ASIIN Accreditation Report

Bachelor's Degree and Master's Degree Programme
Chemical Technology of Inorganic Substances
Chemical Technology of Organic Substances

Master's Degree Programme
Chemical Technology of Explosives and Pyrotechnical Produce
Nanotechnology and Nanomaterials
Petrochemistry

Provided by
al-Farabi Kazakh National University

Version: 01st July 2016

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A About the Accreditation Process

Title of the degree Programme	Labels applied for [1]	Previous accreditation	Involved Technical Committees (TC)[2]
Ba Chemical Technology of Inorganic Substances	ASIIN, Eurobachelor® Labell	none	09
Ma Chemical Technology of Inorganic Substances	ASIIN, Euromaster® Label	none	09
Ba Chemical Technology of Organic Substances	ASIIN, Eurobachelor® Label	none	09
Ma Chemical Technology of Organic Substances	ASIIN, Euromaster® Label	none	09
Ma Chemical Technology of Explosives and Pyrotechnical Produce	ASIIN, Euromaster® Label	none	09
Ma Nanotechnology and Nanomaterials	ASIIN, Euromaster® Label	none	09
Ma Petrochemistry	ASIIN, Euromaster® Label	none	09
Date of the contract: 10.06.2013 **Submission of the final version of the self-assessment report:** 17.02.2014 **Date of the onsite visit:** 08.07.2014 **at: Almaty**			

[1] ASIIN Seal for degree programmes; Eurobachelor®/Euromaster® Label: European Chemistry Label

[2] TC: Technical Committee for the following subject areas: TC 01 – Mechanical Engineering/Process Engineering; TC 02 – Electrical Engineering/Information Technology); TC 03 – Civil Engineering, Surveying and Architecture; TC 04 – Informatics/Computer Science); TC 05 – Physical Technologies, Materials and Processes); TC 06 – Industrial Engineering; TC 07 – Business Informatics/Information Systems; TC 08 – Agronomy, Nutritional Sciences and Landscape Architecture; TC 09 – Chemistry; TC 10 – Life Sciences; TC 11 – Geosciences; TC 12 – Mathematics; TC 13 – Physics.

Peer panel: Prof. Dr. Heinrich Lang, Technical University Chemnitz; Prof. Dr. Reinhard Schomäcker, Technical University Berlin; Prof. Dr. Gerolf Marbach, University of Applied Sciences Esslingen; Dipl.-Ing. Roy Seewald, Shell Deutschland Oil GmbH; Ekaterina Astafyeva, student of South Kazakhstan State University
Representative of the ASIIN headquarter: Dr. Georg Ebertshäuser
Responsible decision-making committee: Akkreditierungskommission für Studiengänge
Criteria used: European Standards and Guidelines as of 10.05.2005 ASIIN General Criteria, as of 28.06.2012 Subject-Specific Criteria of Technical Committee 09 – Chemistry as of 09.12.2011

In order to facilitate the legibility of this document, only masculine noun forms will be used hereinafter. Any gender-specific terms used in this document apply to both women and men.

B Characteristics of the Degree Programmes

a) Name & Final Degree	b) Areas of Specialization	c) Mode of Study	d) Duration & Credit Points	e) First time of offer & Intake rhythm	f) Number of students per intake	g) Fees
Chemical Technology of Inorganic Substanc-es/B.Sc.	n.a.	Full time	8 Semester 253 CP	2005 WS	90 / year	700 000 kzt
Chemical Technology of Inorganic Substanc-es/M.Sc.	n.a.	Full time	4 Semester 105 CP	2005 WS	9 / year	750 000 kzt
Chemical Technology of Organic Sub-stances/B.Sc.	n.a.	Full time	8 Semester 243 CP	2004 WS	146 / year	700 000 kzt
Chemical Technology of Organic Sub-stances/M.Sc.	n.a.	Full time	4 Semester 98 CP	2004 WS	20 / year	750 000 kzt
Chemical Technology of Explosives and Pyro-technical Pro-duce/M.Sc.	n.a.	Full time	4 Semester 85 CP	2008 WS	10 / year	650 000 kzt
Nanotechnol-ogy and Nanomaterial s/M.Sc.	n.a.	Full time	4 Semester 85 CP	2010 WS	10 / year	650 000 kzt
Petrochemistr y/M.Sc.	n.a.	Full time	4 Semester 98 CP	2010 WS	8 / year	650 000 kzt

For the degree programme BA Chemical Technology of Inorganic Substances, the self-assessment report states the following **intended learning outcomes**:

knowledge

knowledge
knowledge of mathematics, physics and chemistry which enables them to understand the phe-

nomena which occur in the field of chemical engineering
knowledge the methods for the preparation of basic inorganic chemicals
knowledge the fundamental principles of chemical engineering for the modelling and simulation of chemical reactions, of energy, mass and momentum transport processes, and of separation processes.
Knowledge of modern information technologies used in processing the results of scientific experiments, in collecting, processing, storage information and communication, application of technology, their using in conducting scientific research
Knowledge of foreign languages and the state, to have skills of oral and written communication

understanding

understanding
An understanding of professional and ethical responsibility
An understanding of principles of chemical technology of inorganic substances
An understanding of applicable techniques and methods and their limits in chemical engineering
An understanding the impact of chemical engineering solutions in an environmental and societal context

Results of training programs:

application

application
To apply knowledge of mathematics, science, and chemical engineering
The ability to design and conduct experiments, as well as to analyze and interpret data
The ability to apply their knowledge of different areas taking safety measures and ecological and economic demands into account responsibly, and also to extend their knowledge on their own responsibility
The ability to present the results of their work in both written and oral form in an articulate

way
Application of legislative and regulatory acts in the field of safety and environmental protection in professional activities

analysis

analysis
The ability to analyze flow diagrams for chemical products
The ability to analyze techno-economic indices of production
To identify problems in their subject and to abstract, formulate and solve them holistically using fundamental principles
To consider and analyse processes and methods of inorganic substances preparation
Interpretation the scientific information in the field of chemical technology
Classifying the most relevant theoretical and applied tasks of various field of chemical industry, to collect, perform critical analysis and interpret new information

synthesis

synthesis
Creation of new scientific information
Formulation of its proposals clearly and precisely
Formulation and presentation the problem and ways of their solution to address staff and colleagues in the form of reports, presentations and discussions
Assembling the large amounts of information of different nature of chemical and technological processes and highlight the main thing
Plan the acquition, storage and release of stocks in the production of inorganic substances

evaluation

evaluation

Environmental assessment of the chemical technology
Economic evaluation of the chemical technology
Select and apply suitable methods of analysis, modelling, simulation and optimization in chemical engineering
Evaluation the ideas about state-of-the-art scientific world pattern and the latest trends of its modification
Estimation the conclusions on the basis of obtained experimental data

The following **curriculum** is presented:

Title of modules	Course code	Title of courses	Credit	ECTS credits	Lec/ prac/ Lab.	Sem
Semester 1						
1. State Compulsory Module (9 credits)	HK1101	History of Kazakhstan	3	5	2+1+0	1
	POK(R)L1102	Professionally-Oriented Kazakh (Russian) Language	3	5	0+3+0	1
	POFL1103	Professionally-Oriented Foreign Language	3	5	0+2+1	1
3. Vocational Modules (9 credits)	**Basic Professional Modules**					
	Module 1. Mathematics					
	Mat11401	Mathematics 1	3	5	1+2+0	1
	Module 2. Physics					
	Fiz11403	Physics 1	3	5	1+0+2	1
	Module 3. Inorganic chemistry					
	TBIH1406	Theoretical bases of inorganic chemistry	3	5	1+0+2	1
Semester 2						
3. Vocational Modules (18 credits)	**3.1 Natural Sciences (STEM) module**					
	MMTP1301	Mathematical modeling of technological processes	3	5	1+2+0	2
	ECG1302	Engineering and computer graphics	3	5	1+0+2	2
		Module 1. Mathematics				
	Mat21402	Mathematics 2	3	5	1+2+0	2
		Module 2. Physics				
	Fiz21404	Physics 2	3	5	1+0+2	2
		Module 3. Inorganic chemistry				
	ICh1405	Inorganic chemistry	3	5	1+0+2	2
		Module 4. Analysis and its metrological support				
	Ach1407	Analytical chemistry	3	5	1+0+2	2
4. Internship (4 credits)	Professional internship (by types of internship)					
	EP101	Educational internship (1 week)	4	7		2
Semester 3						
2. Social and Communicative Module (18 cred-	PIC2201	Psychology of Interpersonal Communication	2	3	1+1+0	3
	TAPS2202	Theoretical and Applied Political Science	2	3	1+1+0	3
	EPSS2203	Ethics of Personal and Social Success	2	3	1+1+0	3
	CR2204	Culture and Religion	2	3	1+1+0	3
	GAS2205	General and Applied Sociology	2	3	1+1+0	3
	HLS2206	Human Life Safety	2	3	1+1+0	3

its)	ESD2207	Ecology and Sustainable Development	2	3	1+1+0	3
	KL2208	Kazakhstan Law	2	3	1+1+0	3
	FE2209	Fundamentals of Economics	2	3	1+1+0	3
3. Vocational Modules (19 credits)	**3.2. Basic Professional Modules**					
	PhChMA2408	Physico-chemical methods of the analysis	3	5	1+0+2	3
	SMC2409	Standardization, metrology and certification	2	3	1+1+0	3
	Module 5. Chemistry of organic substances and materials					
	OH2410	Organic chemistry	3	5	1+0+2	3
	Module 7. Physical chemistry					
	PhChI2414	Physical chemistry I	3	5	1+0+2	3
	4 Interdisciplinary Module					
	IE2401	Innovative Entrepreneurship (trade-wise)	2	3		3
	IPL2402	Intellectual Property Law	2	3		3
	ECDChP2403	Economic calculations in design of chemical productions	2	3		3
	Pat2404	Patent science	2	3		3
Semester 4						
1. State Compulsory Module (2 credits)	PSK1104	Philosophy of Scientific Knowledge	2	3	1+1+0	4
3. Vocational Modules (18 credits)	**3.1 Natural Sciences (STEM) module**					
	TAM2304	Theoretical and applied mechanics	3	5	1+0+2	4
	3.2. Basic Professional Modules					
	Module 5. Chemistry of organic substances and materials					
	ChHMC2411	Chemistry of high-molecular compounds	3	5	1+0+2	4
	Module 6. Colloidal chemistry					
	CChSP2412	Colloidal chemistry and superficial phenomena	2	3	1+1+0	4
	PWCChSP2413	Practical work on colloidal to chemistry and the superficial phenomena	2	3	0+0+2	4
	Module 7. Physical chemistry					
	PhChII2415	Physical chemistry II	3	5	1+0+2	4
	Module 8. Fundamentals of Chemical Technology, processes and devices					
	TMPDChTI2416	The main processes and devices in chemical technologyI	3	5	1+0+2	4
4. Internship (2 credits)	Professional internship (by types of internship)					
	PT202	Internship Training (2 week)	2	3		4
Semester 5						
3. Vocational Modules (18 credits)	**3.1 Natural Sciences (STEM) module**					
	BN3303	Basics of nanotechnology	3	5	1+2+0	5
	Module 8. Fundamentals of Chemical Technology, processes and devices					
	TMPDChTI3417	The main processes and devices in chemical technologyII	3	5	1+0+2	5
	Module 9. New in technology of production of mineral raw materials					
	MRMKWFT3419	Mineral raw materials of Kazakhstan. Waste-free technology	3	5	1+0+2	5
	3.3 Modules for Individual Educational Trajectories (IET)					5
	Chemistry and technology of rare elements	**Electrochemical technology of inorganic substances**	**Chemical technology based on high-temperature processes**	**Chemical technology of silicate and binding materials**	**Complex processing of mineral raw materials**	

	EEBTRE3502 Electrical equipment bases in technology of rare elements	BTE3502 Bases of theoretical electrochemistry	TEP3502 Technology of electrothermal processes	ChChTG3502 Chemistry and chemical technology of glass	AMRMPP3502 Analysis of mineral raw materials and products of its processing	3	5	1+0+2	5
	ARM3503 Analysis of raw materials	ORPChT3503 Oxidation-reduction processes in chemical technology	FCChCPh3503 Fundamentals of crystal chemistry and crystal physics	ChTSMS3503 Chemical technology of semiconductor and metallurgical silicon	SPAOM3503 Sample preparation in the analysis of ores and minerals	3	5	1+0+2	5
	DERM3504 Division and enrichment of raw materials	EEET3504 Electroradio engineering in electrochemical technologies	EEChT3504 Electrical engineering in chemical technology	ChTBM3504 Chemical technology of binding materials	ChTIABS3504 Chemical technology of inorganic acids, bases and salts (1+0+2)	3	5	1+0+2	5
Semester 6									
3. Vocational Modules (19 credits)	**Module 8. Fundamentals of Chemical Technology, processes and devices**								
	TARRE3418	Technology and analysis of rare and rare-earth metals				3	5	1+0+2	6
	Module 9. New in technology of production of mineral raw materials								
	ChTMF3420	Chemistry and technology of mineral fertilizers				3	5	1+0+2	6
	Module 10. Electrochemical technology and analysis of inorganic materials								
	ETIS3421	Electrochemical technology of inorganic substances				3	5	1+0+2	6
	GChT3422	General chemical technology				3	5	1+0+2	6
	Module 11. Materials Science and technical equipment factories								
	Mat3424	Materials Science				3	5	1+1+1	6
	3.3 Modules for Individual Educational Trajectories (IET)								
	Chemistry and technology of rare elements	**Electrochemical technology of inorganic substances**	**Chemical technology based on high-temperature processes**	**Chemical technology of silicate and binding materials**	**Complex processing of mineral raw materials**				
	SW3501 Scientific writing	SW3501 Scientific writing	SW3501 Scientific writing	SW3501 Scientific writing	SW3501 Scientific writing	1	1		6
	ETR3505 Electrochemical technology of rare metals	EEPPAC3505 Equipment of electrochemical productions and protection against corrosion	MPhASM3505 Modern physical analysis of substances and materials	ChChTCM3505Chemistry and chemical technology of ceramic materials	HNM3505 Hydrometallurgy of nonferrous metals	3	5	1+0+2	6

4. Internship (2 credits)	4.1	Professional internship (by types of internship)							
	PT303	Internship Training (5 week)				2	3		6
Semester 7									
3. Vocational Modules (20 credits)	**Module 11. Materials Science and technical equipment factories**								
	BDEP4423	Bases of design and equipment of plants				3		1+2+0	7
	3.3 Modules for Individual Educational Trajectories (IET)								5
	Chemistry and technology of rare elements	**Electrochemical technology of inorganic substances**	**Chemical technology based on high-temperature processes**	**Chemical technology of silicate and binding materials**	**Complex processing of mineral raw materials**				
	ACTREE4506 Analytical control in technology of rare-earth elements	EN4506 Electrochemistry of nanomaterials	HTPChP4506 High-temperature plasma-chemical processes (1+0+1)	IChTOM4506 Innovations in chemistry and technology of inorganic materials	PChTP4506 Power of chemical and technological processes	2	3	1+0+1	7
	TRM4507 Technology of refractory metals	EM4507 Electrolysis of melts	TPTChEP4507 Technical thermodynamics and power technology of chemical engineering processes	ChChTIP4507 Chemistry and chemical technology of inorganic polymers	TTSEP4507 Technogenic systems and environment protection	3	5	1+0+2	7
	TPM4508 Technology of precious metals	EWMR4508 Electrolysis without metal recovery	ChTBCEP4508 Chemical technology on the basis of combustion and explosion processes	TRSBSM4508 Technology of receiving sorbents on the basis of silicate material	TRTISFGMK4508 Technology of target inorganic substances obtaining from gallurgy raw materials of Kazakhstan	3	5	1+0+2	7
	ChChTU4509 Chemistry and chemical technology of uranium	EAEPPIS4509 Electrochemistry in addressing environmental problems of production of inorganic	SHSTIM4509 SHS technology of inorganic materials	ChChTHIM4509 Chemistry and chemical technology of heat-insulating	TTPSPMBP4509 The theory and internship of synthesis of polymeric materials on	3	5	1+0+2	7

		substances		materials	the basis of phosphates				
	CPTRE4510 Complexation processes in the technology of rare elements	THEP4510 Technology of hydroelectro metallurgical processes	SFChEI4510 Safety fundamentals of chemical engineering industries	ChTFRM4510 Chemical technology of fire-resistant materials	ChTRBCC4510 Chemistry and technology of obtaining boron-containing compounds	3	5	1+0+2	7
	SAChEP4511 Systems analysis of chemical engineering processes	ETHP4511 Electrochemical technology and hydrogen power	ChTPEC4511 Chemical technology of pyrotechnic and explosives compounds	ChTA4511 Chemical technology of alumina (1+0+2)	TPCWM4511 Technology of production of complex N, P, K-fertilizer with microelements	3	5	1+0+2	7
Semester 8									
4. Internship (4 credits)	4.1	Professional internship (by types of internship)							
	PT404	Internship Training (9 week)				4	7	Internship Training (9 week)	8
5. Final Certification (2 credits)	PPBD	Preparation and Presentation of Bachelor's Dissertation (Diploma Project)				2	3		8
6. Additional Types of Learning **(8 credits)**	PhT	Sport and Recreation				8	15		1,2, 3,4

For the degree programme MA Chemical Technology of Inorganic Substances, the self-assessment report states the following **intended learning outcomes**:

knowledge

knowledge
Knowledge of design principles of industrial chemical systems
Knowledge in the commercialization of scientific results, finding the most relevant and cost-effective chemical processes and innovative technologies
Knowledge on the essential facts, concepts, principles and theories relevant to the chemical technology of inorganic substances

Knowledge on the using of laboratory methods or computer-based tools to generate data

understanding

understanding
Understanding of problem solving capacities to new and unfamiliar situations in wide multidisciplinary situations, although related to their area of studies
Understanding advanced concepts of fundamental sciences and engineering to identify, formulate and solve complex chemical engineering problems, particularly as they pertain to renewable energy and sustainability
Understanding of how this knowledge may be applied in practice in an economic and environmentally sustainable fashion
Understanding the research techniques which might include information retrieval, experimental design and statistics, modelling and safety
Understanding on the management and communication skills, including problem definition, project design, decision processes, teamwork, written and oral reports, scientific publications

Results of training programs:

application

application
Contribute to innovation and practical implementation of ideas for new chemical processes and concepts in research and industry within their area of specialization
Plan and carry out experimental research within their field of study including necessary risk assessments for health, safety and the environment
Working both independently and in teams with technical and scientific problems of high complexity and to put the work into a broader context of industry and society
Applying advanced concepts of chemical engineering to design and develop chemical reactors, unit operations and plant processes for effective renewable energy, sustainability and chemical production

Conducting and interpreting manual and instrumental quantitative and qualitative analyses* and tests accurately using prescribed laboratory procedures

analysis

analysis
Analysis and solve problems using a multidisciplinary approach, applying professional judgements to balance costs, benefits, safety and social and environmental impact
Analysis results, determine their strength and validity, and make recommendations
Analysis the problem-solving skills to chemical engineering technology
To consider mathematical, physical, and chemical concepts to the performance of assigned tasks and the analysis of problems

synthesis

synthesis
Planing, conducting and writing-up a programme of original research
Performing a process feasibility study by calculations of mass and energy balances, simpler investment analyses and other process-economic considerations
Integratig knowledge, deal with complex matters, develop solutions or put forward opinions on situations of limited or incomplete information, including reflecting upon the implications and ethical and social responsibilities that result from both those solutions and opinions or indeed that condition them
Performing a technical presentations

evaluation

evaluation
Assess the need to implement changes in processing plants by improving unit operations in terms of product quality, environmental impacts and increased production
Acquire and evaluation relevant information and to read, interpret and sum up scientific litera-

ture on the chemical technology of inorganic substances
Evaluate, formulate and apply appropriate problem solutions in the field of chemical technology of inorganic substances
Evaluate and integrate information from a variety of sources

The following **curriculum** is presented:

Title of modules	Course code	**Title of courses**	Credit	**ECTS credits**	**Lec/ prac/ Lab.**	**Sem.**
Semester 1						
1. State Compulsory Module (8 credits)	IFN 5201	History and Philosophy of Science	2	3	1+1+0	1
	IYA(p)5202	Foreign language (Professional)	2	3	1+1+0	1
2. Compulsory Professional Module (14 credits)	AVAPMS 5205	Topical Questions of Analysis and Processing of Mineral Resources	2	3	1+1+0	1
	OPNI 5206	Organization and Planning of Scientific Research	3	5	2+1+0	1
	TPPNM 5207	Technology of obtaining polymeric inorganic materials	3	5	2+1+0	1
	IGTPE 5208	Selected chapters of theoretical and applied electrochemistry	3	5	2+1+0	1
4. Additional Types of Training (13 credits)	NIRM I	Master's Reseach Work and Fullfilment of Dissertation	1	1	1	1
Semester 2						
1. State Compulsory Module (8 credits)	Ped 5203	Pedagogics	2	3	1+1+0	2
	Psy 5204	Psychology	2	3	1+1+0	2
2. Compulsory Professional Module (14 credits)	MPTD 5209	Technique of Teaching of Technological Disciplines	3	5	2+1+0	2
3. Modules of Individual Educational Paths (20 credits)	***Technology of processing of mineral resources***					
	3.1 Equipment and Modern Technologies in the Processing of Mineral Resources		**4**	7		
	STPRM 5301	Modern Technologies in the Production of Rare Metals	2	3	1+1+0	2
	OOP 5302	Equipment of Enrichment Industries	2	3	1+1+0	2
	3.2 Technology of Enrichment of Mineral Resources		**4**	7		
	TOUS 5303	Technology of Enrichment of Carboncontaining Resources	2	3	1+1+0	2
	TPAKPMS 5304	Theory and Applied Aspects of Complex Formation in the Processing of Mineral Resources	2	3	1+1+0	2
	Technology of electrochemical production					
	3.1 Planning and Equipment Electrochemical Industries		**4**	7		

	OPIO 5301	General Approaches for Research, Processing and Representation of Experimental Data	2	3	1+1+0	2
	AUTEP 5302	Automation and Management of Technologies of Electrochemical Productions	2	3	1+1+0	2
	3.2 Methods of Preparation of Metals		**4**			
	OG 5303	Foundations of Galvanotechnics	2	3	1+1+0	2
	EVAM 5304	Electrochemical allocation of active metals	2	3	1+1+0	2
	Inorganic substances and materials					
	3.1 Calculations and Ways of Production of Inorganic Substances		**4**	7		
	GSPNVM 5301	Halurgy Way of Production of Inorganic Substances and Materials	2	3	1+1+0	2
	TR 5302	Technochemical Estimations	2	3	1+1+0	2
	3.2 Economy and Mathematical Modeling		**4**	7		
	UEHP 5303	Management and Economy of the Chemical Industry	2	3	1+1+0	2
	MMUHP 5304	Mathematical Modeling and Stability of Chemical Processes	2	3	1+1+0	2
4. Additional Types of Training (13 credits)	NIRM II	Master's Reseach Work and Fullfilment of Dissertation	1	1	1	2
	IP	Research internship	1	1	1	2
Semester 3						
3. Modules of Individual Educational Paths (20 credits)	**3.3 Preparation of the Mineral Resources**		**6**	10		
	MRKAMS 6305	Methods of Separation and Concentration During Analysis of Mineral Resources	3	5	1+0+2	3
	TPRTM 6306	Technologies of the Production of Scattered and Refractory Metals	3	5	1+2+0	3
	3.4 Control of the Technology Obtaining the Metals		**6**	10		
	AOTPMS 6307	Analytical Provision of the Technology Obtaining the Metals and Alloys	3	5	1+0+2	3
	EPTPMS 6308	Ecological Problems of the Technology of Processing of Mineral Raw Materials	3	5	1+2+0	3
	Inorganic substances and materials					
	3.3 Synthesis of Inorganic Materials and Enviromental Aspects of Chemical Productions		**6**	10		
	EAUP 6305	Ecological Aspects of Uranium Industry in the RK	3	5	1+0+2	3
	STSMOPF 6306	Modern Technology to Synthesis of Inorganic Materials on the Basis of Polymeric Phosphates	3	5	1+2+0	3
	3.4 Systemic Analysis in the Chemical Technology		**6**	10		
	FChOO 6307	Physico-chemical Basis of Enrichment of Non-ferrous Metals Ores	3	5	1+0+2	3
	PASA 6308	Applied Aspects Of Systemic Analysis of Chemical Technological processes	3	5	1+2+0	3
4. Additional Types of Training (13 credits)	NIRM III	Master's Reseach Work and Fullfilment of Dissertation	1	1	1	3
	PP	Pedagogical Internship	3	5	3	3
Semester 4						
4. Additional Types of	NIRM IV	Master's Reseach Work and Fullfilment of Dissertation	4	7	4	4

Training (13 credits)	IP	Research internship	2	3	2	4
5. Final Attestation (4 credits)	KE	Complex Examination	1	1	1	4
	ZD	Dissertation Fullfilment and Defence	3	5	3	4

For the degree programme BA Chemical Technology of Organic Substances, the self-assessment report states the following **intended learning outcomes**:

- **Remembering**

- Modern scientific methods and knowledge of the nature of various processes, principles of economic theory and the legal system of Kazakhstan law, principles of computer science, classification of programming languages, basic mathematics, the laws of physics, chemistry needed to solve professional problems, defining a specific area of operation;

-principles of design of technological objects of physical and chemical principles of hydrodynamic, thermal, mass transfer and chemical reaction processes of technology, including thermal, catalytic, chemical and instrumental methods of analysis of substances and quality control;

- functions, principles of technological schemes of production and processing of organic matter and the choice of process equipment refineries, petrochemical, chemical, and other enterprises; principles of non-waste and environmentally sound technologies.

- **Understanding**

- on the basic human, social, and economic doctrines, about the processes and phenomena of nature, and the unity of their relationship;
- the fundamental unity of science and its possibilities for further development of the global environmental problems

- the place and role of chemical engineering in the development of science, technology and production; the basic chemical industries, sources of raw materials, the principles of design and analysis of chemical processes, development trends of Chemical Technology; the main problems and prospects of scientific and technical development in the field of chemical engineering and production polymer processing, processing of oil, gas, coal, plant material, and their relationships with related industries.

I. **Knowledge**

1. Know the content, role of chemical engineering in the development of science, technology and production
2. Repeat the basics of designing technological objects and instrumental methods of chemical analysis of substances and quality control
3. Determine basic chemical industries, sources of raw materials, the principles of design and analysis of chemical processes, development trends of Chemical Technology
4. Remember main problems and prospects of scientific and technical development in the field of chemical engineering and production polymer processing, processing of oil, gas, coal, plant material, and their relationships with related industries.

II. **understanding**

1.Understand the place and role of chemical engineering in the development of science, technology and production

2. To consider the problems and prospects of scientific and technical development in the field of chemical engineering and production polymer processing, processing of oil, gas, coal, plant material, and their relationships with related industries
3. Classify the resulting information for decision-making, planning and forecasting
4. Describe the principles of design and analysis of chemical processes, development trends of Chemical Technology
5. Discuss the correctness of the valuation of assets

Results of training programs

1. Application

1.apply the production processes of organic substances to control them with the use of automation

2. Chose the conditions and mode of operation of process equipment;
3. perform research in the field of production technology and polymer processing, oil refining, gas and coal, vegetable raw materials to process
4. Use the basic concepts, laws and models of mechanics, electricity and magnetism, oscillations and waves, quantum physics, statistical physics and thermodynamics, chemical systems, the reactivity of substances, chemical identification

3. Analysis

1. Analyze the principles of design of technological facilities; chemical processes, methods of chemical and instrumental analysis of substances and quality control
2. Operated of the process equipment, to conduct research
3. analyze the results of the production technology and polymer processing, oil, gas and coal plant material

4. Evaluate the principles of technological schemes of production and processing of organic matter

5. Selected process equipment refining, petrochemical, chemical and other companies

4. The synthesis

1. Organize economic bases of enterprises
2. Demonstrate methodological basis of the most advanced knowledge in all sections of the chemical technology of organic substances
3.Develop a program principles of construction of technological schemes of production and processing of organic substances and materials in the selection process equipment
4. To manage design process lines businesses
5. Propose possible scientific methods of learning to achieve goals

5. evaluation

1. Determine the results modern information technology education, and make use of mathematical models, to make regulatory and legal documents, plan and organize production processes of organic substances
2. design process lines businesses

3. Discuss the principles of construction of technological schemes of production and processing of organic substances
4. Choose costing materials in the selection process equipment
5. Compare processes equipment, to conduct research and analyze the results of the production technology and polymer processing, oil, gas and coal plant material

The following **curriculum** is presented:

Title of modules	Course code	Title of courses	Credit	ECTS/ hours	Lec/prac/Lab.	Sem.
Semester 1						
1. State Compulsory Module (10 credits)	HRK 1101	History of the Republic of Kazakhstan	2	3/90	2-1-0	1
	K(R)LPP 1102	Professional Kazakh (Russian) Language	3	5/135	0-2-1	1
	FLPP 1103	Professional Foreign Language	3	5/135	0-2-1	1
Vocational Modules (115 credits)	**3.2.** Basic Professional Modules		***69***			
	Module 1 «Higher mathematics»		6			
	HM11401	Higher mathematics 1	3	5/135	1-2-0	1
Vocational Modules (115 credits)	**Module « Physics»**			OK		
	P	Physics	3	5/135	1-0-2	1
	Module «Inorganic chemistry»			OK		
	IC	Inorganic chemistry	2	3/90	1-1-0	1
	LPIC	Laboratory practice on Inorganic chemistry	2	3/90	0-0-2	1
Additional Types of Learning	PT	Physical trainaing	8	12/360	0+0+2	1
Semester 2						
2. Social and Communicative Module (4 credits)	PIC 2201	Psychology of Interpersonal Communication	2	3/90	1+1+0	2
	TAPS 2202	Theoretical and Applied Political Science	2	3/90	1+1+0	2
	EPSS 2203	Ethics of Personal and Social Success	2	3/90	1+1+0	2
	CR 2204	Culture and Religion	2	3/90	1+1+0	2
	GAS 2205	General and Applied Sociology	2	3/90	1+1+0	2
	HLS 2206	Human Life Safety	2	3/90	1+1+0	2
	ESD 2207	Ecology and Sustainable Development	2	3/90	1+1+0	2
	KL 2208	Kazakhstan Law	2	3/90	1+1+0	2
	FE 2209	Fundamental Economics	2	3/90	1+1+0	2
	3.1 Natural Sciences (STEM) module					
	EEG 1302	Engineering and Computer Graphics	***3***	5/135	1-0-2	2
	ITTMMCP 2301	Information Tehnologies and Mathematical Modeling of Chemical Processes	3	5/135	1+0+2	2
	TAM 2304	Theoretical and Applied Mechanics	3	5/135	1-0-2	2
	3.2. Basic Professional Modules		***69***			
	Module « Higher mathematics»					

	HM21402	Higher mathematics 2	3	5/135	1-2-0	2
	Module « Physics»		5			
	Fiz21404	Physics 2	2	3/90	0-0-2	2
	Module «Analytical chemistry»			OK		
	ACPMA1407	Analytical chemistry and physicochemical methods of analysis	3	5/135	2-1-0	2
	LPACPMA140	Laboratory practice on Analytical chemistry and physico-chemical methods of analysis	2	3/90	0-0-2	2
Additional Types of Learning	PT	Physical trainaing	8	12/360	0+0+2	2
Practice		Professional practice (by types of practice)	11			
		Educational practice	2	3/90		2
Semester 3						
Name of modules	Discipline code	**Title of courses**	Credit	**ECTS/ hours**	**Lec/prac/Lab.**	**Sem.**
	3.1 Natural Sciences (STEM) module		**12**			
	ITMMCP	Information Technologies and Mathematical Modeling of Chemical Processes	***3***	5/135	1-2-0	3
	TAM	Theoretical and Applied Mechanics	***3***	5/135	1-0-2	3
	3.2. Basic Professional Modules					
	Module «Physical chemistry»					
	FSMC2409	Fundamental standardization, metrology and certification	2	3/90	1-1-0	3
	PC2410	Physical chemistry	3	5/135	2-1-0	3
	LPPC2411	Laboratory practice on Physical chemistry	2	3/90	0-0-2	3
	Module «Organic chemistry»			OK		
	OCAC2412	Organic chemistry of aliphatic compounds	2	3/90	1-1-0	3
	LPOCFC2413	Laboratory practice on Organic chemistry of aliphatic compounds	2	3/90	0-1-2	3
	Module «Chemical technology principles»			OK		
	FPACI2416	Fundamental processes and apparatus of chemical industry I	3	5/135	1-0-2	3
Additional Types of Learning	PT	Physical trainaing	8	12/360	0+0+2	3
Semester 4						

Name of modules	Discipline code	Title of courses	Credit	ECTS/hours	Lec/prac/Lab.	Sem.
1. State Compulsory Module (10 credits)	PSK 1104	Philosophy of Scientific Knowledge	2	3/90	1-1-0	4
3. Vocational Modules (115 credits)	**Basic Professional Modules**					
	Module «Organic chemistry»					
	OCCC2414	Organic chemistry of cyclic compounds	2	3/90	1-1-0	4
	LPOCCC2415	Laboratory practice on Organic chemistry of cyclic compounds	2	3/90	0-1-2	4
	Module «Chemical technology principles»			MC		
	FPACI2417	Fundamental processes and apparatus of chemical industry II	3	5/135	1-0-2	4
	GCT2418	General chemical technology	3	5/135	1-0-2	4
	Module «Colloidal chemistry and high molecular compounds»			MC		
	CCSP2419	Colloidal chemistry and surface phenomena	2	3/90	2-0-0	4
	LPCSP2420	Laboratory practice on Colloidal chemistry and surface phenomena	2	3/90	0-0-2	4
	PCP2421	Polymer chemistry and physics	2	3/90	1-1-0	4
	LPPCP2422	Laboratory practice on Polymer chemistry and physics	2	3/90	0-0-2	4
Additional Types of Learning	PT	Physical trainaing	8	12/360	0+0+2	4
Practice		Professional practice (by types of practice)	11			
		Industry Practice	2	3/90		4
Semester 5						
Vocational Modules (115 credits)	**Natural Sciences (STEM) module**					
	NB3303	Nanotechnology Basics	***3***	5/135	1-2-0	5
	Module «Oil refining, gas and coal technology»					
	ORGCT2423	Oil refining, gas and coal technology	3	5/135	1-0-2	5
		Module «Bioorganic chemistry»				
	BC2424	Bioorganic chemistry	3	5/135	1-0-2	5
		Module «Main and fine Organic Synthesis»				
	CTMOS2	Chemical Technology of main Organic Synthesis	3	5/135	1-0-2	5

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TFOS2426	Technology of Fine Organic Synthesis				3	5/135	1-0-2	5
	Module «Engineering and equipment of the plants»					MC		
DBEP2428	Design basis of equipment and plants				3	5/135	1-2-0	5
Semester 6								
	3.3 Modules for Individual Educational Trajectories (IET)				**30**	**KB**		6,7
IET 1 Chemical Technology of Fine Organic Synthesis	**IET** 2 «Chemical technology of natural compounds»	**IET** 3 «Chemical technology of polymers»	**IET** 4 « Chemical technology of oil and gas refining»	**IET** 5 «Technology of cosmetics and cleansers»	**33**	**KB**		
Chemistry and Technology of synthetic dye	Chemistry and technology of Natural compounds	Theoretical bases of monomers and polymers synthesis and thechnology	Oil, gas and coal chemistry and physics	Technology of cosmetics based on dispersed systems	3	5/135	1+0+2	6
Chemical Technology of synthetic medicinal preparation	Fundamental Biochemistry and Surface active substances synthesis	Physical and chemical bases of polymers processing	Theory and technology of catalytic petrochemical productions	Chemical technology of foams and aerosols	3	5/135	1+0+2	6
Chemical Technology of Surfactants	Chemical technology of vegetative raw materials processing	Principles of polymer composite materials technology	Technology of oil and gas preparation and refining	Surfactants Technology	3	5/135	1+0+2	6
Pharmaceutical analysis of medicinal preparation	Chemical technology phytopreparations	Chemical technology of polymers	Catalysts technology of petrochemical industry	Technology of solid surface modification	3	5/135	1+0+2	6
3.4 Interdisciplinary Module					4	KB		
Innovative Entrepreneurship (trade-wise)					2	3/90	1+1+0	6
Intellectual Property Law					2	3/90	1+1+0	6

	Science of science and patenting					2	3/90	1+1+0	6
	Design basis of equipment and plants					3	5/135	1-2-0	6
4. Practice		Professional practice (by types of practice)				11			
		Industry Practice				2	MC		6
Semester 7									
	IET 1 Chemical Technology of Fine Organic Synthesis	**IET** 2 «Chemical technology of natural compounds»	**IET** 3 «Chemical technology of polymers»	**IET** 4 « Chemical technology of oil and gas refining»	**IET** 5 «Technology of cosmetics and cleansers»	**33**	**KB**		
	Scientific writing	**Scientific writing**	**Scientific writing**	**Scientific writing**	**Scientific writing**	1	2/45	0+1+0	7
	Physical and chemical methods of organic substance and materials analysis	Chromatography analysis of natural compounds and materials	Polymer processing technology	Technology of catalytic processes in oil processing	Physico-chemical mechanics of cosmetics	3	5/135	1+0+2	7
	Asymmetric synthesis in Surface active substances technology	Hydrocarbons chemistry and technology	Chemistry and technology of chemical fibre and elastomers	Technology of thermal processes in oil refining	Surfactants and polymers adsorption	3	5/135	1+0+2	7
	Methods of technological processes control in fine organic synthesis products production	Spectrum analysis of phytogenous biologically active substance	Chemistry and Technology of paint-and-lacquer materials and films	Petrochemical synthesis Technology.	Chemistry and technology of washing and cleaning products	3	5/135	1+0+2	7
	Chromatography analysis of Organic substances	Identification of phytogenous biologically active substanc	Chemistry and technology of special-purpose polymers	Processing Technology of natural and oil gases.	Nanotechnologies in cosmetics and household chemical goods	3	5/135	1+0+2	7

		es							
	Chemis-try and technolo-gy of hetero cyclic substance	Immobil ization princi-ples of natural biologi-cally active substanc e	Introduction into chemis-try and technology of biomedi-cal polymers	Processing technology of uncon-ventional hydrocar-bons	Technology and applica-tion of microemulsi ons	3	5/135	1+0+ 2	7
	System analysis of chemi-cal tech-nological processes	Drugs chemi-cal analysis	Quality control of polymer materials	Processing technology of petrochemic al production wastes	Technology of enzymes and biologi-cal surfac-tants	2	3/90	1+0+ 1	7
4. Practice	4.1	Professional practice (by types of practice)				11			
		Industry Practice				2	3/90		8
5. Final Certifica-tion	PPBD 401	Preparation and Presentation of Bachelor's Dissertation (Diploma Project)				2	MC		
TOTAL						**Minimum of 151 credits**			

For the degree programme MA Chemical Technology of Organic Substances, the self-assessment report states the following **intended learning outcomes**:

Knowledge

1. Know the current trends in chemistry and chemical technology of organic substances

2. Know the innovative technologies in the field of deep processing of hydrocarbon raw material of RK

3. Understand the principles of non-waste and environmentally friendly technologies.

4. Ability to establish the relationship between the structure and activity of organic substances, natural compounds and polymers

5. Select and instrumental methods of chemical analysis of organic substances and their quality control

6. Explain the modern technology of creating and flotation agents and dyes

7. Have basic scientific analysis and forecasting of the basic chemical processes and fine chemicals, chemical processes for production and processing of organic substances.

8.Organize and analyze knowledge of modern innovative technology of organic substances for

use in scientific, industrial and educational activities

9.Understand the functions, principles of technological schemes of production and processing of organic matter and selection process equipment refining, petrochemical, chemical, and other enterprises

10.Know the techniques and methods of practical implementation of the theoretical knowledge they have acquired in the field of pedagogy, psychology and training

Understanding

1. Possess significant and sustainable knowledge, providing a holistic and systemic perception in professional activities, skills, scientific and professional communication

2. Understand the methods and techniques that are applicable to their own research and advanced scientific research in the field of chemistry and technology of organic substances

3. Understand the role and place of chemical engineering in the development of science, technology and production

4. Classify the basic chemical production, sources of raw materials

Possess the principles of design and analysis of chemical processes

Describe the products of organic synthesis and their further application

Explain the promising trends and tendencies of development of chemical technology of organic substances of natural compounds and polymers

Understand the basic scientific and technical problems and prospects of development in the field of chemical technology of organic materials, processing of different types of raw materials and their interaction with related industries

To find the most efficient and effective use of existing knowledge in teaching activities

To have a system understanding, allowing critically evaluate current research and theory in the field of chemistry and technology of organic substances

Results of training programs

Application

1. Perform research in the field of production technology of organic substances, biologically active compounds, and processing of oil, plant materials, polymers

2. To process and analyze the results of research using sophisticated computer programs and innovative technologies in the field of chemistry and technology of organic substances

3 . Know and be able to work in the modern manufacturing and laboratory equipment

4 . Use theoretical knowledge of the chemistry and technology of organic matter for the planning, specification and implementation of a research project

5 . Navigate in productive activities and to adapt to the new conditions of the methodological and conceptual approach

6. Transform and use cognitive skills and innovative technology to find unusual, creative decisions in the context of professional activity

7. Implement an effective written and oral communication in professional activities organized to solve tasks through generalization and systematization of scientific information

8.To have a modern methodology of scientific research and development activities in the field of biologically active compounds of synthetic and plant origin

Analysis

1. Control the quality of products of primary and fine chemicals

2. Acquire in-depth knowledge in the field of chemical technology of organic substances, and be able to carry out a critical analysis of the state of current research in the field of basic and fine chemicals

3. To establish the fine structure of organic substances of synthetic origin

4. Find the original application of existing knowledge, along with a practical understanding of how existing methods of research and analysis applies in the relevant science for the creation and interpretation of new knowledge

5. Make and use mathematical models, to make regulations on synthetic and natural biologically active substances

6. Possess the ability to retrieve and analyze information from various sources

7. To study the theoretical foundations of teaching methodology course of organic chemistry, modern teaching aids

the synthesis

1. Ability to present and execute the results of research carried out assignments in the form of essays, research projects, presentations, articles, reports, etc.

2. Generate creative ideas for organizing, planning and research, problem solving tasks on the basis of methodological and conceptual approach

3. The ability to extract and analyze information from a variety of sources including the patent and scientific literature, as well as a base of leading media companies such as Thomson Reuters, Scopus, etc.

4. The ability to extract and analyze information from a variety of sources including the patent and scientific literature, as well as a base of leading media companies such as Thomson Reuters,

Scopus, etc.

5. Propose draft design of technological facilities, chemical processes of organic matter, and instrumental methods of chemical analysis of organic substances and their quality control

6. To solve the tasks in an organized through generalization and systematization of scientific information in the field of chemical engineering polymers and colloids

7. To collect the theoretical material with the use of electronic scientific base for research or project

8. Plan, define and implement the research project in the field of technology of organic substances of natural compounds and polymers

9. Patent pending regulatory and technical documentation, process and laboratory regulations for the production of organic compounds, natural products, polymers

10.Propose draft design of technological facilities, chemical processes of organic matter, and instrumental methods of chemical analysis of organic substances and their quality

Evaluation

1. To assess the methodological approaches, to exercise their critical analysis and if necessary, propose new hypotheses,

2 . Be able to design principles of technological objects and instrumental methods of chemical analysis of substances and quality control, organizational and economic bases of enterprises

3 . Choose modern information technology education

4 . Make and use mathematical models, regulatory and legal documents

5. To plan and organize the production processes of organic matter, to analyze the conditions and mode of operation of process equipment

6. To conduct research and analyze the results of the production technology of organic substances, polymer processing, oil, gas and coal plant material

7. Demonstrate knowledge and understanding of the methodological basis of the most advanced knowledge in all sections of the chemical technology of organic substances and the organizational and economic bases of enterprises

8. Possess the principles of construction of technological schemes of production and processing of organic substances and materials

9.Evaluate the selection process equipment, the principles of creating waste-free and environmentally friendly technologies

10.To have language and communication skills necessary for the implementation of research and teaching, gathering and interpretation of scientific and experimental information on practical activities to make judgments taking into account social, economic, scientific or ethical reasons

The following **curriculum** is presented:

Title of modules	Course code	Title of courses	Credit	Unit	Lec/prac/Lab.	Sem.
Semester 1						
1. Compulsory State Module 1 (4 credits)	IFN 5201	History and Philosophy of Science	2	3/90	1+1+0	1
	Iya(p)5202	Foreign language (Professional)	2	3/90	0+2+0	1
2. Specialized Compulsory Module 1 (14 credits)	SSPRPN 5205	The current panel status and prospects of development of oil refining processes	2	3/90	1+1+0	1
	OPNI 5206	Organization and Planning of Scientific Research	***3***	5/135	2+1+0	1
	SPHTP 5207	Modern problems of chemistry and technology of polymers	***3***	5/135	2+1+0	1
	SPKKHP 5208	Modern problems of quality control of chemical products	***3***	5/135	2+1+0	1
5. Additional Types of Learning (13 credits)	NIRM	Master's Reseach Work and Fullfilment of Dissertation				
	NIRM I	Research Seminar I	1		1	
Semester 2						
3. Compulsory State Module 2 (4 credits)	Ped 5203	Pedagogics	2	3/90	1+1+0	2
	Psy 5204	Psychology	2	3/90	1+1+0	2
4. Modules of Individual Educational Paths (20 credits)	**Module of Individual Educational Path 1**		***5***			
	Module 1 Modern Technologies of Receiving and Processing of Synthetic Organic Substances					
	SPSBAV 5301	Modern Technologies of Obtain of Synthetic Biologically Active Substances	3	5/135	1+0+2	2
	SITOOS 5302	Modern Innovative Technologies of the Main Organic Synthesis	2	3/90	1+1+0	2
	Module 2 Modern Technologies of Allocation of BAS from Vegetative Raw Materials		***5***			
	HTPA 5301	The Chemical Technology of Production Alkaloids	3	5/135	1+0+2	2
	HTPGS 5302	Chemistry and Technology of Natural Heterocyclic Compounds	2	3/90	1+1+0	2
	Module 2 Modern Technologies of Allocation of BAS from Vegetative Raw Materials		***5***			
	HTFAP 5301	Chemistry and Technology of Physiologically Active Polymers	3	5/135	1+0+2	2
	HTB 5302	Chemistry and Technology of Biodisperses	2	3/90	1+1+0	2

	Module of Individual Educational Path 2					
	Module 1 Chemistry and technology of monomers and immobilization of BAS		**5**			
	HTIBAV 6303	Chemistry and technology of immobilization of biologically active substances	**3**	5/135	**1+0+2**	2
	HTPPM 6304	Chemical technology of production and processing of monomers	**2**	3/90	**1+1+0**	2
	Module 2 Technological Bases of an Immobilization and Creation of Medicinal Forms		**5**			2
	TOIBAV 6303	Technology Bases of Immobilization of Byological Activ substances	**3**	5/135	**1+0+2**	2
	STPPP 6304	Innovative Technologies of Processing of Natural Polymers	**2**	3/90	**1+1+0**	2
	Module 3 Chemistry and Technology of Stimuli-Sensitive Polymers and Fermentative Catalysis		**5**			
	HTPSP 6303	Chemistry and Technology of Stimuli-Sensitive Polymers Production	**3**	5/135	**1+0+2**	2
	HTFK 6304	Chemistry and Technology of Fermentative Catalysis	**3**	5/135	**1+1+0**	2
5. Specialized Compulsory Module 1 (14 credits)	STPOV 5209	Modern technologies of processing of organic substances	***3***	5/135	2+1+0	2
Semester 3						
Name of modules	Discipline code	**Title of courses**	Credit	**ECTS/hours**	**Lec/prac/Lab.**	**Sem.**
6. Modules of Individual Educational Paths (20 credits)	**Module of Individual Educational Path 3**					
	Module 1 Production Technology of Products of Thin Organic Synthesis		**5**			
	TPF 6305	Technology of Production flotoreagents	**3**	5/135	**1+0+2**	3
	TPK 6306	Production Technology of Dyes	**2**	3/90	**1+1+0**	3
	Module 2 Create dosage forms of herbal products		**5**			
	IGF 6305	Selected chapters of Pharmaceutical Chemistry	**3**	5/135	**1+0+2**	3
	ONISLFPS 6306	The Organization of Scientific Researches on Creation of Medicinal Forms from Natural Raw Materials	**2**	3/90	**1+1+0**	3
	Module 3 Quality Control of Polymers and Detergents		**5**			
	SKKPPM 6305	Certification and Quality Analisis of Polymers and Polymer Materials	**3**	5/135	**1+0+2**	3

	SKK 6306	Sertification and Quality Analisis of Modern Detergents Quality	**2**	3/90	**1+1+0**	3
	Module of Individual Educational Path 4					
	Module 1 Modern Methods of the Analysis and Standardization of Organic Substances		**5**			
	SSOV 6307	Standardization and Certification of Organic Substances	**3**	5/135	**1+0+2**	3
	SMASLF 6308	Modern Methods of the Analysis of Synthetic Medicinal Forms	**2**	3/90	**1+1+0**	3
	Module 2 Standardization and Methods of the Analysis of Medicinal Forms from Vegetative Raw Materials		**5**			
	FSS 6307	Standardization and Certification of Phytopreparations	**3**	5/135	**1+0+2**	3
	SMALFPP 6308	Modern Methods of the Analysis of Medicinal Forms from Natural Raw	**2**	3/90	**1+1+0**	3
	Module 2 Actual Problems of Chemistry and Technology of Polymer Materials		**5**			
	SPPM 6307	Modern problems of polymeric materials science	**3**	5/135	**1+0+2**	3
	RHTPM 6308	Radiation chemistry and technology of polymeric materials	**2**	3/90	**1+1+0**	3
Semester 4						
Name of modules	Discipline code	**Title of courses**	Credit	**ECTS / hours**	**Lec/prac/Lab.**	**Sem.**

For the degree programme MA Chemical Technology of Explosives and Pyrotechnical Produce, the self-assessment report states the following **intended learning outcomes**:

I. Knowledge

knowledge

1. Know and use the theoretical and experimental foundations of modern chemistry and chemical technology of explosives and pyrotechnics for creative problem solving in the educational, research and scientific activities.
2. Know the basic techniques and methods of research in chemistry, chemical engineering explosives and pyrotechnic devices and their application in internship.
3. Organizes and be able to work in a team and independently, making social and ethical obligations.

II. Understanding

understanding

1. To understand and to think of fundamental principles of unity of Chemical Technology, explosives and pyrotechnics.

2. Describe the state and convincing evidence to make a comprehensive written and oral presentation.

Results of training programs

I. Application

application

1. To demonstrate a systematic and creative approach to solving complex problems, be able to make informed judgments in the absence of complete data and effectively present their findings, both for professionals and for audiences who do not have adequate training.
2. Demonstrate independence and original approach to solving problems, to plan and solve problems in a professional manner.

II. Analysis

analysis

1. Analyze and interpret complex experimental data and draw conclusions.
2. Assess the methodological approaches to exercise their critical analysis and if necessary, propose new hypotheses.

III. The synthesis

the synthesis

1. Ability to work in an interdisciplinary team, the ability of persuasion, argumentation and draw conclusions, the ability to lead.
2. Ability to prioritize training and professional and research activities and to relate their own interests with social and ethical values, as well as the interests of the team.

IV. Evaluation

evaluation

1. Evaluate the economic importance of fundamental research, to understand the reasons why some of them turn out to be more promising than the other (economic, energy, environmental, raw material, structural, social, and political factors).
2. Select and organize the processes of production.

The following **curriculum** is presented:

Title of modules	Course code	Title of courses	Credit	ECTS/ hours	Lec/prac/Lab.	Sem.
State Compulsory Module (8 credits)	IFN 5201	History and Philosophy of Science	2	3/ 90	1+1+0	1
	Iya(p) 5202	Foreign language (Professional)	2	3/ 90	1+1+0	1
	Ped 5203	Pedagogics	2	3/ 90	1+1+0	2
	Psy 5204	Psychology	2	3/ 90	1+1+0	2
Compulsory Professional Modules - 14 credits	OTPGV 5205	Fundamentals of the theory of combustion and explosion	2	3/ 90	1+1+0	1
	OPNI 5206	Organization and Planning of Scientific Research	3	5/135	2+1+0	1
	PVSKR 5207	Pyrotechnic Means-Classification, Calculation, Features of Manufacture	3	5/135	2+1+0	1
	VVSKR 5208	Explosives - Classification, Calculation, Features of Manufacture	3	5/135	2+1+0	1
	FMAKTP 5209	Physical methods of analysis and control of technological processes of production of pyrotechnic and explosive substances	3	5/135	2+1+0	2
Modules of Individual Educational Paths – 20 credits	Educational Program Modern problems of burning energy-intensive materials		Credit	ECTS / hours	Lec /prac /Lab.	Sem.
MIOT 1 Processes of burning of explosives and means	VIMC 5301	The explosion and its use for peaceful purposes	2	3/ 90	1+1+0	2
	MPDV 5302	Modeling of ProcessesDetonation and Explosion	2	3/ 90	1+1+0	2
MIOT 2 Modern problems of burning energy-intensive materials	OTCPVV 6303	Fundamentals of the technological cycle of production of explosives	2	3/ 90	1+1+0	2
	ITPVV 6304	Innovative technologies in the explosives industry	2	3/ 90	1+1+0	2
MIOT 3 Environmental Problems of Practical Application of Energy-Intensive Materials	PVVP 6305	Industrial explosives, and their preparation.	3	5/135	2+1+0	3
	OHVV 6306	The main characteristics of explosives and their definition	2	3/ 90	1+1+0	3
MIOT 4 Safety issues of manufacture and use of explosives and prod-	OFTB 6307	Hazards and safety at enterprises producing explosives and product.	3	5/135	2+1+0	3
	BPTHI	Safety in production, transporta-	*2*	3/ 90	1+1+0	3

ucts	6308	tion, storage and use of explosives				

Modules of Individual Educational Paths – 20 credits	Educational Program New technologies in pyrotechnics		Credit	ECTS / hours	Lec /prac /Lab.	Sem.
MIOT 1 Bases of Practical Pyrotechnics	GKS 5301	Combustion of Condensed Systems	2	3/ 90	1+1+0	2
	MPG 5302	Modeling of combustion processes	2	3/ 90	1+1+0	2
MIOT 2 New technologies in pyrotechnics	OTCPPI 6303	Fundamentals of the technological cycle of production of fireworks	2	3/ 90	1+1+0	2
	PSVSP 6304	Processes Self-Propagating High-Temperature Synthesis in Pyrotechnics	2	3/ 90	1+1+0	2
MIOT 3 Fundamentals of practical pyrotechnics	OTPVP 6305	The main types of pyrotechnic materials and their preparation	3	5/135	2+1+0	3
	OHPVIO 6306	The main characteristics of pyrotechnic substances and products and their identification	2	3/ 90	1+1+0	3
MIOT 4 Safety issues of manufacture and use of pyrotechnic products	PISNH 6307	Pyrotechnic Products on Service of a National Economy and Emergency Situations	3	5/135	2+1+0	3
	BPIVV 6308	Safety Issues of Manufacture and use Explosives Matters	*2*	3/ 90	1+1+0	3
Master's Reseach Work and Fullfilment of Dissertation 7 credits		Additional Types of Training	Minimum of 7 credits			Sem.
	NIRM I	Research Seminar I	1			1
	NIRM II	Research Seminar II	1			2
	NIRM III	Research Seminar III	1			3
	NIRM IV	Research Seminar IV	4			4
Professional Internship 6 credits	PP	Pedagogical Internship	3	5/135		3
	IP	Research internship	3	5/135	2+1	1, 4
Final Attestation 4 credits	KE	Complex Examination	1	1/45		4
	ZD	Dissertation Fullfilment and Defence	3	5/135		4
TOTAL			59			

For the degree programme MA Nanotechnology and Nanomaterials, the self-assessment report states the following **intended learning outcomes**:

I. Knowledge

knowledge

1. Provide training in the field of nonmaterial's and nanotechnology to high academic standards in a competitive but challenging educational environment, attractive to the best students from the Republic of Kazakhstan and other countries.
2. Form a system skills related to problem solving, critical assessment of the original data and communication.

II. Understanding

understanding

1. Graduates should acquire in-depth knowledge in the field of nanotechnology and to be able to carry out a critical analysis of the state of current research.
2. Graduates should be prepared to learn for a degree in any leading university of the Republic of Kazakhstan or other countries.

Results of training programs

I. Application

application

1. The use of theoretical and experimental foundations of modern nanotechnology for creative problem solving in the educational, research and scientific activities.
2. Methodological foundations enhance the cognitive activity in the disciplines of nanotechnology and nonmaterial's in order to develop the capacity to understand and manage the environment.

II. Analysis

analysis

1. Ability to collate, analyze and interpret complex experimental data and draw conclusions.
2. The ability to present convincing evidence and make a comprehensive written and oral presentation.

III. The synthesis

the synthesis

1. Have knowledge and understanding of the essence of nanochemistry and nanotechnology when creating new technologies in science and technology.
2. Know technological techniques when producing nanopowders, films, multi-functional composite materials.

IV. Evaluation

evaluation

1. Planning, implementation and description of major research project.
2. Ability to develop the ability to research and development and management of research projects.

The following **curriculum** is presented:

Title of modules	Course code	Title of courses	Credit	ECTS/ hours	Lec /prac /Lab.	Sem.
State Compulsory Module (8 credits)	IFN 5201	History and Philosophy of Science	2	3/ 90	1+1+0	1
	Iya(p) 5202	Foreign language (Professional)	2	3/ 90	1+1+0	1
	Ped 5203	Pedagogics	2	3/ 90	1+1+0	2
	Psy 5204	Psychology	2	3/ 90	1+1+0	2
Compulsory Professional Modules - 14 credits	FJNT 5205	Fundamental bases of nanotechnologies	2	3/ 90	1+1+0	1
	OPNI 5206	Organization and Planning of Scientific Research	3	5/135	2+1+0	1
	SSPRN 5207	Current state and prospects of development of nanochemistry	3	5/135	2+1+0	1
	FHOPNN 5208	Physical and chemical bases of receiving nanomaterials and nanostructures	3	5/135	2+1+0	1
	EMINN5209	Experimental methods of research of nanomaterials and nanostructures	3	5/135	2+1+0	2
Modules of Individual Educational Paths – 20 credits	Educational Program Carbon nanomaterials		Credit	ECTS/ hours	Lec /prac /Lab.	Sem.
MIOT 1Carbon Nanomaterials and Their Characteristics	SUNM 5301	Properties of Carbon Nanomaterials	2	3/ 90	1+1+0	2
	HNM 5302	Chemistry of Nanomaterials	2	3/ 90	1+1+0	2
MIOT 2 Structure and Chemical Properties of Nanoparticles	UNTFGS 6303	Carbon Nanotubes and Fullerens and waterproof soot	2	3/ 90	1+1+0	2
	SHSN 6304	Structure and Chemical Properties of Nanoparticles	2	3/ 90	1+1+0	2
MIOT 3 Use of nanomaterials in practical activities	NBT6305	Nanobiotechnology	3	5/135	2+1+0	3
	6306 MSKM	Mechanochemical synthesis of composite materials	2	3/ 90	2+1+0	3
MIOT 4 Nanoscience and its Place in Scientific and Technical Progress	SCMME 6307	Synthesis of composite materials by an electrospinning method	3	5/135	2+1+0	3
	UNMORS6308	The carbon nanostructured materials on the basis of vegetable raw materials	*2*	3/ 90	2+1+0	3
Modules of Individual Educational Paths – 20 credits	Educational Program Methods of receiving nanomaterials in a flame and low-temperature plasma		Credit	ECTS/ hours	Lec /prac /Lab.	Sem.

MIOT 1 Receiving nanomaterials in low-temperature plasma	FHOPNMNP 5301	Physical and chemical bases of receiving nanomaterials in low-temperature plasma	2	3/ 90	1+1+0	2
	MPNMNP5302	Methods of receiving nanomaterials in low-temperature plasma	2	3/ 90	1+1+0	2
MIOT 2 Technologies of receiving nanomaterials in plasma	PPNMNSPR 630	Processes of receiving nanomaterials and nanostructures in plasmochemical reactors	2	3/ 90	1+1+0	2
	SUNMNP 6304	Synthesis of carbon nanomaterials in low-temperature plasma	2	3/ 90	1+1+0	2
MIOT 3 Receiving nanomaterials in low-temperature plasma	SFP 6305	Synthesis of fullerens in the flame	3	5/135	2+1+0	3
	FHOPUNTP 6306	Physical and chemical bases of receiving carbon nanotubes in a flame	2	3/ 90	1+1+0	3
MIOT 4 Mathematical modeling of receiving nanomaterials in the conditions of low-temperature plasma	KMSNMP6307	Computer modeling of synthesis of nanomaterials in plasma	3	5/135	2+1+0	3
	KMPPNMNSPR 6308	Computer modeling of processes of receiving nanomaterials and nanostructures in plasmochemical reactors	*2*	3/ 90	1+1+0	3
Master's Reseach Work and Fullfilment of Dissertation 7 credits		Additional Types of Training	Minimum of 7 credits			Sem.
	NIRM I	Research Seminar I	1			1
	NIRM II	Research Seminar II	1			2
	NIRM III	Research Seminar III	1			3
	NIRM IV	Research Seminar IV	4			4
Professional Practice 6 credits	PP	Pedagogical Practice	3	5/135		3
	IP	Research practice	3	5/135	2+1	1, 4
Final Attestation 4 credits	KE	Complex Examination	1	1/45		4
	ZD	Dissertation Fullfilment and Defence	3	5/135		4
TOTAL			59			

For the degree programme MA Petrochemistry, the self-assessment report states the following **intended learning outcomes**:

I. Knowledge

1. Knowledge and use of theoretical and experimental bases of modern petrochemistry at the creative decision of problem situations in educational, educational-research and scientific activity.
2. Knowledge of the basic receptions and methods of researches in the field of petrochemistry and their application in practical activities
3. Knowledge of the general theoretical and experimental principles and petrochemistry methods.
4. Possession of a wide spectrum of knowledges in all areas of petrochemistry from the theory and practice to modern technologies and petrochemistry and oil refining catalysts.
5. Knowledge of serious experimental procedures, including data recording, the analysis and experiment planning. Knowledge of used mathematical methods, their application at chemical calculations and modeling of petrochemical processes.
6. Knowledge of electronics, computer programming and numerical methods in the appendix to petrochemistry.
7. Possession of profound newest knowledges in the basic areas of petrochemical specialization (for choice): petrochemistry, technology of chemistry of oil, organic petrochemical synthesis.

II. Understanding

1. Understanding of unity of basic principles of chemistry. Ability to understanding and an establishment of communications between a wide spectrum of the chemical phenomena and the facts, applying these fundamental principles.
2. Creation of theoretical models of technological processes, devices and property of materials and products.
3. Understanding of the principles of work and ability to work at the modern equipment when carrying out scientific research.

Results of training programs

I. Application

1. Ability adequately to apply the methods based on information technology in petrochemistry.
2. Ability to solve a wide spectrum of known problems of a petrochemical science and to undertake the decision of implicit and unresolved problems.
3. Application deep natural-science, mathematical and engineering knowledges for creation of new materials.
4. Построение и использование модели для описания и прогнозирования различных явлений, осуществление их качественного и количественного анализа ; 2 . Construction and modeling for the description and forecasting of the various phenomena, implementation of their qualitative and quantitative analysis.

II. Analysis

1. Ability to use the knowledge received at studying base and elective of disciplines at the petrochemistry course, at decision-making in the basic directions of practical activities.
2. Ability to compare, analyze and interpret the difficult experimental information and to do conclusions to its base.
3. Анализ технологичности изделий и процессов.
4. Search, processing, analysis and systematization of scientific and technical information on a research subject, choice of techniques and task cures.
1. The synthesis

III. The synthesis

1. Ability of planning, realization and the description of serious scientific research, with the subsequent making up and protection of master dissertation
2. Ability to solve a problem of a petrochemical science in a various context and ability to establish connection between problems and basic principles.
3. Ability to planning and realization opened (open-ended) scientific researches or projects.

IV. Evaluation

1. Ability to state the proofs and to do exhaustive written and oral presentations
2. Assessment of prospect and possibility of use of achievements of scientific and technical progress in innovative development of branch, the offer of ways of their realization.
3. Assessment of efficiency and introduction in production new technologies.
4. Ability and readiness to count and estimate conditions and consequences (including economic) made organizational and administrative decisions
5. Assessment of economic efficiency of technological processes, their ecological safety and technological hazards at introduction of new technologies.

The following **curriculum** is presented:

Title of modules	Course code	**Title of courses**	Credit	**Unit (ECTS)**	**Lec/prac/Lab.**	**Sem.**
1. State Compulsory Module 1-2 (8 credits)	IFN 5201	History and Philosophy of Science	2	3	1+1+0	1
	Iya(p)5202	Foreign language (Professional)	2	3	1+1+0	1
	Ped 5203	Pedagogics	2	3	1+1+0	2
	Psy 5204	Psychology	2	3	1+1+0	2
2. Compulsory Professional Modules (14 credits)	OPNI 5206	Organization and Planning of Scientific Research	3	5	2+1+0	2
	STAN 5205	Modern Theoretical Aspects of Petrochemistry	2	3	1+1+0	1
	STNGU 5207	Modern Technologies of Oil, Gas and Coal	3	5	2+1+0	1
	KKPR 5208	Catalysis, Catalytic Processes and Reactors	3	5	2+1+0	1
	ISKN 5209	Selectivity and stereospecificity of catalysts in petrochemistry	3	5	2+1+0	1
3.Modules of Individual Educational Paths (20 credits)	**Module 1 Methods of Pedagogy and Psychology in Higher School**					
	PPVSk 5301	Psychology Higher School	2	3	1+1+0	2
	MPHDS 5302	Teaching Methods of speciality of disciplines	2	3	1+1+0	2
	Module 2 Petrochemical Manufactures					
	KPTFN 5303	Catalytic Processing of Heavy Fractions Oils	2	3	1+1+0	2
	TOPVKB 5304	Theoretical Bases of Highly Octane Components of Gasolines Reception	2	3	1+1+0	2
	Module 3 Technology of Petromanufactures				ED	
	SADTN 6305	Modern aspects of Extraction and Transportation of oil	3	5	2+1+0	3
	AEANP 6306	Actual Ecological Aspects of Petrochemical Manufactures	3	5	2+1+0	3
	Module 4 Petrochemical Synthesis				ED	
	TGGPN 6307	Technology of Heterolytic and Homolitic Oil Refining Processes	3	5	2+1+0	3
	SOZhTUNP 6308	Syntheses Based on Liquid and Solid Hydrocarbons of Petroleum Origin	3	5	2+1+0	3
4. Additional Types of Training (13 credits**)**	**Master's Reseach Work and Fullfilment of Dissertation**		**Credit**	**Unit (ECTS)**	**Sem.**	
	NIRM I	Research Seminar I	1	2	1	
	NIRM II	Research Seminar II	1	2	2	
	NIRM III	Research Seminar III	1	2	3	
	NIRM IV	Research Seminar IV	4	7	4	
	Professional Practice					
	PP	Pedagogical Practice	3	5	3	
	IP	Research practice	3(1+2)	5	1,4	
5. Final Attestation (4 credits **)**	**Final Attestation**					
	KE	Complex Examination	1	2	4	
	ZD	Dissertation Fullfilment and Defence	3	5	4	
TOTAL			59 credits			

C Peer Report for the ASIIN Seal[3]

1. Formal Specifications

Criterion 1 Formal Specifications

Evidence:

- Self-Evaluation-Report
- Auxiliary document: “University-wide Academic Policies and Procedures of al-Farabi Kazakh National University”

Preliminary assessment and analysis of the peers:
The formal specifications of the programs are defined in the Self Evaluation Report as presented in the table ahead. The audit team confirmed that the names chosen reflect the respective programme-contents. The master´s programs are consecutive programs with a preceding bachelor´s degree. The duration of studies is in line with the Kazakh state requirements. This means the bachelor´s programs lasting four years, in which around 150 Kazakh credits (reported to correspond with around 250 ECTS) are achieved and the master´s programs lasting two years with overall 59 Kazakh credits (reported to correspond with around 98 ECTS).

The expected intake of the programs depends on the state grants the Kazakh Ministry for Education and Science allocates annually. It is therefore difficult to anticipate the expected intake of the programs. Additionally, students can enroll on a self-paid basis with the fees measured at a comparable level like the state grants. Discounts for supporting special social situations are available, too.

Concerning the remaining formal attributes of the programs (degree awarded, intake rhythm), the audit team considered the formal specifications of the programs to be adequately defined. This information is published on the websites of al-Farabi Kazakh National University and in its “Academic Policy” (which is also available on the websites of the university).

[3] This part of the report applies also for the assessment for the European subject-specific labels. After the conclusion of the procedure, the stated requirements and/or recommendations and the deadlines are equally valid for the ASIIN seal as well as for the sought subject-specific label.

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

The peers confirmed their judgment concerning the criteria.

2. Degree programme: Concept & Implementation

Criterion 2.1 Objectives of the degree programme

Evidence:

- Discussions with the responsible members of university management
- Discussions with staff responsible for managing the study programmes
- Defined programme objectives and learning outcomes in the Self-Evaluation-Report

Preliminary assessment and analysis of the peers:

The discussion between the audit team and responsible staff from the university- and programme-management showed that the programs covered by this report are carried out as “specialties” according to the Kazakh governmental education plan. Compulsory and vocational parts of these specialties are defined by the Ministry of Education and Science for all programs in Kazakhstan, benchmarking them with programs from other renowned international universities and taking into account specific Kazakh labor market needs. The autonomy of the Faculty of Chemistry and Chemical Technology in program development is thus limited to the elective courses, which can be chosen by students as individual trajectories. Those electives are reported to be revised each year.

The learning outcomes of the bachelor´s programs can be considered as equivalent to level 6 of the European Qualifications Framework and the learning outcomes of the master´s programs equivalent to level 7. With regards to the programme objectives – in particular at master´s and PhD level, the members of the university´s management explained the ongoing transformation process of al-Farabi University into a research-oriented university. Al-Farabi University was reported to be working close with the Kazakh Ministry of Education and Science to establish a wider range of autonomy required for a self-directed transformation. Research orientation should also find its counterpart in the educational process – especially in the trajectories at master´s and PhD level.

Although al-Farabi University did not consider itself to be on the end of its way, significant achievements are visible in the enhancement of the university´s rank in the QS World University Rankings (presently <300).

Criterion 2.2 Learning Outcomes of the Programme

Evidence:

- Discussions with the responsible members of university management
- Discussions with staff responsible for managing the study programmes
- Defined programme objectives and learning outcomes in the Self-Evaluation-Report
- Module handbook

Preliminary assessment and analysis of the peers:
In general, the bachelor´s programs are more professionally oriented whereas the master´s programs orient student activities to scientific research (including publication requirements). The subject-specific definition of learning outcomes for every programme distinguishes between *knowledge*, *understanding*, *application*, *analysis*, *synthesis* and *evaluation*. The learning outcomes of all programs were regarded by the peers as sufficiently specific. The peers perceived that the intended learning outcomes are accessible to the relevant stakeholders, that they reflect the qualification thought, and that they are achievable, valid, and reflect the currently foreseeable developments in the subject areas.

The peers judged the intended learning outcome of all the degree programs to be comparable to the exemplary learning outcomes set out in the Subject Specific Criteria by ASIIN's Technical Committee 09 – Chemistry.

However, the peers wondered, why the HEI implemented a set of such highly specialized degree programs, which cover each only a certain aspect of the whole range of chemistry. Normally the peers would have expected to find these specialties as a field of specialization within a general chemistry degree program. Result of the very high grade of specialization in the degree programs subject to the accreditation procedure is that they do not comply with the basic criteria for reward of the Eurobachelor and Euromaster label. The peers pointed out that the principal aim of the Eurolabels is to ensure that a given degree programs fulfills the basic curricular requirements for a general chemistry program. In case of the degree programs Bachelor and Master of Chemical Technology of Inorganic Substances, Bachelor and Master of Chemical Technology of Organic Substances, Master of Chemical Technology of Explosives and Pyrotechnical Produce, Master of Nanotechnology and Nanomaterials, and Master of Petrochemistry the basic curricular contents of a general chemistry degree program are not fully attained. The peers therefore came to the conclusion that the Eurobachelor, respective Euromaster labels cannot be awarded.

Criterion 2.3 Learning outcomes of the modules/module objectives

Evidence:

- Module Handbook
- Objectives Matrix

Preliminary assessment and analysis of the peers:

The module descriptions clearly distinguish between knowledge, skills and competences to achieve and overall provide adequate descriptions in these terms. The descriptions are accessible in the UNIVER-system and students were perceived to be informed about them. For every programme, a meaningful objectives matrix is presented – showing the correspondence between defined objectives and learning outcomes at programme level and modules leading towards them.

There are some drawbacks concerning the module descriptions. The peers asked to correct the following issues in the modules description: the calculation of the workload is not consistent, the number of credit points allotted to the different modules needs to be revised and updated; module descriptions for the eighth semester in the Bachelor's degree program Chemical Technology of Inorganic Substances are completely missing. These have to be included in the module descriptions.

The peers were informed by the program representatives that the students have an academic calendar which contains much more and more detailed information on the modules than are included in the modules descriptions. The peers expressed their wish to inspect this academic calendar. They therefore asked the HEI to provide an academic calendar for each of the degree programs before the peers make their final judgment.

Criterion 2.4 Job market perspectives and practical relevance

Evidence:

- Overview of companies and institutes in the Self-Evaluation-Report
- Discussion with responsible staff for the study programs

Preliminary assessment and analysis of the peers:

Because of the programs aligned to labor market needs by state regulation, there was no doubt for the peers concerning their practical relevance and the job market perspectives of their graduates. The peers were informed by the students that most of the graduates obtain an employment in the industries, some seek a position as teaching staff at an university, but all are very optimistic and confident about finding an employment adequate

to their skills and profession. The HEI confirmed that nearly all of the graduates are employed. A list of employers is presented in the Self-Evaluation-Report.

Over the whole course of studies in the bachelor´s programs, the faculty is following the concept of a permanent internship, taking place every semester either as practical training or as a professional internship in companies/non-university institutes (in the 6th and 8th semester of the bachelor´s programs).

The audit team perceived an alignment with job market perspectives in Kazakhstan.

Criterion 2.5 Admissions and entry requirements

Evidence:

- Discussion with responsible staff for the study programs
- Auxiliary document: "University-wide Academic Policies and Procedures of al-Farabi Kazakh National University"

Preliminary assessment and analysis of the peers:

The admission to the bachelor´s degree programs depends to a vast extent on state grants provided by the Kazakh government. They are distributed to students on a competitive basis. Students have to pass the Unified National Test (covering competences in mathematics, natural sciences, languages, history) and – in case of successful competition – are awarded with a state grant for a specific programme, covering study fees and to some extend the costs for accommodation and subsistence. It is also possible to take part in the degree programs on a self-paying basis, but the number of students without state grants at the faculty is low. International students can apply for the Higher Education Institutes in Kazakhstan as well by taking a standardized test (for bachelor´s programs) and university entrance exams. Parts of these university entrance exams require a command of Kazakh language. The HEI reported that students from China, Korea, and Spain are currently studying at the Faculty of Chemistry.

Admission to the master´s degree programs is also defined by the Ministry of Education and Science of Kazakhstan. The testing system for the distribution of state grants works similar to the bachelor´s level. Educational grants for master's degree programs are awarded to students on a competitive basis. Candidates for the master´s programs have to take entrance exams which comprise a standardized test of foreign language command and written exams for the specific subject conducted by the al-Farabi University´s Admission Commission. Altogether only around 10% of students pass into the second cycle by state grants. The vast majority of bachelor students find employment on the job market.

The peers came to the conclusion that admission procedures are transparent and governed by strictly applied procedures and quality criteria. They therefore decided that the degree programs meet the ASIIN criteria with view on admission requirements.

Criterion 2.6 Curriculum/Content

Evidence:

- Curriculum overview in the Self-Evaluation-Report
- Objectives matrix in the Self-Evaluation-Report

Preliminary assessment and analysis of the peers:
The equivalence between the defined learning outcomes at programme-level and the relevant subject-specific criteria has been described in chapter 2.2. The coherence between the programme outcomes and the respective modules leading to them is subject to the present chapter. The faculty has presented objectives matrixes for every programme, showing the correspondence between learning outcomes and the modules where they are achieved. Unintended overlaps in module contents and their provision are prevented by educational planning on a central level of the faculty.

In chapter C.2.2. it is already pointed out that the peers found the establishment of highly specialized degree programs for certain aspects of chemistry to be unusual in an international context. However, for the designed degree programs in question, the peers judged the curricula in place as generally adequate to achieve the intended learning outcomes by the time the degree is completed. Only for the Master's degree program in Petrochemistry the peers found lab courses lacking in order to ensure that all students can attain a certain level of practical experience in laboratory work skills. The peers deemed it therefore necessary, that the HEI includes lab courses in the Petrochemistry Master's degree program.

The peers noticed that all the degree programs, especially the Bachelor's degree programs, contain a number of elective courses on culture and other humanities related subjects. The peers understood that the HEI and the Kazakh state try to enhance the overall education and cultural sophistication of all graduates. Nevertheless, the peers expressed the view that the room occupied by these cultural courses is missing for more and advanced training in the specialties, as well as training in import soft skills, such as presentations, team-building, or leadership. Because of this reason the peers recommended to the HEI to reduce the number of elective courses on culture in the curriculum in order to enhance specialty training, and give more room for courses on soft skills.

For the Bachelor's and Master's degree programs of Chemical Technology of Inorganic Substances and Chemical Technology of Organic Substances the peers observed, although the programs are comprehensive and soundly built as a whole, a certain deficiency in fundamental courses on methods. The peers therefore recommended to the HEI to incorporate more of such courses in the curricula of the respective degree programs.

The peers furthermore found the objectives and content of the individual modules to be coordinated in order to avoid any unintended overlaps.

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

The HEI expressed the conviction that all degree programs cover the broad range of general chemistry and therefore merit the award of the Eurobachelor/Euromaster label. The peers took notice of the HEI's opinion, but nevertheless upheld their original judgment that the degree programs in question are too highly specialized and lack certain aspects of a general chemistry degree. In the view of the peers the Eurolabels could therefore not be awarded.

The peers welcomed the willingness of the HEI to work on the module descriptions according to the hints outlined in the report. The peers took note of the academic calendar provided by the HEI, but could not derive any further information from it. Their original judgment concerning chapter C.2.3. remains therefore unchanged.

The peers accepted the correction of the HEI regarding chapter C.2.5. that around 30% of the Master's degree students receive a state grant (not only 10%).

The peers noticed the information of the HEI that in the current state of affairs the HEI is not able to reduce the amount of culture courses in the curriculum, because of government regulations. The peers expressed the hope that this stance of the government may change in future and deemed it necessary to uphold their former judgment.

Regarding lab courses in the Master's degree program Petrochemistry, the peers learned from the comments of the HEI to the report, that module "Catalytic processes of processing of heavy oil raw materials" contains experimental laboratory work worth of 100 hours. The peers found this to be just sufficient but were convinced that an even larger amount of laboratory practice would be profitable for the students. Therefore, the peers changed the respective requirement into a recommendation. Furthermore, the peers noted, that the module mentioned by the HEI in their comment cannot be found in the modules description by the same title. The peers once more stressed the need to revise, correct, and update the modules descriptions (see C.2.3).

3. Degree Programme: Structures, Methods & Implementation

Criterion 3.1 Structure and modularity

Evidence:

- Curriculum overview in the Self-Evaluation-Report
- Module Handbook

Preliminary assessment and analysis of the peers:
The faculty delivered module descriptions in the Self-Evaluation-Report. These module descriptions are reported to be published annually (in the university´s "UNIVER"-System) to enable students to choose an individual trajectory of studies (in the area of electives). Students also report getting a student "guidebook" at the entrance of the first year.

Modules at bachelor´s level are clearly distinguished from modules at master´s level in most cases. The peers noticed that there are several modules in the Bachelor's and Master's degree programs which bear the same name. The peers were however informed that the agreement in name does not signify an agreement in content, but that the modules of the Master's degree programs are deeper going in substance and methodology. One module usually contains several types of courses (lectures, seminars, practical training) and the description also takes into account times for unguided and guided self-studies. For the latter, teaching staff is available on request.

As already mentioned above in C.2.2., the peers opined that the establishment of a variety of highly specialized is rather unusual view before an international background. Especially the Master's degree programs Chemical Technology of Explosives and Pyrotechnical Produce as well as Petrochemistry lack in the eyes of the peers the methodological and theoretical depth to act as stand-alone programs. Graduates of these specialties are fit to work in the industries closely related to the subject, but are rather ill equipped to function as general chemistry scientist or teachers, for example. Therefore, the peers recommended to the HEI to merge the Master's degree program Chemical Technology of Explosives and Pyrotechnical Produce with the Master's degree program Chemical Technology of Inorganic Substances and the Master's degree program Petrochemistry with the Master's degree program Chemical Technology of Organic Substances.

The peers perceived that the program concept allows for time to be spent at another higher education institution or on a practical placement without loss of time. The peers learned from the program representatives that only a small number of Master students go abroad for a longer period of term. Most students spend only ten or more days on a

state grant at a foreign university. The peers understood that this phenomenon stems from the peculiarities of state planning for grants, the modularity and structure of the degree programs still allow for the studying abroad for a more extended period of time.

Criterion 3.2 Workload and credit points

Evidence:

- Auxiliary document: "University-wide Academic Policies and Procedures of al-Farabi Kazakh National University"
- Module Handbook
- Discussions with students

Preliminary assessment and analysis of the peers:

As far as the peers could see, every compulsory part of the programs is credited (including the internships), differentiating student workload in time for courses as well as guided and unguided self studies. The average workload in the Bachelor´s programs usually exceeds thirty ECTS-credits. In the Master´s programs this is expected to be similar, but there is an uncertainty in the calculation of ECTS. Concerning the comparison between both credit systems the peers do not understand the calculation at master´s level. The "University-wide Academic Policies and Procedures of al-Farabi Kazakh National University" state that one credit in the master´s programs is equal to 60 hours of student workload. In this calculation, the master´s programs should sum up to around 131 ECTS although 98 ECTS are stated in the Self-Evaluation-Report.

The audit team relied on the students´ feedback, considering this amount of workload to be challenging but acceptable. The peers learned from the students that they invest about 55 hours weekly in their courses and self study on average. The students viewed this amount to be necessary to master all the skills needed for employment and offered by the degree programs. Nevertheless, the students admitted also that regularly some students are not able to conclude their degree program in the prescribed time frame and need to add one or two semesters to complete their studies.

The peers came to the conclusion that the workload pressure on the students is to high and may result in delays of the students to finish their studies in due course and time. Therefore, the peers pointed out to the HEI that students' workload per semester must be set at a level that avoids structural pressure on training quality. In line with the ECTS Users' Guide, the workload per semester must not exceed that of a full-time employee (maximum of 900h). The ECTS credits awarded must be adapted accordingly.

Criterion 3.3 Educational methods

Evidence:

- Discussion with teaching staff
- Module handbook

Preliminary assessment and analysis of the peers:
The module descriptions distinguish between lectures, practical training and seminars. Although not explicitly marked as a teaching method, it is also visible and confirmed by teaching staff that several modules in all study programs contain projects, which are partly funded by the government. From the third year on students may participate in practical research work and thereby spend time on individual research work.

The peers stated that the English language nowadays is the common means of communication in the sciences, especially the natural sciences. They perceived that not all of the students are able to speak English on the same level. They were informed by the program representatives and students that some of the publications the Master students have to write have to be in English language. However the overall amount of English language literature used in the degree programs, including the Master's degree programs, still is in Kazakh or Russian language. Most of the basic textbooks used in lectures are Russian, too. The peers were aware that all the modern research literature in English language is available at the HEI online. They recommend to the HEI to make more use of the English / International literature.

Each programme enables students to a certain extent to choose between elective modules in individual trajectories. The peers appreciate this rich variety of educational methods.

Overall, the criteria for the educational methods are perfectly met.

Criterion 3.4 Support and advice

Evidence:

- Auxiliary document: "University-wide Academic Policies and Procedures of al-Farabi Kazakh National University"
- Discussions with students
- Discussions with teaching staff

Preliminary assessment and analysis of the peers:
Students reported the support and advice at the faculty to be excellent. They described their advisors as engaged, diligent, kind and open-minded. There is obviously sufficient

time for supervising students. Non-subject specific counseling needs are addressed by a special counseling-infrastructure at university level (including a bologna office supporting mobility).

Overall, students made a very satisfied impression on the peers. They therefore consider the respective criteria for support and advice to be sufficiently fulfilled.

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

The peers noticed the declaration of the HEI that no module of the Bachelor's and Master's degree programs is repetitive. Even if there are similarities or consistencies in the module name, the content nevertheless is different.

With regard to the peers' recommendation to include the degree programs Technical Chemistry of Explosives and Pyrotechnical Produce and Petrochemistry as elective lines in the degree programs Technical Chemistry of Inorganic Substances and Technical Chemistry of Organic Substances respectively, the peers understood that within the current educational system and under the laws and regulations of the ministry of education the HEI is not able to implement such a change in curriculum. However, the peers thought it important to adjust the degree programs and their curricular outline in the long run to international customs and conventions. For this reason the peers stood fast to their original recommendation.

The peers welcomed the statement of the HEI that English language literature is more widely used than might be obvious at first glance. However, the *access* to English language literature does not necessarily imply the *usage* of it also. Therefore the peers confirmed their original view on this issue and the respective recommendation.

With view to the other aspects of the criterion 3 the peers confirmed their judgment as stated in the report.

4. Examination: System, Concept & Implementation

Criterion 4 Exams: System, concept & implementation

Evidence:

- Auxiliary document: "University-wide Academic Policies and Procedures of al-Farabi Kazakh National University"
- Module Handbook

- Inspection of final theses

Preliminary assessment and analysis of the peers:
The types of exams are defined in the module handbooks of the study programs. Usually, every module exam splits into a midterm and the final exam. According to the explanation of the program representatives most of the exams are in written form. Since the peers deemed it helpful for the development of the students to have a broader variety of examination forms, including also oral exams as well as presentation to foster the students' soft skills the peers recommended to the HEI to make increased use of oral examinations and presentations instead of written tests..

The examination schedule is drafted on central level of the faculty to assure that there are no overlaps in exams on compulsory courses and that there are one to two days between the single exams. As far as this is concerned, nothing is indicating an interference with individual students´ progress. With regards to the achievement of module objectives, students confirm exams to be reasonably linked to the course contents and the competences they are expected to achieve. An appeal against examinations is possible within 24h after publication of the marks. It is processed by a specific commission. If a student fails to pass an examination he is allowed a second attempt but has to pay for the additional examination as well as the preparatory extra lessons before the second attempt.

Each study program has a final thesis and the peers could inspect the topics of the mostly in Russian or Kazakh written theses, because they had a preceding English abstract. The subject of the final thesis is developed together with a supervisor from the faculty. This relationship is fixed in the last year of studies. Students then no longer have a right to deviate from this subject until the defense of the final thesis. The peers noticed that the credit points allocated to the bachelor's and especially the Master's theses are quite low. The program representatives explained that students work from the beginning on their Master's project, so that the last semester contains only the credits for the finalization and defense of the thesis. The peers could understand this reason, but nevertheless suggested to the HEI to reexamine the allocation of credits to the theses.

Overall, with the constraints mentioned, the peers considered the respective criteria to be sufficiently met.

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

The peers welcomed the HEI's plans to include more oral examinations in the degree programs. Otherwise, the peers confirmed their judgment regarding the criterion.

5. Resources

Criterion 5.1 Staff involved

Evidence:

- Staff handbooks in the Self Evaluation Reports
- Discussion with members of the university management
- Discussions with teaching staff
- Discussions with students

Preliminary assessment and analysis of the peers:
In the discussion with the peers, the members of the university management resumed the yet ongoing transformation process of al-Farabi University into a research institution, after being a more educationally oriented university in former times. Concerning scientific staff, this is to be achieved by a results-based management approach, which appears in individual agreements on objectives and individual reporting, taking into account the research performance to 50%, the educational performance to 35% and to 15% the social work of teaching staff in creating a generation with a deep respect to society.

In general, the academic career stages lead from the position of a young researcher to an assistant professor to an associate professor and then to a full professorship with the latter being the only permanent position in the academic career. The appointment to titles is based on requirements set by the Ministry of Education and Science, mostly taking into account the number of publications and their impact factor. The requirements are elevated towards the next position. Staff recruitment in general is conducted by open calls (e.g. announcements in newspapers) and for new specialities, staff is partly recruited directly from companies. There is also a governmental budget available for the invitation of foreign researchers. A number of foreign professors is spending their sabbatical at the HEI for research and also teaching.

There are fixed ratios of students to teaching staff required by the ministry of education. Generally, the approximate ratio follows 8:1 at bachelor´s level, 4:1 at master´s level and 3:1 at PhD-level. For courses e.g. at bachelor´s level this means that a lecture group should contain about 50 students, a seminar group around 25 and 15 for a lab group. The peers judged the teaching staff to student ratio as very good.

The members from the university management confirmed that the present resources for the programmes in terms of staff, equipment and budget are assured for the period of accreditation and that the development of these programmes will be supported. There is no reason for the peers to doubt this declaration.

Concerning the present teaching staff, the audit team had a good overview through the staff handbooks provided in the Self Evaluation Report. The peers approve sufficiency of teaching staff to conduct the programmes.

Criterion 5.2 Staff development

Evidence:

- Discussion with members from the university management
- Discussion with members from the faculty management
- Discussion with teaching staff

Preliminary assessment and analysis of the peers:
Already at master´s level some pedagogical practice is integrated into the course of studies. At PhD-level it is quite usual that PhD-students hold lectures from their supervising professors to supplement their salaries. Young professors are supported by a mentoring programme and there are seminars on educational methods available where staff can obtain certificates on their pedagogical competences. Funds from research projects can be used to a certain extent for personal development as well. For professors teaching in English language special training courses in English language skills are available. The professors stated that the on average take part in about 2 international conferences per year. A great part of the teaching staff of the faculty has spent at least some time at a HEI abroad. The peers lauded the mobility, motivation, and commitment of the teaching staff as an important asset of the faculty.

Overall the audit team considered the opportunities to be sufficient to meet the respective criteria.

Criterion 5.3 Institutional environment, financial and physical resources

Evidence:

- Visitation of the laboratories
- Lists of equipment in the Self-Evaluation-Report

Preliminary assessment and analysis of the peers:
The self-evaluation-report provided a detailed list of the laboratory and IT-equipment available. In addition to this, the audit team had the possibility to visit the laboratories of the Faculty of Chemistry. In general, the peers had a very positive impression of the adequacy of equipment for the education in the Bachelor's and Master's degree programs. The professors and students expressed their wish for a good NMR machine, but were overall satisfied with the equipment available. Especially the physical resources for the

Master of Nanotechnology and Nanomaterials impressed the members of the audit team. The peers underpinned as a very positive fact that students are allowed from the beginning to use all the modern and expensive equipment. Access to all equipment is equally granted to all members of the HEI and in no way restricted for students, even not on the junior level. However the peers found the safety standards and safety equipment of the laboratories of the faculty of Chemistry not being up to modern standards. Because safety precautions and equipment and its use and application are of the utmost importance for the daily work of researchers and laboratory staff in international chemistry the peers made it clear that the HEI has to modernize safety devices and standards according to international standards.

The peers found the cooperations with other universities as well as with companies being sufficiently regulated and based on a firm contractual basis. For the industry practice of five weeks students have guaranteed places with paid expenses available at the cooperating industry companies.

Although the peers viewed the English language textbooks listed in the modules descriptions somewhat outdated they could confirm that the library of the faculty has all the most recent international literature available online. Databases like Scopus, Springer or science Direct are free available to all students.

The financial stability and future support of the programmes was confirmed by a member of the university management. All in all the physical equipment is considered to be sufficient to achieve the learning outcomes of the programs at the Bachelor's and Master's degree level.

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

The peers noted the information given by the HEI that the (security) equipment is improved steadily by government investment and research grants. The peers confirmed their original judgment regarding the criterion.

6. Quality Management: Further Development of Degree Programmes

Criterion 6.1 Quality assurance & further development

Evidence:

- Auxiliary document: "University-wide Academic Policies and Procedures of al-Farabi Kazakh National University"
- Sample of the evaluation questionnaire
- Discussion with students

Preliminary assessment and analysis of the peers:

Concerning quality assurance and further enhancement, the university reported to have implemented an ISO 9001 approach for management- and administration-oriented issues. This approach and the respective certificates are visible on the websites of the university. For quality enhancement in educational aspects, the responsibility belongs to the Methodological Bureau every faculty of al-Farabi University has appointed. This responsibility includes the discussion of teachers-based evaluation results and the enhancement and modernization of educational approaches in general (e.g. distant learning technologies) and teaching performance in particular.

One important method to collect feedback from students is focused on the quality of teaching staff. The faculty has implemented an evaluation questionnaire which focuses on teaching performance. Systematic errors (e.g. unpopular topics) are taken into account when discussing the results, as a member of the university management explains. Additionally, exams are checked by a commission to rate the teachers´ performance (this also counts for advisors). As a support for enhancement, there are didactical trainings available provided by the university. Teaching staff also reports about a university-wide competition to identify the best teacher, which is granted with a sabbatical. But unfortunately, the winner takes the only award. The audit team would really appreciate an approach with a broader-scale-effect. In view of students attending the discussions, an enhancement of teaching performance is visible, but it could be communicated closer in connection of the questionnaire´s results. Because of non-permanent contracts for a significant share of teaching staff, a bad feedback over three consecutive years can lead to not prolonging the contract. Of course, this is the last resort after conceding a defined time for improvement. In view of students attending the discussions, an enhancement of teaching performance is visible, but it could be communicated closer in connection of the questionnaire´s results. Because of non-permanent contracts for a significant share of teaching

staff, a bad feedback over three consecutive years can lead to not prolonging the contract. Of course, this is the last resort after conceding a defined time for improvement.

The peers were informed by the program representatives that the HEI keeps track of graduates and alumni. However, viewed before the background of the ongoing efforts to enhance the international standing of the HEI the peers opined that a wider and more systematic use of alumni contacts could be helpful. Additionally, because of the uncertain workload situation the peers judged it desirable to introduce a systematic and comprehensive workload evaluation into the quality management system.

Overall, the audit team considered sufficient quality management procedures to be implemented. However the peers recommended to the HEI to enhance the Quality Management System with view to students' evaluation, alumni and graduates analysis, and a systematic workload workload evaluation.

Criterion 6.2 Instruments, methods and data

Evidence:

- Self Evaluation Report

Preliminary assessment and analysis of the peers:
The instruments for quality assurance purposes have been described in the previous chapter. In its Self-Evaluation-Reports, the faculty has presented data on staff capacity, facilities and equipment as well as on student counts, statistics about graduates for all study programmes and the ratio of self paying students. In general, the data presented depict the implementation of the programs and are thus considered as useful for programme development.

Final assessment of the peers after the comment of the Higher Education Institution regarding criterion 6:

The peers confirmed their original judgment regarding the criterion.

7. Documentation & Transparency

Criterion 7.1 Relevant Regulations

Evidence:

- Auxiliary document: "University-wide Academic Policies and Procedures of al-Farabi Kazakh National University"

Preliminary assessment and analysis of the peers:
Most topics relevant to regulations are explained in the "University-wide Academic Policies and Procedures of al-Farabi Kazakh National University". This document was provided in supplement to the Self-Evaluation-Report and is published on the websites of the university. It contains information on admission, the academic calendar, credits points required to achieve in the respective cycles, exams and grading, the structure of the university and the Law on Education of the Republic of Kazakhstan.

The audit team considered the characteristics of the programs to be adequately defined by this document.

Criterion 7.2 Diploma Supplement and Certificate

Evidence:

- Sample of the Transcript of records

Preliminary assessment and analysis of the peers:
Samples of a Diploma Supplement and a Transcript of Records were missing in the documentation provided by the HEI. The peers pointed out that both, the Diploma Supplement and the Transcript of Records have to been provided as additional documents before the peers can fell their final judgment regarding the fulfillment of the criteria in question.

Final assessment of the peers after the comment of the Higher Education Institution regarding criterion 7:

The HEI has provided samples of the Diploma Supplement and Transcript of Record of the degree programs in view. The peers found the documents to be complete and meaningful. However, although the provided Diploma Supplement contains information about the final mark and how it was calculated, the following information was missing: objectives and intended learning outcomes, structure and level of the degree programs, as well as an individual's performance. They pointed out to the HEI that the Diploma Supplement has to contain the aforementioned information.

D Additional Documents

Before preparing their final assessment, the panel 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:

1. Academic calendar
2. Diploma Supplement, Transcript of Records

E Comment of the Higher Education Institution (05.09.2014)

The institution provided a detailed statement as well as the following additional documents :

- Academic Calendar 2014-2015
- Diploma Supplements for all degree programs
- Transcripts of Records for the Master's degree programs Chemical Technology of Explosives and Pyrotechnicals Produce and Nanomaterials and Nanotechnology

F Summary: Peer recommendations (15.09.2014)

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

Degree program	**ASIIN-Seal**	**Subject specific Label**	**Accreditation until max.**
Ba Chemical Technology of Inorganic Substances	With requirements for one year	Eurobachelor® not awarded	30.09.2019
Ma Chemical Technology of Inorganic Substances	With requirements for one year	Euromaster® not awarded	30.09.2019
Ba Chemical Technology of Organic Substances	With requirements for one year	Eurobachelor® not awarded	30.09.2019
Ma Chemical Technology of Organic Substances	With requirements for one year	Euromaster® not awarded	30.09.2019
Ma **C**hemical Technology of Explosives and Pyrotechnical Produce	With requirements for one year	Euromaster® not awarded	30.09.2019
Ma Nanotechnology and Nanomaterials	With requirements for one year	Euromaster® not awarded	30.09.2019
Ma Petrochemistry	With requirements for one year	Euromaster® not awarded	30.09.2019

Requirements

For all degree programs

A 1. (ASIIN 2.3) The module descriptions have to be enhanced as stated in the report (calculate the work load for the individual student in the module descriptions).

A 2. (ASIIN 3.2) The students' workload per semester must be set at a level that avoids structural pressure on training quality. In line with the ECTS Users' Guide, the workload per semester must not exceed that of a full-time employee (maximum of 900h). The ECTS credits awarded must be adapted accordingly.

A 3. (ASIIN 5.3) Safety devices and standards must be modernized according to international standards.

A 4. (ASIIN 7.2) A programme-specific Diploma Supplement has to be prepared and handed out to students on a regular basis providing information about the objectives, intended learning outcomes, structure and level of the degree, as well as about an individual's performance.

Recommendations

For all degree programs

E 1. (ASIIN 6.1) It is recommended to enhance the Quality Management System with view to the points described in the report (students' evaluation, alumni and graduates analysis, workload evaluation).

E 2. (ASIIN 2.6) It is recommended to reduce the number of elective courses on culture in the curriculum in order to enhance specialty training, and give more room for courses on soft skills.

E 3. (ASIIN 3.3) It is recommended to make more use of the English / International literature.

E 4. (ASIIN 4) It is recommended to make increased use of oral examinations and presentations instead of written tests.

For the Bachelor's and Master's degree programs Technical Chemistry of Organic Substances and Technical Chemistry of un-organic substances

E 5. (ASIIN 2.6) It is recommended to include more fundamental courses on methods in the curricula.

For the Master's degree program Technical Chemistry of Explosives and Pyrotechnical Produce

E 6. (ASIIN 3.1) It is recommended to include the degree program as an elective line in the Master's degree program Technical Chemistry of un-organic substances.

For the Master's degree program Petrochemistry

E 7. (ASIIN 3.1) It is recommended to include the degree program as an elective line in the Master's degree program Technical Chemistry of organic substances.

E 8. (ASIIN 2.6) It is recommended to revise the curriculum to include more lab courses in order to ensure the achievement of the intended learning outcomes.

G Comment of the Technical Committee 09 - Chemistry (by way of circulation)

Assessment and analysis for the award of the ASIIN seal:

The Technical Committee agrees to the vote of the peers'.

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

The Technical Committee deems that the indented learning outcomes do not comply with the subject knowledge areas of ECTNA.

The 09 - Chemistry recommends the award of the seals as follows:

Degree program	**ASIIN-Seal**	**Subject specific Label**	**Accreditation until max.**
Ba Chemical Technology of Inorganic Substances	With requirements for one year	Eurobachelor® not awarded	30.09.2019
Ma Chemical Technology of Inorganic Substances	With requirements for one year	Euromaster® not awarded	30.09.2019
Ba Chemical Technology of Organic Substances	With requirements for one year	Eurobachelor® not awarded	30.09.2019
Ma Chemical Technology of Organic Substances	With requirements for one year	Euromaster® not awarded	30.09.2019
Ma **C**hemical Technology of Explosives and Pyrotechnical Produce	With requirements for one year	Euromaster® not awarded	30.09.2019
Ma Nanotechnology and Nanomaterials	With requirements for one year	Euromaster® not awarded	30.09.2019

Degree program	ASIIN-Seal	Subject specific Label	Accreditation until max.
Ma Petrochemistry	With requirements for one year	Euromaster® not awarded	30.09.2019

H Decision of the Accreditation Commission (05.12.2014)

Assessment and analysis for the award of the ASIIN seal:

The Accreditation Commission decides to reframe the former recommendations E6 and E7 regarding the inclusion of the Master's degree programmes Technical Chemistry of Explosives and Pyrotechnical Produce as elective lines into the Master's degree programmes Technical Chemistry of Inorganic Substances and Technical Chemistry of Organic Substances respectively. This new recommendation E5 takes effect for all degree programmes. The requirements and recommendations in general have to be harmonized in wording with the other clusters at the al-Farabi University. Otherwise, the Accreditation Commission follows the votes of the peers and the Technical Committee and awards the the ASIIN seal.

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

The Accreditation Commission deemed that the indented learning outcomes do not comply with the subject knowledge areas of ECTNA. The Eurobachelor®/Euromaster® Labels are not awarded.

The Accreditation Commission decides about the award of seals as follows:

Degree program	**ASIIN-Seal**	**Subject specific Label**	**Accreditation until max.**
Ba Chemical Technology of Inorganic Substances	With requirements for one year	Eurobachelor® not awarded	30.09.2020
Ma Chemical Technology of Inorganic Substances	With requirements for one year	Euromaster® not awarded	30.09.2020
Ba Chemical Technology of Organic Substances	With requirements for one year	Eurobachelor® not awarded	30.09.2020

Degree program	ASIIN-Seal	Subject specific Label	Accreditation until max.
Ma Chemical Technology of Organic Substances	With requirements for one year	Euromaster® not awarded	30.09.2020
Ma **C**hemical Technology of Explosives and Pyrotechnical Produce	With requirements for one year	Euromaster® not awarded	30.09.2020
Ma Nanotechnology and Nanomaterials	With requirements for one year	Euromaster® not awarded	30.09.2020
Ma Petrochemistry	With requirements for one year	Euromaster® not awarded	30.09.2020

Requirements

For all degree programs

A 1. (ASIIN 2.3) The module descriptions have to be enhanced as stated in the report (calculate the work load for the individual student in the module descriptions).

A 2. (ASIIN 3.2) The students' workload per semester must be set at a level that avoids structural pressure on training quality. In line with the ECTS Users' Guide, the workload per semester must not exceed a maximum of 900h. The ECTS credits awarded must be adapted accordingly.

A 3. (ASIIN 5.3) It has to be proved, how the students are familiarized with international security standards, how they develop an understanding of safety at work, and how the teaching staff implements this.

A 4. (ASIIN 7.2) An English diploma supplement has to be provided as a separate document, specifying the qualification achieved.

A 5. (ASIIN 3.2) The transformation of the Kazakh credit points into ECTS points must correspond to the ECTS regulation that one credit point bases on 25-30 hours student workload.

Recommendations

For all degree programs

E 1. (ASIIN 6.1) It is recommended to enhance the Quality Management System with view to the points described in the report (students' evaluation, alumni and graduates analysis, workload evaluation).

E 2. (ASIIN 2.6) It is recommended to reduce the number of elective courses on culture in the curriculum in order to enhance specialty training, and give more room for courses on soft skills.

E 3. (ASIIN 3.3) It is recommended to make more use of the English / International literature.

E 4. (ASIIN 4) It is recommended to make increased use of oral examinations and presentations instead of written tests.

E 5. (ASIIN 3.1) It is recommended to develop the degree programmes in such a way that they do not only qualify the graduated according to the needs of the regional labour market.

For the Bachelor's and Master's degree programs Technical Chemistry of Organic substances and Technical Chemistry of Inorganic Substances

E 6. (ASIIN 2.6) It is recommended to strengthen the foundations in mathematics, natural sciences, and chemistry as well as methodological competences in the curriculum.

For the Master's degree program Petrochemistry

E 7. (ASIIN 2.6) It is recommended to revise the curriculum to include more lab courses in order to ensure the achievement of the intended learning outcomes.

I Fulfillment of Requirements (22.10.2015)

The university provides extensive material and tries to document in which way the requirements have been fulfilled.

Peer Recommendation (18.11.2015)

The peers judge all requirements to be fulfilled.

Comment of the Technical Committee 09 - Chemistry (19.11.2015)

The Technical Committee discusses the accreditation procedure and decides that requirements A1, A2, A3 and A5 are not fulfilled, because the calculation of the student workload is inconsistent.

Decision of the Accreditation Commission (11.12.2015)

The Accreditation Commission discusses the accreditation procedure and decides that requirements A1, A2, A3 and A5 are not fulfilled.

The Accreditation Commission decides about the award of seals as follows:

Degree Programme	**ASIIN seal**	**Subject-specific Label**	**Maximum duration of accreditation**
Ba Chemical Technology of Inorganic Substances	requirements 1, 2, 3, 5 not fulfilled 6 months prolongation	Eurobachelor® not awarded	30.09.2020
Ma Chemical Technology of Inorganic Substances	requirements 1, 2, 3, 5 not fulfilled 6 months prolongation	Euromaster® not awarded	30.09.2020
Ba Chemical Technology of Organic Substances	requirements 1, 2, 3, 5 not fulfilled 6 months prolongation	Eurobachelor® not awarded	30.09.2020

Degree Programme	ASIIN seal	Subject-specific Label	Maximum duration of accreditation
Ma Chemical Technology of Organic Substances	requirements 1, 2, 3, 5 not fulfilled 6 months prolongation	Euromaster® not awarded	30.09.2020
Ma **C**hemical Technology of Explosives and Pyrotechnical Produce	requirements 1, 2, 3, 5 not fulfilled 6 months prolongation	Euromaster® not awarded	30.09.2020
Ma Nanotechnology and Nanomaterials	requirements 1, 2, 3, 5 not fulfilled 6 months prolongation	Euromaster® not awarded	30.09.2020
Ma Petrochemistry	requirements 1, 2, 3, 5 not fulfilled 6 months prolongation	Euromaster® not awarded	30.09.2020

The Accreditation Commission justifies its decision as follows:

Requirement A1:

The calculation of the students` workload in the module descriptions is misleading and incomprehensible.

Requirement A2:

The total workload per semester cannot be evaluated because the calculation of the workload in the module descriptions is incomprehensible.

Requirement A3:

It remains unclear how exactly the students are familiarized with international security standards, how they develop an understanding of safety at work, and how the teaching staff implements this.

Requirement A5:

The conversion in ECTS credits is also incomprehensible.

J Fulfilment of Requirements (01.07.2016)

Analysis of the peers and the Technical Committee 09 – Chemistry (20.06.2016)

The peers and the Technical Committee 09 – Chemistry judge the requirements to be fulfilled.

Decision of the Accreditation Committee (01.07.2016)

The Accreditation Committee decides to extend the accreditation term as follows:

Degree Programme	**ASIIN-seal**	**Subject-specific labels**	**Duration of accreditation**
Ba Chemical Technology of Inorganic Substances	All requirements fulfilled*	Eurobachelor® not awarded	30.09.2020
Ma Chemical Technology of Inorganic Substances	All requirements fulfilled*	Euromaster® not awarded	30.09.2020
Ba Chemical Technology of Organic Substances	All requirements fulfilled*	Eurobachelor® not awarded	30.09.2020
Ma Chemical Technology of Organic Substances	All requirements fulfilled*	Euromaster® not awarded	30.09.2020
Ma Chemical Technology of Explosives and Pyrotechnical Produce	All requirements fulfilled*	Euromaster® not awarded	30.09.2020
Ma Nanotechnology and Nanomaterials	All requirements fulfilled*	Euromaster® not awarded	30.09.2020
Ma Petrochemistry	All requirements fulfilled*	Euromaster® not awarded	30.09.2020