

**MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE**  
**NATIONAL TECHNICAL UNIVERSITY “KHARKIV POLYTECHNIC**  
**INSTITUTE”**

**PROVISIONS ON CRITERIA AND ASSESSMENT SYSTEM**  
**OF KNOWLEDGE, SKILLS AND ON RATING OF STUDENTS**

Approved by the Academic Council of NTU "KhPI"

Head of the Academic Council  
L.L. Tovazhnyanskyy  
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**Provisions on criteria and assessment system ... of the National Technical University “Kharkiv Polytechnic Institute”**

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OF KNOWLEDGE, SKILLS AND ON RATING OF STUDENTS**

**of the National Technical University “Kharkiv Polytechnic Institute”**

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## **General Provisions**

Ukraine has adopted a credit transfer system for education, which is an integral part of the European Credit Transfer System (ECTS). The latter is a tool to help develop, describe and implement curricula and award higher education qualifications. It is based on the transparency of learning results and focused on the learner.

The credit transfer system requires mandatory structuring of the student's workload (the number of credits allocated for the study of every discipline) and assessment of the quality of students' knowledge by logically completed modules.

The number of credits allocated for a specific discipline and the structure of the discipline (lectures, laboratory classes, individual tasks, independent work of students, etc.) are determined by the curriculum of the appropriate level of education.

The number of modules in the discipline is determined depending on the volume of the academic load and its structure, moreover, each module can include material corresponding to a different number of credits, however, disciplines with a total volume of no more than 3 credits consist of one module.

One of the important components of the credit transfer system is the system of students' knowledge and skills assessment and the rating system.

### **Criteria and Students' Knowledge and Skills Assessment System**

According to the main provisions of ECTS, the assessment system should be understood as a set of methods (written, oral and practical tests, exams, projects, etc.) used in assessing the achievement by students of the expected learning outcomes.

Successful assessment of learning outcomes is a prerequisite for awarding credits to a student. Therefore, statements about the results of the study of program components should always be accompanied by clear and appropriate assessment criteria for the assignment of credits. This makes it possible to assert that the student received the necessary knowledge, understanding, and competencies.

**Assessment criteria** are descriptions of what a learner is expected to do to demonstrate learning results.

The main conceptual provisions of the students' knowledge and skills assessment system are:

1) improvement of the quality of training and competitiveness of specialists by stimulating independent and systematic work of students during the academic semester, establishment of constant feedback from teachers with every student and timely adjustment of his/her educational activities;

2) increase of the objectivity of students' knowledge assessment through modular and semester tests during the semester and use of a 100-point scale (see

Table 1) to assess the students integrated knowledge for each module (academic discipline) with the obligatory transfer of these assessments to the national scale (with the state semester grade "excellent", "good", "satisfactory" or "unsatisfactory") and in the ECTS scale (A, B, C, D, E, FX, F).

Determination of the **students rating** is an integral part of the training system which defines the features of the organization of the educational process at the university.

**The rating assessment system** is a system based on operational control and the accumulation of rating points for students' versatile educational and cognitive activities.

The rating score is an integrated assessment of the results of all types of student learning activities, which includes:

1. Mastering the content of the curriculum disciplines;
2. Preparation and defence of course projects (works);
3. Various types of practical training;
4. Fulfilment and defence of the final qualifying (diploma) work (project).

A feature of the rating assessment is that, firstly, it should reflect all assessments of the educational process components, taking into account their weight indicators (in the approved curriculum) belonging to a given reference period: module, semester, and year of study. The assessment should be easy by definition, visual, easily perceived by students and comparable during its determination by various departments that participate in the educational process and defend their control methods and various principles of assessing the student's level of knowledge.

The purpose of the rating system is:

- intensification of the educational process and improvement of the quality of training;
- increase of the students' motivation to active, conscious learning, systematic independent work during the semester and responsibility for the results of educational activities;
- establishment of constant feedback from the teacher with every student and timely adjustment of his/her educational activities;
- ensuring healthy competition in education;
- improvement of the assessment objectivity of the student training level;
- reduction of psychological, emotional and physical overload during examination sessions.

**Table 1**  
**Criteria for Students' Knowledge and Skills Assessment**

Rating Score, points	ECTS grade and its definition	National grade	Assessment criteria	
			positive	negative
90-100	A	Excellent	<b>Deep knowledge</b> of the module training material contained in the main and additional literature sources; <b>-ability to analyze</b> the studied phenomena in their interrelationships and development; - ability to perform <b>theoretical calculations</b> ; - <b>clear, concise and logically consistent answers</b> to questions; - <b>ability to solve</b> complex practical problems.	The answers to the questions may contain <b>minor inaccuracies</b>
82-89	B	Good	- <b>Deep level of knowledge of the required module material</b> ; - ability to give reasoned answers to questions and perform <b>theoretical calculations</b> ; - ability to solve <b>complex</b>	The answers to the questions contain <b>certain inaccuracies</b> ;

			<b>practical problems.</b>	
75-81	C	Good	<b>-Strong knowledge</b> of the studied material and its <b>practical application</b> ; - ability to give <b>reasoned answers</b> to questions and perform theoretical calculations; - ability to solve <b>practical problems.</b>	- Inability to use theoretical knowledge to solve <b>complex practical problems.</b>
64-74	D	Satisfactory	- Knowledge of the <b>basic fundamental provisions</b> of the studied material and their <b>practical application</b> ; - ability to solve simple <b>practical problems.</b>	- Inability to give <b>reasoned answers</b> to questions; - inability to analyze the presented material and <b>perform calculations</b> ; - inability to solve <b>complex practical problems.</b>
60-63	E	Satisfactory	- Knowledge of the <b>basic fundamental provisions</b> of the module material, - ability to solve the simplest <b>practical problems.</b>	-Ignorance of <b>certain (unprincipled ) issues</b> from the module material; - inability to express an opinion consistently and reasonably ; - inability to

				apply theoretical principles to solving <b>practical problems</b>
35-59	FX (additional study required)	Unsatisfactory	<b>Additional study</b> of the module material can be performed <b>in the terms provided by the curriculum.</b>	Ignorance of the <b>basic fundamental provisions</b> of the training material of the module; - <b>significant errors</b> in answering questions; - inability to solve <b>simple practical problems.</b>
1-34	F (re-study required)	Unsatisfactory	-	Complete <b>lack of knowledge</b> of a significant part of the module training material; - <b>significant errors</b> in answering questions; - ignorance of the <b>basic fundamental provisions</b> ; - inability to set a target when solving <b>simple</b>

				<b>practical problems</b>
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## 2. Procedure and Methods of Student's Rating Determination

The student's rating is determined by the generalized results of the entire semester, namely: academic disciplines, training practices, research work, etc.

Similarly, the student's rating is determined by individual courses (I, II years of study, etc.)

**It is mandatory to determine the student's rating for the entire period of study at the educational and qualification level.**

**The student's rating score** (grade) is determined from a separate academic discipline, taking into account all of the academic semester components (by modules into which the semester load is distributed) or by part of the academic discipline, if it is planned for several semesters.

### 2.1. Calculation of a Student Rating in a Discipline

To simplify the calculation of different types of student ratings (discipline, module, semester, course, term of study), each type of rating is evaluated according to a 100-point scale.

The student's academic success is determined using the criteria and students' knowledge and skills assessment system developed at NTU "KhPI" (see Table 1).

#### **Monitoring student performance**

Student performance control is carried out in the form of current and final control, as well as state certification.

**Current control** is carried out during practical and laboratory classes, as well as tests and aims to verify students' mastery of the content of the modules of the discipline.

**Final control** is carried out in order to determine the level of assimilation of theoretical and practical material in the discipline and to make a final assessment. The final grade can be set based on the results of the exam, tests, or as a result of the accumulation of grades from individual modules in the case of a student performing all types of current control measures.



The final grade for each discipline is set by the lecturer based on the results of credit modules, which is also recorded in the credit record book. Grades from individual credit modules are put by teachers who conduct tests in the relevant modules, on the ECTS scale and the national scale. The final grade is set on a national scale, as well as the ECTS scale.

The calculated value in the quantitative form of the final score **O** can be determined by the formula:

$$O = \Sigma (K_i * O_i) / \Sigma K_i$$

where **K<sub>i</sub>** is the number of credits of the i-th module;

**O<sub>i</sub>** - assessment in quantitative form from the i-th module

The results of the assessment of credit modules by the ECTS scale in quantitative form **O<sub>i</sub>** and the translation of the calculated value of the final assessment to the ECTS scale and the national scale of knowledge assessment is carried out using Table 2, which is given below.

**Table 2**

**Transfer of Evaluation Results from National to ECTS Scale**

Points	60	64	75	82	90	100
Grade by ECTS scale	E	D	C	B	A	
Grade by National scale	Satisfactory	Satisfactory	Good	Good	Excellent	

**Table 3**

**An Example of the Final Grade Determination in the Discipline (Discipline "Fundamentals of Fuel Processing Technology")**

Module Name	Number of credits K <sub>i</sub>	ECTS grade	Evaluation in quantitative form O <sub>i</sub>	K <sub>i</sub> *O <sub>i</sub>
Solid fuel technology (module 1)	1,0	A	100	100
Oil preparation technology (module 2)	1,5	A	90	135
Oil refining technology (module 3)	1,5	D	70	105
Gas processing technology (module 4)	1,0	E	60	60

Carbon Graphite Production Technology (module 5)	1,5	C	80	120
TOTAL	$\Sigma K_i = 6,5$		$\Sigma K_i \cdot O_i = 520$	

Estimated grade -  $O = \Sigma (K_i \cdot O_i) / \Sigma K_i = 520 / 6.5 = 80$

Assessment on the ECTS scale is C

Rating on a national scale is Good.

The rating of a group of students in the discipline is determined by the decrease in the number of points in the discipline or by the ECTS scale.

- A - I place
- In - II place
- C - III place
- D - IV place
- E - V place
- Fx - VI place
- F - VII place

Methodological instructions on the account of final success, definition of a student rating in a discipline and a sample of the test and examination information are given in Appendix 1.

## **2.2. Determination of the student's rating based on the generalized results of the entire semester**

Every discipline of the semester is taken as a separate module with a maximum grading scale of 100 points. The calculation should be similar to the calculation of the rating for the discipline, taking into account the weighting factor. The role of weighting factors of disciplines is performed by the total amount of credits in the discipline.

An example of calculating the final semester rating of the student is shown in Table 4:

**Table 4****Final Semester Rating of the Student \_\_\_\_\_**

Semester I Discipline	Number of credits per semester K <sub>s</sub>	ECTS Grade	Grade in quantitative form O <sub>i</sub>	K <sub>s</sub> * O <sub>i</sub>
1.Higher mathematics	6	C	85	510
2. General physics	5	C	82	410
3. Informatics	5	C	78	390
4.History of Ukraine	3	B	92	276
5.General chemistry	3	B	90	270
6.Theoretical mechanics	3	C	80	240
7.Foreign language	2	B	93	186
TOTAL	Σ K <sub>c</sub> = 27		Σ (K <sub>c</sub> *O <sub>i</sub> ) =2282	

**Estimated grade O = Σ (K<sub>i</sub> \* O<sub>i</sub>) / K<sub>i</sub> = 2282/27 = 84.50**

Assessment on the ECTS scale is **B**

Rating on a national scale is **Good**

**2.3. Calculation of Student Rating for the Academic Year****Table 5**

	Number of credits per semester K <sub>s</sub>	ECTS grade	Grade in quantitative form O <sub>i</sub>	K <sub>c</sub> * O <sub>i</sub>
Semester I	27	B	84	2282
Semester II	27	A	96	2592
TOTAL	Σ K <sub>c</sub> = 54			Σ K <sub>c</sub> *O <sub>i</sub> =4874

**Estimated grade O = Σ (K<sub>i</sub> \* O<sub>i</sub>) / Σ K<sub>s</sub> = 3600/40 = 90, 26**

Assessment on the ECTS scale is **A**

Score on the National scale is **excellent**

The rating of the students of the group according to the generalized results of

the entire academic period is determined in the same way as determining the rating of the student of the group by discipline, by semesters, courses, and the like.

#### **2.4. Additional points to the student rating**

Incentive points must be added to the final rating semester grade of the student. The procedure for their accrual and registration of the student's social and practical rating card is given in Appendix 2.

##### **2.4.1. Rewards and sanctions for student's work**

The above indicated rating graduation determines possible rewards and sanctions in relation to the student's work.

Thus, the "FX" group rating causes additional control over the student's work during current consultations, credit weeks, and exams.

With the "F" group rating, a decision of the dean's office must be made on the presentation of the corresponding department about the possibility of further education of the student.

Upon completion of the training course with the "A" group rating a student may be awarded a personal scholarship or an additional reward with a diploma and other incentives.

At the end of the semester with the "B" group rating a one-time material incentive can be assigned.

At the end of the entire stage of education with a group rating "A" in addition to receiving a diploma with honors the students may be awarded a certificate of completion of NTU "KhPI" indicating the number of rating points and a recommendation on the priority of further employment or further study in a post-graduate school.

Rating results, sanctions, and student incentives must be transparent and communicated to all students who participated in ranking assessment.

**The responsibility for determining rating scores lies with the lecturers on the disciplines (curators of the disciplines).**

**The dean's office is responsible for making the rating scores public.**

## **Appendix 1**

### **Methodological Instructions on Calculating Students' Final Progress in Disciplines and Rating Definition**

1. The final grade for a separate academic discipline can be set either according to the results of the exam (credit), or as a result of the accumulation of grades from separate modules during the semester if the student completes all types of current control activities. The final grade can be set by the teacher in the test sheet only once, as a rule, either on the eve of the examination session in the column "Based on the results of accumulation", or during the exam (credit) in the

column "Based on the results of the examination (credit)".

2. If the curriculum provides for an exam or differential credit for a given discipline, then the following options are possible:

- if a student has passed all credit modules during the semester, then the final grade can be given before the start of the session as a result of the accumulation of grades from individual modules (but not lower than the minimum for any module), or the student can increase this grade by exam at will. The grade obtained on the exam cannot be lower than the one obtained earlier on accumulation. The teacher brings the relevant information to the attention of the students at the end of the semester, and together they determine who of the students wants to go to the exam to improve the grade;

- if a student did not show up for the delivery of at least one module, or did not pass one, several or all modules, then the final grade can be set only based on the results of the exam (credit), taking into account previously compiled modules. At the same time, on the exam (test), the student can answer only those questions of the examination card that include material credit modules not compiled during the semester. After each modular control in the column of the examination sheet of those modules for the delivery of which the student did not appear or did not pass, the teacher makes the entry "not certified";

- if the student did not show up for the exam (test) and he did not pass at least one thematic module during the semester or he did not show up for the delivery of at least one module, then the teacher in the column "Based on the results of the exam (test)" makes a record "did not appear";

- if the student has previously expressed a desire to improve the grade on the exam, but did not show up for the exam, then in the presence of all the modules compiled before, the final grade is set as the result of the accumulation of grades from individual modules, i.e., in the column "Based on the results of accumulation";

- grades for individual modules are set in the transcript and examination sheet at the end of the week of each modular control, after which the sheet is returned by the teacher to the dean's office. The results of the modular control during the semester are NOT retaken;

- to determine the student's rating in a given discipline, the teacher calculates the final grade in quantitative form (O) on a 100-point scale, and the result is entered into the corresponding column of the transcript;

The finally completed examination sheet submitted by the teacher to the dean's office on the day of the exam. The final completed transcript must be returned to the dean's office before the end of the examination session.

## Appendix 2

### The procedure for Calculating the Student's Socio-practical Rating (Rsp)

(Additional "b" points of the "R" rating for participation in scientific and scientific-technical activities, public life, creative and sports activities).

Student's Achievements					Additi onal points	Rece ived points
1. Scientific and Technical Work						
1.1. Achievements at the University level	The prize-winner of Student Olympiad (I stage)		I- place		2	
			II- place		1	
			III- place		1	
1.2. Achievements at the national level	The prize-winner, participant of the All-Ukrainian Student Olympiad (II stage)		I- place		5	
			II- place		4	
			III- place		3	
			Encouraging degree		1	
1.3. Achievements at the international level	The prize-winner, participant of the International Student Olympiad		I- place		5	
			II- place		4	
			III- place		3	
			Encouraging degree		1	
2. Scientific work						
2.1. Achievements at the	The prize-winner at the competition of scientific Works		I- place		2	
			II- place		1	
			III- place		1	
			In foreign publication	Solely	5	
				In cooperation	3	

University level	Scientific publications	Article	In professional international edition	Solely	5	
				In cooperation	3	
			In Ukrainian special edition	Solely	3	
				In cooperation	2	
		Theses	In the proceedings of foreign conferences		2	
			In the proceedings of international and Ukrainian conferences		1	
			In the proceedings of young scientists		0,5	
		The availability of protection documents (invention certificate, declarative patent, etc.)			5	
2.2. Achievements at the national level	The prize-winner, participant of All-Ukrainian competition of scientific works	I- place		5		
		II- place		3		
		III- place		2		
		Encouraging degree		1		
2.3. Achievements at the international level	The prize-winner of foreign scientific student or creative contests			5		
	Participation in foreign scientific student conferences, symposia, creative competitions (programs, abstracts, diplomas, certificates)			2		

<b>3. Public Activity</b>			
<b>3.1. Participation in student self-government activities</b> <i>(by the decision of the Deputy-Dean for educational work, student self-government, trade union, dormitory student board)</i>	Chairman of the Student Self-Government Council of the university, department, trade union bureau (subject to fruitful work not less than a year).	<b>5</b>	
	Member of the Student Self-Government Council of the university, department, trade union bureau (subject to fruitful work not less than a year).	<b>3</b>	
	Monitor (no less than a year of conscientious work).	<b>2</b>	
<b>3.2. Other forms of public activity</b>	Work in public organizations	<b>2</b>	
	Performing socially useful work	<b>0,5-1</b>	
<b>4. Achievements in Sports and Artistic Contests</b>			
4.1. The prize-winner of international sports competitions (world and European championships, Universiade) and laureate of international art competitions (diplomas, awards, provided that the participant represents KhPI).		<b>5</b>	
4.2. Participant in international sports competitions and artistic competitions (Invitations, orders, certificates, awards).		<b>4</b>	
4.3. The prize-winner of sports competitions (championships and Universiades of Ukraine) and a laureate of art competitions at the level of Ukraine (diplomas, awards, provided that the participant represents KhPI).		<b>3</b>	
4.4. The prize-winner of sports competitions (regional, city, university Olympiads) and a laureate of art competitions (at the level of the region, city, university)		<b>2</b>	
4.5. A member of the University team (subject to active participation in competitions) and participant in the artistic team of the KhPI (subject to active participation in rehearsals and concerts).		<b>1-2</b>	
<b>5. Total score (maximum number - 10)</b>			



Head of the graduating department  
(p. 1, 2)

(signature, full name)

Deputy Dean for Educational Work  
(p. 3)

(signature, full name)

Chairman of the Student Trade Union  
(p. 3)

(signature, full name)

Chairman of the Student Self-government of the university  
(p. 3)

(signature, full name)

Chairman of the Student Dormitory Council  
(p.3)

(signature, full name)

Head of Sports club or Head of Sports Department  
(p.4)

(signature, full name)

Director of the Palace of Students  
(p.4)

(signature, full name)

Student

\_\_\_\_\_  
(signature, full name)

\_\_\_\_\_  
(Date)

## **The Procedure for Issuing a Card of Student Socio-practical Rating (Rsp) and its Approval**

1. The student himself draws up a social and practical rating card for the current semester and presents it with all the necessary supporting documents and signatures to the head of the academic group before the start of the examination session. Only positions with achievements that the student has can be left on the card. In this case, the shape of the card should not change.

2. The head of the academic group submits data on all students of his group (in the form of information about the socio-practical rating of students (see File <Information about Rsp-KIT\_1>)) to a meeting of the graduating department for approval.

3. In case of revealing false information, the card is liquidated.

4. If the student performed other types of socially useful work that are not on the card, he writes an application addressed to the head of the graduating department with a request to enroll them with the appropriate points and gives it to the head of the academic group (in this case, it is necessary to indicate the specific type of work and the number points). All necessary documents are attached to the application. The application is endorsed by the relevant persons listed on the card. After that, the required points are entered by the head of the academic group for information about the Rsp.

5. The leaders of the academic groups submit the approved information about the social and practical rating of students to the dean's office no later than a week before the end of the examination session.