilišta Josipa Jurja Strossmayer u Osijeku* Adresa: Trg Ljudevita Gaja 6, 31 000 Osijek	Re-accreditation of the *Department of Physics* *Josip Juraj Strossmayer University of Osijek* Address: Trg Ljudevita Gaja 6, 31 000 Osijek

Link ZOOM https://zoom.us/j/94507193497 jedan link na sve sastanke / one link for all meetings!

	Petak, 9. travnja 2021.	Friday, 9th April 2021
10:00 – 11:00 (CEST)	Testno spajanje na poveznicu (link) ZOOM – Stručno povjerenstvo, Odjel za fiziku UNIOS, prevoditelj i kordinatorice iz AZVO-a	Testing the link for joining the ZOOM meeting – Expert panel, Department of Physics, translator and ASHE coordinators

Prvi dan reakreditacije u virtualnom okruženju / First day of re-accreditation in virtual form

	Ponedjeljak, 12. travnja 2021.	Monday, 12 April 2021	Ime i prezime sudionika/funkcija Name and surname of the participants/position
8:45 – 9:00 (CEST)	Spajanje dijela članova Stručnog povjerenstva na poveznicu (link) ZOOM	Joining the part of the Expert Panel members to the ZOOM meeting via link	
9:00 – 10:00	Sastanak s Upravom Sveučilišta (rektor, prorektori za znanost, nastavu, studente, međuinstitucijsku suradnju itd.) i Upravom Odjela (pročelnik, zamjenici pročelnika)	Meeting with the University Management and Department Management	Uprava Sveučilišta: 1. prof.dr.sc. Vlado Guberac, rektor Sveučilišta Uprava Odjela za fiziku: 2. doc.dr.sc. Zvonko Glumac, zamjenik Pročelnika za nastavu i studente 3. izv.prof.dr.sc. Igor Lukačević, zamjenik Pročelnika za znanstveno-istraživačku djelatnost 4. izv.prof.dr.sc. Vanja Radolić, Pročelnik Odjela za fiziku
10:00 – 10:15	*Pauza*	*Break*	
10:15 – 11:15	Sastanak s predstavnicima Radne skupine za izradu Samoanalize i Odjeljka za unapređenje i osiguravanje kvalitete visokog obrazovanja	Meeting with the representatives of the Working team for Self-evaluation Report and Office for Quality Assurance and Improvement of Higher Education	1. doc. dr. sc. Zvonko Glumac, koordinator radne grupe 2 - „Studijski programi“, i radne grupe 3 - „Nastavni proces i podrška studentima“ 2. Bruno Lončar, mag. iur., stručni suradnik

			za pravne poslove i upravljanje ljudskim resursima 3. izv. prof. dr. sc. Igor Lukačević, koordinator radne skupine 4. doc. dr. sc. Mislav Mustapić, koordinator radne grupe 1 - „Interno osiguravanje kvalitete i društvena uloga visokog učilišta“ 5. doc. dr. sc. Marina Poje Sovilj, član radnih grupa 1 i 5 6. izv. prof. dr. sc. Vanja Radolić, koordinator radne grupe 4 - „Nastavnički i institucijski kapaciteti“ 7. doc. dr. sc. Maja Varga Pajtler, član radnih grupa 2 i 3
11:15 – 11:30	*Pauza*	*Break*	
11:30 – 12:30	Sastanak s predstojnicima zavoda	Meeting with the Heads of the departments	Predstojnici Zavoda: 1. doc. dr. sc. Maja Varga Pajtler, Predstojnik Zavoda za teorijsku fiziku i računarstvo 2. izv. prof. dr. sc. Branko Vuković, Predstojnik Zavoda za eksperimentalnu fiziku Predsjednici Katedri (dostupni na zahtjev): 1. prof. dr. sc. Darko Dukić, Predsjednik katedre za informatiku 2. doc. dr. sc. Zvonko Glumac, Predsjednik

			katedre za teorijsku fiziku 3. doc. dr. sc. Dario Hrupec, Predsjednik katedre za osnove fizike 4. doc. dr. sc. Mislav Mustapić, Predsjednik katedre za fiziku čvrstog stanja 5. doc. dr. sc. Marina Poje Sovilj, Voditelj laboratorija za niske radioaktivnosti 6. doc. dr. sc. Maja Varga Pajtler, Predstojnik Zavoda za teorijsku fiziku i računarstvo
12:30 – 13:15	*Analiza dokumenata*	*Document analysis*	
13:15 – 14:30	Obilazak Odjela (predavaonice, nastavni laboratorij/praktikumi, informatičke učionice, knjižnica i dr.) i prisustvovanje nastavi ukoliko je moguće	Tour of the Department (classrooms, Laboratory's, computer classrooms, library etc.) and participation in teaching classes	Osobe zadužene za obilazak: 1. doc.dr.sc. Marina Poje Sovilj 2. doc.dr.sc. Maja Varga Pajtler
14:30 – 16:00	*Radni ručak u organizaciji AZVO-a (samo članovi Stručnog povjerenstva)*	*Working Lunch organized by ASHE (only Expert panel members)*	

Drugi dan reakreditacije u virtualnom okruženju / Second day of re-accreditation in virtual form

	Utorak, 13. travnja 2021.	Tuesday, 13 April 2021	Prezime i ime sudionika / Surname and name of the participants
9:45 – 10:00 (CEST)	Spajanje na poveznicu (link) ZOOM	Joining ZOOM meeting via the link	
10:00 – 11:00	Sastanak s nastavnicima u stalnom radnom odnosu (osim onih na rukovodećim mjestima)	Meeting with full-time employed teachers (except those in managerial positions)	1. doc.dr.sc. Domagoj Belić 2. prof.dr.sc. Darko Dukić 3. doc.dr.sc. Dario Hrupec 4. doc.dr.sc. Mislav Mustapić 5. doc.dr.sc. Marina Poje Sovilj 6. doc.dr.sc. Denis Stanić 7. doc.dr.sc. Goran Šmit 8. doc.dr.sc. Ivan Vazler
11:00 – 11:15	*Pauza*	*Break*	
11:15 – 11:45	Sastanak s: • voditeljem Odjeljka za studente • djelatnicima u poslovima vezanim uz znanost, projekte, međunarodnu suradnju i cjeloživotno učenje	Meeting with: • Head of the Office for Students • Employees in jobs related to Science, Projects, International Cooperation and Lifelong Learning	1. Dario Ferić, Ured za bilateralnu i multilateralnu suradnju 2. Darija Krstić, Ured za EU fondove, stručne i razvojne projekte s gospodarstvom 3. Maja Vidaković, stručni referent za studenska pitanja 4. Jelena Žužić, stručni referent za studenska pitanja
11:45 – 13:00	*Kratka pauza za ručak,* *Interni sastanak Stručnog povjerenstava*	*Short lunch break,* *Internal meeting of the Expert panel members*	
13:00 – 14:00	Sastanak sa studentima	Meeting with students	1. Kristijan Dragičević 2. Dino Galić 3. Margareta Glumac 4. Rafaela Hujbert, predstavnik/ca studenata u Vijeću Odjela, član

			5. Ivan Kovač 6. Luka Kovačević 7. Matej Lučić 8. Marta Rupčić 9. Filip Savanović 10. Ana Stipić 11. Magdalena Topić 12. Ilija Vučković 13. Karolina Zelić-Sturm
14:00 – 14:15	*Pauza*	*Break*	
14:15 – 15:00	Sastanak s vanjskim dionicima – predstavnicima strukovnih i profesionalnih udruženja, poslodavci, stručnjaci iz prakse, organizacijama civilnog društva…	Meeting with external stakeholders - representatives of professional organisations, professional experts, external lecturers, non-governmental organisations…	1. Verica Jovanovski, AZOO, podružnica Osijek 2. dr.sc. Marko Kralj, ravnatelj Instituta za fiziku, Zagreb 3. Tanja Paris, županijsko stručno vijeće učitelja fizike Osječko-baranjske županije 4. Ana Petrinec, ORQA, Osijek 5. Snježana Švelec, županijsko stručno vijeće učitelja fizike Osječko-baranjske županije 6. Frano Vukelić, Robotički klub Osijek 7. Leon Zakanji, hrvatska zajednica tehničke kulture Osječko-baranjske županije
15:00 – 15:15	*Pauza*	*Break*	
15:15 – 16:00	Sastanak s alumnijima (bivši studenti koji nisu zaposlenici Odjela/Visokog učilišta)	Meeting with Alumni (former students who are not employed by the Department/Higher education institution)	1. Hrvoje Brkić 2. Dejan Bošnjaković 3. Adrijan Čačić 4. Dejan Gemeri 5. Aljoša Graovac 6. Iva Ivanišić

			7. Aleksandar Živković
16:00 – 16:30	Organizacija dodatnog sastanka o otvorenim pitanjima – prema potrebi	Organisation of an additional meeting on open questions – if needed	
16:30 – 17:15	*Interni sastanak Stručnog povjerenstva – osvrt na prvi dan i prema za drugi dan*	*Internal meeting of the Expert panel members – comment on the first day and preparation for the second day*	

Treći dan reakreditacije u virtualnom okruženju / Third day of re-accreditation in virtual form

	Srijeda, 14. travnja 2021.	Wednesday, 14 April 2021	Prezime i ime sudionika Surname and name of the participants
8:45 – 9:00 (CEST)	Spajanje na poveznicu (link) ZOOM	Joining ZOOM meeting via the link	
9:00 – 9:45	Sastanak s voditeljima znanstvenih projekata	Meeting with the Heads of research projects	1. doc.dr.sc. Dario Hrupec 2. doc.dr.sc. Mislav Mustapić 3. izv.prof.dr.sc. Vanja Radolić 4. doc.dr.sc. Maja Varga Pajtler
9:45 – 10:00	*Pauza*	*Break*	
10:00 – 10:45	Sastanak s asistentima i poslijedoktorandima	Meeting with Teaching Assistants and postdoctoral researchers	1. dr.sc. Matko Mužević, poslijedoktorand 2. Danijela Kuveždić, asistent

			3. Jelena Strišković, asistent
10:45 – 11:00	*Pauza*	*Break*	
11:00 – 11:30	Organizacija dodatnog sastanka o otvorenim pitanjima – prema potrebi	Organisation of an additional meeting on open questions – if needed	
11:30 – 12:00	*Interni sastanak članova Stručnog povjerenstva*	*Internal meeting of the Expert Panel members*	
12:00 – 12:15	Završni sastanak s Upravom Odjela	Exit meeting with the Department Management	1. doc.dr.sc. Zvonko Glumac, zamjenik Pročelnika za nastavu i studente 2. izv.prof.dr.sc. Igor Lukačević, zamjenik Pročelnika za znanstveno-istraživačku djelatnost 3. izv.prof.dr.sc. Vanja Radolić, Pročelnik Odjela za fiziku
12:15 – 15:00	*Kratka pauza za ručak i interni sastanak Stručnog povjerenstva – ocjenjivanje prema standardima kvalitete*	*Short lunch break and internal meeting of the Expert panel members – assessment according to quality standards*	

SUMMARY

The Department of Physics at the University of Osijek is a young department and has made good progress in important respects, such as in the growth of scientific activity. The study programmes offered by the Department are of good quality and the staff and management of the Department should be proud of their achievements. The Department will need to the support of the university to continue the positive trajectory that it is on, in particular in relation to the allocation of spatial, human, and financial resources. The Department needs to fully explore various avenues for external collaborations, including EU level programmes and industrial collaborations, that have the potential to bring additional resources to the Department.

The high drop-out rate from its undergraduate study programme is a particular challenge that is faced by the Department. The staff and management of the Department are very aware of the issue and the challenges associated with it. The Department should be prepared to take bold and imaginative steps in addressing this challenge.

The five-member accreditation panel, with different backgrounds, makes its recommendations and quality gradings contained in this final report with a consensus achieved through detailed discussion on each of the quality standards. For the evaluation of the *Internal quality assurance and the social role of the higher education institution* the decision has been: Minimum level of quality. For the evaluation of the *Study programmes*, the decision is Satisfactory level of quality. For the *Teaching process and student support* section, a Minimum level of quality, has been decided. The fourth section, the *Teaching and institutional capacities*, has been laveled as Minimum level of quality, and finally, the fifth section, *Scientific/artistic activity*, has been received a Minimum level of quality. This report includes significant instititutional advantages as well as some disavantages and a list of good practices.

One aim of this report is to provide recommendations that will be useful for the Department to ensure that the never-ending journey to improving quality can be continued in a positive manner. In particular, the four areas where there is an overall grading of Minimum level of quality will benefit from close attention. The panel was impressed with the energy, enthuasiasm, and openness of many of the staff of the Department that we met during the accreditation event. This is an essential ingredient that will allow the implementation of the recommendations contained in this report. The panel recognises the large efforts made by the Department in the period since the last

accreditation process. We wish the best to the Department in its mission to reach a higher degree of excellence at both national and international level. Clear, sound, and grounded strategies will be needed to fulfil this aim.