

Ministry of Education and Science of Ukraine
Sumy National Agrarian University
Faculty of Engineering and Technology
Department of Technical Systems Design

Syllabus of the educational component

OK 8 Engineering and Computer Graphics
(mandatory)

Implemented within the educational program " **Food technologies** »

in the specialty **G 13 "Food technology"**
(code, name)

at the first (bachelor's) level of higher education

Developer: _____ ,
(signature)

Alla REBRII senior lecturer
(surname, initials) (academic degree and title, position)

Considered, approved and ratified at a meeting of the Department of Technical Systems Design (name of the department)	minutes of <u>03.06.2026</u> No. <u>14</u>
	Manager departments  Oleksandr IVCHENKO

Agreed:

Guarantor of the educational program

 Olena KOSHEL

Dean of the Faculty 

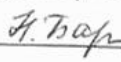
Nataliia BOLHOVA

Review of the work program (attached) provided by:

 Olena KOSHEL

 Oksana MELNYK

Methodologist of the Education Quality Department,
licensing and accreditation

 N. Baranik

Registered in the electronic database: date: 16.06. 2026.

Information on reviewing the work program (syllabus):

Academic year in which changes are made	Number of the appendix to the work program with a description of the changes	Changes reviewed and approved		
		Date and number of the department meeting minutes	Head of the Department	Educational program guarantor

1. GENERAL INFORMATION ABOUT THE EDUCATIONAL COMPONENT

1.	Name OK	OK8 Engineering and Computer Graphics /							
2.	Faculty/department	Engineering and Technology / Design of Technical Systems							
3.	Status OK	mandatory							
4.	Program/Specialty(s) that include OK for	Food technologies / G 13 "Food Technologies"/							
5.	NQF level	Level 6 NRC							
6.	Semester and duration of study	1 course - 1 semester, 15 weeks							
7.	Number of ECTS credits	5.0							
8.	Total hours and their distribution: 1 course - 1 semester - 150 hours, differential credit /	Contact work (classes)						Independent work	
		Lectures		Practical/seminar		Laboratory			
		Daily	Zaoch	Daily	Zaoch	Daily	Zaoch	Daily	Zaoch
		14	4			46	10	90	136
9.	Language of instruction	Ukrainian							
10.	Teacher/Educational Component Coordinator	teacher Rebriy Alla Nikolaevna senior teacher							
10.1	Contact information	Department Auditorium 415m, Faculty of Engineering and Technology, Building No. 4, ralm777.as@gmail.com							
11.	General description of the educational component	This discipline is the basis of graphic literacy, which is of particular importance in modern production. It forms in future specialists deep theoretical and practical knowledge on reading and executing drawings, the ability to analyze geometric shapes, methods of constructing images of spatial forms on a plane and methods of solving geometric problems based on a given image of these forms, develops logical thinking and spatial perception of students. Teaches to use graphic computer programs to perform graphic tasks.							
12.	Purpose of the educational component	<i>The purpose of the educational component "Engineering and Computer Graphics" The goal is to develop students' understanding of spatial forms of objects in the surrounding world using graphic methods, to study methods of constructing and reading drawings, to study state standards, and to acquire skills in drawing using drawing tools and computer graphics software.</i>							

13.	Prerequisites for studying OK, connection with other educational components of OP	The competencies developed in the educational component are necessary for the formation of higher education students' ability to develop spatial forms of objects in the surrounding world using graphic methods. The educational component is the basis for the educational components: Food production processes and equipment; Technological equipment for food production; Design of food enterprises.
14.	Academic Integrity Policy	The system of requirements that are placed on a higher education applicant when studying the educational component: - students completing the assessment stages within the established deadlines; - completion and defense of laboratory and graphic works within the established deadlines; - compliance by students with the code of academic integrity of Sumy NAU (https://bit.ly/3xf92wW). Graphic works must be original, completed independently. Works submitted after the deadline without good reason will be evaluated with a lower grade. Works that are a copy of someone else's work will be evaluated with a "zero" with the subsequent performance of the work according to another original individual task. Resubmission of written works occurs after repeated performance or revision. Copying from various sources of information (including using mobile devices and gadgets) during the test is prohibited. If the fact of copying is detected, the student's work is canceled and the test is retaken. Retaking the test is carried out with the permission of the dean's office within the specified time after re-learning the material from the educational component.
15.	Link to the course in Moodle system	https://cdn.snau.edu.ua/moodle/course/view.php?id=1181
16.	Keywords	Graphic disciplines; Information technologies; Computer graphics; Computer aided design systems

2. LEARNING OUTCOMES BY EDUCATIONAL COMPONENT AND THEIR RELATIONSHIP WITH PROGRAM LEARNING OUTCOMES

Learning outcomes for OK: After studying the educational component, the student is expected to be able to...	Program learning outcomes that the OC aims to achieve (indicate the number according to the numbering given in the OP)					How is RND assessed?
	PRN02. Demonstrate creative initiative and improve one's professional level through continuing education and self-education.	PRN03. Be able to apply information and communication technologies to provide information for professional activities and conduct applied research.	PRN04. Search and process scientific and technical information from various sources and apply it to solve specific technical and technological problems.	PRN012. Be able to design new and modernize existing enterprises, workshops, production areas using computer-aided design systems and software	PRN024. Carry out technological, technical, and economic calculations within the framework of the development and introduction of food products to the consumer market, and keep records of the costs	
DRN 1. Perform drawings in accordance with standards .	x	x	x			Performing and defending laboratory, practical and graphic works. Preparing and defending the GR according to the individual task.
DRN 2. Possess a set of basic methods of presenting information when performing graphic work.	x	x	x	x		Performing and defending laboratory, practical and graphic works. Preparing and defending the GR according to the individual task.
DRN 3. Apply modern methods of graphical representation of information when performing and designing drawings using an automated design system	x	x	x	x	x	Performing and defending laboratory, practical and graphic works. Preparing and defending the GR according to the individual task.

3. CONTENT OF THE EDUCATIONAL COMPONENT (COURSE PROGRAM)

1 semester 1 year / 1 year (part-time)

Topic. List of issues to be addressed within the topic	Distribution within the overall time budget			Recommended reading	
	Classroom work		Independent work		
	Luke Full-time 1 year / correspondence		Lab . with. Daily 1 year / correspondence course	Daily 1 course / correspondence	
Topic 1: <i>Introduction. Types of projection systems. Coordinate method, Monge complex drawing .</i> 1. Introduction. The subject of the discipline, its objectives. 2. Types of projection systems. Coordinate method. 3. Basic rules for drawing. Font types. Line types. Scales. 4. Geometric drawing. Conjugation. Dividing a circle into equal parts.	2/2		2/-	8/12	[1], [2], [3], [4], [5], [6] [13], [14], [15], [16]
Topic 2 : <i>Introduction to computer graphics. Fundamentals of graphical representation of information.</i> 1. Introduction to document types. Main document interface. 2. Technique creation Drawing . Toolbar . 3. Working with the options ribbon and the special control panel.	-		2/-	6/10	[1], [2], [3], [4], [5], [6] [13], [14], [15], [16]
Topic 3 : <i>Main menu. Toolbars.</i> 1. Construction graphic primitives 2. Editing drawings.	-		2/2	8/12	[1], [2], [3], [4], [5], [6] [13], [14], [15], [16]

3. Drawing dimensions.					
Topic 4. <i>Parallel and orthogonal projection. Polyhedra and surfaces of revolution.</i> 1. Projections of polyhedra (prisms, pyramids). 2. Projections of surfaces of revolution (cylinder, cone). 3. Construction of projections of polyhedra and surfaces of revolution	2/-		4/-	10/14	[1], [2], [3], [4], [5], [6] [13], [14], [15], [16]
Topic 5: <i>Section of surfaces by a plane.</i> 1. Plane cross-section of a prism and pyramid. 2. Section of a cylinder and a cone by a plane.	2/-		4/2	10/14	[1], [2], [3], [4], [5], [6] [13], [14], [15], [16]
Topic 6. <i>Threads and threaded connections.</i> 1. Thread designation. 2. Standard cuts. 3. Threaded connections.	2/-		4/-	8/14	[1], [2], [3], [4], [5], [6] [13], [14], [15], [16]
Topic 7. <i>Plan of the food industry enterprise workshop.</i> 1. Drawing of the workshop floor plan. Axes, walls, windows, doors. 2. Designation of the area of the premises. 3. Drawing internal and external dimensions. 4. Compilation of the table "Explanation of premises".	2/2		8/2	10/16	[1], [2], [3], [4], [5], [6] [13], [14], [15], [16]
Topic 8. <i>Construction cuts</i> 1. Types of construction sections (longitudinal and transverse).	2/-		8/2	10/16	[1], [2], [3], [4], [5], [6] [13], [14], [15], [16]

2. Classification of sections, their depiction and designation on drawings.					
Topic 9. <i>Master plan of a food industry enterprise.</i> 1. General information about master plans. 2. Requirements for the preparation of master plans. 3. Drawing dimensions on master plans.	2/-		6/-	10/14	[1], [2], [3], [4], [5], [6] [13], [14], [15], [16]
Topic 10. <i>Technological schemes of food industry enterprises.</i> 1. Symbols on technological diagrams. 2. Compilation of the table "Equipment Symbols". 3. Compilation of the table "Conventional designations of flows".	-		6/2	10/14	[1], [2], [3], [4], [5], [6] [13], [14], [15], [16]
Total per semester	14/4		46/10	90/136	

4.TEACHING AND LEARNING METHODS

DRN	Teaching methods (work that will be carried out by the teacher <u>during classroom lessons</u> , consultations)	Number of hours	Teaching methods (what types of learning activities should <u>the student perform independently</u> .)	Number of hours
DRN 1	Lecture-presentation with demonstration and use of interactive technologies. Showing examples of solving problems using the interactive method in lectures and laboratory classes. Laboratory classes with graphic works on individual tasks.	20	Studying the supporting lecture notes and working with the book. Studying the material for independent study. Taking notes. Completion of graphic work tasks that were started during the contact lesson. Self-assessment of knowledge.	30

DRN 2	Lecture-presentation with demonstration and use of interactive technologies. Showing examples of solving problems using the interactive method in lectures and laboratory classes. Laboratory classes with graphic works on individual tasks.	20	Studying the supporting lecture notes and working with the book. Studying the material for independent study. Taking notes. Completion of graphic work tasks that were started during the contact lesson. Self-assessment of knowledge.	30
DRN 3	Lecture-presentation with demonstration and use of interactive technologies. Showing examples of solving problems using the interactive method at lectures and Laboratory classes. Laboratory classes with graphic works on individual assignments.	20	Studying the supporting lecture notes and working with the book. Studying the material for independent study. Taking notes. Completion of graphic work tasks that were started during the contact lesson. Self-assessment of knowledge.	30

5. EVALUATION BY EDUCATIONAL COMPONENT

5.1. Diagnostic assessment (indicated as needed)

5.2. Summative assessment

5.2.1. To assess the expected learning outcomes, there are
full-time education

No.	Summative assessment methods	Points / Weight in the overall score	Date of compilation
1.	Completion, preparation and defense of laboratory (practical) work (10 points) and graphic work according to an individual assignment (3 GRs of 10 points each). Final computer-based testing - multiple choice test	40 points / 40%	during the semester 2-8 weeks
2.	Execution, preparation and defense of laboratory (practical) (10 points) and graphic works according to an individual assignment (5 GRs of 10 points each). Final computer-based testing is a multiple-choice test.	60 points / 60%	during the semester Week 9-15

Component	Evaluation		
Implementation graphic work	<i>Each completed graphic work is evaluated at 10 points.</i>		
	<i>1- 4 points</i>	<i>5-7 points</i>	<i>8-10 points</i>

	<i>Not fully completed</i>	<i>All task requirements have been met, but there are minor comments regarding the design.</i>	<i>All task requirements have been met in full.</i>
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correspondence form of study

No.	Summative assessment methods	Points / Weight in the overall score	Date of compilation
1.	Performing individual graphic works	40 points / 40%	during the session
2.	Intermediate computer-based testing - multiple choice test	60 points / 60%	Exam session dates

5.2.2 Evaluation criteria

full-time education

Component	Unsatisfactorily	Satisfactorily	Good	Perfectly
Execution, preparation and defense of laboratory (practical) and graphic works according to individual assignments. Final computer-based testing - multiple choice test	< 20 points	20 - 24	25 - 34 points	35 - 40 points
	<i>Requirements for laboratory (practical) work not completed. Unfinished graphic works 1-3</i>	<i>laboratory (practical) requirements completed, but individual components are missing or insufficiently disclosed. Partially completed graphic works 1-3</i>	<i>laboratory (practical) requirements have been met. works , but there are minor comments . Graphic works 1-3 are completed, but there are minor comments regarding the design</i>	<i>All requirements for laboratory (practical) work have been met , and your own solution to the tasks has been proposed. Graphic works 1-3 are fully completed</i>
Execution, preparation and defense of laboratory (practical) and graphic works according to individual assignments. Final computer-based testing - multiple choice test	< 40 points	40-50	50-55 points	55-60 points
	<i>Requirements for laboratory (practical) work not completed. Unfinished graphic works 4-8</i>	<i>laboratory (practical) requirements completed, but individual components are missing or insufficiently disclosed. Partially completed graphic works 4-8</i>	<i>laboratory (practical) requirements have been met. works , but there are minor comments . Graphic works 4-38 are completed, but there are minor comments regarding the design</i>	<i>All requirements for laboratory (practical) work have been met , and your own solution to the tasks has been proposed. Graphic works 4-8 are fully completed.</i>

correspondence form of study

Component	Unsatisfactorily	Satisfactorily	Good	Perfectly
Performing individual graphic works	< 50 points <i>Task requirements not met</i>	51-54 <i>Most requirements are met, but some components are missing or insufficiently disclosed</i>	55- 57 points <i>All task requirements have been met, but there are minor comments regarding the design.</i>	58- 70 points <i>All task requirements have been met, and your own solution to the task has been proposed.</i>
Intermediate computer-based testing - multiple choice test	< 9 points <i>Less than 9 out of 30 correct answers</i>	9-19 <i>Correct answers from 9 to 19 out of 30</i>	20-28 points <i>Correct answers 20 to 28 out of 30</i>	29- 30 points <i>Correct answers 30</i>

5.3 Formative assessment:

To assess current progress in learning and understand areas for further improvement,

No.	Elements of formative assessment	Date
1	<i>Performing laboratory (practical) work according to an individual assignment during classes with feedback from the teacher.</i>	Within 2-15 weeks
2	<i>Oral feedback from the teacher while working on individual assignments during classroom sessions .</i>	Within 2-15 weeks
3	<i>Oral feedback from the teacher and students during the preparation of graphic work according to the individual assignment .</i>	Within 3-15 weeks
4	<i>Oral feedback from the instructor and students after the defense graphic work according to individual assignment</i>	During the 15th week after protection

6. LEARNING RESOURCES (LITERATURE)

1. Descriptive geometry and engineering graphics : a manual / Ivchenko O. V., Rebriy A. M., Andrusyak V. O., Kulikov O. A. – SNAU, 230 pp ., 2026.
2. Engineering computer graphics : workshop" - Polishchuk M.M. et al ., 2025 - 122 p.
3. Engineering graphics. / Compiled by: V. I. Kovbashyn , A. I. Pik. - Ternopil: Textbooks and manuals, 2023 - 240 p.
4. Methodological instructions for performing laboratory work for 2nd year students of specialty 181 "Food Technologies" of full-time and part-time forms of study. Sumy, 2023, 97 p.

5. Engineering and Computer Graphics. Lecture notes for 2nd year students of specialty 181 "Food Technologies" full-time and part-time forms of study. Sumy, 2023, 51 p.
6. Engineering and computer graphics. Methodological instructions for performing independent work "Geometric constructions" in the discipline for applicants of 2nd and 1st year of studies of the educational programs "Food Technologies" and " Craft Technologies and Gastronomic Innovations" of full-time and part-time forms of obtaining education for the degree of higher education "Bachelor". Sumy, 2025. , 55 p.
7. Rebriy A.M. The use of modern educational technologies in the study of graphic disciplines / A.M. Rebrii // Materials of the scientific and practical conference of teachers, postgraduates and students of Sumy NAU, April 26-29, 2022: abstracts supplement - Sumy: SNAU, 2022. – P.113
8. Rebrii A.M. Using online tools in the educational process / A.M. Rebrii // Collection of abstracts based on the materials of the 29th International Scientific and Practical Conference "Technologies of the 21st Century", November 20-22, 2023. Part 2: abstracts supplement . – Sumy: SNAU, 2023. – P.121
9. Rebriy A.M. Computer graphics - a tool for improving the quality of students' knowledge / A.M. Rebrii // Materials of the scientific and practical conference of teachers, postgraduates and students of Sumy NAU, May 14-16, 2024: abstracts supplement . - Sumy: SNAU, 2024. - P.558
10. Rebrii A.M. Application of the Autodesk computer-aided design system Inventor in the training of specialists with a higher education degree of "bachelor" / A.M. Rebrii , I.O. Rybenko , // 3rd International Scientific and Practical Conference « Global Trends in the Development of Information Technology and Science ", Stockholm , Sweden April 2-4, 2025, pp. 49-52.
11. Rebrii A. M. New technologies of teaching and learning / A. M. Rebrii // Materials of the 31st international scientific and practical conference Innovative technologies in industry 5.0, October 21-23, 2025: abstracts of supplementary part 2 - Sumy: SNAU, 2025. – P.122
12. Rebrii A.M. Use of information technologies in agricultural engineering / A.M. Rebrii , // Materials of the scientific and practical conference of teachers, postgraduates and students of Sumy NAU, April 13-17, 2026: abstracts supplement . - Sumy: SNAU, 2026. - P.317.
13. Microsoft Office software package (Microsoft Word word processor, Microsoft Excel spreadsheet, Microsoft PowerPoint presentation program.
14. Free web browser, (web browser) from Google - Google Chrome .
15. [https://iq.vntu.edu.ua/fm/fdb/1056/%D0%9F%D0%BE%D1%81%D1%96%D0%B1%D0%BD%D0%B8%D0%BA_%D0%9A%D0%BE%D1%80%D0%BC%D0%B0%D0%BD%D0%BE%D0%B2%D1%81%D1%8C%D0%BA%D0%B8%D0%B9_\(1\).pdf](https://iq.vntu.edu.ua/fm/fdb/1056/%D0%9F%D0%BE%D1%81%D1%96%D0%B1%D0%BD%D0%B8%D0%BA_%D0%9A%D0%BE%D1%80%D0%BC%D0%B0%D0%BD%D0%BE%D0%B2%D1%81%D1%8C%D0%BA%D0%B8%D0%B9_(1).pdf) .
16. https://nmetau.edu.ua/file/inzhenerna_grafika.pdf .