



**NON-PROFIT JOINT STOCK COMPANY  
“KAZAKH NATIONAL RESEARCH TECHNICAL  
UNIVERSITY NAMED AFTER K.I. SATBAYEV”**

**METHODOLOGICAL RECOMMENDATION ON  
FORMING THE EDUCATIONAL AND METHODOLOGICAL  
COMPLEX OF DISCIPLINES**

Almaty 2022

**Preface**

**1 DEVELOPED AND INTRODUCED** by Educational and Methodological department of Academic Affairs Department at NPJSC "Kazakh National Research Technical University named after K.I. Satbayev"

Head of EMU DAA  
«22» 09 2022.



A. Zhumagaliyeva

**2 AGREED**

Board Member - Vice-Rector for  
Academic Affairs  
«22» 09 2022.

B. Zhautikov

Director of DAA  
«22» 09 2022.



A. Baukenov

**3 PUT INTO OPERATION** by the decision of Educational and Methodological Council at NPJSC KazNRTU named after K.I. Satbayev dated "22" 09 2022. # 1.

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## **1 Field of application**

The given methodological recommendation establishes the general requirements for structure, content, procedure for elaboration, organization of quality control and approval of syllabus, educational and methodological complex in disciplines (hereinafter EMCD) and areas of personnel training under the credit system of education.

Requirements for the methodological recommendation are mandatory for all the teaching staff of NPJSC “Kazakh National Research Technical University named after K.I. Satbayev” (hereinafter KazNRTU) participating in the educational process under the credit system.

## **2 Regulatory references**

The following normative references are used in the given methodological instruction:

2.1 Law of the Republic of Kazakhstan "On Education" dated 27.07.2007. # 319- III (with amendments and additions);

2.2 Law of the Republic of Kazakhstan "On Science" dated 18.02.2011. # 407-IV (with amendments and additions);

2.3 Law of the Republic of Kazakhstan "On RK Languages" dated 11.07.1997. # 151-I (with amendments and additions);

2.4 State mandatory standard of higher and postgraduate education. Approved by the decree of Minister of Science and Higher Education of the Republic of Kazakhstan dated 20.07.2022. # 2 (with amendments and additions);

2.5 Standard rules of activity in organizations of higher and (or) postgraduate education. Approved by the decree of Minister of Education and Science of the Republic of Kazakhstan dated 30.10.2018. # 595 (with amendments and additions);

2.6 Rules for organizing the educational process on credit technology of education in organizations of higher and (or) postgraduate education. Approved by the decree of Minister of Education and Science of the Republic of Kazakhstan dated 20.04.2011. #152 (with amendments and additions);

2.7 Quality policy of K.I. Satbayev KazNRTU;

2.8 IS ISO 9001:2015 "Quality management systems. Requirements";

2.9 Regulatory documents of NPJSC KazNRTU named after K.I. Satbayev.

## **3 Basic concepts and definitions**

In the given methodological instruction, terms and definitions are used in accordance with Law "On Education", RK SMSE.

EMCD is a set of educational and methodological documentation, training and control tools developed for the discipline. EMCD includes complete information sufficient for passing the discipline. EMCD in individual disciplines are part of the degree program. EMCD defines the content, scope and procedure of studying the

discipline of the basic curriculum's mandatory component, reflects the range of basic knowledge, skills, abilities and competencies necessary for mastering, as well as recommended literature.

Department-developer is responsible for the high-quality preparation of EMCD that meets RK SMSE requirements, for educational, methodological and technical support of the relevant discipline, including for providing the educational process with educational-methodological literature.

EMCD is elaborated by teachers that conduct classes in the given discipline, considered at Department meeting and approved by Institute Director.

EMCD is compiled in the language in which the relevant discipline is taught.

At drawing EMCD, it is recommended to adhere to the following rules:

- ciphers in the state and Russian languages "Times New Roman" (font height # 14);
- page parameters: top margin – 2 cm, bottom margin – 2 cm, left margin - 3 cm, right margin - 2.0 cm;
- page numbering – from the 3<sup>rd</sup> page, in the center, at the bottom, without dashes;
- indent before and after the title – one "Enter";
- line spacing – 1.0.

Educational and methodological complex of the discipline should include:

1. Syllabus;
2. lecture notes on the discipline topics;
3. tasks for practical and (or) laboratory classes and guidelines for their implementation;
4. tasks for the student's independent study with indication of the complexity and methodological recommendations for their implementation;
5. program (list of topics and questions) current, final control;
6. methodological guidelines for performing the term papers (if the course work is provided for the discipline being studied);

**Syllabus** is a curriculum that includes a description of the discipline being studied, the goals and objectives of the discipline, its brief content (types of classes), topics and duration of their study, tasks of independent work, consultation time, schedule on checking the students' knowledge, teacher requirements, criteria for evaluating the students' knowledge and a list of references.

Syllabus is elaborated by a university teacher who conducts classes in this discipline, it is necessary to remember about the student's academic load, which must be coordinated with European Credit Transfer System (ECTS). The training load is the time required for students to complete all tasks and training activities with the purpose to achieve learning outcomes (hereinafter referred to as LO) for the course.

Syllabus content should be interconnected with the content of teaching other disciplines of the degree program in order to avoid duplication in studying the individual topics.

Syllabus volume is no more than 10 pages and is approved before the beginning of each academic year/semester (in August for the fall semester; in January for the spring semester), F KazNRTU 703-08. Syllabus.docx that provides complete information about the discipline being studied.

Syllabus has a clear structure (*Appendix 1*):

- Title page;
- Information about the instructor;
- The purpose of the course;
- Course Description;
- Learning Outcomes (LO);
- Calendar and thematic plan;
- List of required and supplementary literature;
- Framework of Competences;
- Schedule of submission of mandatory assignments;
- Evaluation rating and possible final variants of assessments based on criteria;
- Evaluation criteria;
- Late delivery policy;
- Policy of academic conduct and ethics.

**Lecture summary** is a synopsis of the lecture content, including the main theoretical provisions, concepts and their justification by facts, examples, conclusions etc. Lecture summary is elaborated by the program manager (lecturer) in accordance with Syllabus for the current academic year.

Functions of lecture summary: presenting the information in the concise and systematized form, proof of its professional usefulness and practical value for students, questions and/or tasks for controlling theoretical knowledge, allowing students to independently determine the level of assimilation of educational material, activation of logical thinking etc. This will help students in getting prepared for classes, and will also become a theoretical basis for studying the topic in the recommended basic and supplementary literature (*Appendix 2*).

**Tasks for practical and (or) laboratory classes and guidelines for their implementation.**

Plans for practical and laboratory classes, if any, are provided for in the working curriculum (*Appendix 3*), should be presented in EMCD. In the plan, it is necessary to clearly formulate the lesson's purpose, specifically to list what kind of theoretical knowledge or practical skills (practical and laboratory) the given lesson is aimed at, to justify the need and relevance of developing a particular competence, professional skill or ability, to show the intended course of the lesson, planned means and methods of training etc., it is recommended to provide students with methodological recommendations for getting prepared for classes, indicate the necessary set of knowledge, skills and abilities that will be required during the lesson (availability and preparation of equipment, appliances, tools, utensils, reagents etc., safety instructions for the work, correctness of description of the observed process, correspondence of equations of physical, chemical and other reactions to the

observed process, ability to process and present the experiment results, applying the methods of statistical processing of results, graphical analysis and, if necessary, other methods of processing results (regression or correlation analysis), formation of skills in designing and presenting the results in tabular and text format), give detailed instructions on working with sources etc.

### **Student Independent Study**

Student independent study (hereinafter referred to as SIS) is work on a specific list of topics allocated for independent study, provided with educational and methodological literature and recommendations, controlled in the form of tests, control papers, colloquiums, abstracts, essays and reports; depending on the category of students, it is divided into independent work of a student (hereinafter referred to as SIS), independent study of a master student (hereinafter referred to as MIS) and independent study of a doctoral student (hereinafter referred to as DIS). The entire volume of SIS is confirmed by tasks that require daily independent work from the student. Structure. Content of SIS program.

- Tasks for SIS should include separate issues of topics that are not considered in classroom lessons and rendered for independent study by students.

- Tasks for SIS can be included in the description of each module or can be rendered as an independent section of the program.

- Tasks for SIS are mandatory for the discipline.

- Tasks for SIS include:

- list of questions;

- time allotted for independent preparation;

- deadlines for issuing assignments and deadlines for their submission to the teacher (based on weeks);

- list of references required to complete the task;

- evaluation criteria.

Checking the fulfillment of SIS tasks is carried out by the teacher either during the interim control, or (in the case of a written assignment) – during extracurricular time.

Content of SIS program:

- topic name;

- the purpose of the lesson;

- tasks, questions;

- methodological recommendations for implementation;

- literature.

Independent study of a student under the teacher's guidance

Independent study of a student under the teacher's guidance (hereinafter referred to as TSIS) – extracurricular work of a student under the teacher's guidance, conducted according to the approved schedule; depending on the category of students, it is divided into: independent study of a student under the teacher's guidance (hereinafter referred to as TSIS), independent work of a master student under the teacher's guidance (hereinafter referred to as TMIS) and independent work of a doctoral student under the teachers' guidance (hereinafter referred to as TDIS).

TSIS performs advisory and supervisory functions.

a) advisory function:

- assistance in the student's independent work in studying the discipline;
- assistance to the student in choosing the methods of work necessary for mastering the program material;
- creating the opportunities to re-listen to the explanation of a difficult topic for a student, performing practical tasks to consolidate the educational material;
- promoting in-depth study of educational material;

b) a controlling function:

- knowledge control during the current, intermediate and final control;
- constant monitoring of student's academic achievements.

#### **4 Control and storage of EMCD**

The teacher accountable for the given type of classes enters EMCD on the educational portal.

-Department (accountable for EMCD) and the staff of EMU OR jointly, at the beginning of the current semester, monitor the provision of EMCD loading on the educational portal and the check results are entered in the form. (*Appendix 4*). Further, the report of EMCD monitoring results based on departments is provided to Vice-rector for Academic Affairs.

-Approved Syllabus is stored at Department, Department head is responsible for its safety.

-A scanned copy of Approved Syllabus is posted on University's educational portal.





**Institute** \_\_\_\_\_  
(full name of the institute)

**Department** \_\_\_\_\_  
(full name of the department)

**APPROVED**

by  
Director of Institute \_\_\_\_\_  
(Institute name )

\_\_\_\_\_  
(signature, seal) (Full name of Institute Director)  
« \_\_\_ » \_\_\_\_\_ 20 \_\_.

## SYLLABUS

\_\_\_\_\_  
(code and name of the discipline)

\_\_\_\_\_  
(cipher, name of the degree program)

\_\_\_\_\_ credits  
(the number of)

**Semester:** \_\_\_\_\_, 20\_\_ - 20\_\_ academic year  
(specify the semester number for the course, autumn/spring)

Almaty 20 \_\_

## 1 Information about the instructor (-s)

### 1.1 Lecturer (-s):

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*(full name of the teacher, position)*

Form of study – full-time

office: \_\_\_\_\_  
*(room, corpus)*

Office hours: \_\_\_\_\_

Tel., WhatsApp +7(\*\*\*) - \*\*\*\_\*\*\*\*

e-mail: \_\_\_\_\_

### 1.2 Teacher (-s), conducting the practical / laboratory work

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*(full name of the teacher, position)*

## 2 Purpose and objectives of the course

**Aim:**

**Objectives:**

### 3 Course description:

The course is intended for students of the degree program (-s)

« \_\_\_\_\_ » \_\_\_\_\_  
*(cipher, name of the degree program)*

## 4. Learning outcomes

4.1. After completing the course, the student should:

**be able to:**

**know:** \_\_\_\_\_

**have the skills:** \_\_\_\_\_

### 5 Course calendar

Week	Lecture topic	Topic of practical work	Topic of laboratory work	Reference to literature	Assignment	Deadline
1						
2						
3						
4						
5						
6						
7						
8	<b>The first attestation</b>					Week 8
9						
10						
11						
12						
13						
14						
15	<b>The second final attestation</b>					Week 15
	<b>Examination</b>					Based on the schedule

### 6 Literature

Required literature	Supplementary literature

*\*Literature is available in the electronic resources of the library.*

*\*\* The required literature should not be older than 10 years.*

*~ Literature is available on the teacher's learning portal.*

### 7 Framework of Competences

Descriptors of Learning	Competences				
	Scientific and philosophical competence	Social-personal and civil competence	Basic engineering and professional competence	Intercultural communicative competence	Professionally-based competence
Knowledge and perception					
Application of knowledge and comprehension					
Expression of judgments and analysis of actions					
Communicative and creative skills					
Self-learning and digital skills					

### 8 Schedule of submission of mandatory assignments

# s/n	Types of control	Max. scores of the week	Weeks															Total max scores
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
1	Activeness in lecture discussions																	
2	Performing the tasks (TSIS)																	
3	Student Independent study (SIS)																	
4	Performing the practical/laboratory tasks																	
6	1 <sup>st</sup> mid-term attestation																	
8	2 <sup>nd</sup> final attestation																	
9	Final exam*																	
	<b>Total in the sum</b>																	<b>100</b>

### 9 Grades rating and possible final options by assessment criteria

Letter grade	GPA	scores	Criteria
A	4	95-100	Shows the highest standards of knowledge, exceeding the volume of the course taught
A-	3,67	90-94	Meets the highest standards of knowledge
B+	3,33	85-89	Very good and meets high standards of knowledge
B	3	80-84	Good and meets high standards of knowledge
B-	2,67	75-79	More than sufficient knowledge approaching high standards
C+	2,33	70-74	Sufficient knowledge that meets the general standards
C	2	65-69	Satisfies and conforms to most common knowledge standards
C-	1,67	60-64	Satisfies, but some aspects of knowledge do not meet the standards
D+	1,33	55-59	Minimally satisfying, but does not meet the standards of a large range of knowledge
D	1	50-54	Minimally satisfactory passing score with questionable compliance with standards
FX	0,5	25-49	Temporary assessment: Unsatisfactory low indicators, retake of the exam is required
F	0	0-49	Didn't try to master the discipline. It is also exposed when a student tries to get a grade on the exam by cheating
I	0	0	Temporary assessment: A student who completed most of the course successfully, did not complete the final control measures due to valid circumstances
W	0	0	The student voluntarily withdrew from the discipline and did not master it until the 6 <sup>th</sup> academic week
AW	0	0	The student was removed from the discipline by the teacher for systematic violations of academic order and rules

### 10 Evaluation criteria

Each work except tests is evaluated according to 4 criteria:

- precision and accuracy (A) – 30% (how accurately and neatly the work is calculated);
- inventiveness and creativity (T) – 30% (how and in what way the work is

presented);

– completeness and maturity (M) – 40% (how profoundly, logically and structurally the work is solved);

– originality (O) – a special coefficient of 1.0, 0.5 or 0 is used.

Criteria	Excellent (0.9-1.0)	Good (0.7-0.9)	Satisfactory (0.4-0.7)	Unsatisfactory (0-0.4)
precision and accuracy				
inventiveness and creativity				
completeness and maturity				
originality				

The overall score will be calculated due to the formula:

$$Score = (A + T + 3) \times O$$

### Maximal assessment of knowledge by types of tasks

Tests and activeness	
Student Independent study (SIS)	
Practical training and bonus	
Laboratory classes	
1st Midterm attestation (Midterm)	
Course project	
2nd final attestation (Endterm)	
Final exam	<b>40</b>
<b>Total</b>	<b>100</b>

### 11 Late submission policy

The student should be prepared for lectures and practical (laboratory) classes. Timely protection and full performance of all types of work (practical and independent) are required. The student should not be late and miss classes; he should be punctual and mandatory. It is planned to reduce the maximum score by 10% for untimely work. If you are forced to skip the interim assessment for good reasons, you should warn the teacher in advance, so that you can pass the intermediate control in advance. Skipping an exam for a disrespectful reason deprives you of the right to take it. If you miss the exam for a good reason, a special permit is issued and the date, time and place of the exam are assigned.

### 12 Academic Conduct and Ethics Policy

Be tolerant, respect the opinions of others. Formulate objections in the correct form. Plagiarism and other forms of dishonest work are unacceptable. Prompting and cheating during exams, passing the exam for another student are unacceptable. A student caught falsifying any course information will receive a final "F" grade.

*Activeness* in lectures and practical classes is mandatory and is one of the

components of your final score / assessment. Many theoretical questions supporting the lecture material will be presented only at lectures. Therefore, skipping a class can affect your academic performance and final grade. However, attending classes in itself does not mean an increase in points. Your constant active participation in the classes is necessary. A mandatory requirement of the course is to be prepared for each lesson. It is necessary to review the specified sections of the textbook and additional material not only in preparation for practical classes, but also before attending the corresponding lecture. Such training will facilitate your perception of new material and will contribute to your active acquisition of knowledge within the walls of the university.

**Assistance:** For advice on implementing the independent work, its submission and defending, as well as for additional information on the material covered and other questions arising during the course, contact the teacher’s office hours or via electronic means of communication in working hours.

### **During training**

Participation in training sessions according to the schedule is mandatory. It determines the readiness for the lesson. In case of absence, the student is obliged to notify the teacher within a day and present the plan for self-study of the learning material:

- reading of the presented materials before the lesson is mandatory;
- assignments must be submitted on time;
- 20% of non-participation in the class (for a valid reason with the supporting documents) – the rating is "F (Fail)";
- plagiarism and cheating during the execution of the assignments are not allowed;
- mandatory use of electronic gadgets in the classroom is welcome, but it is unacceptable during exam.

Within the framework of training, any forms of corruption manifestations are unacceptable. The organizer of such actions (teacher, students or third parties on their behalf) are fully responsible for violating the law of the Republic of Kazakhstan.

Reviewed and approved at Department meeting \_\_\_\_\_  
Minute’s №\_\_ dated from «\_\_»\_\_ 20\_\_\_\_\_ (department name)

**Head of the department** \_\_\_\_\_ **Full name.**  
(signature)

**Compiler:** \_\_\_\_\_ **Full name**  
(position) (signature)

**Lecture #**

**Topic:** \_\_\_\_\_

**Plan of lessons:**

- 1.
- 2.
- 3.

**Lecture content**

**Introduction** (setting the topic, goals, main tasks, accessibility and explanation of new terms and concepts, evidence and argumentation, highlighting the main thoughts and conclusions etc.).

**Use of consolidation techniques:** control questions (questions for self-control).

**Literature:**

➤ *Lecture materials (number of lectures based on syllabus);*

### **Practical/laboratory classes #**

**Topic:**

**Goal:**

**Assignment and guidelines**

➤ \* *Practical/laboratory work (according to syllabus);*



EMCD provision check form (fall semester)

Institute  
 Department

#	Code of discipline based on EMCD	Code of discipline based on WC	Name of discipline	Teacher's full name	Name of major points of EMCD (electronic format)										Analysis of the work done			Signature of teachers		
					Syllabus of the discipline		Lecture summary		Practical tasks		Laboratory works		SIS/TSIS		Method.guidelines for laboratory/practical classes		Defined comments on loading		Note on loading	Date
					yes	no	yes	no	yes	no	yes	no	yes	no	yes	no				
1																				
<b>Department</b>																				

Head of Educational and Methodological Department \_\_\_\_\_

Head of Department \_\_\_\_\_

Chief Manager of Educational and Methodological Department \_\_\_\_\_

Accountable for Department EMCD \_\_\_\_\_

**Registration sheet on changes by** \_\_\_\_\_  
*document designation*

Serial number of the change	Section, item of the document	Type of the change (to replace, cancel, add)	Notification number and date	The change was made	
				Date	Surname and initials, signature, position