



REPORT
of the Expert Panel
on the

RE-ACCREDITATION OF
Josip Juraj Strossmayer University of Osijek
Department of Physics

Date of the site visit:
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INTRODUCTION

This report on the re-accreditation of the Josip Juraj Strossmayer University of Osijek Department of Physics was written by the Expert Panel appointed by the Agency for Science and Higher Education, on the basis of the self-evaluation of the institution and supporting documentation and a visit to the institution.

Re-accreditation procedure performed by the Agency for Science and Higher Education (ASHE), a public body listed in EQAR (European Quality Assurance Register for Higher Education) and ENQA (European Association for Quality Assurance in Higher Education) full member, is obligatory once in five years for all higher education institutions working in the Republic of Croatia, in line with the Act on Quality Assurance in Higher Education.

The Expert Panel is appointed by the ASHE Accreditation Council, an independent expert body, to perform an independent peer-review-based evaluation of the institution and their study programs.

The report contains:

- a brief analysis of the institutional advantages and disadvantages,
- a list of good practices found at the institution,
- recommendations for institutional improvement and measures to be implemented in the following period (and checked within a follow-up procedure), and
- detailed analysis of the compliance to the Standards and Criteria for Re-Accreditation.

The members of the Expert Panel were:

1. Prof. Arnold Hanslmeier, Ph.D., Institut für Physik, Universität Graz, Republic of Austria
2. Prof. Annette Bussmann-Holder, Ph.D., Max-Planck-Institut für Festkörperforschung and Institute of Physics University of Basel, Federal Republic of Germany – head of the Panel
3. Prof. dr. sc. Barbara Drinovec Drnovšek, Faculty of Mathematics and Physics, University of Ljubljana, Republic of Slovenia
4. Prof. dr. sc. Amir Hamzić, Department of Physics, Faculty of Science of the University of Zagreb, Republic of Croatia
5. Assoc. prof. dr. sc. Igor Pažanin, Department of Mathematics, Faculty of Science of the University of Zagreb, Republic of Croatia
6. Nikola Šegedin, student, Department of Physics, Faculty of Science of the University of Zagreb, Republic of Croatia

In the analysis of the documentation, site visit and writing of the report the Panel was supported by the ASHE staff:

- Vlatka Šušnjak Kuljiš, coordinator
- Ksenija Anić, translator

During the visit to the Institution the Expert Panel held meetings with the representatives of the following groups:

- The Management;
- Representatives of the Commission for Quality
- The students;
- Deputy Head of Department for Education and Students;
- Deputy Head of Department for Research;
- The Teachers;
- Teaching assistants and junior researchers.

The Expert Panel also had a tour of the library, IT rooms, student register desk, and the classrooms at the Josip Juraj Strossmayer University of Osijek Department of Physics, where they held a brief question and answer session with the students who were present.

Upon completion of re-accreditation procedure, the Accreditation Council renders its opinion on the basis of the Re-accreditation Report, an Assessment of Quality of the higher education institution and the Report of Fulfilment of Quantitative Criteria which is acquired by the Agency's information system.

Once the Accreditation Council renders its opinion, the Agency issues an Accreditation Recommendation by which the Agency recommends to the Minister of Science, Education and Sports to:

1. **issue a confirmation** to the higher education institution, which confirms that the higher education institution meets the requirements for performing the higher education activities or parts of activities, in case the Accreditation Recommendation is positive,

2. **deny a license** for performing the higher education activities or parts of activities to the higher education institution, in case the Accreditation Recommendation is negative, or

3. **issue a letter of recommendation** for the period up to three (3) years in which period the higher education institution should remove its deficiencies. For the higher education institution the letter of recommendation may include the suspension of student enrolment for the defined period.

The Accreditation Recommendation also includes an Assessment of Quality of the higher education institution as well as recommendations for quality development

SHORT DESCRIPTION OF THE EVALUATED INSTITUTION

NAME OF HIGHER EDUCATION INSTITUTION: Josip Juraj Strossmayer University of Osijek
Department of Physics

ADDRESS: Osijek, Trg Ljudevita Gaja 6

NAME OF THE HEAD OF HIGHER EDUCATION INSTITUTION: Associate Professor Branko
Vuković, Ph.D.

ORGANISATIONAL STRUCTURE (e.g. chairs, departments, centres): Division of experimental and theoretical physics divided into Chair of theoretical and computational physics, Chair of experimental physics and Laboratory for low radioactivity

LIST OF STUDY PROGRAMMES (and levels): Undergraduate university study programme of Physics and Graduate university study programme of Physics

NUMBER OF STUDENTS (part-time/full-time/final-year): 150 full-time students and 29 final year students

NUMBER OF TEACHERS (full-time, external associates): 7 full-time teachers in scientific-teaching grade, 4 full-time teachers in teaching grade, 23 external associates

NUMBER OF SCIENTISTS (doctors of science, elected to grades, full-time): 7

TOTAL BUDGET (in kuna): 5.315.374,00 HRK

MSES FUNDING (percentage): 90%

OWN FUNDING (percentage): 10%

SHORT DESCRIPTION OF HIGHER EDUCATION INSTITUTION:

The study of physics in Osijek started as a part – time study in 1958/59. The Educational centre of the Teachers Training College Zagreb was founded and the first generation of teachers, who taught mathematics and physics at primary schools, was enrolled. In 1961/62 the Pedagogical Academy was established and it included the studies of Mathematics and Physics and from the year 1964/65 the studies of Physics and Basic Techniques and Production. The Pedagogical Academy became the Faculty of Education in 1977/78 and Osijek got a Teachers Training College. In the beginning, physics teachers at both studies were professors from the

Faculty of Science in Zagreb, the Ruđer Bošković Institute and the Institute of Physics in Zagreb. The Senate of the Josip Juraj Strossmayer University established on the 13th of December 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. In the academic year 2005/2006 the Department of Physics started with a new program that complies with the Bologna Process and the Law of Scientific Activities and Higher Education. Since 2001 the branch of the Croatian Physical Society works at the Department of Physics, too. They have organized many educational lectures and workshops with the aim to popularize physics among pupils in primary and secondary schools.

CONCLUSIONS OF THE EXPERT PANEL

ADVANTAGES OF THE INSTITUTION

1. nice and inspiring environment for teachers and students,
2. good communication between teachers and students,
3. well-represented students at all levels.

DISADVANTAGES OF THE INSTITUTION

1. only one study program,
2. extremely large number of administrative staff in comparison to the number of teachers,
3. inefficient management and inappropriate organizational structure,
4. insufficient number of full time teachers in computer science,
5. ill-defined strategic lines for research,
6. lack of mobility among students and teachers,
7. non-formalized mentorship for methodological practise.

FEATURES OF GOOD PRACTICE

1. mentoring students throughout their study,
2. popularization of the study program in the region,
3. oral examination as a part of the final exam,
4. well-prepared graduates for serving as teachers.

RECOMMENDATIONS FOR IMPROVEMENT

1. Management of the Higher Education Institution and Quality Assurance

- The organizational structure should be simplified.
- Initial testing and preparatory courses need to be introduced.
- Mechanisms for monitoring the quality of research should be implemented.

- The number of administrative staff should be reduced.
- The strategic plan should be critically analysed and revised.

2. Study Programmes

- A single study program is insufficient. Instead of establishing the new study programs proposed by HEI in the strategic plan, we strongly suggest to initiate a joint study program of Mathematics and Physics. Both departments, Department of Physics and Department of Mathematics, should equally contribute to this new study program.
- The enrolment quotas should be reduced, especially at the graduate level.
- Level A of mathematics on State Matura for enrolling students should be established.
- It is necessary to impose annual student surveys and internal peer review reports for teaching.
- More measures of students' accomplishments need to be launched.

3. Students

- Reconsider the entering criteria for enrolment of the undergraduate study.
- Alumni tracking should be introduced.
- Students' feedback should be encouraged severely.
- Students should be made acquainted with learning outcomes.
- Study courses need to be revised and adapted on a regular basis according to the students' feedback.

4. Teachers

- HEI is urged to employ a sufficient number of full time teachers in computer science.

5. Scientific and Professional Activity

- HEI should recognize and focus on the reduced number of research areas where excellence is expected. The quality of the research facilities needs substantial innovations.
- Additional efforts have to be invested to participate in international and domestic projects.
- Transfer of knowledge should be established and commercialised.
- Younger researchers have to be encouraged to overtake important roles in research activities. In particular, postdocs and longer leaves should be enabled for those.

6. International Cooperation and Mobility

- The mobility of teachers and students in both directions should be systematically and substantially increased.
- It is recommended to the HEI to offer courses in English at the graduate level.

7. Resources, Administration, Space, Equipment and Finance

- The allocation of the financial resources needs to be revised according to the requirements.
- More investment in teaching and research equipment is needed.

***DETAILED ANALYSIS OF INSTITUTIONAL COMPLIANCE TO THE STANDARDS AND CRITERIA
FOR RE-ACCREDITATION***

Institutional management and quality assurance

1.1

The strategic plan is too ambitious and unlikely to be realized. Neither stake holders nor students were included in its development. There are too few monitoring mechanisms to insure the realization of strategic goals.

1.2

The organizational structure is overloaded with respect to the number of employees. There are too many hierarchy levels which cannot be justified. In our opinion the ratio of teachers with respect to administrative staff is extremely low. Similar departments should share common administrative amenities.

1.3

Not applicable for university departments.

1.4

Study programmes and institutional missions are not converging. The emphasis is on educating future teachers, however, in the mission it is stated that they are in charge of the organization of research and professional activities. Learning outcomes are published.

1.5

The stronger involvement of students and other stake holders in quality assurance is advised since the current situation is unsatisfactory. Though internal quality commissions are established, there are no corresponding initiatives.

1.6

The monitoring for improvement of the teaching quality is conducted every two years. We recommend that it is carried through for each course at the end of each semester and possibly with specifics of the particular study program.

On the other hand we encourage them to continue the practise of mentoring students throughout their study.

1.7

It is of major importance to establish initial testing and preparatory courses to ensure the equal level entrance to the study program of the first year students. Some mechanisms of monitoring research quality should be introduced.

1.8

The code of ethics exists. There is, however, no student ombudsperson at the level of HEI.

Study programmes

2.1

The improvement of existing study programs depends to a great extent on external associates. In view of this fact it is more difficult to introduce changes to this program. The institution is demanded to continue to encourage students for their feedback.

2.2

We are not convinced that the recent increase of the enrolment quota at the undergraduate study program is justified primarily by the needs of the society. Moreover, the enrolment quota at the graduate study program is too high. Tracking of alumni is insufficiently developed.

2.3

Upon considering the teaching resources and the lack of additional training of underprepared students, we strongly recommend to take this criterion into account already in the starting phase of implementation.

2.4

Learning outcomes have to be explained in deeper detail since they do not adequately describe knowledge and skills students acquire upon the completion of the study programme.

2.5

The students are aware of all requirements to qualify for the exam in advance. We particularly encourage oral examinations as a part of the final exam. The assessment methods should be reviewed and analysed periodically.

2.6

ECTS revisions are not conducted on a regular basis.

2.7

Internationally recognized standards are not met, especially for the experimental part of the teaching. The implementation of the latest scientific achievements is beyond the scope of teaching.

2.8

The teachers apply appropriate teaching methods as much as possible.

2.9

Currently sufficient supplementary resources are available to the students and teachers. Future problems should be anticipated. The publishing activity of the Department should be increased.

2.10

The cooperation with high schools and elementary schools must be placed on the formal level. We acknowledge the cooperation with DZRNS.

Students

3.1

The admission criteria are not relevant for the learning outcomes to be achieved during study. In particular, we consider the level B mathematics on State Matura as insufficient.

3.2

The institution fosters student involvement in various extracurricular activities.

3.3

The institution offers counselling, mentorship and professional orientation services to ensure personal and professional development of students.

3.4

More effort should be invested by HEI to inform the students about the possibility to appeal against the decision concerning their assessment.

3.5

Tracking of alumni is only in the starting phase of implementation.

3.6

The institution regularly informs the public about its study programmes, learning outcomes, qualifications and employment opportunities.

3.7

HEI does not perform regular anonymous surveys.

3.8

Students are well represented, but there is insufficient student feedback of their surveys to supply a useful basis for concrete improvement.

Teachers

4.1

HEI does not employ a sufficient number of full time teachers in computer science.

4.2

The department cannot influence the development of human resources due to the current Ministry measures caused by the economic situation of the state. Therefore we are unable to assess this criterion.

4.3

The institution takes into account the number of full-time teachers, maintaining the optimal ratio between students and full-time teachers.

4.4

We encourage continuing the practise for training the teachers in methodological and pedagogical skills.

4.5

Policies governing the assignment of teachers' workload provide for a fair and equitable distribution of effort and include teaching, research, mentorship, and student consultations.

4.6

HEI ensures that teaching and research activities of the employed teaching staff are not affected by their external commitments.

Scientific and professional activity

5.1

Although the institution has a strategic agenda we consider this to be too general. Especially, a detailed analysis of the research potential is missing. The planned research activities are very dispersed and unlikely to be accomplished.

5.2

A strategic document has not been developed in coordination with the partners from other organisations; in addition, the ongoing collaborations are not listed.

5.3

The minimal requirements for the number of researchers from the Ordinance are met. Accomplishing the strategic agenda is unlikely to be realized in the foreseen period.

5.4

The current research activity and the quality of the scientific work should be strengthened.

5.5

The institution has no mechanisms installed for recognizing and supporting excellence of its employees, in particular a reward system has not been implemented.

5.6

In view of the given list of scientific papers we consider this criterion to be partially implemented.

5.7

The number of projects, both domestic and international, needs to be increased substantially.

5.8

Transfer of knowledge to the industry should be strengthened.

5.9

Specific research activities can be commercialized to produce additional income.

5.10

This criterion is not applicable since the HEI does not offer PhD study program.

International cooperation and mobility

6.1

In spite of the fact that the institution enables and supports the mobility of students from other institutions, the realisation remains too scarce.

6.2

The students rarely take advantage of the opportunity to complete a part of their program abroad. In view of this fact the department should increase the efforts in obtaining new bilateral agreements.

6.3

The international cooperation is limited and as a consequence the teachers' mobility is strongly diminished, although the HEI provides the flexibility in terms of time off.

6.4

International cooperation is realized on a personal basis only.

6.5

HEI has neither invested any effort nor has shown any interest in attracting students from abroad.

6.6

Due to the limited financial resources the institution is not able to provide conditions for more visits.

6.7

International cooperation is realized on a personal basis.

Resources: administration, space, equipment and finances

7.1

Although the laboratories enable quality teaching, the equipment needs to be updated to conform to modern standards.

7.2

In spite of the fact that the teachers are satisfied with the number and availability of support staff we are convinced that the ratio should be changed in the favour of the teaching staff.

7.3

The institution has well-developed policies that ensure professional development of non-teaching staff, in line with the institution's mission.

7.4

Considering that experiment is fundamental to physics, part of the equipment should be replaced by more modern tools that comply to international standards.

7.5

In a very specific respect the technical support for the research activity is on rather modern level, whereas it needs significant improvement in other research fields. There exists appropriate equipment for quality teaching.

7.6

The number of seats in the library is insufficient in view of the number of students from 3 departments who share the same library. We acknowledge the reviewed teaching materials published on the HEI's website.

7.7

The balance sheets in the self-evaluation and their presentation is inadequate to convince us of full financial sustainability of the HEI. Tuition fees are only partially spent according to their purpose. Some expenditures (ITEM 1.3. AWARDS IN TABLE 7.11.) are surprisingly high and not fully justified. The amount SPENT for literature (ITEM 4.79. LITERATURE IN TABLE 7.11.) is very small. We acknowledge that the intellectual and personal services expenditures were kept low. The HEI's positive balance from the previous years is not visible in the financial records.

7.8

One of the main objections is the following: HEI's own funds have not been spent to cover the expenses of the mentorship in schools, which are directly linked to the quality of the study program. Overall the manner of allocating funds must be improved.