REPORT
of the Expert Panel
on the

RE-ACCREDITATION OF

Josip Juraj Strossmayer University of Osijek
Department of Chemistry

Date of the site visit:

15th – 16th of April 2015.

June, 2015

CONTENTS

INTRODUCTION

This report on the re-accreditation of the Department of Chemistry, University Josip Juraj Strossmayer in Osijek 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, supporting documentation and a site-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
- a detailed analysis of the compliance to the Standards and Criteria for Re-Accreditation.

The members of the Expert Panel were:

1. **Prof. Jürg Bähler, Ph. D.**, Division of Biosciences, University College London, United Kingdom of Great Britain and Northern Ireland
2. **Prof. Thorsten Bernhardt, Ph.D.**, Institute of Surface Chemistry and Catalysis University of Ulm, Federal Republic of Germany (**panel chair**)
3. **Prof. Vesna Benković, Ph.D.** associate professor, Department of Biology, Faculty of Science of the University of Zagreb, Republic of Croatia
4. **Prof. Hrvoj Vančik, Ph.D.**, full- professor, Department of Chemistry, Faculty of Science of the University of Zagreb, Republic of Croatia
5. **Snježana Dunđer**, **student**, Department of Chemistry, 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:

- Frano Pavić, coordinator, ASHE
- Goran Briški, interpreter at the site visit and report translator, ASHE.

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
- Working group that compiled the self-evaluation report
- The students
- Deputy head of department for education and research
- The teachers
- Teaching assistants
- Leader of scientific projects

The Expert Panel also had a tour of the library, student register desk, and the classrooms at the Josip Juraj Strossmayer University of Osijek Department of Chemistry, 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

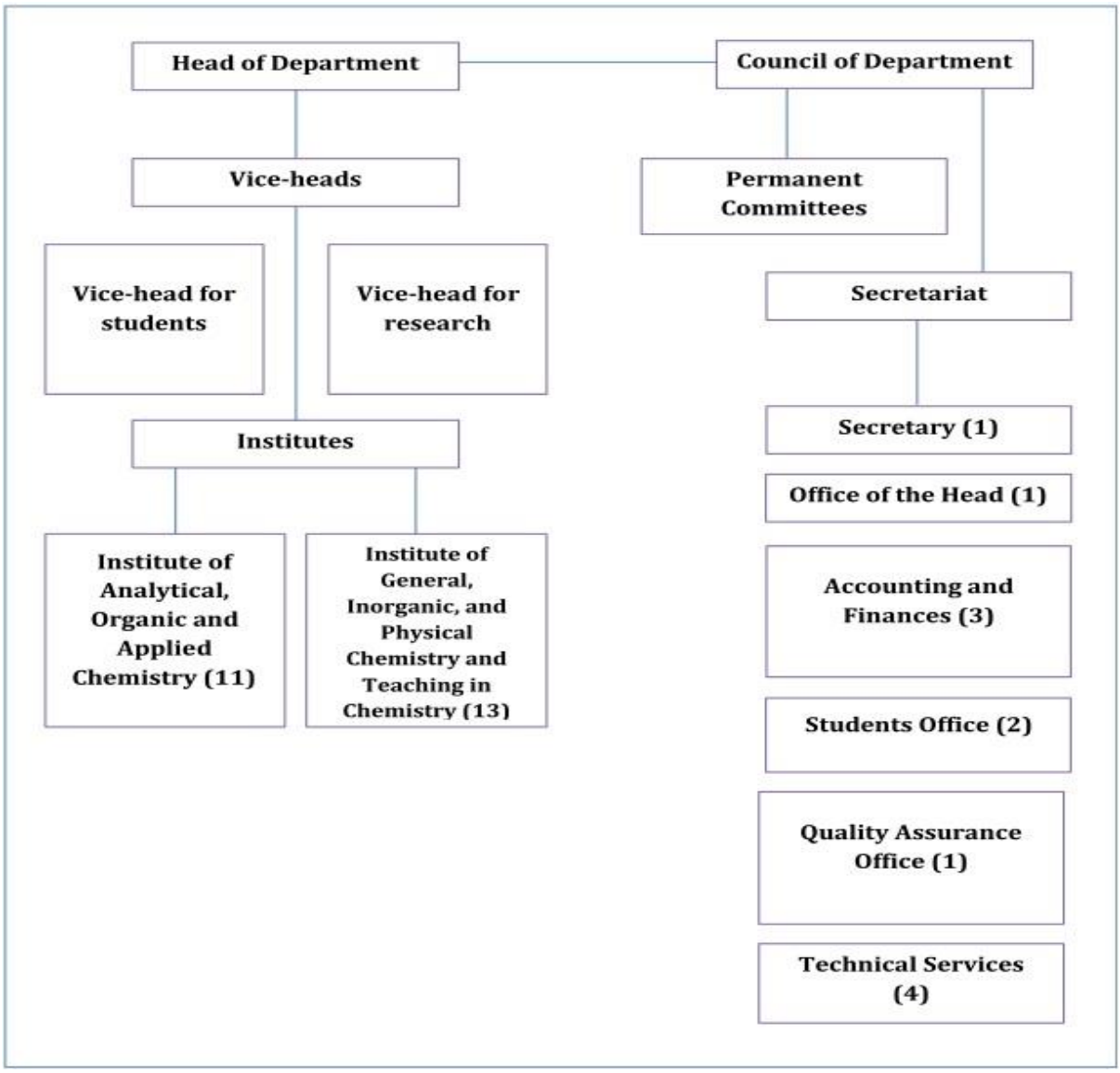
SHORT DESCRIPTION OF THE EVALUATED INSTITUTION

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

ADDRESS: Ulica cara Hadrijana 8/A, HR-31000 Osijek

NAME OF THE HEAD OF HIGHER EDUCATION INSTITUTION: Milan Sak - Bosnar, Ph.D. Full Professor

ORGANISATIONAL STRUCTURE (e.g. chairs, departments, centres): according to Self-evaluation, p. 10



LIST OF STUDY PROGRAMMES (and levels):

- Undergraduate university study programme in Chemistry
- Graduate university study programme in Chemistry- Educational

NUMBER OF STUDENTS (part-time/full-time/final-year): according to self-evaluation document the institution has 144 full-time students and 2 final year students

NUMBER OF TEACHERS (full-time, external associates): according to Table 4.1. of the Self-evaluation, p. 66

Staff	Full-time staff		Cumulative employment		Full-time teachers who are employed part-time in other institutions	Part-time employees	
	Number	Average age	Number	Average age	number	Number	Average age
Full professors	2	68				4	61
Associate professors							
Assistant professors	8	45	1	40		5	41
Teaching grades						2	49
Assistants	7	34				2	28
Professional assistants	2	34					
Junior assistants							
Technical staff	4	46			-------		
Administrative staff	9	39			-------		
Supporting staff	4	45			-------		

NUMBER OF SCIENTISTS (with PhD, elected to grades, full-time): 10
TOTAL BUDGET (in kuna): 6,574,730.96 HRK
MSES FUNDING (percentage): 92%
OWN FUNDING (percentage): 0%

SHORT DESCRIPTION OF HIGHER EDUCATION INSTITUTION:

The Faculty of Education was established in 1977/1978 with the Study of Primary Education and the Study of Pre-school Education and in its sixteen-year long period of existence had 3963 graduates who have studied Croatian language, geography, history, English language, mathematics, physics, biology and chemistry. In 1997, the Study of Primary Education and the Study of Pre-school Education separated from the Faculty of Education, and Studies of Mathematics, Physics, Biology and Chemistry separated gradually after that. The Department of Chemistry was founded by the Senate of Josip Juraj Strossmayer University of Osijek on April 20, 2005. The first Chairs in the Department of Chemistry were established on July 25, 2006, namely Chair for General and Inorganic Chemistry, Analytical Chemistry and Physical Chemistry and Chair for Methodology of Teaching Chemistry and Organic Chemistry. At that time, the Department of Chemistry delivered joint Biology-Chemistry graduate study with the Department of Biology. On June 26, 2007 the Department of Chemistry got the license for the undergraduate study of chemistry and the first undergraduate students of chemistry enrolled in the academic year 2008/2009. The license for the delivery of graduate study of chemistry was obtained on June 19, 2009. By the end of 2011, renovated premises in the University campus were assigned and given for use to the Department of Chemistry. Equipping and relocation was completed by summer of 2013, and teaching at the new location began in the academic year 2013/2014.

CONCLUSIONS OF THE EXPERT PANEL

ADVANTAGES OF THE INSTITUTION

1. Young Department, which is still in the process of evolving and expanding. The panel was impressed by how much has been achieved in a short time and with limited resources.
2. New, adequate and well-equipped premises with sufficient space and options for expansion of number of teachers and students.
3. Well-established undergraduate research programme; innovative strategies for new graduate study programme that combines educational and research-oriented opportunities and thus solves previous problems with potentially separated programmes.
4. Successful strategies to attract foreign teachers and to develop the quality and number of teaching staff.
5. Successful efforts to attract projects and financing.
6. Modern classrooms, teaching laboratories and offices, creating a pleasant work atmosphere.

DISADVANTAGES OF THE INSTITUTION

1. Research strategy has to be focused and developed
2. Focused research strategy appears particularly necessary as the number of scientific researchers has the prospect to increase in the near future.
3. Defined research strategy and research focus that highlights the scientific assets of the department will help to further attract external financial support. It is necessary to extent the research programmes in a way to cover more of teaching fields.
4. Although already existing, collaborations should be increased. In particular, the panel suggests that the opportunities for interdisciplinary collaborations present at the departments of the university (especially biology) are exploited, both with respect to research and teaching.

FEATURES OF GOOD PRACTICE

1. Strategies to attract foreign teaching personnel.
2. Possibilities for students to participate in voluntary laboratory projects in the Department.
3. Good collaboration between university council and students to solve emerging problems.
4. Good feedback on the outcome of appeals.

5. Close contact between teachers and students.
6. Good links to local industry.
7. Good infrastructure.
8. Well-educated administrative personnel.
9. Spirit that teachers and students alike wish to contribute to the benefit and positive development of the department.

RECOMMENDATIONS FOR IMPROVEMENT

1. Management of the Higher Education Institution and Quality Assurance

- The strategic plan of the Department is still in its initial phase. We encourage the Department to continue the initiated process of its realization and the optimization of the quality monitoring mechanisms.
- The Department has developed an effective organizational structure, which fits the actual size of the Department. It would be good, however, to implement an extra Deputy for Research.
- With respect to the quality assessment of teaching and research, it is recommended to schedule meetings of the quality assessment committee on a regular basis, to take and distribute minutes, and follow-up on any decisions made.
- In particular, the monitoring and subsequent improvement of research quality has to be implemented.

2. Study Programmes

- In particular with respect to the prospective graduate study programme, it is recommended to closely follow the implementation strategy as envisaged by the Department.
- The panel anticipates that the quotas of student admission need to be increased in the near future, especially for the newly proposed graduate study programme.
- They should continue to monitor and optimize the defined learning outcomes on a regular basis.
- A peer-reviewing process should be implemented for the teaching personnel. Efforts are recommended to resolve interpersonal problems of teachers that appear to sometimes affect the coordination of lectures and exams, and to enforce the respective control and monitoring mechanisms.
- Access to scientific literature (in particular electronic) has to be ensured as far as possible.

3. Students

- It is recommended to request Mathematics on the highest level on State Matura for admission. Chemistry should also be an obligatory subject requested on State Matura.
- Knowledge assessment procedures are implemented, but in some instances no clear regulations are stated. Here, clearly is space for improvement, in particular as also the (sometimes large) number of exams and their emerging redundancy appears.

4. Teachers

- In line with the development strategy of the institution, we recommend the number of internal staff members to be increased.
- As stated and supported in the case of the Biology Department, the panel encourages both institutions (Departments of Biology and Chemistry) in their efforts to collaborate better with respect to the graduate study program in Biology and Chemistry Education.
- Organized procedures and measures for the professional development of scientific teaching staff seem not very well supported and developed. It is recommended to formalize the professional development strategies.
- The assignment of teacher workload, in particular with respect to potential elective courses, should be checked.

5. Scientific and Professional Activity

- It is strongly recommended to develop a research focus and a sound research strategy, in particular with respect to the prospective future development of the Department in increasing the number of research personnel and expanding the research activities. The establishment of the new research programs, especially in the field of organic and theoretical chemistry is recommended.
- The panel recommends to further extend collaborative efforts with institutions both in Croatia and abroad (including direct neighbouring countries and other European states).
- In the course of the development strategy, the past successful efforts to attract a number of national and also international researchers have to be continued.
- The publication impact on a global level and the number of papers per scientist need to be improved. This may primarily be achieved by publication in more prestigious scientific journals.
- These mechanisms to recognize and encourage excellence are recommended to be formalized and an award system should be implemented.
- The panel encourages efforts to apply for new projects to be continued.
- First efforts of the Department to attract industry projects are evident. Further progress in this direction is also encouraged.

6. International Cooperation and Mobility

- The Department encourages the international mobility of its teaching staff. It is recommended to further motivate the teachers in this respect.
- The Department has already successfully attracted several students from abroad. The panel supports the Department in its efforts to extend these initiatives and to even improve the conditions to attract foreign students.

- The panel supports the Department in its efforts to attract teachers from abroad and to even improve the conditions to attract foreign teachers.
- Inter-institutional cooperation partly exists and are planned to be intensified and further formalized. These efforts are encouraged by the panel.

7. Resources, Administration, Space, Equipment and Finance

- The learning resources are appropriate for the present number of students. Additional laboratory equipment and chemicals for the student lab courses would be beneficial for the study programs.
- Policies for the development of the non-teaching staff should be extended.
- The equipment of the library is still on a basic level. No electronic journal access is available. It is strongly recommended to provide access to the relevant scientific databases.

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

1. Institutional management and quality assurance

1.1
The strategic plan contains all the necessary elements and is in accordance with the strategic plan of the University. The Department has also developed its own strategic plan development strategy) for the period 2012-2017. This plan looks comprehensive and adequate for the conditions in which the Department is active. Since the strategic plan is in its initial phase, they still need to develop the details and optimize the monitoring mechanisms. We wish to encourage the Department to continue the initiated process of realization and the optimization the quality monitoring mechanisms.

1.2
The Department has developed an effective organizational structure, which corresponds to the actual size of the Department. It would be good, however, to implement an extra deputy for research.

1.3
Not applicable for department.

1.4
The study programmes seem to be mostly, but not in all the components, in line with the mission of the University. We support the implementation of the study that they are planning.

1.5
The quality monitoring only comprises the quality assessment of teaching. We recommend scheduling meetings on a regular basis, taking and distributing minutes, and following up decisions.

1.6
Sensible mechanisms have not yet been satisfactorily developed, but they are in the good direction as exemplified on a successful problem solving strategy concerning a particular incident between students and professor.

1.7
The monitoring and subsequent improvement of research quality has only marginally been realized so far. We recommend them to develop the corresponding monitoring mechanisms.

1.8
An ethics committee has been established at the department and it takes care of respecting the settings of the code of ethics of the University.

2. Study programmes

2.1
Procedures for monitoring and improving the quality of study programmes are active. In particular, with respect to the prospective graduate programme, it is recommended to closely follow the implementation as envisaged by the Department.

2.2
The quotas might be appropriate at the present situation. However, the panel anticipates that the quotas need to be increased in the near future, especially for the newly proposed graduate study programme.

2.3
The quotas are in accordance only with the actual system of study programs and the equipment available, but not with the further development of study programs.

2.4
Learning outcomes are in line with the knowledge and skills required for students. It should be continued to monitor and optimize the defined learning outcomes on a regular basis.

2.5
The impact of regularly performed student assessments of the study outcome is visible. Monitoring and improvement should be continued.

2.6
The ECTS points for the courses reflect the realistic estimate of the student workload.

2.7
The content and quality of the study programmes complies with internationally recognized standards.

2.8
No peer-reviewing process has been implemented. Interpersonal problems of some teaching staff appear to sometimes affect the coordination of lectures. There appears to be a consensus among the students that not enough freedom in laboratory work is granted and that there is sometimes a redundancy in study subjects which indicates that the control mechanisms are not fully effective.

2.9
The library is existent and presents a good work environment. However, it is equipped on a rather basic level. No electronic literature is available.

2.10
Students have opportunities to apply their knowledge in practical research.

3. Students

3.1
The panel finds that knowledge in mathematics of present students is not on a satisfactory level. Chemistry should also be an obligatory subject requested on State Matura.

3.2
The Department provides sufficient supports in students' extracurricular activities, in particular sports (financial and ideological support is available).

3.3
Counselling and mentorship are available.

3.4
Knowledge assessment procedures are implemented, but in some instances no clear regulations are stated. Here is clearly room for improvement, in particular as also the (sometimes large) number of exams and an emerging redundancy appears (student example: mathematical methods lectures in chemistry in undergraduate programme). Furthermore, some subjects appear to be taught on a rather low level (student example: physical chemistry taught in class appears to be on a considerably lower than in Atkins' physical chemistry textbook).

3.5
The alumni club has been implemented recently, and students expect to profit from alumni contacts in the future.

3.6
The public relation programme of the Department is impressive. There are various ways to inform public ("open door" days, science fair, etc.).

3.7
Student feedback, especially through the quality assurance office and the student council, is well established and functioning.

3.8
Students receive feedback on the measures that have been taken on the basis of their opinions.

4. Teachers

4.1
The institution employs an adequate number of full-time teachers. However, in line with the development strategy of the institution, it wants to increase the number of internal staff members which is considered fully appropriate by the panel. As stated and supported also in the case of the Biology Department, the panel encourages the institution in its efforts to collaborate with respect to the educational graduate program in Biology and Chemistry.

4.2
The growth and development policy is excellent.

4.3
The ratio between students and full-time teacher complies with best international standards.

4.4
Organized procedures and measures for the professional development of scientific teaching staff seem not very well supported and developed. It is recommended to formalize the professional development strategies.

4.5
The assignment of teacher workload appears to be very high in particular cases which, however, might be put in relation due to potential elective courses that do not necessarily take place annually.

4.6
No external commitments have been reported.

5. Scientific and professional activity

5.1
A strategic research agenda is not evident to the panel. It is strongly recommended to develop a research focus and a sound research strategy, in particular with respect to the prospective future development of the institution in Department the number of research personnel and expanding the research activities.

5.2
Collaborative efforts with institutions both in Croatia and abroad (e.g., Pecz, Hungary) are already established. However, there is clearly room for further extending these efforts also to include additional local and international partners (including direct neighbouring countries and other European countries).

5.3
The Department already succeeded to attract a number of national and also international researchers. In the course of the development strategy, these efforts have to be continued and adapted to the research strategy to be established.

5.4
The per person publication rate is rather mediocre (reflecting the limited resources and heavy teaching load), although they are strong within the University of Osijek. Every effort should be made to improve the research impact on a global level. This should be achieved by publication in more prestigious scientific journals (JACS, ANIE, ChemComm, etc.)

5.5
The Department has only informal mechanisms to recognize and encourage excellence of its employees. These mechanisms are recommended to be formalized and an award system should be implemented.

5.6
The number of peer-reviewed scientific publications is average and needs to be improved.

5.7
There are a number of projects. The members of the institution are continuously submitting project applications and contributing to new project proposals. These efforts are encouraged by the panel to be continued.

5.8
First efforts of the Department to attract industry projects are visible. Further progress in this direction is also encouraged.

5.9
Additional earnings of the Department are marginal. The submission of patents is envisaged by the Department to be beneficious in this direction.

5.10
The Department does not carry out a postgraduate (doctoral) study programme, but the scientific staff members are mentoring Ph.D. students that perform research at the institution and contribute to the scientific advancement of the department.

6. International cooperation and mobility

6.1
The institution enables and facilitates the internal mobility of students. Enrolment of students on graduate study programme is allowed for those who have finished adequate university study programme from the field of natural sciences in Croatia (or abroad). Those who have finished Faculty of Science in Zagreb and in Split, as well as the same study programme at the Faculty of Chemical Technology have direct enrolment.

6.2
In principle, students are supported by the Department to complete part of their studies abroad. However, monetary problems have been identified with respect to the Erasmus program in one case. The students make frequently use of IAESTE opportunities.

6.3
The Department encourages the international mobility of its teaching staff through Erasmus and CEEPUS programmes, Fulbright scholarship, and bilateral agreement and within projects. It is recommended to further motivate the teachers in this respect.

6.4
Members of the Department are part of international associations and are exchanging the results of their scientific research.

6.5
The Department has already successfully attracted several students from abroad. The panel supports the Department in its efforts to extend these initiatives and to further improve the conditions to attract foreign students.

6.6
The Department has already successfully attracted several teachers from abroad. The panel supports the Department in its efforts to extend these initiatives and to even improve the conditions to attract foreign teachers.

6.7
Inter-institutional cooperation partly exists and are planned to be intensified and further formalized. With respect to Erasmus, the established procedures are currently only at an informal level. These efforts are strongly encouraged by the panel.

Resources: administration, space, equipment and finances

7.1
The learning resources are appropriate for the present number of students. Additional laboratory equipment and chemicals for the student lab courses would be beneficial for the study programs.

7.2
According to the data provided in the self-evaluation document and direct questions, the ratio of teaching and non-teaching staff is appropriate.

7.3
Some policies for the development of the non-teaching staff have been implemented but are not sufficient at this stage. As an example, the department is supportive for non-teaching staff to pursue further education, like Ph.D. research, which is commended by the panel. Standard Health & Safety courses are offered, but no other formalized development opportunities.

7.4
The number and the quality of the existing laboratory equipment are at a good level and enable high quality teaching and research. Some equipment comes with established usage protocols (ISO 9000), but such protocols are only partly implemented. Formalized certification procedures are in plan for the future by the department.

7.5
The equipment is used in accordance with the Department mission. The technological level is very good and enables high quality teaching and research (provided the newly ordered computers will arrive).

7.6
The equipment of the library is on a basic level. No electronic journal access is available. It is strongly recommended to provide access to the relevant scientific databases.

7.7
The Institutional funding is transparent and satisfactory for enabling students to finish their study programs.

7.8
Extra income of the Department is properly used for the improvement of scientific and teaching activities. The Institution has been actively seeking alternate resources of funding (e.g. to finance instruments and organize workshops).