

**NJSC "Kazakh national research technical University named after K. I. Satbayev»
Institute of chemical and biological technologies
Department of Chemical and Biochemical Engineering**

EDUCATION PROGRAM

«CHEMICAL PROCESSES AND PRODUCTION OF CHEMICAL MATERIALS»

**Master of engineering and technology by education program of the
7M07110 - "Chemical processes and production of chemical materials"**

2nd edition
in accordance with the SES of higher education 2018

Almaty 2020

Разработано:	Рассмотрено: заседание УС Института	Утверждено: УМС КазНТУ	Страница 1 из 21
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Утверждено на заседании Ученого Совета Казахского национального исследовательского технического университета им К.И. Сатпаева. Протокол №4 от 14.01.2020 г.

Квалификация:

Уровень 7 Национальной рамки квалификаций:

7М07 – Инженерные, обрабатывающие и строительные отрасли

7М071 – Инженерия и инженерное дело (магистр)

Профессиональная компетенция: владение современными методами научных исследований, постановка и формулирование задач научных исследований на основе результатов поиска, обработки и анализа научно-технической информации, разработка новых технических и технологических решений при создании химической продукции с учетом технико-экономических и экологических требований, организация работы коллектива исполнителей, принятия управленческих решений в условиях различных мнений, применения интерактивных форм и инновационных методов обучения в современном вузе.

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BRIEF DESCRIPTION OF THE PROGRAM

1 Objectives:

- formation of General cultural, professional and special competencies that allow graduates to independently set and solve production and technological and experimental research tasks in the field of modern production of chemical materials;
- training of specialists with modern methods of organization and management of chemical processes and production of chemical materials, able to solve management problems and be responsible for decisions;
- training of masters with leadership skills, capable of self-education, fluent in a foreign language at a professional level.

2 Types of employment. Graduate of the educational program "Chemical processes and production of chemical materials" in the field of training 7M071 – Engineering and engineering business is preparing for the following professional activities:

- production;
- design;
- organizational and managerial.

3 Objects of professional activity: chemicals and materials; methods and devices for determining and studying the composition and properties of substances and materials; technological processes and industrial systems for the production of chemicals and materials, as well as their management and control systems.

Subjects of professional activity: chemical enterprises and production of various profiles, research and engineering companies, research and design industry institutes; research laboratories.

PASSPORT OF THE EDUCATIONAL PROGRAM

1 Scope and content of the programme

The period of study in the master's degree is determined by the volume of mastered academic credits. When mastering the set amount of academic credits and achieving the expected results of training for a master's degree, the educational program of the master's degree is considered to be fully mastered. In profile magistracy with a typical training period of 1 year at least 60 academic credits for the entire period of study, including all types of educational and scientific activities of the undergraduate.

Planning the content of education, the method of organization and conduct of the educational process is carried out by the university and the scientific organization on their own on the basis of credit technology training.

The magistracy in the profile direction realizes educational programs of

postgraduate education on preparation of the administrative personnel possessing profound professional training.

The content of the master's educational program consists of:

- 1) theoretical training, including the study of cycles of basic and major disciplines;
- 2) practical training of undergraduates: different types of practices, scientific or professional training;
- 3) experimental research work, including the implementation of the master's thesis – for the profile of the magistracy
- 4) final certification.

Normative documents for the development of the educational program

The normative legal basis for the development of this educational program is:

- Law of the Republic of Kazakhstan "On education" with amendments and additions in the framework of legislative changes to improve the independence and autonomy of universities from 04.07.18, № 171-VI.

- Law of the Republic of Kazakhstan "On amendments and additions to some legislative acts of the Republic of Kazakhstan on the expansion of academic and managerial independence of higher education institutions" dated 04.07.18 № 171-VI;

- Order of the Minister of education and science of the Republic of Kazakhstan dated 30.10.18 № 595 "On approval of Standard rules of activity of educational organizations of appropriate types»;

- State obligatory standard of postgraduate education (Annex 8 to the order of the Minister of education and science of the Republic of Kazakhstan dated 31.10.18 № 604;

- Order of the Minister of education and science of the Republic of Kazakhstan dated 20.01.15 № 19 «On approval of the rules of transfer and restoration of students by type of educational institutions with amendments and additions» by order № 601 dated 31.10.18;

- Working curriculum of the educational program "Chemical processes and production of chemical materials" for 2019-2020, approved by the rector Of the Kazakh national Research Technical University named after K. I. Satpaev;

- Documents of the QMS system (Quality Management System) on the organization of the educational process at the Kazakh National Research Technical University named after K. I. Satpaev.

Content of the EP: the EP "Chemical processes and production of chemical products" is implemented by KazNRTU after K. I. Satpaev in the direction of training 7M071- Engineering and engineering business (master) and presents a system of documentation regulating the objectives, expected results, content and implementation of the educational process in the field of chemical engineering and production of chemical materials.

EP provides an opportunity to gain in-depth knowledge, key skills and abilities of the graduate and their further development in the field of chemical engineering and production of chemical materials. This EP is built taking into account the possibility of providing bachelors the opportunity to choose the appropriate educational path or a specific specialization based on the basic educational program, but containing their own individual competencies, reflecting the specifics of a particular specialization within a single educational direction 7M071 – Engineering and engineering business (master).

EP contains the following specializations:

- chemical technology of inorganic substances;
- nuclear chemical technology;
- innovative technologies of building materials;
- chemical technology of organic substances;
- chemical technology of polymeric materials.

Objectives of the educational program:

Master in the field of training 7M071 – engineering and engineering business should be prepared to solve the following professional tasks in accordance with the direction of EP "Chemical processes and production of chemical materials" and professional activities:

1. Project activity

- calculate the material and thermal balances of the chemical process;
- to make the hardware and technological scheme of the process;
- calculate the main structural and technological parameters of the main and auxiliary equipment;
- develop or select drawings of equipment, buildings and structures;
- to develop simulation models of chemical and technological processes.

2. Production activity

- develop chemical and technological processes for the production of new substances and materials;
- to improve the technological schemes of existing production with the justification of the main parameters and indicators of the process;
- possess the skills of technical analysis and production control, process management and technology optimization;
- on the basis of existing standards to be able to formulate technical requirements for specific types of finished products, to possess modern methods of testing, to use state and international standards in professional activities;
- to make a business plan of chemical and technological project;
- to apply innovations in the field of activity, to develop energy- and resource-saving technologies in the field of production of chemical materials;
- develop measures to protect the environment for chemical enterprises.

3. Organizational and management activities.

- to provide information support of production, labor and management;
- to carry out activities on the organization of production in accordance with regulatory documents;
- develop and prepare the necessary documentation;
- organize the activities of the team, make work plans and set production targets.
- to solve the issues of logistics, to control the execution of tasks.

2 Requirements for applicants

Previous level of education of applicants (first cycle) - higher professional education (bachelor). The applicant must have a diploma of the established sample and confirm the level of knowledge of the English language with a certificate or diplomas of the established sample.

The procedure for admission of citizens to the master's degree is established in accordance with the "Standard rules for admission to educational institutions that implement educational programs of postgraduate education."

The formation of the contingent of undergraduates is carried out through the placement of the state educational order for the training of scientific and pedagogical personnel, as well as payment for training at the expense of citizens' own funds and other sources. Citizens of the Republic of Kazakhstan shall be provided with the right to receive free postgraduate education on a competitive basis in accordance with the state educational order, if they receive this level for the first time.

At the "entrance" the master student must have all the prerequisites necessary for the development of the appropriate educational program of the magistracy. The list of necessary prerequisites is determined by the higher education institution independently.

In the absence of the necessary prerequisites undergraduates are allowed to master them on a fee basis.

3 Requirements to complete the course and receive a diploma

Awarded degree / qualifications: A graduate of the educational program "Chemical Processes and Production of Chemical Materials" in the profile direction is assigned an academic degree "Master of Engineering and Technology."

A graduate who has mastered the program of specialized magistracy should have the following general professional competencies:

- the ability to independently acquire, comprehend, structure and use in professional activity new knowledge and skills, develop their innovative abilities;
- ability to independently formulate research goals, establish the sequence of solving professional tasks;
- the ability to put into practice the knowledge of fundamental and applied sections of the disciplines that determine the direction (profile) of the master's program;

- the ability to professionally select and creatively use modern scientific and technical equipment to solve experimental and practical problems;
- the ability to critically analyze, represent, protect, discuss and disseminate the results of their professional activities;
- Possession of skills for the preparation and execution of scientific and technical documentation, reviews, reports and articles;
- readiness to lead the team in their professional activities, tolerantly perceiving social, ethnic, confessional and cultural differences;
- readiness for communication in oral and written forms in a foreign language for solving problems of professional activity.

A graduate who has mastered the master's program must have professional competencies corresponding to the types of professional activity to which the master's program is oriented:

production activities:

- ability to independently carry out production, field and laboratory and interpretation work in solving practical problems;
- ability to professional exploitation of modern field and laboratory equipment and devices in the field of mastered master programs;
- the ability to use modern methods of processing and interpreting complex information to solve production problems;

project activity:

- the ability to independently draw up and submit research and development projects;
- readiness to design complex research and production works in solving professional problems;

organizational and management activities:

- readiness to use the practical skills of organizing and managing research and production works in solving professional problems;
- readiness for practical use of regulatory documents in the planning and organization of research and production work.

During developing a master's program, all general cultural and general professional competencies, as well as professional competences related to the types of professional activities for which the master's program is focused and included the set of required results of master program.

4 Working curriculum of the educational program

4.1. Duration of training 1 years

Educational program "CHEMICAL PROCESSES AND PRODUCTION of CHEMICAL MATERIALS"
2020 - 2021 academic year

Academic degree: Master of engineering and technology

Duration of study: 1 year

year of study	Code	Name of course	Component	Academic credits	lec/ lab/ prac/MSIW	Prerequisites	Code	Name of course	Component	Academic credits	lec/ lab/ prac/MSIW	Prerequisites
1	1 semester						2 semester					
	LNG202	Foreign language (professional)	BD IC	6	0/0/3/3		AAP248	Work placement	PS	7		
	MNG274	Management	BD IC	6	2/0/1/3		AAP207	Master's student experimental research work, including internship and master's project implementation	MSERW	13		
	HUM204	Management Psychology	BD OC	4	1/0/1/2		ECA206	Registration and defense of the master's project (RaDMP)	FA	12		
		Электив	BD OC	4								
		Электив	PS OC	6								
		Электив	PS OC	6								
		Электив	PS OC	6								
		In total		38				In total		32		

In all

70

4.2 Catalogue of elective disciplines

Catalogue of elective disciplines for Masters degree 2020 - 2021 academic year					
Term of study: 1 year					
№	Code	Name of discipline	Credits ECTS	Lec/lab/pr	Semester
BD Optional component - 4 credits					
Advanced basic module					
BD2.4	CHE205	Fundamentals of modern technologies for processing mineral raw materials *	4	1/1/0/2	1
PD Optional component - 18 credits					
Module of <u>technologies of the main production</u>					
PD3.1	CHE272	Industrial reactors for large-scale chemical production *	6	2/0/1/3	1
	CHE292	Biofuel technology *	6	2/0/1/3	1
Module of <u>chemical technology of the inorganic substances</u>					
PD3.2	CHE750	Modern methods of corrosion protection of technological equipment *	6	2/0/1/3	1
	CHE297	Modern methods of scientific research in chemical technology *	6	2/0/1/3	1
	CHE288	Fundamentals of Physical Chemistry of Silicates	6	2/1/0/3	1
Module of <u>chemical technology of the organic substances</u>					
PD3.3	CHE293	Chemotology of petroleum products	6	2/0/1/3	1
	CHE725	Technology of heterolytic and homolytic processes *	6	2/0/1/3	1
	BIO705	Industrial catalysis and catalysts in oil refining *	6	2/0/1/3	1

* - disciplines of an interdisciplinary nature

4.3 MODULAR CURRICULUM

Education program: 7M07110 – «Chemical processes and production of chemical materials»

Form of study: full Duration of training: 1 years Academic degree: Master of technic and technologies

The cycle	code	Name of disciplines	Semester	Acad. credits	lec.	lab.	prac	IWS	Type of control	Chair
Profile training module										
Basic disciplines (BD) (20 credits)										
University component (UC) (16 credits)										
BD 2.1.1	LNG202	Foreign language (professional)	1	6	0	0	3	3	Exam	EL
BD 2.2.1	MNG274	Management	1	6	2	0	1	3	Exam	SECPM
BD 2.3.1	HUM204	Management psychology	1	4	1	0	1	2	Exam	SD
Choice component (ED) (4 credits)										
Advanced basic module										
BD 2.4.1	CHE298	Fundamentals of modern technologies for processing mineral raw materials *	1	6	2	1	0	3	Exam	ChP&IE
Major disciplines (PD) (20 credits)										
PD Choice component (ED) 18 credits										
Module of technologies of the main production										
PD 3.1.1	CHE272	Industrial reactors for large-scale chemical production *	1	6	2	0	1	3	Exam	Ch&BChE
	CHE292	Biofuel technology *	1	6	2	0	1	3	Exam	Ch&BChE
Module of chemical technology of the inorganic substances										
PD3.2.1	CHE750	Modern methods of corrosion protection of technological equipment *	1	6	2	0	1	3	Exam	ChP&IE
	CHE297	Modern methods of scientific research in chemical technology *	1	6	2	0	1	3	Exam	ChP&IE
	CHE288	Fundamentals of Physical Chemistry of Silicates	1	6	2	0	1	3	Exam	ChP&IE
Module of chemical technology of the organic substances										
PD3.3.1	CHE 293	Chemotology of petroleum products	1	6	2	0	1	3	Exam	Ch&BChE
	CHE725	Technology of heterolytic and homolytic processes	1	6	2	0	1	3	Exam	Ch&BChE
	BIO705	Industrial catalysis and catalysts in oil refining	1	6	2	0	1	3	Exam	Ch&BChE
Practice-oriented module										
PD	AAP248	Research practice	2	7					Report	Ch&BChE ChP&IE
Research Module (13 credits)										

MSSR	AAP207	Master's student scientific research	2	13					Report	Ch&BChE ChP&IE
Module of final attestation (12 credits)										
FA	ECA206	Registration and defense of the master's thesis	2	12					Defense of dissertation	Ch&BChE ChP&IE
Total				32						

* - disciplines of an interdisciplinary nature

5 Descriptors of level and scope of knowledge, skills and competences

The requirements for the level of training of a master degree are determined on the basis of Dublin descriptors of the second level of higher education (master degree) and reflect the mastered competencies expressed in the achieved learning results.

The results of training are formulated at the level of the entire educational program of the magistracy, and at the level of individual modules or discipline.

Descriptors reflect the learning outcomes characterizing the learner's abilities:

1) demonstrate developing knowledge and understanding in the field of chemical processes and production of organic and inorganic substances and materials, based on advanced knowledge of chemical science and engineering in the development and (or) application of ideas in the context of research;

2) apply professionally their knowledge, understanding and abilities to solve problems in a new environment, in a broader interdisciplinary context;

3) collect and interpret information to form judgments based on social, ethical and scientific considerations;

4) clearly and unambiguously communicate information, ideas, conclusions, problems and solutions to both professionals and non-specialists;

5) demonstrate the training skills necessary for self-continuation of further training in the field of chemical engineering and engineering business.

6 Competencies upon completion of training

6.1 Requirements to key competences of graduates of profile magistracy. The graduate must:

1) have a performance:

- on current trends in the development of scientific knowledge;
- on actual methodological and philosophical problems of natural (social, humanitarian, economic) Sciences;
- contradictions and socio-economic consequences of globalization processes;

- on the current state of the economic, political, legal, cultural and technological environment of the global business partnership;
- on the organization of strategic enterprise management, innovation management, leadership theories;
- on the main financial and economic problems of enterprises.

2) know:

- methodology of scientific knowledge;
- the main driving forces of changes in the structure of the economy;
- features and rules of investment cooperation;
- at least one foreign language at a professional level that allows for research and practice.

3) be able:

- apply scientific methods of knowledge in professional activities;
- critically analyze existing concepts, theories and approaches to the study of processes and phenomena;
 - integrate the knowledge gained in different disciplines, use them to solve analytical and management problems in new unfamiliar conditions;
 - to carry out microeconomic analysis of economic activity of the enterprise and to use its results in management of the enterprise;
 - apply new approaches to marketing and management organization in practice;
 - make decisions in difficult and unusual situations in the field of organization and management of economic activity of the enterprise (firm);
 - to apply in practice the norms of the legislation of the Republic of Kazakhstan in the field of regulation of economic relations;
 - think creatively and approach creatively to solving new problems and situations;
 - to carry out information-analytical and information-bibliographic work with the involvement of modern information technologies;
 - summarize the results of experimental research and analytical work in the form of a master's thesis, article, report, analytical note, etc.

4) have skills:

- solutions of standard scientific and professional tasks;
- scientific analysis and solution of practical problems in the organization and management of economic activities of organizations and enterprises;
- research problems in the field of management and marketing and use the results to improve the methods of enterprise management;

- professional communication and intercultural communication;
- oratory, correct and logical design of their thoughts in oral and written form;
- expanding and deepening the knowledge necessary for daily professional activities and continuing education in doctoral studies;
- use of information and computer technologies in the field of professional activity.

5) be competent:

6)

- in the field of research methodology in the specialty;
- in the field of modern problems of the world economy and the participation of national economies in world economic processes;
- in the organization and management of the enterprise;
- in the implementation of industrial relations with various organizations, including public service bodies;
- ways to ensure constant updating of knowledge, skills and abilities.

B-basic knowledge and skills:

B1-ability to use philosophical concepts of natural science to form a scientific worldview;

B2-the ability to apply knowledge of the methodology of chemical Sciences and chemical engineering to solve specific professional problems and assess technological risks;

B3-the ability to use psychological methods and means to improve the efficiency and quality of training.

P-professional competences:

P1-the ability to independently analyze the available information, set goals and objectives and carry out experimental research using modern instrumental methods and computational tools, to be responsible for the quality of research and scientific reliability of the results;

P2-ability to generate new ideas and methodological solutions;

P3-the ability to professionally draw up, submit and report the results of research and production and technological works on the approved forms;

P4-willingness to creatively apply modern computer technology in the collection, storage, processing, analysis and transmission of information to solve professional problems in the field of chemical engineering and production of chemical materials;

P5-the ability to plan and carry out activities to assess the state and protection of the environment, to organize activities for environmental management;

P6-possession of skills of formation and representation of educational material in various form, carrying out laboratory and practical occupations, readiness for teaching in educational institutions and the management of research work of students.

O-human, social and ethical competences:

O1-knowledge of contemporary social and political problems;

O2-ability to perceive intercultural differences, ability to observe and maintain ethical norms and rules;

O3-communication skills in a foreign language, ability to work in an international context;

C-special and managerial competences:

C1-the ability to manage the work team and ensure safety measures;

C2 - ability to plan and organize professional events;

C3-willingness to act in unusual situations, to bear social and ethical responsibility for decisions.

6.2 Requirements for experimental research work of a graduate student in the profile master study.

Experimental research work of a master student should:

1) correspond to the profile of the educational program of the master's degree, which is performed and protected by the master's project;

2) be based on modern achievements of science, technology and production and contain specific practical recommendations, independent solutions of management tasks;

3) be carried out with the use of advanced information technology;

4) contain experimental research (methodical, practical) sections on the main protected provisions.

6.3 Requirements for the organization of practices:

The educational program of the profile magistracy includes practical training in the cycle of MS.

Industrial practice in the cycle of MS is carried out in order to consolidate the theoretical knowledge gained in the learning process, the acquisition of practical skills, competencies and experience of professional activity in the educational program of the master's degree, as well as the development of best practices.

7 Annex to the certificate according to the standard ECTS

The annex is developed according to the standards of the European Commission, the Council of Europe and UNESCO/CEPES. This document serves only for academic recognition and is not an official confirmation of the document on education. Without a diploma of higher education is not valid. The purpose of completing the European annex is to provide sufficient data on the holder of the diploma, the qualification obtained, the level of this qualification, the content of the training program, the results, the functional

purpose of the qualification, as well as information on the national education system. The model of the application on which the estimates will be translated uses the European credit transfer or transfer system (ECTS).

The European diploma supplement provides an opportunity to continue education in foreign universities, as well as to confirm the national higher education for foreign employers. By traveling abroad for professional recognition, it will be required additional legalization of the diploma of education. European diploma supplement is filled in English on individual request and will be issued free of charge.

Foreign language (professional)

CODE – LNG205

CREDITS – 6 (0/0/3/3)

PREREQUISITES-Academic English, Business English, IELTS 5.0-5.5

THE PURPOSE AND OBJECTIVES OF THE COURSE

The aim of the course is to develop students ' English language skills for their current academic studies and improve their performance in project management.

BRIEF DESCRIPTION OF THE COURSE

The course aims to build vocabulary and grammar for effective communication in project management and to improve reading, writing, listening and speaking skills at the Intermediate level. It is expected that students will acquire a vocabulary of business English and learn grammar structures, which are often used in the context of management. The course consists of 6 modules. The 3rd module of the course ends with an intermediate test, and the 6th module is accompanied by a test at the end of the course. The course ends with the final exam. Students also need to practice on their own (MIS). MIS - independent work of undergraduates under the guidance of a teacher.

KNOWLEDGE AND SKILLS UPON COMPLETION OF THE COURSE

Upon successful completion of the course, students are expected to be able to recognize the main idea and message, as well as specific details by listening of monologues, dialogues and group discussions in the context of business and management; understand written and spoken English on topics related to management; write management texts (reports, letters, e-mails, minutes of meetings), following the generally accepted structure with a higher degree of grammatical accuracy and using business words and phrases, talk about different business situations, using the appropriate business vocabulary and grammatical structures - in pairs and group discussions, meetings and negotiations.

Management

CODE – MNG274

CREDITS – 3 (2/0/1/3)

PREREQUISITES – not

THE PURPOSE AND OBJECTIVES OF THE COURSE

The purpose of teaching the discipline is the development of project management methodology in various fields, education of culture, adequate to modern project management and information technology, the creation of conditions for the introduction of new information technologies in the field of project implementation. The course is based on international recommendations for project Management (Project Management Body of Knowledge).

BRIEF DESCRIPTION OF THE COURSE

The content of the discipline is aimed at the study of modern concepts, methods, tools of project management in order to apply them in the future practice of a specialist to solve the problems of planning and execution of projects.

KNOWLEDGE AND SKILLS UPON COMPLETION OF THE COURSE

Be able to: prepare documents of the project initiation stage, such as feasibility study, project Charter, etc.; develop and analyze documents related to the planning of project activities, apply various methods to support decision-making; promptly monitor the execution of works and track deadlines; select personnel, resolve contradictions between team members; manage risks arising from the implementation of projects.

The knowledge acquired in the course of discipline: Modern standards in the region management proektami their characteristics; the PMI Approach to project management; Planning investment; Accounting of project risks; Methods of optimizing the use of available resources; Ways of resolving conflict situations; Analysis of actual performance to make timely adjustments to the progress.

Skills: project management in accordance with modern requirements of project management; apply in the process of project management software MS Project.

Psychology of management

CODE – HUM204

CREDIT – 4 (1/0/1/2)

PREREQUISITE – not

PURPOSE AND OBJECTIVES OF THE COURSE

The main goal of the course is aimed at studying the characteristics of the behavior of individuals and groups of people within organizations; determining psychological and social factors influencing the behavior of workers. Also, much attention will be paid to issues of internal and external motivation of people. The main goal of the course is to apply this knowledge to improve the effectiveness of the organization.

SHORT DESCRIPTION OF THE COURSE

The course is designed to provide balanced coverage of all the key elements that make up the discipline. It will briefly review the origins and development of the theory and practice of organizational behavior, followed by a review of the main roles, skills and functions of management with a focus on management effectiveness, illustrated with real-life examples and case studies.

KNOWLEDGE, ABILITY, SKILLS TO COMPLETE THE COURSE

Upon completion of the course, students will know: the basics of individual and group behavior; basic theories of motivation; basic leadership theories; concepts of communication, management of conflicts and stress in the organization; will be able to define the different roles of leaders in organizations; look at organizations from the point of view of managers; understand how effective management contributes to an effective organization.

Defense of the master thesis

CODE – ECA2013

CREDITS - 12

The purpose of the master thesis is: demonstration of the level of scientific/research qualification of undergraduates, the ability to conduct scientific research independently, the ability to solve specific scientific and practical problems, obtaining knowledge of the most common methods and techniques for their solution.

BRIEF DESCRIPTION

Master thesis-final qualifying scientific work, which is a synthesis of the results of independent research undergraduate one of the actual problems of a particular specialty of the relevant branch of science, which has internal unity and reflects the progress and results of the development of the chosen topic.

Master thesis-the result of the research/experimental research work of the undergraduate, conducted during the entire period of study undergraduate.

The defense of the master's thesis is the final stage of the master degree. Master thesis must meet the following requirements:

- the work should be carried out research or solve current problems in the field of chemical technology of inorganic substances;
- the work should be based on the identification of important scientific problems and their solution;
- decisions should be scientifically grounded and reliable, have internal unity;
- dissertation work should be written alone.

Content

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РЕЦЕНЗИЯ

на образовательную программу
«Химические процессы и производство химических материалов»
в области инженерии и инженерного дела
(профильная магистратура, срок обучения 1 год)

Рецензируемая образовательная программа (ОП) «Химические процессы и производство химических материалов» квалификации «7М071 - Инженерия и инженерное дело» (магистр техники и технологии) Национальной рамки квалификации представляет собой описание образовательной подготовки специалистов, разработанной на основе Государственного общеобязательного стандарта высшего образования Республики Казахстан (магистратура).

Содержание и структура ОП по направлению подготовки «7М071 – Инженерия и инженерное дело» (профильная магистратура) отвечает основным требованиям стандарта и содержит следующую информацию: цели и задачи ОП, характеристику профессиональной деятельности выпускника; академические требования к поступающим, требования для завершения обучения и получение диплома, рабочий учебный план, дескрипторы уровня и объема знаний, умений, навыков и полный перечень общечеловеческих, социально-этических, базовых, профессиональных и специальных компетенций.

Структура Учебного плана ОП «Химические процессы и производство химических материалов» логична и последовательна. Дисциплины учебного плана раскрывают сущность актуальных на сегодняшний день проблем. Общая трудоемкость программы составляет 60 академических кредитов при сроке обучения 1 год.

Сильными сторонами рецензируемой ОП являются:

- приобретение выпускниками профессионально-ориентированных навыков и умений, что позволит удовлетворить потребности химических производств в высококвалифицированных химиках-технологах;
- возможность выбора обучающимися различных видов профессиональной деятельности, что повышает их востребованность на рынке труда.

На основании вышесказанного считаю, что образовательная программа «Химические процессы и производство химических материалов» направления подготовки «7М071 – Инженерия и инженерное дело» (профильная магистратура, срок обучения 1 год) может быть рекомендована для внедрения в учебный процесс.

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