NJSC SHAKARIM UNIVERSITY OF SEMEY

# DEVELOPMENT PLAN
# EDUCATIONAL PROGRAM

8D05301 - Chemistry

Semey

**NJSC "SHAKARIM UNIVERSITY OF SEMEY"**

APPROVED
Member of the Board- Vice rector for
Academic affairs _____ I. Oralkanova
« 25 » _____ 2023

# EDUCATIONAL PROGRAM DEVELOPMENT PLAN
## 8D05301-Chemistry
## for 2023-2026

Semey 2023

## 1. PassportoftheDevelopmentPlanoftheEPofdoctoralprogram8D05301-Chemistry

| | | |
|---|---|---|
| 1 | Basisfordevelopment | Strategic plan of Shakarim University for 2021-2025<br>Facultyworkplan |
| 2 | Implementationtimeline | 2023-2026 |
| 3 | Expectedimplementationresults | • Providingeducationalservicesatthelevelofworldeducationalstandardsthatensurethe competitiveness ofgraduatesin the labormarket<br>• Training of highly qualified personnel with in-deptheducational,methodologicalandresearchtraininginthefieldofchemistry,capableofensuringprogressivescientific,technical,socio-economicandcultural developmentsociety. |

**2. AnalyticaljustificationoftheEP**

**2.1 Informationabouttheeducationalprogram**

The educational program has been developed in accordance with the National Qualifications Framework and ProfessionalStandards, according to the Dublin Descriptors and the European Qualifications Framework. The typical period of mastering theeducationalprogramofdoctoralstudiesis3years.

EP"8D05301-Chemistry"wasdevelopedbytheAcademicCommittee.

Reviewed at the meeting of the Quality Assurance Commission of the Faculty of Engineering and Technology (Protocol No. 4/6 of 10.04.2023)

Approved at the meeting of the Academic Council of the University(Protocol No.8 of 25.04.2023).

Themain criterion for the completion of the educational process is the development ofat least 180 credits, with the award ofthedegreeofDoctorofPhilosophyPhDin theeducationalprogram8D05301-Chemistry.

The educational program 8D05301- Chemistry is aimed at training highly qualified specialists for higher, postgraduate education, research and production areas with in-depth fundamental educational, methodological and research training. The training of specialists in EP 8D05301 – Chemistry is carried out by a special department "Chemical Technology and Ecology" of the Faculty of Engineering and Technology (ITF) on the basis of the Appendix to license no. KZ 38LAA00018432 issued on 25.06.2020, the State Mandatory Standard of Postgraduate Education, the Decree of the Government of the Republic of Kazakhstan dated 31.10.2018, Standard Rules for the activities of educational organizations implementing educational programs of higher and (or) postgraduate education. Order of the Ministry of Education and Science of the Republic of Kazakhstan dated 30.10.2018,No.595.

**2.2 Informationaboutstudents**

| Academicyear<br><br>Thebasisoftraining2022-2023 | 2023-2024 academicyear | 2024-2025 academicyear | 2025-2026 учacademic year |
|---|---|---|---|
| Grant | 10 | 10 | 10 |
| Contract | - | - | - |
| Total | 10 | 10 | 10 |

## 2.3 InternalandexternalconditionsforthedevelopmentofEP

Theacademicpolicyofthedepartmentimplementing OP 8D05301-Chemistryisaimedatusinginnovativeteachingtechnologies based on the best practice of teaching modern pedagogical and technical disciplines, on the quality of teaching usingmodern learningstrategies,modernteaching methodsin higher education.

Students, teaching staff and university staff have unlimited access to information and educational resources and electroniclibrary systems necessary to perform independent educational and research work. Electronic information resources: full access to databases – Scopus, Science Direct, the Electronic Library system "Polpred", Cyberleninka, the Presidential Library named after B.N. Yeltsin, the digitallibraryofthepublishinghouseAKNURPRESSandSmart-kitap(multimediae-books).PolyCom,Zoomconference system is used for online conferences, lectures, seminars with the participation of leading scientists from Kazakhstan, nearandfar abroad.

Students have access through an electronic resource https://ais.semgu .kz for teaching materials - lectures, videos, tasks for self-examination, presentations on topics, teaching aids. There is an open system "Openmeeting", which allows you to conduct two-wayandmulti-sidedvideoandaudioconferencesingoodquality.

The most common innovative methods developed by teaching staff of departments for lecturing, conducting practical andseminar classes, independent work of students include: video lectures, slide presentations, working with an interactive whiteboard,using software (ORIGIN, CHEMOFFICE, Activ Inspire, Freemake Video Converter, QuizMaker, Kahoot). In seminars and practicalclasses, ORIGIN and CHEMOFFICE programs are used in the processing of results. Every year, as part of the panorama of openclasses,masterclasseson lecturesandseminarsandpracticalclassesinan interactiveformareheld.

All types of practices implemented within the framework of the OP are carried out according to the program of practices approved bythe Faculty Council, the academic calendar, contracts with practice bases, as well as on the basis of P 042-2.14-2022 "Regulations onthe organization and conduct of practices and scientific internships of undergraduates and PhD doctoral students" and the order of therectoroftheuniversity.Thepracticebasesmeet therequirementsand content ofthepractice.

ThebasesofpracticesofEP"8D05301-Chemistry"are:

- InstituteofPolymerMaterialsandTechnologies(Almaty)
- ResearchInstituteofChemicalandEnvironmentalProblems
- Testingregionallaboratoryofengineeringprofile"ScientificCenterforRadioecologicalResearch"
- NationalNuclearCenteroftheRepublicofKazakhstan(Kurchatov)
- EcosadLLP
- FacultyofScienceUniversityofHelsinki(Finland)
- CenterforNuclearMedicineandOncology
- A.N. Nesmeyanov Institute of Organoelement Compounds of the Russian Academy of Sciences (Moscow, Russian Federation)

• "Dubna University" (Russian Federation).

An important factor is the development of academic mobility within the framework of the OP, the involvement of the best foreign and domestic teachers. As of October 2023, the department has submitted an application for the invitation of a foreign scientist Aseev V., PhD, University of Helsinki, Finland. By invitation, from October 16 to November 11, 2023, lectures and consulting of doctoral dissertations of PhD Juzsakova T (University of Pannonia, Hungary) are planned. According to the results of the visits, joint publications in rating journals are expected to be prepared, as well as the conclusion of a memorandum of cooperation with Pannonia University.

**2.4 Informationabouttheteachingstaffimplementingtheeducationalprogram**

| № | Indicators | Unit ofmeasurement | 2023-2024 academic year | 2024-2025 academic year | 2025-2026 academic year |
|---|---|---|---|---|---|
| 1 | Share of teaching staffwithanacademicdegreein EP | % | 100 | 100 | 100 |

Theteaching staff of theDepartmentofChemicalTechnologyandEcology,which providestheimplementation ofEP8D05301 – Chemistry, consists of 6 people, including 2 candidates of Chemical Sciences, 1 candidate of Biological Sciences, 3 PhDdoctors. Settling down is 100%. All teachers of the educational program have a basic education and perform pedagogical activitiesaccordingtoanindividualplan,therearenodeviationsfromtheplan.

The department carries out the educational process at three levelsof study: bachelor's degree, Master's degree and PhDdoctorate.

The formation of scientific and pedagogical personnel at the department is carried out by training through a master's degree,PhD doctoral studies, advanced training of the teaching staff. Currently, 10 masters are studying for a doctorate in the educationalprogram"8D05301–Chemistry".

EP teachers undergo advanced training in leading universities of Kazakhstan (according to the FPC plan) and training seminarsheld by the Ministry of Education and Science of the Republic of Kazakhstan, universities and other organizations. Teachers' trainingis confirmed by certificates and certificates. Teaching staff of the University undergo scientific internships in universities of far andnearabroad,inuniversitiesand research institutesoftheRepublicofKazakhstan.

The qualified staff of teachers is able to provide a high-quality educational process, meets the qualification requirements, thelevel and specifics of the educational program. Among the teaching staff of the department, 3 are holders of the title "Best UniversityTeacher",2 areholdersoftheStateScientificScholarshipfor talentedyoungscientists.

Teachersandstudentsofthedepartmentareactivelyengagedinscientificactivities.Thescientificdirectionofthedepartmentis connected with research in the field of polymer complexes and their practical application for various purposes – the creationofbiocompatible materials, in the fight against land desertification, for reforestation, water purification from radionuclides. Teachingstaff of the department "HTE" successfully implements funded research projects. Over the past 5 years, 4 funded projects have beenfullyimplemented,currently1projectisbeingimplemented.

The teaching staff of the department has a high scientific and methodological publication activity. The results of the scientificactivity of teachers are reflected in scientific publications with a high impact factor. Scientists of the Department of "HTE" have theHirsch index(h-index)intheWebofSciepseandScopusdatabases.

**2.5 Characteristicsoftheachievements oftheEP**

OP 8D05301 – Chemistry in 2023 successfully passed specialized accreditation in the Independent Accreditation and Rating Agency (IARA) for a period of 5 years.

**3. ThemainobjectivesoftheEPdevelopmentplan**

FortheeffectiveimplementationoftheEP,thefollowingtasksaredefined

- Providingconditionsforobtainingafull-fledged,high-qualityprofessionaleducation
- Formationofthemainprofessionalcompetenciesoffuturespecialists
- Expansionofinternationalcooperationwithuniversitiesofthefarandnearabroad
- Consultations of employers and leading scientists in the selection of relevant and practically significant doctoral dissertationsExpected final results imply: participation in funded grant projects, publication activity of teaching staff in rating publications with anon-zeroimpactfactor, development andoperation of jointeducational programswith foreign universities, implementation ofresearch results in the educational process, involvement of doctoral students in the implementation of scientific research research,academic mobility of students and teaching staff

**4. Risk analysis of EP**

| № | Thenameoftherisks | Measurestoeliminate |
|---|---|---|

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|---|---|---|
| 1 | Reduction of the contingent of students in the EP | Involvement in training on a contractual basis, strengthening the language training of applicants |
| 2 | Untimely exit of doctoral students to defend their dissertation | Monitoring the implementation of the IPRD and the publication plan |
| 3 | Insufficient development of external and internal academic mobility of students and teaching staff | Strengthening academic mobility through training and scientific internships of students and teaching staff in domestic and foreign universities, according to the Bolashak program |

## 1. Action plan for the development of the EP

| № | Criteria | Expectedresults | unit | 2022-2023 | 2023-2024 | 2024-2025 |
|---|---|---|---|---|---|---|
| **Direction1.Educationalandmethodologicalsupport** | | | | | | |
| **1.1** | Updatingtheeducationalprogrambasedonprofessionalstandards,takingintoaccounttherecommendations ofemployers | Conducting an examination of theEducationalprogram"8D05301-Chemistry"inordertoincrease practicalorientation anddevelopmentofprofessionalcompetenciesof graduates | fact | + | | + |
| **1.2** | Monitoringandupdatingcatalogsofelectivedisciplines in accordance with the development ofkey and professional competencies, labor marketdemands | Improvingthequalityofthecontentofeducational programs by including electivecoursesaimedatdevelopingkeyandprofessionalcompetenciesofgraduatesinaccordance withrequests labormarket. | fact | + | | + |

| | | | | | | |
|---|---|---|---|---|---|---|
| **1.3** | Introductionintotheeducationalprocessofmodern learning technologies that contributetothedevelopmentofcognitiveactivity,communicativeabilityofstudents | Improving the quality of teaching academicdisciplines, taking into account the noveltyanddiversityofformsofworkthatcontribute to the development of cognitiveactivity. | fact | + | | + |
| **1.3.1** | Implementation of Massive Open Online Courses(MOOCs) in the educational process according tothe educationalprogram | Introductionofdisciplinesintotheeducational processImproving thequalityofteachingacademicdisciplines,taking intoaccountthenoveltyanddiversityofformsofworkthatcontributetodevelopmentcognitiveactivity. | unit | | | **1** |
| **1.4** | nvolvementofsocialpartnersandemployersinthe development, examination of the implementationofeducationalprograms | Improving thequalityofongoingeducational programs, taking into account marketdemandsand employers'recommendations | unit | **1** | **1** | **1** |
| **1.5** | Developmentandimplementationofelective coursesinEnglish | Introductiontotheeducational process of disciplinesinEnglish | unit | - | - | - |
| **1.6** | Conductingseminarsandroundtablesontheapplicationofinnovativetechnologiesintheeducationalprocess | Implementationofinnovativetechnologies intheeducational process | unit | **1** | **1** | **1** |
| **1.7** | Publicationof educational,educational-methodicalandscientificliteratureonimplementedEPs | Improvementofeducationalandmethodological support in the disciplines ofongoingeducationalprograms | unit | **1** | **1** | **1** |
| **1.8** | Conclusionofagreementswithforeignanddomestic universities-partnersinordertodevelop the academic exchange of students of alllevels andteachingstaff | Creationofadatabaseofforeignanddomesticuniversities-partnersforthedevelopmentofacademicexchangeofstudents ofalllevelsandfaculty | unit | **1** | **1** | **1** |
| **1.9** | Invitation of students from partner universities tostudyforasemester,short-terminternships,practice,etc. | Developmentofinternationalrecognitionofeducational programs, implementation ofacademicmobilityprogramsfor students | pers | | **1** | |

| | | | | | | |
|---|---|---|---|---|---|---|
| **1.10** | Participationofteachingstaffandstudentsininternationalacademicexchange programs | Developmentofinternationalcooperation with foreign universities implementingeducationalprogramsofthe educationalprogram"8D05301-Chemistry" | pers | | **1** | |
| **1.11** | Developmentofoutgoingacademicmobilityof teachingstaffandstudentsinthedirectionofPhysical andchemicalsciences | Improvingtheeducationalprogrambasedonthe useofexperienceintheimplementation ofsimilarprograms in the leadinguniversitiesoftheRepublicofKazakhstan | pers | | **1** | |
| **Direction2.Faculty** | | | | | | |
| **2.1** | Raisingtheprofessionallevelandtrainingofscientificandpedagogicalpersonnelfortheimplementation ofeducationalprogramsonceevery5years | Theshareofteachingstaffwhohaveundergoneadvancedtrainingattherepublican levelis atleast 20% | pers | **1** | **1** | **1** |
| **2.2** | Passageofadvancedtraining,retraining,internships of teaching staff at the internationallevel | Passageofatleast2teachersoftheadvancedtraining program, retraining, internship ofteachingstaff atthe internationallevel | pers | | **1** | |
| **2.3** | Promotionofpublicationsoftheteachingstaff's worksininternational publicationsindexedbytheWebofScienceandScopus databases | Anincreaseintheshareofteachingstaff whopublishedtheresultsofscientificresearch in publications indexed by the Webof Science andScopus databases - at least30%of totalnumber of teachingstaff | % | **30** | **30** | **30** |
| **2.4** | Involvementofspecialistsinthepracticalfieldofactivity in teachingandscientificactivities | Participationintheimplementationofeducationalprogramsofpractitioners(atleast20%ofspecialists) | % | - | - | - |
| **3.Internationalizationofeducationalprograms** | | | | | | |

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|---|---|---|---|---|---|---|
| **3.1** | Conclusionofagreementsoninternational cooperationwithforeignuniversities | Implementationofjointprojects,preparation of scientific publications with foreignpartners, creation of bases for scientificinternships students | unit | | **1** | |
| **3.2** | Attractingforeign studentsto studyunderthe educationalprogram | "8D05301-Chemistry"Increasingthe numberofforeignstudents | pers | - | - | - |
| **3.3** | Organizationofjointscientificandpracticalevents with internationalpartners | Increasingtheefficiencyofscientificandscientific-methodicalactivitiesofteachingstaff,exchange ofexperiencewithforeignpartners | unit | | **1** | |
| **3.4** | Invitationofforeignexpertsforlecturesand consultations on master's projects anddissertations | Improvingthecontentcomponentofeducationalprogramsbasedontheintroduction of the experience of foreignspecialistsintheimplementationofeducational programs | unit | **1** | **1** | **1** |
| **3.5** | Expansion of cooperation with leading foreignscientificandeducationalorganizationsinordertoattract the most qualified foreign specialists to theimplementation ofeducational programs. | Formation of key and professional competenciesinaccordancewiththepracticeofleadinguniversities | pers. | | **1** | |
| **Direction4.Direction4.Materialandtechnicalsupport anddigitalization** | | | | | | |
| **4.1** | Gradualequippingofclassroomswithtechnicalteachingaids(projectors,panels,interactiveandmultimediawhiteboards,multifunctionaldevices,webcam,projectorscreen,etc.) | Equippingclassroomsassignedtothedepartmentwithtechnicalteachingaids(projectors, panels,interactiveandmultimediaboards,multifunctionaldevices,webcam,projector screen,etc.) | ед. | **1** | **1** | **1** |

| | | | | | | |
|---|---|---|---|---|---|---|
| **4.2** | Carrying out automation of the educationalprocess(testing,sessionmanagement,movementofthecontingentofstudents,dean'soffice,department,teachingstaffload,schedule,library,syllabuses) | Information management based on theautomation of the educational process(testing, session management, studentmovement, dean's office, department,teaching staff load, schedule, library,syllabuses) | fact | + | + | + |
| **4.3** | Replenishment of the full-text database ofresultsofscientificresearchresourcesofteachingstaffandstudents(articlesandmonographs,etc.) | Increasingthenumberofresultsofscientific works of scientists, researchof teaching staff and students, teachingstaff(articles,monographs,etc.) | unit | **1** | **1** | **1** |
| **4.4** | Expansion of the fund of scientific and educational literature, including on electronic media on ongoing educational programs | Ensuring the implementation of educational programs based on modern educational and information resources, including on electronic media | % | **10** | **10** | **10** |
| **4.5** | Monitoring and filling and improving the website of the faculty | Formation of the website of the faculty on various aspects of the implementation of educational programs | % | **50** | **50** | **50** |

Head of the department _____ Sabitova A.N.

**CONSIDERED**

On the meeting of the Quality Assurance

Commission engineering and technical Faculty

Meeting protocol #4/6 from 10.04.2023

The Head of QAC _____ Abdilova G.B.

**APROVED**

Dean of Faculty _____ Nurymkhan G.N.

«25» 05 2023ж