ASIIN Seal & Eurobachelor®/Euro-master® Label

Accreditation Report

Bachelor's Degree Programmes
Biology
Chemistry

Master's Degree Programmes
Methodology of Teaching Exact and Natural Sciences (Biology)
Methodology of Teaching Exact and Natural Sciences (Chemistry)

Provided by
Jizzakh State Pedagogical University named after Abdulla Qodiriy, Uzbekistan

Version: 27 June 2025

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A About the Accreditation Process

Name of the degree programme (in original language)	(Official) English translation of the name	Labels applied for [1]	Previous accreditation (issuing agency, validity)	Involved Technical Committees (TC)[2]
Biologiya	Bachelor Biology	ASIIN	-	10
Kimyo	Bachelor Chemistry	ASIIN, Eurobachelor®	-	09
Aniq va tabiiy fanlarni o‘qitish metodikasi (Biologiya)	Master Methodology of Teaching Exact and Natural Sciences (Biology)	ASIIN	-	10
Aniq va tabiiy fanlarni o‘qitish metodikasi (Kimyo)	Master Methodology of Teaching Exact and Natural Sciences (Chemistry)	ASIIN, Euromaster®	-	09
Date of the contract: 18.04.2024 **Submission of the final version of the self-assessment report:** 25.09.2024 **Date of the audit:** 08.04. – 10.04.2025				
Expert panel: Prof. Dr. Tilman Achstetter, University of Applied Sciences Bremen Ass. Prof. Dr. Farrukh Erkinov, Tashkent Institute of Chemical-Technology Dr. Alijonov Utkirjon Mahamadaliyevich, Department of Vocational Education System Development of the Ministry of Higher Education, Science and Innovations, Tashkent Nigina Toshpo'latova, Tashkent State Pedagogical University, Master’s student				
Representative of the ASIIN headquarter:				

[1] ASIIN Seal for degree programmes;
[2] TC: Technical Committee for the following subject areas: TC 10 – Life Sciences; TC 13 – Physics;

Rainer Arnold	
Responsible decision-making committee: ASIIN Accreditation Commission	
Criteria used: European Standards and Guidelines as of 15.05.2015 ASIIN General Criteria as of 23.03.2023 Subject-Specific Criteria of Technical Committee 09 – Chemistry as of 29.03.2019 Subject-Specific Criteria of Technical Committee 10 – Life Sciences as of 28.06.2019	

B Characteristics of the Degree Programmes

a) Name	Final degree (original)	b) Areas of Specialization	c) Corresponding level of the EQF[3]	d) Mode of Study	e) Double/Joint Degree	f) Duration	g) Credit points/unit	h) Intake rhythm & First time of offer
Bachelor Biology	O‘qituvchi Biologiya / Bachelor of Education in Biology	-	6	Full time	No	8 semesters	240 ECTS points	Once a year (September), 2021
Master Methodology of Teaching Exact and Natural Sciences (Biology)	O‘qituvchi, tadqiqotchi Biologiya / Master of Education in Biology	-	7	Full time	No	4 semesters	120 ECTS points	Once a year (September), 2021
Bachelor Chemistry	O‘qituvchi Kimyo / Bachelor of Education in Chemistry	-	6	Full time	No	8 semesters	240 ECTS points	Once a year (September), 2021
Master Methodology of Teaching Exact and Natural Sciences (Chemistry)	O‘qituvchi, tadqiqotchi Kimyo / Master of Education in Chemistry	-	7	Full time	No	4 semesters	120 ECTS points s	Once a year (September), 2021

[3] EQF = The European Qualifications Framework for lifelong learning

Introduction

Jizzakh State Pedagogical University is 48 years old. JDPU was founded in 1974 and is considered to be one of the leading universities in Uzbekistan and was given the name Abdulla Qadiri in 1989. JDPU, which started with five directions and six departments in two faculties and 50 professors and 425 students, has become a large scientific center with 13 faculties and 41 departments. According to the decision PD-289 of the President of the Republic of Uzbekistan Shavkat Mirziyoyev dated on 21.06.2022, Jizzakh State Pedagogical Institute named after A. Qadiri was granted the status of Jizzakh State Pedagogical University.

Currently, there are 11,044 full-time students in 27 undergraduate programmes, 7,086 part-time students in 11 undergraduate programmes, and 1,271 graduate students in 20 Master's programmes. The academic staff consists of 836 people.

Jizzakh State Pedagogical University aims to train competitive, highly qualified specialists and scientific-pedagogical personnel, who are responsible to the state and society, and who respect national and universal values. To achieve these goals, JDPU focuses on implementing innovative teaching methods, enhancing educational quality, establishing international collaborations, strengthening scientific research, developing digital resources, and improving educational and research facilities.

These objectives align with the university's mission to provide modern, quality educational activities, to conduct teaching and research, and to offer educational services that meet the needs of individuals for intellectual, cultural, and spiritual-moral development through higher and postgraduate education.

Summary

The experts positively notice the following aspects:

- Students are satisfied with the degree programmes.
- There is a comprehensive tutorial and advisory system for students.
- The university cooperates well with its external stakeholders (employers, alumni).
- The employers are satisfied with the graduates' qualification profile.
- Bachelor's and Master's graduates have good job perspectives
- Students are involved in the university's boards.

In the following areas, the experts see room for improvement:

- The learning outcomes of the Master's programmes need to reflect the higher academic level (EQF 7) and need to be different from the learning outcomes of the Bachelor's programmes.
- It is necessary to change the English translation of the names of the Master's degree programmes to 'Master Teaching and Research in Biology' and 'Master teaching and Research in Chemistry'.
- It is necessary to change the English translation of the names of the Bachelor's degree programmes to Bachelor Biology Education and Bachelor Chemistry Education.
- Teachers' and students' academic mobility is rather low and should be better promoted. The number of international cooperations and scholarships should be increased and especially Master's students should be encouraged to spend time abroad.
- It would be useful to invite more international guest lecturers and at the same time, the teachers' and students' English proficiency should be improved.
- The module descriptions need to be updated with respect to exam forms, students' total workload, and the contribution of each exam to the final grade. There need to be module descriptions for every course.
- There are no homepages for the Master's programmes. All stakeholders need to have access to the essential information about the degree programmes (profile, learning outcomes, study plan, module descriptions).

- It is necessary to introduce a compulsory final project (Bachelor's thesis) to the curriculum of the Bachelor's programmes. The final project should introduce students to research activities.
- A course on bioinformatics should be offered as an elective in the Bachelor's programmes and as a compulsory course in the Master's programmes.
- Safety measures in the laboratories need to be aligned with international standards (emergency exits signs, safety instructions posters, eye washers, emergency showers, waste management, safety cabinets etc.).
- There is no micro-teaching laboratory at JDPU, where teachers and fellow students can observe and review mock teaching sessions.
- Space is the laboratories in all visited departments is very limited. It is necessary to update and supplement the technical equipment in the research laboratories so that especially Master's students and teachers can better conduct their research activities.

C Expert Report for the ASIIN Seal

1. The Degree Programme: Concept, content & implementation

Criterion 1.1 Objectives and learning outcomes of a degree programme (intended qualifications profile)

Evidence:

- Self-Assessment Report
- Study plans of the degree programmes
- Module descriptions
- Homepage JDPU: https://www.jdpu.uz/en
- Homepage Ba Chemistry: https://jdpu.uz/en/universitet/fakultetlar/kimyo-yonalishi/
- Homepage Ba Biology: https://jdpu.uz/en/biologiya bakalavriat talim yonalishi/
- Discussions during the audit

Preliminary assessment and analysis of the experts:
The experts base their assessment of the learning outcomes on the information provided on the websites and in the Self-Assessment Report of all four degree programmes under review.

For all programmes, Jizzakh State Pedagogical University (JDPU) has defined programme learning outcomes. They cover a number of general and specific competences students should acquire in their respective degree programme. Additionally, there are the specific learning outcomes for each module, which are listed in the respective module description. The learning outcomes and the content of degree programmes are revised at least once every three years, after regularly studying the development of science, technology, culture, economy, and society.

The experts refer to the Subject-Specific Criteria (SSC) of the Technical Committee Life Sciences as a basis for judging whether the intended learning outcomes of the Bachelor's degree programmes Biology, and the Master's degree programme Methodology of Teaching

Exact and Natural Sciences (Biology) as defined by JDPU correspond to the competences as outlined by the SSC.

Graduates of the Bachelor's degree programme Biology should understand the basic biological processes and be capable of applying the scientific and pedagogical methods of the biological sciences. In addition, graduates should acquire relevant scientific knowledge in the different biological areas such as botany, zoology, microbiology, cell biology, molecular biology, biotechnology, and related natural sciences (chemistry, physics). Furthermore, the students should be able to conduct independent and safe laboratory experiments and fieldwork, plan, implement, assess, and follow up the educational biology learning process and be able to design and perform experiments in biology learning to collect, analyse, and interpret data to solve biological issues. Finally, students should be qualified to conduct lifelong learning and work effectively, both individually and in a team, to demonstrate scientific, critical, and innovative attitude in biology learnings, laboratory works, and environmental care.

The Bachelor's degree programme Biology is designed to produce competitive graduates with competences to work as biology educators/teachers, who are able to plan, implement, evaluate, and develop modern biology learning. Most of the graduates of the Bachelor's degree programme Biology will find a suitable occupation in secondary schools or in other educational institutions.

The Master's degree programme Methodology of Teaching Exact and Natural Sciences (Biology) is designed to equip graduates with a deep understanding of biological sciences alongside with advanced pedagogical and social skills. The intended learning outcomes focus on content mastery, educational proficiency, and the ability to conduct research in biology education. To this end, graduates should demonstrate an in-depth knowledge of key areas in biology, such as genetics, ecology, evolution, cell biology, physiology, and molecular biology, and be able to plan and conduct advanced biological experiments. In addition, they should understand the field of biology education in theory and practice, to develop and apply biology teaching techniques and methods, and to analyse education management policies and curricula. Furthermore, they should be able to design and carry out complex research activities in the area of biology education, including designing studies, collecting and analysing data, and interpreting results. Consequently, graduates should be able to take over leadership functions in the education sector.

The experts refer to the Subject-Specific Criteria (SSC) of the Technical Committee Chemistry, Pharmacy as a basis for judging whether the intended learning outcomes of the Bachelor's degree programmes Chemistry, and the Master's degree programme Methodology

of Teaching Exact and Natural Sciences (Chemistry*)* as defined by JDPU, correspond to the competences as outlined by the SSC.

During the course of the Bachelor's degree programme Chemistry, students should acquire a basic knowledge of natural sciences and gain methodological and educational competences in the chemical sciences (analytical chemistry, organic chemistry, inorganic chemistry, physical chemistry, and biochemistry) in order to learn about the structure, dynamics, and energy, as well as the basic principles of separation, analysis, synthesis and characterization of chemicals or complex samples. Furthermore, graduates should also be able to carry out practical work in laboratories and to prepare experiments. Moreover, students should be familiar with the safe handling of laboratory equipment and chemicals and have knowledge about safety and environmental issues. In addition, graduates should acquire the necessary skills to work scientifically as well as in the field of education, adhering to modern methodologies and theoretical concepts in chemistry learning and teaching. This includes designing, implementing, and evaluating chemistry learning media by utilizing information and communication technology. This should qualify graduates to handle chemistry-learning problems and to provide quality chemistry learning that is conducted in classroom or institutions based on scientific data and analysis. Most of the graduates of the Bachelor's degree programme Chemistry will find a suitable occupation in secondary schools or in other educational institutions.

The goal of the Master's degree programme Methodology of Teaching Exact and Natural Sciences (Chemistry) is to impart the necessary professional skills (pedagogic, personal, and social) in chemistry, which are needed to become a successful teacher, education manager, or researcher. To this end, graduates should master advanced theoretical principles in chemistry including organic, inorganic, physical, analytical, and biochemistry, and be able to plan and conduct advanced chemical experiments. In addition, they should understand the field of chemistry education in theory and practice, to develop and apply chemistry teaching techniques and methods, and to analyse education management policies and curricula. Furthermore, they should be able to design and carry out complex research activities in the area of chemistry education, including designing studies, collecting and analysing data, and interpreting results. Consequently, graduates should be able to take over leadership functions in the education sector.

Supplementing the subject-related qualification objectives, students of all degree programmes should have adequate competences in oral and written communication skills, be capable of working autonomously as well as in a team-oriented manner, be able to conduct research activities, and be capable of contributing to the field by publishing research findings or presenting at academic conferences. Furthermore, they should have trained their analytical and logical abilities, be able to apply information and communication technology,

and show a social and academic attitude. This includes issues related to academic honesty, equity, and inclusion in the classroom. Finally, students should acquire communicative and language skills and should develop a strategy for life-long learning.

Several graduates of the Master's programmes continue with their academic education and join a PhD programme, others become teachers at high schools. However, they receive a higher salary and have a higher position than Bachelor graduates usually have. In addition, they can teach at universities or work as consultants in the area of education.

Based on the Self-Assessment Report and the discussions during the audit, the experts see that the graduates of the two Chemistry programmes acquire the subject-specific competences as defined in the SSC of the Technical Committee 09 – Chemistry, Pharmacy. The Bachelor's programme teaches basic mathematical and scientific knowledge relevant to chemistry as well as in-depth knowledge of the core chemical subjects of inorganic, organic and physical chemistry and analytical chemistry. Finally, students are given the opportunity to carry out practical chemical work and learn how to work independently and safely with chemicals in laboratory classes. The Bachelor's degree programme Chemistry thus fulfils the requirements for the award of the European chemistry label (Eurobachelor®), which has also been applied for. Additionally, the experts confirm that graduates of the Master's programme Chemistry have deepened their knowledge in core subjects, special subjects or interdisciplinary subjects. Moreover, they have gained competences qualifying them professionally, e.g. to work as a chemist in industry or public service. This includes the ability to work in a team, to carry out independent scientific work as well as to organise and conduct complex projects in the area of chemistry. Therefore, the graduates are prepared to take on leadership responsibilities, while taking into account ethical responsibility in their decisions. The Master's programme Chemistry thus fulfils the requirements for the award of the European chemistry label (Euromaster®), which has also been applied for.

While analysing the learning outcomes of the Master's degree programmes, the experts notice that that there are hardly any differences in the formulation of the learning objectives between the Master's and the respective Bachelor's programmes. Formulations such as "conducting the scientific experiments in the field of chemistry and analytical interpretation of the obtained results" are inappropriate for a Master's degree programme, as there is an almost identical formulation in the respective Bachelor's degree programme. For this reason, the experts expect JDPU to rewrite the learning outcomes of both Master's degree programmes in order to reflect the higher academic level (EQF 7) in comparison to the Bachelor's programmes. There are many appropriate formulations, which are mostly based on Benjamin Bloom's Taxonomy of Learning Objectives (1956). Especially for Master's programmes competencies such as understanding complex structures by the identification of parts and their relationships (analysis), putting parts together to form a new

whole (synthesis), and making based on the value of evidence and material (evaluation) should be conveyed and this needs to be reflected in the learning outcomes.

In summary, the experts are convinced that the intended qualification profiles of all undergraduate programmes under review allow graduates to take up an occupation, which corresponds to their qualification. The degree programmes are designed in such a way that they meet the goals set for them. In addition, the programmes correspond sufficiently to the ASIIN Subject-Specific-Criteria (SSC) of the Technical Committee 10 – Life Sciences (Ba Biology, Ma Methodology of Teaching Exact and Natural Sciences (Biology)) and the SSC of the Technical Committee 09 – Chemistry, Pharmacy (Ba Chemistry, Ma Methodology of Teaching Exact and Natural Sciences (Chemistry)).

Criterion 1.2 Name of the degree programme

Evidence:

- Self-Assessment Report

Preliminary assessment and analysis of the experts:

During the audit, the experts discuss with JDPU about the appropriate English translation of the names of all degree programmes. They confirm that the original Uzbek names reflect the programmes' objectives and intended learning outcomes appropriately. In addition, the experts appreciate that all four degree can be studied in Uzbek and Russian.

However, the experts point out that the English translation of the Bachelor's programmes does not properly reflect the focus and content of the undergraduate programmes, which is on education in the respective scientific area. For this reason, the experts suggest to name the Bachelor's degree programmes "Biology Education" and "Chemistry Education" or alternatively "Teacher Education Biology" and "Teacher Education Chemistry" in order to make transparent that the focus of the programmes is on educating teachers for secondary schools.

In a similar way, the experts notice that the English names of the Master's programmes are a bit unwieldy and do not reflect the original Uzbek names correctly. It would be more appropriate and useful to call them "Teaching and Research in Chemistry" and "Teaching and Research in Biology".

Criterion 1.3 Curriculum

Evidence:

- Self-Assessment Report
- Study plans of the degree programmes
- Module descriptions
- Discussions during the audit

Preliminary assessment and analysis of the experts:
All four degree programmes under review are offered by the Faculty of Natural Sciences of Jizzakh State Pedagogical University (JDPU).

Education is conducted in Uzbek and Russian. In addition, in each academic year in the Bachelor's degree programmes, two courses are offered in English, intended for students who are proficient in the English language.

The Bachelor' degree programme Biology is designed to prepare students for careers in education in the field of biology. The programme and spans four years, divided into eight semesters, requiring the completion of 240 ECTS points. The curriculum covers various aspects of biology education, including planning and organizing the educational processes, ensuring educational effectiveness, and providing assessment and feedback. It also emphasises creating a safe and stimulating learning environment and establishing cooperation with colleagues and parents. The curriculum includes fundamental biology courses (General Biology, Botany, Zoology, Human Anatomy and Physiology, Genetics, Microbiology, Ecology and Environmental Biology) as well as specialized biology courses (Molecular Biology, Evolutionary Biology, Biochemistry, Developmental Biology). The theoretical education is supplemented by practical laboratory and fieldwork in order to provide hands-on training in laboratory techniques such microscopy, dissection, genetic analysis, and experimental design on one side and nature observation and data collection on the other side. Students learn to conduct experiments, analyse data, and present their findings. During field trips students gain practical experience in ecological and environmental fieldwork, including biodiversity surveys, habitat assessment, and conservation practices. In addition, students can choose elective courses that allow them to explore specific areas of interest within biology or related fields.

The Bachelor' degree programme Chemistry is designed to prepare students for careers in education in the field of chemistry. The programme spans four years, divided into eight semesters, requiring the completion of 240 ECTS points. The curriculum covers various aspects of chemistry education, including planning and organizing the educational processes,

ensuring educational effectiveness, and providing assessment and feedback. It also emphasises creating a safe and stimulating learning environment and establishing cooperation with colleagues and parents. The curriculum includes fundamental chemistry courses (General Chemistry, Organic Chemistry, Inorganic Chemistry, Physical Chemistry, and Analytical Chemistry) as well as specialized chemistry courses (Chemical Technology, Chemical Calculation, Biochemistry, Environmental Chemistry). The theoretical education is supplemented by practical laboratory work in order to provide hands-on training in laboratory skills, including synthesis, purification, analysis, and characterization of chemical compounds. In addition students gain hands-on experience with analytical instruments such as spectrometers, chromatographs, and electrochemical analysers. In addition, students can choose elective courses that allow them to explore specific areas of interest within chemistry or related fields.

As the undergraduate programmes focuses on teacher education, pedagogical training has a large share in the curriculum. This includes courses such General Pedagogy, Teaching Methodology in Biology/Chemistry, Teaching Technologies and Design, and Internship. This way students are trained in teaching methods specific to biology, including the use of experiments, multimedia resources, and interactive learning. Students also learn to design lesson plans, to manage classrooms, and to assess student progress. An essential part are the internships (teaching practicum) which the Bachelor's students conduct from the third semester on. They are following the 4 + 2 model, which means that students spend four days at the university and two days at secondary schools or other educational institutions every week of the semester. During the internships, students first observe the teaching processes and then can also apply their knowledge and teaching methods in real classroom settings. The experts appreciate that this way, students get acquainted with "real life" in schools already from the third semester on and thus can gain sufficient practical experience in teaching.

The general structure of the Bachelor's programmes is depicted in the following table:

Load distribution	**hours**	**credits**
Mandatory subjects	4320	144
Optional subjects	1800	60
Internship	1 080	36
Total	**7 200**	**240**

Table 1: Curriculum Structure Bachelor's programmes, Source: SAR JDPU

One important issue, which the experts discuss in detail with JDPU, is the question why the

Bachelor's degree programme does not include a compulsory final project (Bachelor's thesis). Currently "qualification work" as it is called by JDPU either includes a final project or the "Final State Examination", which are both offered at the end of the studies. According to the decision of the University Council No. 9/5.5 dated May 4, 2023, the opportunity to write a graduation thesis is given to up to 10% of the talented students of the Bachelor's degree programmes by the Department of Organization of Scientific and Research Activities of the Talented Students on the basis of the students' academic performance.

The experts expect that the Faculty of Natural Sciences introduces a compulsory final project (Bachelor's thesis) for all students. This would also support JDPU's goal of becoming an internationally recognised research university. For this reason, all Bachelor's students should be involved in research activities and conduct a final project (Bachelor's thesis). The final project should allow students to explore a specific area of science or science education in depth, involving experimental work and literature review. It should have a scope of at least six ECTS points, which is the minimum by international standards. Group projects are also possible, as long as each student contributes to the project, is responsible for a distinctive part, and receives an individual grade.

The Master's degree programme Methodology of Teaching Exact and Natural Sciences (Biology) is designed to train future educators in the effective teaching of biology at various educational levels. The curriculum typically combines in-depth biological content with pedagogical techniques to ensure that graduates are well-prepared to become researchers in the area of biology or to teach biology in schools or other educational institutions. It is a full-time program that lasts two years, divided into four semesters, and requires the completion of 120 ECTS points.

The Master's degree programme Methodology of Teaching Exact and Natural Sciences (Biology) encompasses the areas pedagogy, biology, and thesis. The pedagogy and biology courses impart professional and practical competences, while the thesis is designed to support the graduates in becoming researchers in biology education or fundamental biology. The curriculum includes only a few compulsory courses such as Methodology of Scientific Research, Methodology of Teaching Special Subjects, Professional Ethics, Development of the Organic World and Anthropology, and Conceptual Foundations of Biology. The rest of the curriculum is dedicated to electives and research work.

The Master's degree programme Methodology of Teaching Exact and Natural Sciences (Chemistry) is designed to train future educators in the effective teaching of chemistry at various educational levels. The programme combines advanced knowledge of chemistry with pedagogical strategies to ensure graduates can effectively teach the subject at various

educational levels. It is a full-time program that lasts for two years, it is divided into four semesters, and requires the completion of 120 ECTS points.

The Master's degree programme Methodology of Teaching Exact and Natural Sciences (Chemistry) encompasses the areas pedagogy, chemistry, and thesis. The pedagogy and chemistry courses impart professional and practical competences, while the thesis is designed to support the graduates in becoming researchers in chemistry education or fundamental chemistry. The curriculum includes only a few compulsory courses such as Methodology of Scientific Research, Methodology of Teaching Special Subjects, Professional Ethics, Physico-Chemical Methods of Analysis, and Chemical synthesis. The rest of the curriculum is dedicated to electives and research work.

Both Master's programmes are designed to produce graduates who are not only proficient in scientific knowledge but also capable of applying their skills in practical, educational, or research settings.

The general structure of the Master's programmes is depicted in the following table:

Distribution of load	hour	credit
Mandatory modules	840	28
Optional modules	960	32
Scientific research	1800	60
TOTAL	3 600	120

Table 2: Curriculum Structure Master's programmes, Source: SAR JDPU

During the four semesters, Master's students must also complete their Master's thesis (18 ECTS plus 16 ECTS for its preparation). The process of preparing for the thesis commences early in the programme, with the Master's thesis topic being assigned to students during the first semester. This allows them to start to develop their individual profile early and supports them to finish their studies on time. The master's thesis covers the research activities as well as reporting on the research project.

The experts discuss with the programme coordinators how biology students learn about bioinformatics. They learn that bioinformatics is included as a topic in the module "Biophysics and Radiology" in the second semester of the Master's programme. However, this is not mentioned in the respective module description. The experts point out that it is important to teach biology students about bioinformatics, because bioinformatics has become an essential part of modern biology. As biology is becoming more and more data-driven, students need to know how to analyse and interpret large amounts of data generated by biological experiments (e.g. genome sequencing and editing, statistical analysis). In addition, students with solid knowledge in bioinformatics are in high demand in the job

market. For these reasons, the experts recommend to introduce a separate course in bioinformatics in the curricula of the biology programmes. In the Bachelor's programmes, it could be an elective, for Master's students it should be a compulsory course.

In general, the experts confirm that both the Bachelor's degree programmes as well as the Master's degree programmes are well designed and impart a broad range of competencies so that graduates can find suitable jobs as teachers, educators, and researchers. In addition, agriculture, ecology, and nature preservation are important areas of occupation. The experts gain the impression that the graduates of all four degree programmes under review are well prepared for entering the labour market, can find adequate jobs in Uzbekistan and have good job perspectives. They stress that the programmes are well balanced between subject specific and educational content.

After analysing the module descriptions and the study plans, the experts confirm that all four degree programmes under review are divided into modules and that each module is a sum of coherent teaching and learning units. All practical lab work and internships are well integrated into the curriculum and the supervision by the Faculty of Natural Sciences guarantees for their respective quality in terms of relevance, content, and structure.

In summary, the experts confirm that the choice of modules and the structure of the curriculum ensure that the intended learning outcomes of the respective degree programme can be achieved.

International Mobility

JDPU is actively advancing internationalisation by establishing partnerships with numerous universities from several countries such as Belarus, Kazakhstan, Korea, Russia, and Turkey through memorandums of understanding or agreements, facilitating collaborative teaching and research activities. Students' mobility at JDPU is coordinated by the International Office which serves as the main center of the university in coordinating students' exchange programs for both JDPU students going abroad as well as receiving international students from neighbouring countries.

JDPU provides some opportunities for students to conduct internships and exchange programmes abroad. Students who take part in student exchanges through cooperation programmes can gain recognition of the acquired credits after obtaining approval from their department. The credits acquired abroad are transferable to JDPU after approval by the Dean's Office. Upon completion of studies at a partner university, a JDPU student must provide a copy and original transcript to the Dean's office. The transcript contains not only ECTS credits, but also the level (course) corresponding to the conditions of study at JDPU and the scale of ECTS credits. The Dean's office, based on a copy of the transcript decides

on the recognition of the credits and enters the results into the university information system. Recognition is possible if the volume of the course (in credits) at the partner university is equal to or exceeds the main content of the same disciplines at JDPU.

The International Office at JDPU is responsible for the international activities such as coordinating and managing student mobility programmes, developing and maintaining relationships with partner institutions and organisations around the world, recruiting and admitting international students, providing support and assistance to international students during their time at JDPU, such as helping with housing, visa issues, and other practical matters. Some financial support is available for students who want to spend some time abroad. As the experts learn during the audit, within the last academic year, 160 students from JDPU spent some time abroad and received partial or full scholarships.

However, the number of students, from either the biology or the chemistry programmes, who spend some time abroad or at least at another Uzbek university is still low despite students' high interest. For example, in the spring semester of the 2021/2022 academic year, one chemistry student in the academic mobility programme spent time at Urganch State University and another student at Tashkent State Pedagogical University. In the fall semester of the 2022/23 academic year, one biology student studied at Samarkand State University and in the spring semester of the 2022/23 academic year, one biology student studied at Tashkent State Pedagogical University. At the same time, the number of incoming students is also very low. For example, in the spring semester of the 2022/23 academic year, one student from Fergana State University came to study at JDPU in the biology programme. The total numbers are shown in the following table:

Academic year	BA - 60110900-Biology BA - 60110800-Chemistry	MA - 70110901-Methodology of teaching exact and natural sciences (biology) MA - 70110801-Methodology of teaching exact and natural sciences (chemistry)
2021-2022	3	0
2022-2023	4	0
2023-2024	1	0
Total:	**8**	0

Table 3: Students' Academic Mobility, Source: SAR JDPU

The students confirm during the discussion with the experts that some opportunities for international academic mobility exist and that the credits acquired abroad are recognised at JDPU. However, they also point out that they wish for more places and scholarships for long- and short-term stays abroad. The number of available places in the mobility pro-

grammes is still limited and there are restrictions due to a lack of sufficient financial support. The lack of financial support hinders students from joining the outbound programmes. The experts understand these problems and recommend to increase the efforts to further internationalising JDPU by offering more places in international exchange programmes and more scholarships. Especially the Master's students should be strongly encouraged to spend some time abroad during their studies. Experiencing another academic and educational environment helps students see their field through a different cultural and scientific lens. This broadens their understanding and also improves their job opportunities.

The same observation concerns the number of teaching staff that spend some time abroad. The Department of Biology has international cooperation agreements with the Bashkir State University of the Russian Federation and the Leibniz Research Center for the Study of Agricultural Landscapes, Germany. Based on these agreements, in the academic year 2021/22, one professor from Bashkir State University conducted lectures on botany for the second year biology students. One professor from the Leibniz Research Center for the Study of Agricultural Landscapes gave a lecture on the basics of scientific research to the fourth year biology students. The Department of Chemistry has international cooperation agreements with Kazakh National University and with South Kazakhstan University.

The experts emphasise that it is very useful for students to spend some time abroad to improve their English proficiency and to get to know other educational systems. To this end, it would also be very useful to offer more subject-specific courses that are at least partly taught in English. Employers prioritise hiring students who possess national certificates or have proficiency in foreign languages. The university should focus on ensuring that its graduates obtain national certifications and develop foreign language skills. In addition, the experts emphasise that not only the students but also the teaching staff should improve its English proficiency in order to be able to teach more in English and to expand the possibilities to conduct international research collaborations. Moreover, it would be very useful to invite more international guest lecturers. However, it would be preferable, if international lecturers would teach students face-to-face. Online teaching is challenging and doesn't provide enough opportunities for students to gain comprehensive knowledge. In-person instruction allows for direct interaction, immediate feedback, and a deeper understanding of the material, which online teaching struggles to offer. While online learning has benefits, such as flexibility, face-to-face teaching remains a more effective approach, especially for complex subjects and developing practical skills, particularly for Master's students.

To enhance academic mobility, JDPU should establish and organise a course that enables its teaching staff to improve their English language skills. Other universities in Uzbekistan have successfully implemented such a course, which has proven to be highly beneficial in

improving the English proficiency of their teachers. Given that teachers often lack sufficient time to attend external learning centers, offering such a course within the university would be highly advantageous for all teaching staff.

A good starting point for initiating more international co-operations are the personal international contacts of the faculty members and the guest lecturers. It is also possible for students and teachers to apply to international organisations like the German Academic Exchange Council (DAAD) for receiving funds for stays abroad. In addition, JDPU should invite more academics from renowned international universities as guest lecturers.

In summary, the experts appreciate the effort to foster international mobility and support JDPU to further pursuing this path. However, with respect to academic mobility there is still room for improvement.

Criterion 1.4 Admission requirements

Evidence:

- Self-Assessment Report
- Website of the University
- Discussions during the audit
- Law "On Education" No. ZRUz-637
- Decree of the President of the Republic of Uzbekistan "On the organisation of admission to study in state higher educational institutions" No. UP-60

Preliminary assessment and analysis of the experts:
The admission regulations for Master's and Bachelor's students at JDPU are published on the university's website. They are mainly regulated by the Republic of Uzbekistan and determined by the Law "On Education" No. ZRUz-637 and Decree of the President of the Republic of Uzbekistan "On the organisation of admission to study in state higher educational institutions" No. PQ-279.

Admission to Bachelor's degree programmes is additionally regulated by the Decision of the Cabinet of Ministers of the Republic of Uzbekistan No. RP-393 "On Adopting the Regulations on the Procedure for Admission to Studies, Transfer, Readmission and Exclusion of Students at Higher Educational Institutions". Applicants for Bachelor's degree programmes must have a certificate of graduation from a secondary school or a diploma of graduation from a college (vocational school). Practical/vocational experience is not required. Applicants must also pass a state examination administered by the State Testing Centre.

When applying for admission to higher education, applicants choose the subject they wish to study. Admission to higher education institutions is based on the results of the state examination. Applicants with the highest scores are recommended for state scholarships within the pre-announced allocation of scholarship places. In the next group, applicants are recommended by the State Commission for enrolment with tuition fees within the available number of study places. A special decree of the President of the Republic of Uzbekistan established special quotas for the admission of girls, disabled persons and children from low-income families to university education under additional allocations based on a state scholarship.

The examination subjects corresponding to the Bachelor's degree programmes of the higher education institutions are approved by the Ministry of Higher Education, Science and Innovation and announced at least six months before the start of the examinations.

For applicants to the Bachelor’s degree programmes Chemistry and Biology the state exam will be held in three compulsory subjects - History of Uzbekistan, Native Language, Mathematics, and two specialty subjects, (chemistry and mathematics for the Bachelor’s degree programme Chemistry, and chemistry and biology for the Bachelor’s degree programme Biology.

Admission to the Master's programmes is granted to graduates of a Bachelor's programme. According to KMRUz No. 393, "Decision on the Approval of the Rules for Admission to Higher Education Institutions, Transfer, Readmission and Exclusion of Students", admission to the Master's programme is based on a selection procedure based on the results of entrance examinations in the field of education and in English.

However, since the academic year 2022/2023, admission to the Master's programme at public higher education institutions will be based on the GPA of the Bachelor's degree. The admission strictly follows the order of scores, while no additional examination will be held. The minimum GPA at JDPU for admission to Master’s programmes is 2.4. Additionally, all applicants for Master’s programmes need to submit a foreign language certificate (usually the foreign language is English) certificate with the minimum level of B2 (according to the Common European Framework of Reference for Languages).

The tuition fees are determined by the State Commission on Admission to the Educational Institutions of the Republic of Uzbekistan on the proposal of the Ministry of Higher and Secondary Special Education in consultation with the relevant ministries.

Foreign citizens shall be admitted to educational institutions of the Republic of Uzbekistan on a fee basis in accordance with the procedure established for citizens of the Republic of

Uzbekistan, unless otherwise provided by the legislation of the Republic of Uzbekistan or international treaties.

The experts see that both Bachelor's degree programmes receive many applications and the demand is higher than the number of available study places. During the last five years, between 720 (2020/21) and 497 (2021/22) candidates applied for the Chemistry programme and between 1383 (2019/20) and 489 (2023/24) for the Biology programme. The capacity of both programmes is between 75 and 125 students per intake. The exact numbers are shown in the following table:

№	Academic year	Applicants submitted documents	Number of applicants admitted
60110800-Chemistry			
1	2019	713	102
2	2020	720	158
3	2021	497	126
4	2022	575	82
5	2023	537	64
60110900-Biology			
1	2019	1383	88
2	2020	1036	120
3	2021	630	124
4	2022	628	92
5	2023	489	102

Table 4: Applications and Enrolment, Bachelor's programmes, source: SAR JDPU

By contrast, the number of applications for the Master's degree programmes is much lower. Since 2022, the number of applications for both Master's programmes has dramatically declined. This is due to a new national regulation, which requires Master's students to have at least a B2 level certificate in a foreign language. This prevents students from applying. However, the situation is changing as the foreign language proficiency of students is increasing. The exact numbers are shown in the following table:

№	Academic year	Applicants submitted documents	Number of applicants admitted
70110801-Methodology of teaching exact and natural sciences (Chemistry)			
3	2021	50	14
4	2022	9*	9
5	2023	6	6
70110901-Methodology of teaching exact and natural sciences (biology)			
3	2021	76	6
4	2022	6	6
5	2023	7	7

Table 5: Applications and Enrolment, Master's programmes, source: SAR JDPU

All students at JDPU, who do not receive a state scholarship have to pay tuition fees. The tuition fee for foreign citizens for one year of Bachelor's programme is 1,200 US dollars and

for a Master's programme it is 1,800 US dollars. For citizens of the Republic of Uzbekistan, the yearly tuition fees for a Bachelor's degree programme are determined at 18 times the basic calculation amount, and for a Master's degree programme at 22 times the basic calculation amount. In 2023, these amounts were determined as 6,412,610 UZS (453 €) for Bachelor's degree programme and 7,771,270 UZS (548 €) for Master's degree programme. Women do not have to pay any tuitions fees if they enrol in a Master's degree programme at JDPU.

In summary, the experts find the terms of admission to be binding and transparent.

Criterion 1.5 Work load and credits

Evidence:

- Self-Assessment Report
- Study plans
- Module descriptions
- Discussions during the audit

Preliminary assessment and analysis of the experts:
JDPU applies the European Credits Transfer System (ECTS) for measuring the students' total workload. The experts confirm that ECTS points are awarded for all mandatory parts of the degree programmes, including work practices (internships). The workload includes contact hours and time for independent work.

The Bachelor's degree programmes encompass 240 ECTS points and one ECTS point is equal to 30 hours of students' total workload. The Master's degree programmes encompass 120 ECTS points. Details on the students' total workload in hours are presented in the module descriptions of each degree programme.

The standard study period is four years (eight semesters) for the Bachelor's degree programmes and two years (four semesters) for the Master's degree programmes. The maximum period of studying in the Bachelor's degree programmes is eight years, and in the Master's degree programmes four years after admission to the first semester.

In summary, the experts conclude that the total work load of the degree programmes is adequate and that there is no structural pressure on the quality of teaching and the level of education due to the work load. The students express their general satisfaction with the amount and the distribution of their work load. The estimated time budget is realistic, and

the students can usually complete the respective degree programme without exceeding the standard study period.

Criterion 1.6 Didactic and Teaching Methodology

Evidence:

- Self-Assessment Report
- Study plans
- Module descriptions
- Discussions during the audit

Preliminary assessment and analysis of the experts:

Various teaching and learning methods such as lectures, class and group discussions, case studies, demonstrations, assignments, simulations, experiments, field studies, teaching practise, and problem-based learning are applied in both undergraduate programmes under review. Structured activities include homework, assignments (reading or problem exercises) and practical activities. Group project assignments are given in some courses to develop students' skills in teamwork, communication, and leadership. The assignments and exercises should help students to develop their abilities with respect to critical thinking, written/oral communication, data acquisition, problem solving, and presentations.

During the classes, active and interactive teaching methods (e.g. lectures, discussions, reports, presentations, and group work) are applied. JDPU wants to encourage the students to gain knowledge from different scientific areas and wants them to be able to solve specific problems through an interdisciplinary approach. This should ultimately contribute to the transition from a teacher-centered to a student-oriented teaching method. In order to involve all students in the learning process and to develop their thinking and analytical skills, the teaching staff uses several methods of training and gives assignments on different levels of complexity. Online video lessons are used and uploaded to the HEMIS platform so that students can learn about the respective subjects. Presentations, video materials, and animated videos are used to explain technological schemes based on the curriculum of the presented topic. However, the experts are convinced that preparing video and animation resources on its own is preferable to downloading them from YouTube.

The most common method of learning in the Bachelor's degree programmes is class session, with several courses having integrated laboratory work. Lecturers generally prepare presentations to support the teaching process. At Bachelor's level, the students first gain theoretical knowledge and have more practical classes in their further studies. At Master's

level, students conduct more individual scientific research. In general, the following teaching methods are used in the degree programmes: lectures, seminars, laboratory classes, internships, small group activities, and final thesis.

With individual or group assignments, such as discussions, presentations, or written tasks, students are expected to improve their academic as well as their soft skills. Laboratory work covers laboratory preparation, pre- or post-tests, laboratory exercises, reports, discussions, and presentations. In addition, practical activities should enable students to become acquainted with academic research methods.

In the Master's degree programmes, more student-centred learning models are applied in order to improve students' analytical and scientific skills. To this end, in most courses didactic methods such as cooperative learning, case studies, and project-based learning are applied. In general, the focus in the Master's degree programmes is on self-organised learning and research-oriented teaching and learning methods.

The education is conducted in Uzbek and Russian languages. Also, every academic year, teaching in English is offered for students with a high English proficiency. In the "Concept of the development of the higher education system of the Republic of Uzbekistan until 2030" approved by the decree of the President of the Republic of Uzbekistan No. PF 5847 dated October 8, 2019 is has been emphasized that in higher education institutions should systematically increase the share of professors and students who have foreign language certificates so that the share of specialised subjects taught in foreign languages can be increased. The students confirm during the discussion with the experts that some classes are offered in English and that they are satisfied with this opportunity.

In summary, the expert group considers the teaching methods and instruments to be suitable to support the students in achieving the intended learning outcomes. In addition, they confirm that the study concepts of all programmes under review comprise a variety of teaching and learning forms as well as practical parts that are adapted to the respective subject culture and study format. It actively involves students in the design of teaching and learning processes (student-centred teaching and learning).

Final assessment of the experts after the comment of the Higher Education Institution regarding criterion 1:

The experts understand that the learning out-comes of the Master's degree programmes were developed in accordance with the requirements of the State Educational Standards of the Republic of Uzbekistan and have been approved by external experts. However, there is a necessity to update the learning outcomes so that they reflect the higher ac-ademic

level (EQF 7) and are substantially different from the learning outcomes of the Bachelor's programmes. The experts expect to receive the verification of the up-dated learning outcomes of both Master's programmes in the further course of the procedure.

The experts strongly support to change the English names in "Master Teaching and Research in Chemistry" and "Master Teaching and Research in Biology" for the Master's programmes and in "Bachelor Chemistry Education" and "Bachelor Biology Education" for the Bachelor's programmes and "Teacher-researcher in Chemistry" and "Teacher-researcher in Biology" This way, it becomes transparent what the content and goal of the respective degree programme is. The experts acknowledge that these changes need to be approved by the University Council and expect to receive the verification of changed English translation of the names of all four programmes in the further course of the procedure.

The experts are glad to hear that JDPU has signed cooperation agreements with universities from countries such as India, Nepal, Turkey, Russia, and Kazakhstan at the beginning of 2025. It is also commendable that JDPU plans to launch a joint Master's degree programme in Zoology in collaboration with Kazan Federal University of the Russian Federation for the academic year 2025/26. The experts point out that these new cooperations now should be filled with life and that students should be supported and encouraged to participate.

The experts appreciate that JDPU is increasing its efforts to invite more international guest lecturers and to improve the teachers' and students' English proficiency. To this end, JDPU has invited 11 international professors in first five months of 2025, who conducted offline classes at the university. By the end of the year, it is planned to involve a total of 53 international professors in the university's academic activities. In addition, special language courses have been organized for both teachers and students to improve foreign language skills. The experts are satisfied with these improvements.

The experts acknowledge that JDPU will introduce a compulsory final project (Bachelor's thesis) to the curriculum of the Bachelor's programmes in 2025/26. The experts expect to receive the verification of the updated curriculum of both Bachelor' programmes in the further course of the procedure.

With respect to offering a course in "bioinformatics" the experts thank JDP for explaining that a request to the Vice-Rector for Academic Affairs was already submitted in academic year 2023/24. It was suggested to replace the elective course "Parasitology" in the 6th semester of the Bachelor's programme in Biology with a course on bioinformatics. This matter will be discussed and finalized at the University Council meeting in May 2025, and it is planned that bioinformatics will be offered as an elective course in the Bachelor's programme Biology Education starting from the 2025/26 academic year. The decision about

introducing a compulsory course in bioinformatics to the Master's degree programme Biology Teacher and Research obviously lies with the Ministry of Higher Education, Science and Innovation of the Republic of Uzbekistan and are uniformly applied to all pedagogical universities. JDPU will forward the experts' recommendation to the Ministry and submit an official request to include bioinformatics as a compulsory course in the Master's programmes. The experts hope that this approach will be successful.

The experts consider criterion 1 to be mostly fulfilled.

2. Exams: System, concept and organisation

Evidence:

- Self-Assessment Report
- Module descriptions
- Regulation on the system of control and evaluation of students' knowledge in higher education institutions
- Discussions during the audit

Preliminary assessment and analysis of the experts:

In the Uzbek system, students' assessment is based on continuous evaluations as well as on midterm and final exams. Students' continuous and midterm exams are evaluated by the teachers who conduct the lectures, seminars, practical or laboratory sessions. Usually, the continuous assessment (including practical work and self-study tasks) contributes with 30 %, mid-term exams with 20 %, and final exams with 50 % to the final grade. Students who have collected at least 60% (30 grades) of the maximum score (50 grades) allocated for the continuous and midterm exams are allowed to take part at the final exam, which can be oral, written, or computer based. The final exam is evaluated on a 50-grade scale, and students need to score at least 60% (30 grades) in order to pass. The students' academic performance is determined by the total grades earned from all types of assessments (continuous, midterm, and final) and is recorded in the students' academic record in the electronic system (HEMIS). The HEMIS information system provides e-learning services to administrative staff, professors, and students for the main areas of activity of higher education institutions. The information system acts as a bridge between the university and the Ministry of Higher Education, Science and Innovation. It reduces the number of different information from the university, rejects their paper form, and digitises the management system. It allows JDPU to manage study plans, lessons, and schedules and includes information about students' learning success.

Mid-term exams are carried out during the semester in order to assess the knowledge and practical skills of the student after the completion of the relevant section of the degree program. The form and duration of the mid-term is determined by the relevant department based on the nature of the subject and the hours allocated to the subject. There is no mid-term exam for courses with less than two academic hours per week. If a student does not enter the mid-term and (or) final exam for valid reasons (illness etc.), the respective exam may be reassigned to that student on the basis of an order from the Dean of the Faculty.

The final examination at the end of the semester is carried out by a teacher, who has not conducted classes in the respective course, meaning that a teacher who has taught the relevant discipline is forbidden from participating in the final examination. Specialists and experienced teachers from other higher educational institutions or stakeholders (preschool institutions, general secondary education organizations) may be involved in the final assessment and evaluation.

A student who, for non-valid reasons, misses 25% or more of the scheduled classroom hours for a discipline, will be suspended from that subject and is not eligible for the final exam. Students who are not allowed to take the final exam, as well as as those having received an unsatisfactory grade in the final exam, have acquired as so called “academic debt”. Academically indebted students have the right to re-take courses in the following semesters at their own expense.

A short summer semester may be organised for the subjects not mastered in the previous semesters during the summer vacation of first to third year undergraduate and first year graduate students. For students who fail to accumulate sufficient credits, it is possible to extend the total duration of Bachelor’s studies up to 8 years and of Master’s studies up to 4 years. On average, around 10% of the Bachelor’s students do not progress from year to year due to various reasons such as family conditions, academic debts, health issues etc. In the Master’s programmes, almost all students fulfil their academic obligations as planned.

The grades are awarded on a scale from two to five: "2" (unsatisfactory”, "3" (satisfactory), "4" (good) or "5" (excellent). Students who are dissatisfied with their grade have the right to appeal to the Appeals Commission, which consists of the chair of the committee and at least four members from among the professors of the relevant discipline who did not participate in the evaluation of the student. The appeal needs to be filed within 24 hours from the time the exam result is announced and will be considered by the Appeals Commission within two days. Midterm examinations are obligatory and carried out in accordance with the academic calendar. Form and content of midterm examinations are determined by the teacher of each module. The grading scale is depicted in the following table:

The "5 scores" grading system	100 points evaluation system	GPA average
“5”	90-100	4,46-5,0
“4”	70-89,9	3,46-4,45
“3”	60-69,9	3,0-3,45
“2”	0-59,9	0-2,99

Table 6: Grading scale, Source: SAR JDPU

The experts think that it would be beneficial to incorporate laboratory-based assessments into the final exams. Currently, final and midterm exams predominantly focus on theoretical knowledge. However, many students and graduates face challenges when it comes to

conducting practical laboratory sessions. By adding laboratory components to the final or midterm exams, students would be better prepared for real-world applications and would have the opportunity to demonstrate their hands-on skills. This approach will also improve the overall evaluation process by providing a more comprehensive assessment of students' capabilities.

In the Master's programmes, the completion of a Master's thesis is a mandatory requirement (18 ECTS plus 16 ECTS for its preparation). The process of preparing for the thesis commences early in the programme, with the Master's thesis topic being assigned to students during the first semester. This allows them to start to develop their individual profile early and supports them to finish their studies on time.

The experts inquire about the Master's theses and would like to know, whether these are done at the university or externally at companies or research institutions; they also ask about the involved quality management. They learn that several Master's students do their thesis at external research institutions, for example, at the Academy of Science, which is the main scientific organization of the Republic of Uzbekistan. It coordinates research in all areas of science and technology. The quality of external research activities is checked by the supervisor, and one supervisor of the final thesis must be a member of the teaching staff. Master's students can chose to conduct their research activities either in the area of fundamental sciences or in the area of science education.As part of the on-site visit, the experts also inspect exemplary examinations as well as Master's theses from all courses of study. Overall, they are satisfied with the quality of the examinations and theses. However, they suggest to give Bachelor's and Master's students the option to submit the thesis in English.

In summary, the experts confirm that the different forms of examination used are competence-oriented and are suitable overall for verifying the achievement of the intended learning outcomes as specified in the respective module descriptions. The form of examination is determined individually for each course and published in the respective module description. The forms of examination are based on the main content of the modules and the level is appropriate for the respective degree programme.

Final assessment of the experts after the comment of the Higher Education Institution regarding criterion 2:

JDPU does not comment on this criterion in its statement.

The experts consider criterion 2 to be fulfilled.

3. Resources

Criterion 3.1 Staff and Development

Evidence:

- Self-Assessment Report
- Staff Handbook
- Study plans
- Module descriptions
- Discussions during the audit

Preliminary assessment and analysis of the experts:
At JDPU, the staff members have different academic positions. There are professors, associate professors, senior teachers, and teachers. The academic position of each staff member is based on research activities, publications, academic education, and supervision of students. For example, a full or an associate professor needs to hold a PhD degree. In addition, the responsibilities and tasks of a staff member with respect to teaching, research, and supervision depend on the academic position.

The teaching staff involved in both Chemistry programmes includes currently 48 persons (11 full professors, 17 associate professors, 12 senior teachers, and 8 teachers). 28 of them have a doctoral degree (58 %), the rest has a Master's degree.

According to the documents provided by JDPU, the current academic staff of the two Biology Departments (Zoology and Anatomy, Biology and its Teaching Methodology) includes 38 persons (11 full professors, 12 associate professors, 10 senior teachers, and 5 teachers). 23 of them have a doctoral degree (60 %), the rest has a Master's degree.

The detailed numbers are shown in the following table:

	Number of academic staffs	DSc	PhD	Head teacher	Teacher
60110800-Chemistry, 70110801- Methodology of teaching exact and natural sciences (chemistry)					
2019-2020	43	1	8	24	10
2020-2021	38	1	9	6	22
2021-2022	38	2	16	8	12
2022-2023	46	3	21	12	10
2023-2024	48	5	23	12	8
60110900-Biology, 70110901- Methodology of teaching exact and natural sciences (biology)					
2019-2020	55	5	15	25	10
2020-2021	42	4	19	11	8
2021-2022	34	4	16	7	7
2022-2023	38	3	18	10	7
2023-2024	38	3	20	10	5

Table 7: Number of Academic Staff Members, Source: SAR JDPU

Only staff members with a doctoral degree can teach in the Master's programmes. Senior teachers and teachers supervise seminars, practical sessions, and laboratory work but usually do not give any lectures. In addition, there are non-academic staff members consisting of librarians, technicians and administrative staff.

The experts discuss with JDPU's management how new staff members are recruited. They learn that every year the faculties and departments announce their vacancies to JDPU's management, which subsequently announces the vacancies on the university's homepage. Applicants with a PhD are preferred. However, Master's graduates are also accepted as teachers. New promising teachers with a Master's degree are encouraged to join a PhD programme either at JDPU or at another university.

During the audit, the experts inquire how high the teaching load is and if enough opportunities are offered to the academic staff members to conduct research activities. They learn that academic full and associate professors at JDPU have a workload between 650 and 700 hours per academic year, the workload for senior teachers and teachers is slightly higher at 750 to 800 hours. The members of the teaching staff confirm during the audit that their teaching load is appropriate and leaves them enough time for conducting research activities.

In summary, the experts confirm that the composition, scientific orientation and qualification of the teaching staff are suitable for successfully implementing and sustaining both degree programmes.

Staff Development

JDPU encourages training of its academic staff for improving the educational abilities and teaching skills. For example, the university has a training centre where teachers can attend courses to improve their pedagogical skills as well as other skills such as foreign languages. JDPU also provides financial support to teachers who wish to pursue doctoral studies or other academic development and research activities.

During the audit, the experts inquire if the teaching staff has the opportunity to spend time abroad and to participate in international projects. They learn that there is a budget funded by the university for academic staff who want to go abroad e.g. for taking part at conferences or workshops. In general, the teachers are satisfied with the existing opportunities and the available financial support.

In summary, the experts confirm that JDPU offers sufficient support mechanisms and opportunities for members of the teaching staff who wish for further developing their professional and teaching skills.

Student Support

JDPU provides a support system for all students; it includes consultations with advisors about the individual educational plan and the study progress. Each academic advisor is a member of the academic staff and is responsible for several students from her/his classes. He/she is the student's first port of call for advice or support on academic or personal matters. The role of the academic advisor is to help the students with the process of orientation during the first semesters, the introduction to academic life and the university's community, and to respond promptly to any questions. They also offer general academic advice, make suggestions regarding relevant careers and skills development and help if there are problems with other teachers.

In addition, the students can contact their advisor any time for assistance in academic questions. The members of the teaching staff are available on any issues regarding the degree programmes and offer advice on particular modules, as well as on required papers or reports.

The expert group notes approvingly the dedication and motivation of the teaching staff; there are enough resources available to provide individual assistance, advice, and support for all students. The comprehensive support system is one of the strong points of JDPU, which helps the students to achieve the intended learning outcomes and to complete their studies successfully and without delay.

Criterion 3.2 Funds and equipment

Evidence:

- Self-Assessment Report
- Visitation of the facilities
- Discussions during the audit

Preliminary assessment and analysis of the experts:

Approximately 35% of the university's budget are provided by the Uzbek government and around 55% are derived from tuition fees. Other sources such as cooperations with companies or other institutions contribute with around 10 % to the university' general budget. Additional funds for research activities can be provided by the Uzbek government, but the university has to apply for them. Moreover, the Islamic Development Bank provides funding e.g. for purchasing new laboratory equipment.

The academic staff members emphasise that from their point of view, both the Bachelor's as well as the Master's programmes under review receive sufficient funding for teaching and learning activities. The students confirm this positive impression and state their satisfaction with the available resources.

For the chemistry programmes, there are four teaching laboratories, one scientific laboratory and two research laboratories (for masters and doctoral students). In the biology departments, there are four teaching laboratories and two research laboratories.

During the on-site visit, the experts can see for themselves that the laboratories are equipped with the necessary basic equipment as well as with some advanced and modern laboratory equipment, but that there are a number of outdated instruments in the teaching laboratories of the Faculty of Natural Sciences. Moreover, for an adequate training, and especially for Master's students and teachers to carry out research activities, it is necessary to adapt the technical equipment in the laboratories to today's standards. This impression is confirmed by both the students and the teachers, who, in conversation with the experts, assess some of the technical material equipment of the teaching laboratories as worthy of improvement. The main problem with the facilities is the lack of laboratory working space and that there are no specific laboratories dedicated to certain areas (e.g. microbiology). The visited so called teaching labs resemble class rooms, which can only be used for basic work for example working with microscopes. One group of students is divided into two small groups in order to carry out practical training, where the number of students in the laboratory will be 10 -12 students, who are trained by one teacher. This approach is caused by the limited laboratory space. All visited laboratories are rather small and do not allow to for more students to do the practical work at the same time. Laboratories for conducting research activities and advanced experiments are very limited. For example, the curriculum

of the Bachelor's programme Biology includes a module in microbiology, with 16 hours of practical work. One goal of the course is to "demonstrate knowledge of safety regulations when working in a general microbiology laboratory". From the experts' point of view, this goal cannot be achieved if there is no microbiology laboratory. The issue is similar with the module "Molecular Biology". This module includes 30 hours of practical work. However, there is no laboratory to conduct experiments in the area of molecular biology. Consequently learning outcomes such as "analyze theoretical knowledge obtained during laboratory work" and "work and observe instruments used in molecular biology" cannot be achieved.

The experts emphasise that additional dedicated lab space is required and introducing modern technical equipment is necessary to fulfill the university's goal of "conducting scientific research and integrating findings into the educational process to advance knowledge and practice". This would be essential to facilitate a better research environment for students and teachers. The expert group understands that modern equipment for sophisticated laboratory work, sufficient in terms of quality and quantity, as well as more laboratory space is not readily available and that the funds are limited. For this reason, the experts expect JDPU to provide a concept, a reliable financial plan, and a timetable for stepwise increasing and upgrading the technical equipment used for teaching, education and research in the laboratories as well as for offering more laboratory working space. At that point, more technical and supervising staff might be needed as well.

With respect to the chemistry programmes, the experts point out that no experiments with gases are carried out. As this is an important part of chemistry, it would be better to include study of gas substances in the curriculum and to carry out the respective experiments in the laboratory sessions. This will require the corresponding labs to be equipped accordingly. In addition, the experts critically remark that the budget for chemical reagents for the laboratory experiments should be increased, so that all the experiments can be carried out.

Another critical point from the experts' point of view is the fact that none of the visited laboratories in the Faculty of Natural Sciences follows international safety standards. The experts point out that the basic personal protective equipment that needs to be available to all persons working in laboratories includes safety goggles, laboratory coats, and hand gloves. It should be worn when working in the laboratory with biological samples and chemicals and when conducting experiments. Students should be trained in the right use of the equipment (e.g. the need to change contaminated gloves before touching a door handle or a keyboard, which also might be used by persons not wearing safety gloves). The personal protective equipment should be stored separately from street clothes, which cannot be stored within the labs. In addition, working safety hoods should be available in all labs (with

exhaust to the outside) and chemicals and solvent containers should be labeled properly and be stored in special lockers (also correctly labeled) with exhausts leading outside the labs. Moreover, there should be emergency exit signs and posters with the safety regulations. Fire extinguishers must not be left unsecured in the laboratory, laboratory table surfaces should be acid and solvent resistant, eye-washers need to be available in every laboratory, and safety showers need to be installed near all laboratories, ideally above the door. Finally, it is important that all students know how sterile work in a laboratory is conducted and that at least once year a safety inspection of the laboratories is done and documented.

The experts stress that there are many hazardous substances and instruments used in the laboratories, which might cause a significant risk of accidents and presents a danger to human health, and the environment. This demands care in order to protect human health, conserve the environment and to prevent laboratory accidents. As a consequence, JDPU needs to draw up a plan, how the internationally accepted safety standards are adopted in all laboratories in the near future.

The experts notice that JDPU has currently no micro-teaching laboratory. As micro-teaching is an important teacher training and faculty development technique whereby the professors and fellow students observe and review a teaching session, such a laboratory should be available at JDPU. This way, students can get constructive feedback from professors or fellow students about what has worked and what improvements can be made to their teaching technique.

During the audit, the students express their satisfaction with the available scientific literature and the library. Remote access via VPN is possible and JDPU offers access to several scientific digital databases, so that teachers and students can access current scientific publications and e-books. According to the decision of the President of the Republic of Uzbekistan dated July 6, 2022 "On approval of the innovative development strategy of the Republic of Uzbekistan for 2022 2026" PQ 307, higher education institutions in Uzbekistan can access international scientific platforms such as "Web of Science", "Link Springer" and “Science Direct”. The Ministry of Higher Education, Science and Innovation has reached an agreement with these organisations on the use of their digital databases.

Final assessment of the experts after the comment of the Higher Education Institution regarding criterion 3:

The experts are glad that JDPU has recognised the need to improve the safety standards in the laboratories and has taken first steps such as purchasing special protective equipment, installing fire extinguishers in the laboratories have been installed in specially designated

areas, and placing emergency exit diagrams and safety posters in visible locations. In addition, it is planned to place special containers for the disposal of used reagents from experiments. Moreover, a project is being developed to maintain a stable temperature in the training and laboratory rooms, to install special showers for eye and hand washing in emergency situations. Finally a micro-teaching laboratory that will allow teachers and students to observe and analyze teaching sessions will be launched. Room 124 in the Department of Chemistry and Chemistry Teaching Methodology is planned to be allocated for the micro-teaching laboratory.

With respect to the need for updating and supplementing the technical equipment in the research laboratories, JDPU confirms that modern laboratories play a crucial role in the training of Master's students and for creating an environment not only for conducting experiments but also for fostering scientific research. Starting from the 2025/26 academic year, it is planned to relocate Master's students' research activities to more spacious rooms to better support the scientific research efforts of both students and teaching staff.

These improvements will be completed and commissioned during the 2025/26 academic year. The experts expect to receive verification of the implemented measures and improvement in the further course of the accreditation procedure.

The experts consider criterion 3 to be mostly fulfilled.

4. Transparency and documentation

Criterion 4.1 Module descriptions

Evidence:

- Self-Assessment Report
- Module descriptions
- Homepage JDPU: https://www.jdpu.uz/en
- Homepage Ba Chemistry: https://jdpu.uz/en/universitet/fakultetlar/kimyo-yo-nalishi/
- Homepage Ba Biology: https://jdpu.uz/en/biologiya bakalavriat talim yonalishi/
- Discussions during the audit

Preliminary assessment and analysis of the experts:

After studying the module descriptions, experts observe that the module descriptions do not include all necessary information. They point out that the module descriptions need to inform correctly about the students' total workload (in hours per semester), what kind of exams are conducted, and how the different exams contribute to the final grade. In general, the experts point out that the module handbooks need to be complete and that there needs to be a module description for each course. Currently, several module descriptions are missing, e.g. for the internships in the Bachelor's programmes and for the research activities (Master's thesis and its preparation) in the Master's programmes. Additionally, the module descriptions should be linked with the respective study plan on the programmes' homepages. Moreover, the workload calculation needs to be checked as there are several miscalculations.

At the point where module descriptions are revised, it might be a good idea to introduce, as source of information and as an up-to-date reference, some English textbook. This will at the same time familiarise students with an otherwise uncommon, i.e. scientific vocabulary.

Criterion 4.2 Diploma and Diploma Supplement

Evidence:

- Self-Assessment Report
- Sample Transcript of Records for each degree programme

- Sample Degree Certificate for each degree programme
- Sample Diploma Supplement for each degree programme

Preliminary assessment and analysis of the experts:
The experts confirm that the students of all degree programmes under review are awarded a Degree Certificate, a Transcript of Records, and a Diploma Supplement after graduation. The Diploma Supplement contains all required information about the degree programme. The Transcript of Records lists all the courses that the graduate has completed, the achieved credits, grades, and cumulative GPA.

Criterion 4.3 Relevant rules

Evidence:

- Self-Assessment Report
- All relevant regulations as published on the university's webpage

Preliminary assessment and analysis of the experts:
The experts confirm that the rights and duties of both JDPU and the students are clearly defined and binding. All rules and regulations are published on the university's website and the students receive the course material at the beginning of each semester. However, the experts point out that currently, there are no homepages for the Master's programmes. As it is important that all stakeholders are able to access the essential information about the study programmes (profile, learning outcomes, study plan, module description), the experts expect JDPU to design separate homepages for both Master's programmes, which include the before mentioned information.

Final assessment of the experts after the comment of the Higher Education Institution regarding criterion 4:

The experts confirm that the module descriptions of all four degree programmes have be revised and are now accessible via the programmes' webpages. In addition, the programmes' webpages have been redesigned and now include a list of courses with direct access to their corresponding module descriptions. The experts are satisfied with theses improvements.

The experts consider criterion 4 to be fulfilled.

5. Quality management: quality assessment and development

Evidence:

- Self-Assessment Report
- Sample surveys for students and employers
- Discussions during the audit

Preliminary assessment and analysis of the experts:
The highest academic board at JDPU is the University Council, which is responsible for implementing and supervising all academic processes at JDPU. The Rector of JDPU is the Chairman of the University Council. Vice-rectors, deans, senior university professors, a student, and leaders of public organisations are its members.

The Dean is the Head of the Faculty of Natural Sciences with the authority and responsibility for administering all teaching and learning activities within the faculty. Finally, there are the Heads of the Departments, who are responsible for implementing all educational activities within the respective degree programmes.

The organisation structure of JDPU is depicted in the following diagram:

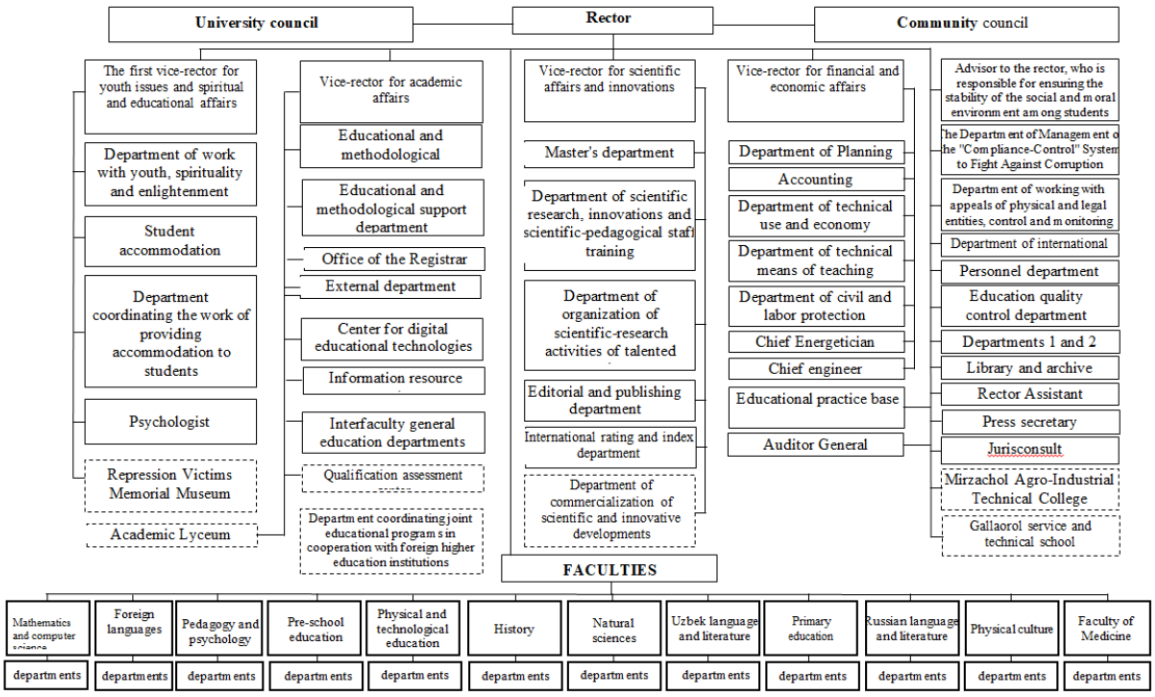

Diagram 1: Structure of JDPU, Source: SAR JDPU

JDPU students are appointed as members of the University Council and Community Council in order to help creating adequate educational conditions and to protect the rights and interests of students. The main function of the University Council is to serve as the highest governing body of JDPU. It is responsible for overseeing the overall academic, administrative, and financial activities of the university. The University Council typically makes key decisions on matters such as strategic development, academic affairs, budget and finance, regulatory compliance, and internal governance. The council ensures that the university's practices align with its strategic objectives and comply with national education regulations. According to the university's charter, the council's members include the Rector and Vice-Rectors as ex officio members. Additional members are elected from the deans, department heads, unit leaders, and distinguished professors and teachers. The total number of council members is determined by the rector's order. As of the latest available information, the council comprises 31 members. Two of the members are employers and one is a student.

In the Community Council, the problems of students, the quality of education, and the learning environment are discussed. At the same time, it carries out activities aimed at supporting and encouraging students to participate at activities that help to develop students' intellectual and creative abilities.

The Student Council at JDPU plays a pivotal role in representing and supporting the student body. One of its primary tasks is to protect students' rights and interests by addressing their concerns within the university framework through their representatives in the University Council and the Community Council. In addition, the Student Council focuses on organising extracurricular and social activities and on involving students in them.

Monitoring of university education quality is carried out by the Department of Education Quality Control, which is an administrative unit of JDPU. The department's regulations are approved by the University Council. The main goal of the department is to evaluate the compliance of students' knowledge with the expected educational standards, control the quality of the educational processes, organise internal quality assessments, identify factors that negatively affect the quality of education, and take measures to eliminate and prevent them.

In order to evaluate the quality of the educational processes at JDPU, the Department of Education Quality Control conducts surveys with students, teachers, and employers.

Satisfaction surveys to gather feedback from students are conducted online at the end of each semester. Students assess various aspects such as quality of course work, soft skills, planning, student involvement, teaching and learning methods, and course descriptions in each enrolled course. Giving feedback on the classes is compulsory for the students. This

way, student can offer insights on the course content, lecturers, and their overall teaching and learning experience. This platform allows students to contribute feedback on the course's quality and its alignment with their learning requirements.

The results of the survey are discussed and analysed in the meetings of the Faculty's Scientific Council. Any shortcomings identified in the courses are evaluated and possibly resolved during these meetings. The Department of Education Quality Control prepares an analytical report on the basis of the data collected and submits the final conclusions to the Rector of the University and the Vice-Rector for Academic Affairs. In accordance with the Rector's instructions, the results of the survey are made available to the University Council, but individual names will not be disclosed and the results will be presented in summary form. The results of the survey will also be communicated to students. In addition to formal evaluations, students are encouraged to provide verbal feedback directly to their teachers, which is then discussed in class. Additionally, students can also give direct feedback (anonymously) to the Vice Rector for Student Affairs.

When asked about their satisfaction with evaluations and general quality management at JDPU, students confirm that evaluations take place regularly and that the results are communicated to them. They state that their critical points are recognised by the university and that changes are made to the programmes on this basis.

Similar to the student evaluation process, annual surveys are conducted with partners from high schools and other educational institutions. JDPU records their recommendations regarding the theoretical and practical training as well as about the internships. In addition, the employers explain during the audit interviews that all of them are in contact with JDPU and are regularly invited to meetings to give their feedback on the programmes and on the needs of the job market. The employers indicate that their suggestions are usually incorporated into the programmes and that they are satisfied with the way they are involved in further developing the programmes. Moreover, they confirm that they are in general satisfied with the graduates' qualification profile. However, the employers point out that it would be useful if students would gain more practical experience with hands-on techniques in the laboratories (see criterion 3.2).

With respect to job opportunities and professional careers, JDPU is well informed about their graduates. As all employers in Uzbekistan also use HEMIS (Higher Education Management System) to register their employees, the government knows about the data from the job market and where graduates find jobs. This digital information system includes "Administrative management", "Educational process", "Scientific activity" and "Financial management" modules. This data is also available to the universities.

As the experts learn during the audit, due to population growth, there is an increasing number of pupils and consequently a rising demand for teachers. Uzbekistan needs about 4,000 new teachers per year. As a consequence, the graduates have very good job opportunities as high school teachers and several Master's graduates work as researchers or are professors at different Uzbek universities.

The experts gain the impression that the quality assurance system of JDPU is well designed and ensures high quality and continuous further development of the study programmes. The feedback of all stakeholders is taken into account by the programme coordinators and changes are made instantly. The experts appreciate that there is good and fruitful cooperation between the external stakeholders (employers, alumni) and the university and confirm that JDPU regularly monitors and reviews the degree programmes to ensure that they achieve the objectives set for them and responds to the needs of the students.

Final assessment of the experts after the comment of the Higher Education Institution regarding criterion 5:

JDPU does not comment on this criterion in its statement.

The experts consider criterion 5 to be fulfilled.

D Additional Documents

Before preparing their final assessment, the experts ask that the following missing or unclear information be provided together with the comment of the Higher Education Institution on the previous chapters of this report:

- none

E Comment of the Higher Education Institution (23.05.2025)

JDPU provides the following statement:

1. The learning outcomes of the Master's programmes need to reflect the higher academic level (EQF 7) and need to be different from the learning outcomes of the Bachelor's programmes.

We would like to emphasize that the undergraduate and graduate degree programmes have been fully developed in accordance with the requirements of the State Educational Standards of the Republic of Uzbekistan and have been approved by external experts, including the Chemistry Association of the Republic of Uzbekistan.

The degree programmes BA 60110800 – Chemistry, BA 60110900 – Biology, MA 70110801 – Methodology of Teaching Exact and Natural Sciences (Chemistry), and MA 70110901 – Methodology of Teaching Exact and Natural Sciences (Biology) were developed by Tashkent State Pedagogical University and were approved by the Center for Higher Education Development Research and Application of Advanced Technologies under the Ministry of Higher Education, Science and Innovation of the Republic of Uzbekistan, the Ministry of Preschool and School Education of the Republic of Uzbekistan, and the Republican Education Center.

Specialists of the university, in cooperation with representatives of educational institutions in Uzbekistan, are revising the content, objectives, and learning outcomes of the master's programmes based on the National Qualifications Framework (https://lex.uz/docs/4814154) and the European Qualifications Framework (EQF Level 7).

The revised degree programmes will be implemented starting from the 2025–2026 academic year.

2. It is necessary to change the English translation of the names of the Master's degree programmes to 'Master Teaching and Research in Biology' and 'Master teaching and Research in Chemistry'.

We consider the English translations of the Master's degree programmes to be accurately rendered as "Master Teaching and Research in Chemistry" and "Master Teaching and Research in Biology."

We would like to inform you that the authority to change the programme titles lies with the University Council, and starting from this year, the names of the Master's programmes will be amended in accordance with the recommendations provided by the experts.

3. It is necessary to change the English translation of the names of the Bachelor's degree programmes to Bachelor Biology Education and Bachelor Chemistry Education.

Taking into account the experts' recommendations, we consider the English translations of the Bachelor's degree programmes as "Bachelor Chemistry Education" and "Bachelor Biology Education" to be appropriate.

We would like to inform you that the authority to change the programme titles lies with the University Council, and starting from this year, the names of the Bachelor's programmes will be amended in accordance with the procedure suggested by the experts.

4. Teachers' and students' academic mobility is rather low and should be better promoted. The number of international cooperations and scholarships should be increased and especially Master's students should be encouraged to spend time abroad.

Jizzakh State Pedagogical University has identified the development of academic mobility and the expansion of international cooperation as one of its strategic priorities. As of 2025, the university has established collaborative relations with 66 foreign higher education and research institutions. In the first five months of 2025, cooperation agreements were signed with prestigious universities from countries such as India, Nepal, Turkey, Russia, and Kazakhstan.

Specifically, for the 2025/2026 academic year, a joint Master's degree programme in Zoology (1+1 format) is planned to be launched in collaboration with Kazan Federal University of the Russian Federation. A formal agreement has already been signed between Kazan Federal University and JSPU to establish this joint programme.

Additionally, 41 faculty members, 2 Master's students, and 1 undergraduate student were sent abroad on official visits to participate in reputable international conferences. As part of academic exchange, in January–February 2025, five students from South Kazakhstan University received online education at JSPU in the field of Pedagogy and Psychology.

To expand international study opportunities at the Master's level, the university has intensified its participation in international cooperation and grant-based projects. Moreover, extensive promotional work is being conducted regarding international scholarship programmes, and mechanisms are being improved to encourage Master's students and young researchers to pursue studies and research abroad. (Appendix 1)

5. It would be useful to invite more international guest lecturers and at the same time, the teachers' and students' English proficiency should be improved.

Jizzakh State Pedagogical University has identified the engagement of international guest lecturers and the enhancement of English language proficiency among faculty and students as strategic priorities.

In the first five months of 2025, 11 international professors conducted offline classes at the university. In total, 23 foreign specialists have been involved in the educational process, 12 of whom are affiliated with universities ranked in the top 1000 globally. By the end of the year, it is planned to involve a total of 53 international professors in the university's academic activities.

A group of instructors with at least a B1 level of English proficiency, capable of teaching their subjects in English, has been formed at the university. Additionally, special language courses have been organized for both teachers and students to improve foreign language skills. These initiatives are being implemented in accordance with the Presidential Decrees of the Republic of Uzbekistan No. PQ-5117 dated May 19, 2021, and No. PQ-407 dated October 20, 2022, as well as the legal requirements that came into effect starting from the 2022/2023 academic year. According to these regulations, applicants to Master's and PhD programmes are required to present a national or international certificate proving their foreign language proficiency (minimum C1 level for philology fields and B2 level for other disciplines).

In recent years, the university has significantly expanded its international partnerships, signing memorandums of cooperation with prestigious institutions such as Al-Farabi Kazakh National University, Auezov South Kazakhstan University, Moscow State University, and Osh State University. For the 2025–2026 academic year, it is planned to invite renowned foreign scholars from these partner universities to JSPU to deliver lectures, seminars, and master classes. (Appendix 2)

6. The module descriptions need to be updated with respect to exam forms, students' total workload, and the contribution of each exam to the final grade. There need to be module descriptions for every course.

Taking the experts' recommendations into account, the course modules have been revised. The updated modules now clearly indicate the types of examinations, the total student workload, and the contribution of each exam to the final grade. You can view the revised module descriptions on the programme webpages.

7. There are no homepages for the Master's programmes. All stakeholders need to have access to the essential information about the degree programmes (profile, learning outcomes, study plan, module descriptions).

The programme webpages have been redesigned to enhance accessibility and transparency. Each degree programme page now includes a list of courses with direct access to their corresponding module descriptions.

Navigation Path:

Main Website → Directions → Bachelor's Degree / Master's Degree

Here are the direct links to the updated programme pages:

- Biology (Bachelor's Degree): https://jdpu.uz/en/biologiya-bakalavriat-talim-yonalishi/
- Chemistry (Bachelor's Degree): https://jdpu.uz/en/universitet/fakultetlar/kimyo-yonalishi/
- Methodology of Teaching Exact and Natural Sciences – Biology (Master's): https://jdpu.uz/en/aniq-va-tabiiy-fanlarni-o%CA%BBqitish-metodikasi-biologiya/
- Methodology of Teaching Exact and Natural Sciences – Chemistry (Master's): https://jdpu.uz/en/aniq-va-tabiiy-fanlarni-oqitish-metodikasi-kimyo/

8. It is necessary to introduce a compulsory final project (Bachelor's thesis) to the curriculum of the Bachelor's programmes. The final project should introduce students to research activities.

Taking into account the recommendations of the ASIIN experts, the university administration has decided to introduce a compulsory final project (Bachelor's thesis) for students in Bachelor's programmes in the exact and natural sciences. This initiative aims to familiarize students with research activities.

The implementation will be formalized through a Rector's order and a University Council decision, and will officially come into force starting from the 2025–2026 academic year.

9. A course on bioinformatics should be offered as an elective in the Bachelor's programmes and as a compulsory course in the Master's programmes.

In the 2023–2024 academic year, the Department of Biology and Teaching Methodology submitted a formal request to the Vice-Rector for Academic Affairs to replace the elective course "Parasitology" in the 6th semester of the Bachelor's programme in Biology

(5110401) with a course on Bioinformatics. Based on this request, the Educational and Methodological Support Department prepared relevant proposals.

This matter will be discussed and finalized at the Educational-Methodological Council and University Council meetings in May 2025, and it is planned that Bioinformatics will be offered as an elective course in the Bachelor's programme in Biology starting from the 2025–2026 academic year.

In addition, we support your recommendation to include Bioinformatics as a compulsory course in the Master's programmes. However, we would like to inform you that the inclusion of compulsory courses in curricula is not within the authority of the university. These courses are determined by the Ministry of Higher Education, Science and Innovation of the Republic of Uzbekistan and are uniformly applied to all pedagogical universities.

We will forward the experts' recommendation to the relevant specialists at the Ministry and submit an official request to include Bioinformatics as a compulsory course in the Master's programmes.

10. Safety measures in the laboratories need to be aligned with international standards (emergency exits signs, safety instructions posters, eye washers, emergency showers, waste management, safety cabinets etc.).

Response to the experts' comments regarding laboratory safety:

- Special protective equipment has been purchased for each laboratory room. For example, laboratory coats, safety goggles, and gloves have been procured in sufficient quantities (Appendix 3);

- Measures have been defined to ensure safety in the laboratory and improve working conditions;

- Fire extinguishers available in the laboratories have been installed in specially designated areas. In addition, it is planned to place special containers for the disposal of used reagents from experiments (for solids, liquids, acids, salts, and others);

- Emergency exit diagrams and safety posters have been placed in visible locations in every laboratory room (Appendix 3);

- Currently, a project is being developed to maintain a stable temperature in the training and laboratory rooms, to install special showers for eye and hand washing in emergency situations, and to launch micro-laboratories for students and faculty. These improvements will be completed and commissioned during the 2025–2026 academic year.

11. There is no micro-teaching laboratory at JDPU, where teachers and fellow students can observe and review mock teaching sessions.

Starting from the 2025–2026 academic year, the university has included in its development plan the establishment and launch of a micro-teaching laboratory that will allow teachers and students to observe and analyze teaching sessions. Room 124 in the Department of Chemistry and Chemistry Teaching Methodology is planned to be allocated for the micro-teaching laboratory. The room will be adapted for practical sessions and for students to test and develop their teaching skills.

It is planned to equip the room with various tools and equipment, such as:

- Cameras and microphones for analyzing movement and speech, as well as for recording and reviewing lessons;
- A projector or interactive whiteboard for visual instruction;
- Computers and tablets to support the teaching and learning process.

12. Space is the laboratories in all visited departments is very limited. It is necessary to update and supplement the technical equipment in the research laboratories so that especially Master’s students and teachers can better conduct their research activities.

Taking into account the crucial role of modern laboratories in the training of Master's students and academic-pedagogical staff—as well as the importance of creating an environment not only for conducting experiments but also for fostering scientific research, analysis, and critical thinking—a plan has been developed based on the experts' recommendations.

Starting from the 2025–2026 academic year, it is planned to relocate Master’s students’ research activities to more spacious classrooms to better support the scientific research efforts of both students and teaching staff.

F Summary: Expert recommendations (30.05.2025)

Taking into account the additional information and the comments given by JDPU, the experts summarize their analysis and **final assessment** for the award of the seals as follows:

Degree Programme	ASIIN-seal	Subject-specific label	Maximum duration of accreditation
Ba Biology	With requirements for one year	-	30.09.2030
Ba Chemistry	With requirements for one year	Eurobachelor®	30.09.2030
Master Methodology of teaching exact and natural sciences (Biology)	With requirements for one year	-	30.09.2030
Master Methodology of teaching exact and natural sciences (Chemistry)	With requirements for one year	Euromaster®	30.09.2030

Requirements

For all degree programmes

A 1. (ASIIN 3.2) All laboratories need to follow international standards with respect to safety measures.

A 2. (ASIIN 3.2) Submit a concept and a timetable on how to update and supplement the technical equipment in the laboratories and how to provide more laboratory space within the accreditation period.

For the Bachelor's programmes

A 3. (ASIIN 1.2) Change the English translation of the names of the degree programmes e.g. to Bachelor Biology Education and Bachelor Chemistry Education so that they correctly reflect the content of the respective degree programme.

A 4. (ASIIN 1.3, 2) Introduce a compulsory final project (Bachelor's thesis) to the curriculum of the Bachelor's programmes. The final project should introduce students to research activities.

For the Masters' programmes

A 5. (ASIIN 1.1) The learning outcomes of the Master's programmes need to reflect the higher academic level (EQF 7) and need to be different from the learning outcomes of the Bachelor's programmes.

A 6. (ASIIN 1.2) Change the English translation of the names of the degree programmes e.g. to Master Teaching and Research in Biology and Master Teaching and Research in Chemistry so that they correctly reflect the content of the respective degree programme.

For the Master's degree programme Biology

A 7. (ASIIN 1.3) Introduce a compulsory course in bioinformatics to the curriculum.

Recommendations

For all degree programmes

E 1. (ASIIN 1.3) It is recommended to further promote teachers' and students' academic mobility and to establish more international cooperations especially in the area of teacher education.

E 2. (ASIIN 3.2) It is recommended to establish a micro-teaching laboratory at JDPU, where teachers and fellow students can observe and review mock teaching sessions.

For the Bachelor's degree programme Biology

E 3. (ASIIN 1.3) It is recommended to introduce an elective course in bioinformatics.

G Comment of the Technical Committees (18.06.2025)

Technical Committee 09 – Chemistry, Pharmacy (10.06.2025)

Assessment and analysis for the award of the ASIIN seal:

The Technical Committee sees that the expert group proposes seven requirements. These relate to the safety standards in the laboratories, the module descriptions, the modernization of the laboratories, a mandatory Bachelor's thesis, the English translations of the degree course titles, the introduction of a module in bioinformatics and the learning objectives of the Master's degree courses. In addition, three recommendations are to be made. The Technical Committee agrees with this assessment

Assessment and analysis for the award of the Eurobachelor®/Euromaster® *label:*

The Technical Committee confirms that the intended learning outcomes of the degree programmes do comply with the Eurobachelor®/ Euromaster® criteria.

The Technical Committee 09 – Chemistry, Pharmacy recommends the award of the seals as follows:

Degree Programme	ASIIN-seal	Subject-specific label	Maximum duration of accreditation
Ba Chemistry	With requirements for one year	Eurobachelor®	30.09.2030
Master Methodology of teaching exact and natural sciences (Chemistry)	With requirements for one year	Euromaster®	30.09.2030

Technical Committee 10 – Life Sciences (18.10.2025)

Assessment and analysis for the award of the ASIIN seal:

The Technical Committee sees that the expert group proposes seven requirements. These relate to the safety standards in the laboratories, the module descriptions, the moderniza-

tion of the laboratories, a mandatory Bachelor's thesis, the English translations of the degree course titles, the introduction of a module in bioinformatics and the learning objectives of the Master's degree courses. In addition, three recommendations are to be made. After a brief discussion, the Technical Committee approves the proposed requirements and recommendations.

The Technical Committee 10 – Life Sciences recommends the award of the seals as follows:

Degree Programme	**ASIIN-seal**	**Subject-specific label**	**Maximum duration of accreditation**
Ba Biology	With requirements for one year	-	30.09.2030
Master Methodology of teaching exact and natural sciences (Biology)	With requirements for one year	-	30.09.2030

H Decision of the Accreditation Commission (27.06.2025)

Assessment and analysis for the award of the subject-specific ASIIN seal:

The Accreditation Commission discusses the procedure and concurs with the proposed requirements and recommendations without changing them.

Assessment and analysis for the award of the Eurobachelor®/Euromaster® *label:*

The Accreditation Commission confirms that the intended learning outcomes of the degree programmes do comply with the Eurobachelor®/ Euromaster® criteria.

The Accreditation Commission decides to award the following seals:

Degree Programme	ASIIN-seal	Subject-specific label	Maximum duration of accreditation
Ba Biology	With requirements for one year	-	30.09.2030
Ba Chemistry	With requirements for one year	Eurobachelor®	30.09.2030
Master Methodology of teaching exact and natural sciences (Biology)	With requirements for one year	-	30.09.2030
Master Methodology of teaching exact and natural sciences (Chemistry)	With requirements for one year	Euromaster®	30.09.2030

Requirements

For all degree programmes

A 1. (ASIIN 3.2) All laboratories need to follow international standards with respect to safety measures.

A 2. (ASIIN 3.2) Submit a concept and a timetable on how to update and supplement the technical equipment in the laboratories and how to provide more laboratory space within the accreditation period.

For the Bachelor's programmes

A 3. (ASIIN 1.2) Change the English translation of the names of the degree programmes e.g. to Bachelor Biology Education and Bachelor Chemistry Education so that they correctly reflect the content of the respective degree programme.

A 4. (ASIIN 1.3, 2) Introduce a compulsory final project (Bachelor's thesis) to the curriculum of the Bachelor's programmes. The final project should introduce students to research activities.

For the Masters' programmes

A 5. (ASIIN 1.1) The learning outcomes of the Master's programmes need to reflect the higher academic level (EQF 7) and need to be different from the learning outcomes of the Bachelor's programmes.

A 6. (ASIIN 1.2) Change the English translation of the names of the degree programmes e.g. to Master Teaching and Research in Biology and Master Teaching and Research in Chemistry so that they correctly reflect the content of the respective degree programme.

For the Master's degree programme Biology

A 7. (ASIIN 1.3) Introduce a compulsory course in bioinformatics to the curriculum.

Recommendations

For all degree programmes

E 1. (ASIIN 1.3) It is recommended to further promote teachers' and students' academic mobility and to establish more international cooperations especially in the area of teacher education.

E 2. (ASIIN 3.2) It is recommended to establish a micro-teaching laboratory at JDPU, where teachers and fellow students can observe and review mock teaching sessions.

For the Bachelor's degree programme Biology

E 3. (ASIIN 1.3) It is recommended to introduce an elective course in bioinformatics.

Appendix: Programme Learning Outcomes and Curricula

According to the Self-Assessment Report, the following **objectives** and **learning outcomes (intended qualifications profile)** shall be achieved by the Bachelor's degree programme Biology:

- "Knowledge of the decisions of the Cabinet of Ministers "On the introduction of the Continuous Education System" and "On the establishment of general secondary education in the Republic of Uzbekistan";
- Knowledge of the decree of the President of the Republic of Uzbekistan "On the State National Program for the Development of School Education in 2004 2024" and its implementation;
- Based on the decree of the President, he knows that schools will be provided with modern educational and laboratory equipment, computer equipment, new biology textbooks and educational methodological materials, and its implementation;
- Implementation of the newly revised State Education Standard, curriculum and thematic planning in the educational process of biology;
- Ability to organize the educational process and analyze students' knowledge;
- having experience in skilfully conducting training sessions using various technical tools (microscopes, projection devices, computers, educational tools) and didactic materials and visual aids used in teaching biology;
- being familiar with the contents of new textbooks, educational methodical literature on the subject of biology and to analyze them and to be able to use them regularly in the educational process;
- Knowledge of modern pedagogical technologies from biology, tools that activate students' knowledge, and have the skills to use them in training sessions;
- knowing the methods of monitoring students' knowledge, to be able to analyze and to have the skills of assessment;
- knowing the means of organization and methodical provision of students' independent learning;
- knowing the educational heritage of Central Asian thinkers in the field of biology and other natural sciences and to have the skills to use them in the educational process;
- having the knowledge of advanced work practices in the field of biological education and training and to have the ability to use them in the educational process;

- knowing the methods of organization of educational work performed outside of the lesson, class and school in the subject of biology and to put it into practice;
- having information about news, scientific research and problems in the field of biology;
- knowing the procedures and rules for conducting scientific methodical and experiment--testing work related to biology in general secondary education schools;
- being able to observe and analyze biology lessons;
- being able to conduct career guidance of students in general secondary educational institutions in the direction of biology;
- knowing the requirements, content and forms of education in biology schools and classes;
- having mastered the ways and methods of independent improvement of the level of knowledge and pedagogical skills in biology;
- being able to apply the decrees issued by the President this year in the teaching of biology."

The following **curriculum** is presented:

1st academic year, 1st semester

Subject code	Qualification code of subject	Name of subject	Hours	Credits	Type of choice
1.01.	PSY108	General psychology	120	4	Compulsory
1.02.	MATH103	Mathematics	90	3	Compulsory
1.03.	O'EYT104	The latest history of Uzbekistan	120	4	Compulsory
1.06.	BT111	Botany I	180	6	Compulsory
1.07.	ZO110	Zoology I	150	5	Compulsory
1.09.	AO'RT104	Practical Uzbek (Russian) language	120	4	Compulsory
1.10.	DTIY102	Doing business in the state language	60	2	Compulsory
1.11.	YFG102	Age physiology and hygiene	60	2	Compulsory
		Total:	**900**	**30**	

1st academic year, 2nd semester

Subject code	Qualification code of subject	Name of subject	Hours	Credits	Type of choice
1.01.	PSY108	General psychology	120	4	Compulsory
1.04.	MSVAX104	Media literacy and information culture	120	4	Compulsory
1.05.	RB105	Developmental Biology	120	4	Compulsory
1.06.	BT111	Botany I	150	5	Compulsory
1.07.	ZO110	Zoology I	150	5	Compulsory
1.08.	FAL104	Philosophy	120	4	Compulsory
1.16.	O'EYT104	General chemistry	120	4	Compulsory
		Total:	**900**	**30**	

2nd academic year, 3rd semester

Subject	Qualification	Name of subject	Hours	Credits	Type of choice
code	code of subject				
1.12.	PED208	General pedagogy	120	4	Compulsory
1.14.	BT208	Botany II	120	4	Compulsory
1.15.	ZO208	Zoology II	120	4	Compulsory
1.17.	OAF208	Human anatomy and physiology I	120	4	Compulsory
1.18.	БК204	Biochemistry	120	4	Compulsory
1.19.	TAT204	Application of information technologies in professional activity	120	4	Compulsory
		Internship	180	6	Compulsory
		Total:	**900**	**30**	

2nd academic year, 4th semester

Subject code	Qualification code of subject	Name of subject	Hours	Credits	Type of choice
1.12.	PED208	General pedagogy	120	4	Compulsory
1.13.	InkT.GP204	Inclusive education. Hospital pedagogy	120	4	Compulsory
1.14.	BT208	Botany II	120	4	Compulsory
1.15.	ZO208	Zoology II	120	4	Compulsory
1.17.	OAF208	Human anatomy and physiology I	120	4	Compulsory
2.01.	OB202	Human biology	60	2	Elective
	EN202	Entomology			
2.02.	BF202	Physiology of plants	60	2	Elective
	OF202	Biophysics			
		Qualification and pedagogical practice	180	6	Compulsory
		Total:	**900**	**30**	

3rd academic year, 5th semester

Subject code	Qualification code of subject	Name of subject	Hours	Credits	Type of choice
1.20.	EAMM2308	Ecology and environmental protection	120	4	Compulsory
1.21.	GSA306	Fundamentals of genetics and selection	120	4	Compulsory
1.22.	BO'M3411	*Methodology of teaching biology I	120	4	Compulsory
1.23.	BMMYE35609	Solving problems and exercises from biology	120	4	Compulsory
1.24.	OAF304	Human Anatomy and Physiology II	120	4	Compulsory
2.03.	BTX302	Biotechnology	60	2	Elective
	BD302	Horticulture			
2.04.	UM302	General microbiology	60	2	Elective
	TAD302	Fundamentals of entrepreneurship and personal management			
		Qualification and pedagogical practice	180	6	Compulsory
		Total:	**900**	**30**	

3rd academic year, 6th semester

Subject code	Qualification code of subject	Name of subject	Hours	Credits	Type of choice
1.20.	EAMM2308	Ecology and environmental protection	120	4	Compulsory
1.21.	GSA306	Fundamentals of genetics and selection	120	4	Compulsory
1.22.	BO'M3411	*Methodology of teaching biology I	120	4	Compulsory
1.23.	BMMYE35609	Solving problems and exercises from biology	120	4	Compulsory
2.05.	AnK302	Inorganic chemistry	120	4	Elective
	FK103	Physics			
2.06.	BOT302	Biology teaching technologies and design	60	2	Elective
	IP304	Basics of medical knowledge			
2.07.	RDB302	Radiobiology	60	2	Elective
	IQT302	Analytical chemistry			
		Internship	180	6	Compulsory
		Total:	**900**	**30**	

4th academic year, 7th semester

Subject code	Qualification code of subject	Name of subject	Hours	Credits	Type of choice
1.25.	KSXT303	Foreign languages in the professional field	120	4	Compulsory
1.26.	BO'M406	*Methodology of teaching biology II	180	6	Compulsory
1.27.	UTTVZY402	Trends and modern approaches in continuing education	60	2	Compulsory
2.09.	MB4404	Molecular Biology	120	4	Elective
	GBT404	Geobotany			
2.10.	O'DO'404	Medicinal plants of Uzbekistan	120	4	Elective
	IXT404	Ichthyology			
2.11.	EvolT406	Evolutionary theory	120	4	Elective
	IM304	Parasitology			
	GA401	Fundamentals of genomics			
	IPA401	Sericulture			
		Internship	180	6	Compulsory
		Total:	**900**	**30**	

4th academic year, 8th semester

Subject code	Qualification code of subject	Name of subject	Hours	Credits	Type of choice
2.08.	QX408	Biological basis of agriculture	180	6	Elective
	Imm 406	Immunology			
2.12.	KO`M404	Methodology of teaching chemistry	120	4	Elective
	KMMYe404	Solving problems and exercises from chemistry			
2.13.	EvolT406	Evolutionary theory/	180	6	Elective
	OrK406	Organic chemistry			
2.14.	AS404	Beekeeping	120	4	Elective
	O'EYT104	General Chemistry			
		Internship	180	6	Compulsory
		Final state exams*	120	4	Compulsory
		Total:	**900**	**30**	

According to the Self-Assessment Report, the following **objectives** and **learning outcomes (intended qualifications profile)** shall be achieved by the Master's degree programme Methodology of Teaching Exact and Natural Sciences (Biology):

- "to have theoretical principles of biological sciences, modern technologies, scientific knowledge in the field of chemistry;
- theoretical and practical methods of conducting scientific research;
- interpretation and generalization of information related to biology, also in foreign languages;
- selection, planning, design and implementation of the content of teaching materials in biology;
- in accordance with the goals and tasks of biological education, taking into account its most important functions, to be able to understand and correctly organize the types and forms of lessons, classroom and extracurricular activities, their characteristics;
- paying attention to individual students in academic groups;
- use of new educational technologies and teaching methods with the introduction of innovations;
- the use of effective methods and didactic and technical means of managing the quality of educational services in the activities of the educational lesson, and identifying organizational deficiencies related to the quality of educational services;
- application of the main principles of management of the educational system;
- self management in monitoring the pedagogical process and correcting deficiencies;
- improving your professional skills in the field of biology;
- presenting the results of educational and research activities in the form of scientific reports;
- formation of scientific research problems and research tasks in the field of biology and science;
- the use of educational technologies with the correct selection of methods and tools for solving problems;
- conducting scientific experiments in the field of biology and analytical interpretation of the obtained results;
- conducting experiments and analyzing and evaluating work situations to find ways to obtain research results."

The following **curriculum** is presented:

1st academic year, 1st semester

Subject code	Qualification code of subject	Name of subject	Hours	Credits	Type of choice
1.01.	ITMM05	Methodology of scientific research.	150	5	Compulsory
1.02.	YO'TSM05	Reforms in the field of education in the development strategy of the new Uzbekistan	150	5	Compulsory
2.01.	BAT06	Basics of gardening	180	6	Elective
	TT06	Testology			
2.02.	NOTT06	Modern technology of making non-traditional fertilizers	180	6	Elective
	PT06	Parasitology			
3.01.		Preparation of scientific research work and master's thesis	120	4	Compulsory
3.02.		Scientific and pedagogical work	120	4	Compulsory
		Total:	**900**	**30**	

1st academic year, 2nd semester

Subject code	Qualification code of subject	Name of subject	Hours	Credits	Type of choice
1.03.	KMM03	Professional spirituality	90	3	Compulsory
1.04.	AFO'MM05	Methodology of teaching special subjects	150	5	Compulsory
2.03.	VCHAT06	Fundamentals of Veterinary	180	6	Elective
		Medicine and Animal Husbandry			
	BRT06	Biophysics and radiology			
2.04.	BICHIT04	Integration of biology and production	120	4	Elective
	BFO'ZYT04	Modern approaches and innovations in teaching biology			
3.01.		Preparation of scientific research work and master's thesis	180	6	Compulsory
3.02.		Scientific and pedagogical work	180	6	Compulsory
		Total:	**900**	**30**	

2nd academic year, 3rd semester

Subject code	Qualification code of subject	Name of subject	Hours	Credits	Type of choice
1.05.	OORAM05	Development of the organic world and anthropology	150	5	Compulsory
1.06.	BLAM05	Conceptual foundations of biology	150	5	Compulsory
2.05.	BDMT04	Current problems of biology	120	4	Elective
	BT04	Bioethics			
2.06.	GHBT06	Gene and Cell Biotechnology	180	6	Elective
	O'HET06	Evolution of plants and animals			
3.01.		Preparation of scientific research work and master's thesis	180	6	Compulsory
3.02.		Scientific and pedagogical work	180	6	Compulsory
		Total:	**900**	**30**	

2nd academic year, 4th semester

Subject code	Qualification code of subject	Name of subject	Hours	Credits	Type of choice
3.01.		Preparation and defense of scientific research work and master's thesis.	540	18	Compulsory
3.02.		Scientific and pedagogical work.	180	6	Compulsory
3.03.		Scientific practice (gaining experience)	180	6	Compulsory
		Total:	**900**	**30**	

According to the Self-Assessment Report, the following **objectives** and **learning outcomes (intended qualifications profile)** shall be achieved by the Bachelor's degree programme Chemistry:

- "knowing the basics of chemical knowledge, basic concepts laws of chemistry, atomic molecular theory, basic principles of chemistry;
- knowledge of the classification of inorganic substances, basic terms and terms, and stoichiometric analysis and analysis;
- having the necessary knowledge, skills and abilities to distinguish physical and chemical properties, knowing the classification of chemical elements, cations and anions in D.I. Mendeleev's periodic system, knowing the methods of physical and chemical analysis and instrumental analysis;
- knowing the chemical structure and classification of organic compounds, the theory of mechanisms, to understand the classification of organic reactions, functional derivatives of hydrocarbons, acquiring the skills of their structure, chemical properties, and their synthesis;
- knowing the basics of chemical kinetics and catalysis, the basics of the mechanism of chemical reactions;
- acquiring practical skills in working with electrochemistry, dispersed systems, methods of their preparation and studying the properties of dispersed systems;
- having mathematical and chemical calculation skills, having knowledge about thermal effects, equilibrium constants of chemical reactions, properties of polymer substances, structure and use of chemical complex compounds;
- demonstrating an active citizenship position in interpersonal and intercultural communication, to play a role in the modernization and digitization of political, cultural, psychological sciences based on fundamental knowledge and skills in the social sphere, having one's own civic position in a democratic society;
- being able to plan the educational process by developing quarterly and annual calendar lesson plans for chemistry and to create educational work plans within the framework of the updated content of general secondary education, academic lyceum and inclusive education;
- organizing and conducting practical and laboratory experiments in the educational process on the topic;
- organizing and managing students' creative and science clubs;
- preparing talented students for republican and international Olympiads in chemistry."

The following **curriculum** is presented:

1st academic year, 1st semester

Subject code	Qualification code of subject	Name of subject	Hours	Credits	Type of choice
1.02.	O'RT104	Practical Uzbek (Russian) language. (ECTS)	120	4	Compulsory
1.03.	O'RT102	Public language proceedings (ECTS	60	2	Compulsory
1.05.	O'EYT104	New history of Uzbekistan	120	4	Compulsory
1.06.	YFVG104	Young physiology and hygiene	60	2	Compulsory
1.08.	PSY108	General psychology	120	4	Compulsory
1.10.	MATH105	Mathematics	120	4	Compulsory
1.17.	FC110	Introduction to the specialty	180	6	Compulsory
1.22.	KT104	History of chemistry	120	4	Compulsory
		Total:	**900**	**30**	

1st academic year, 2nd semester

Subject code	Qualification code of subject	Name of subject	Hours	Credits	Type of choice
1.01.	FALMAD104	Philosophy (ECTS)	120	4	Compulsory
1.07.	MSVAX104	Media literacy and information culture	120	4	Compulsory
1.08.	PSY108	General psychology	120	4	Compulsory
1.11.	GCH110	General chemistry	300	10	Compulsory
1.18.	KH109	Chemical calculation I	120	4	Compulsory
1.23.	KXT103	Chemical safety techniques	120	4	Compulsory
		Total:	**900**	**30**	

2nd academic year, 3rd semester

Subject code	Qualification code of subject	Name of subject	Hours	Credits	Type of choice
1.09.	PED208	General pedagogy	120	4	Compulsory
1.12.	ANK206	Inorganic chemistry	180	6	Compulsory
1.13.	AT204	Application of Information Technology in Professional Activities (ECTS 4)	120	4	Compulsory
1.15.	AK208	Analytical chemistry	120	4	Compulsory
1.18.	KH109	Chemical calculation I	60	2	Compulsory
1.25.	EK204	Environmental chemistry	120	4	Compulsory
		Internship	180	6	Compulsory
		Total:	**900**	**30**	

2nd academic year, 4th semester

Subject code	Qualification code of subject	Name of subject	Hours	Credits	Type of choice
1.09.	PED208	General pedagogy	120	4	Compulsory
1.14.	OK206	Organic chemistry	180	6	Compulsory
1.15.	AK208	Analytical chemistry	120	4	Compulsory
1.16.	PHY203	Physics	120	4	Compulsory
1.18.	KH109	Chemical calculation I	60	2	Compulsory
1.24.	InkT.GP304	Inclusive education. Hospital pedagogy	120	4	Compulsory
		Internship	180	6	Compulsory
		Total:	**900**	**30**	

3rd academic year, 5th semester

Subject code	Qualification code of subject	Name of subject	Hours	Credits	Type of choice
1.04.	KSXT304	Foreign Languages in Vocational Field (ECTS 4)	120	4	Compulsory
1.20.	KH308	Chemical calculation III	120	4	Compulsory
1.26.	FK304	Physical chemistry	120	4	Compulsory
1.28.	KO'M308	Methodology of teaching chemistry I	120	4	Compulsory
2.01.	GEOK203	Geochemistry	120	4	Elective
	SE204	Industrial ecology			
2.02.	BOT304	Botany	120	4	Elective
	BIOK304	Biochemistry			
		Internship	180	6	Compulsory
		Total:	**900**	**30**	

3rd academic year, 6th semester

Subject code	Qualification code of subject	Name of subject	Hours	Credits	Type of choice
1.20.	KH308	Chemical calculation III	120	4	Compulsory
1.27.	KT304	Chemical technology	120	4	Compulsory
1.28.	KO'M308	Methodology of teaching chemistry I	120	4	Compulsory
2.03.	AGK304	Agrochemistry	120	4	Elective
	ELK304	Electrochemistry			
2.04.	ZOO304	Zoology	120	4	Elective
	OAVF304	Human anatomy and physiology			
2.05.	TAD302	Fundamentals of entrepreneurship and personal management	120	4	Elective
	IQT302	Economics			
	KK302	Colloid chemistry			
		Internship	180	6	Majburiy
		Total:	**900**	**30**	

4th academic year, 7th semester

Subject code	Qualification code of subject	Name of subject	Hours	Credits	Type of choice
1.21.	KH402	Chemical calculation IV	60	2	Compulsory
1.29.	KO'M408	Methodology of teaching chemistry II	180	6	Compulsory
1.30.	UTTVZY402	Trends and modern approaches in continuing education	60	2	Compulsory
2.06.	BO'M408	Biology teaching methodology	240	8	Elective
	KKM308	Computer modeling of chemistry			
2.07.	YK404	Green chemistry	180	6	Elective
	KK404	Quantum chemistry			
		Internship	180	6	Compulsory
		Total:	**900**	**30**	

4th academic year, 8th semester

Subject code	Qualification code of subject	Name of subject	Hours	Credits	Type of choice
2.08.	MT403	Substance structure	120	4	Elective
	NK403	Nanochemistry			
2.09.	GEN406	Fundamentals of genetics and selection. Evolutionary doctrine	180	6	Elective
	TBA406	Basics of medical knowledge			
	BMVM406	Problems and exercises from biology			
2.10.	UMMB403	General microbiology	180	6	Elective
	ET403	Evolutionary doctrine			
2.11.	BIOK404	Bioorganic chemistry	180	6	Elective
	KM403	Educational management			
	KBK404	Chemistry of complex compounds			
		Internship	180	6	Compulsory
		Final state exams*	120	4	Compulsory
		Total:	**900**	**30**	

According to the Self-Assessment Report, the following **objectives** and **learning outcomes (intended qualifications profile)** shall be achieved by the Master's degree programme Methodology of Teaching Exact and Natural Sciences (Chemistry):

- "having theoretical principles of chemistry, modern technologies, scientific knowledge in the field of chemistry;
- knowing the theoretical and practical methods of conducting scientific research;
- interpreting the chemistry information in foreign languages;
- selecting, planning, design and implementation of the content of the educational material in chemistry;
- in accordance with the goals and tasks of chemical education, taking into account its most important functions, to be able to understand and correctly organize the types and forms of lessons, classroom and extracurricular activities, their characteristics;
- paying attention to individual students in academic groups;
- using new educational technologies and teaching methods with the introduction of innovations;
- using effective methods and didactic and technical means of managing the quality of educational services in the activities of the educational lesson, and identifying organizational deficiencies related to the quality of educational services;
- application of the main principles of management of the educational system;
- self management in monitoring the pedagogical process and correcting deficiencies;
- improvement of professional qualification in the field of chemistry;
- presenting the results of educational and research activities in the form of scientific reports;
- forming scientific research problems and research tasks in the field of chemistry;
- using the educational technologies with the correct selection of methods and tools for solving problems;
- conducting the scientific experiments in the field of chemistry and analytical interpretation of the obtained results;
- conducting experiments and analyzing and evaluating work situations to find ways to obtain research results."

The following **curriculum** is presented:

1st academic year, 1st semester

Subject code	Qualification code of subject	Name of subject	Hours	Credits	Type of choice
1.01.	ITMM05	Methodology of scientific research.	150	5	Compulsory
1.02.	YO'TSM05	Reforms in the field of education in the development strategy of the new Uzbekistan	150	5	Compulsory
2.01.	YKT06	Green chemistry	180	6	Elective
	TKT06	Commodity chemistry			
2.02.	OBRT06	Reaction mechanisms of organic compounds	180	6	Elective
	TBOUT06	Learning the methods of obtaining natural compounds			
3.01.		Preparation of scientific research work and master's thesis	120	4	Compulsory
3.02.		Scientific and pedagogical work 1	120	4	Compulsory
		Total:	**900**	**30**	

1st academic year, 2nd semester

Subject code	Qualification code of subject	Name of subject	Hours	Credits	Type of choice
1.03.	KMM03	Professional spirituality	90	3	Compulsory
1.04.	AFO'MM05	Methodology of teaching special subjects	150	5	Compulsory
2.03.	MKAT06	Fundamentals of molecular chemistry	180	6	Elective
	NTGKT06	Petroleum and natural gas chemistry			
2.04.	YuMBKT04	Chemistry of higher molecular compounds	120	4	Elective
	EBKT04	Chemistry of elemental organic compounds			
3.01.		Preparation of scientific research work and master's thesis	180	6	Compulsory
3.02.		Scientific and pedagogical work 2	180	6	Compulsory
		Total:	**900**	**30**	

2nd academic year, 3rd semester

Subject code	Qualification code of subject	Name of subject	Hours	Credits	Type of choice
1.05.	AFKMM05	Physico-chemical methods of analysis	150	5	Compulsory
1.06.	KSM05	Chemical synthesis	150	5	Compulsory
2.05.	NST04	Inorganic synthesis	120	4	Elective
	KKT04	Crystal Chemistry			
2.06.	KBKT06	Chemistry of complex compounds	180	6	Elective
	BKT06	Biorganic chemistry			
3.01.		Preparation of scientific research work and master's thesis	180	6	Compulsory
3.02.		Scientific and pedagogical work 3	180	6	Compulsory
		Total:	**900**	**30**	

2nd academic year, 4th semester

Subject code	Qualification code of subject	Name of subject	Hours	Credits	Type of choice
3.01.		Preparation and defense of scientific research work and master's thesis.	540	18	Compulsory
3.02.		Scientific and pedagogical work 4	180	6	Compulsory
3.03.		Scientific practice (gaining experience)	180	6	Compulsory
		Total:	**900**	**30**	