

# BUNIN YELETS STATE UNIVERSITY

Director of the Institute of Culture, History  
and Law /I.A. Karpacheva/



## THE WORK PROGRAMME OF THE DISCIPLINE B1.E.01.02 MATERIALS SCIENCE

**Direction of training:** 44.03.01 Pedagogical Education

**Programme:** Fine Arts

**Qualification (degree):** bachelor

**Mode of study:** full-time

**Institute of Culture, History and Law**

**Department:** Design, art education and technology

	full-time form	full-time and part-time form	part-time form
Study course	1		
Term	2		

Lectures	18		
Laboratory work			
Seminars (practical work)	18		
including practical training			
Form(s) of control	Exam – 0,3		
Control	9		
Other forms of work			
Independent work	26,7		

**Total number of academic hours:** 72

**Labour intensity:** 2 credits

*Developer of the work programme:*

*Associate Professor Kislykh L.V.*

## I. ORGANIZATIONAL AND METHODOLOGICAL SECTION

**The purpose of studying the discipline:** is to develop the ability to analyze and determine the requirements for a design project and synthesize a set of possible solutions to problems or approaches to the implementation of design projects.

### **Objectives of studying the discipline:**

- To form professional skills and techniques of working with various materials;
- To study the basics of production and the formation of structures of fabrics and other materials;
- To form the skills of design form-making, taking into account the peculiarities of ornamental fabric compositions;
- To study the plastic properties of fabric in the compositional construction of clothing;
- To study the geometric, physical, mechanical properties of materials, devices and methods of their testing;
- To study the requirements for the properties of materials and characteristics of assortment groups.

**The place of the discipline in the structure of the basic professional educational program:** it is implemented within the framework of the variable part (the part formed by the participants of educational relations) of block B1. Disciplines (modules).

### **Planned learning outcomes for the discipline:**

<b>Competence code</b>	<b>Indicators of competence achievement</b>	<b>Planned learning outcomes for the discipline</b>
<b>PCS-1</b> Able to teach an academic subject based on the use of subject-specific methods and use modern educational technologies that ensure the achievement of meta-subject, subject and personal results.	<b>To know:</b> <ul style="list-style-type: none"><li>– fundamentals of specific teaching methods(techniques) in the subject area;</li><li>– characteristics of students' personal, meta-subject and subject results in the context of teaching in the subject area (according to the Federal State Educational Standard and the model curriculum);</li><li>– modern educational technologies and methodological patterns of their selection; methods of monitoring, assessing and correcting learning results in the subject area.</li></ul>	<b>– Knows:</b> <ul style="list-style-type: none"><li>– fundamentals of specific teaching methods(techniques) in the subject area;</li><li>– characteristics of students' personal, meta-subject and subject results in the context of teaching in the subject area (according to the Federal State Educational Standard and the model curriculum);</li><li>– modern educational technologies and methodological patterns of their selection;</li><li>– methods of monitoring, assessing and correcting learning results in the subject area.</li></ul>
	<b>To be able to:</b> <ul style="list-style-type: none"><li>– design a work program in the subject area;</li><li>– design and implement various forms of training and organization of extra-</li></ul>	<b>Is able to:</b> <ul style="list-style-type: none"><li>– design a work program in the subject area;</li><li>– design and implement various forms of training and organization of extra-</li></ul>

	curricular activities of students in the subject area (profiles ensuring the achievement of meta-subject, subject and personal results.	curricular activities of students in the subject area (profiles ensuring the achievement of meta-subject, subject and personal results.
	<b>To possess:</b> <ul style="list-style-type: none"> <li>– teaching methods in the subject area and the methodology for their selection taking into account the specifics of the content of the educational material, age and educational needs of students;</li> <li>– modern educational technologies ensuring the achievement of students' meta-subject, subject and personal results;</li> <li>– methods of monitoring, assessing and correcting learning results in the subject area.</li> </ul>	<b>To possess:</b> <ul style="list-style-type: none"> <li>– teaching methods in the subject area and the methodology for their selection taking into account the specifics of the content of the educational material, age and educational needs of students;</li> <li>– modern educational technologies ensuring the achievement of students' meta-subject, subject and personal results;</li> <li>– methods of monitoring, assessing and correcting learning results in the subject area.</li> </ul>
<b>PCS-2</b> Able to apply subject knowledge in the implementation of the educational process.	<b>To know:</b> <ul style="list-style-type: none"> <li>– patterns, principles and levels of formation and implementation of educational content in the subject area;</li> <li>– structure, composition and didactic units of the content of a school subject in the subject area;</li> <li>– subject content in the subject area;</li> <li>– skills in selecting variable content taking into account the relationship between class and extracurricular forms of training in the subject area.</li> </ul>	<b>Knows:</b> <ul style="list-style-type: none"> <li>– regularities, principles and levels of formation and implementation of educational content on the fundamentals of materials science;</li> <li>– structure, composition and didactic units of content of the subject on the fundamentals of materials science;</li> <li>– subject content on the fundamentals of materials science;</li> <li>– skills of selection of variable content taking into account the relationship between class and extracurricular forms of education on the fundamentals of materials science.</li> </ul>
	<b>To be able to:</b> <ul style="list-style-type: none"> <li>– select educational content for implementation in various forms of training in the subject area in accordance with the didactic goals, age characteristics of students and the requirements of the Federal State Educational Standard of General Education.</li> </ul>	<b>Is able to:</b> <ul style="list-style-type: none"> <li>– select educational content for implementation in various forms of training in the fundamentals of materials science in accordance with the didactic goals, age characteristics of students and the requirements of the Federal State Educational Standard of General Education.</li> </ul>
	<b>To possess:</b> <ul style="list-style-type: none"> <li>– subject content of disciplines corresponding to the Pedagogical Education programme Fine Arts;</li> <li>– skills in selecting variable content taking into account the relationship between class and extracurricular forms of training in the subject area.</li> </ul>	<b>To possess:</b> <ul style="list-style-type: none"> <li>– subject content of disciplines corresponding to the Pedagogical Education programme Fine Arts;</li> <li>– skills in selecting variable content taking into account the relationship between class and extracurricular forms of training in the fundamentals of materials science.</li> </ul>

## II. CONTENT AND SCOPE OF THE DISCIPLINE

indicating the number of hours allocated for contact work of students with the teacher  
(by type of class) and for independent work

### Full-time education

№	Name of sections and topics	Total	Classroom lessons			Ind. work.
			Lec.	Sem. (pract.)	Lab.	
1	2	3	4	5	6	7
	<b>Section 1. "Materials Science for Sewing Production"</b>	<b>62,7</b>	<b>18</b>	<b>18</b>		<b>26,7</b>
1.	<b>Topic 1.</b> Introduction. Fibrous materials.	3	1			2
2.	<b>Topic 2.</b> Natural fibers.	6	2	2		2
3	<b>Topic 3</b> Chemical fibers.	6	2	2		2
4.	<b>Topic 4.</b> Types of textile threads.	6	2	2		2
5.	<b>Topic 5</b> Weaving production..	6,7	2	2		2,7
6.	<b>Topic 6.</b> Fibrous composition of fabrics.	6	2	2		2
7.	<b>Topic 7.</b> Fabric finishing.	8	2	2		4
8.	<b>Topic 8.</b> Structure of tissues.	8	2	2		4
9.	<b>Topic 9.</b> Properties of fabrics.	8	2	2		4
10.	<b>Topic 10.</b> Knitwear.	5	1	2		2
	<i>Control</i>	9				
	<i>Exam</i>	0,3				
	<i>Total for 2 term</i>	72	18	18		26,7

### Full-time and part-time education (not implemented)

### Part-time education (not implemented)

## III. EVALUATION MATERIALS FOR CONDUCTING CURRENT AND INTER-IM CERTIFICATION OF STUDENTS IN THE DISCIPLINE

Current certification is carried out in the form of a test.

### Standard version of the test (in traditional form)

Option A.

1. Natural fibers of plant origin.
2. Chemical fibers.
3. Obtaining yarn. Spinning processes.

#### 4. Physical properties of textile materials.

##### Option B.

1. Natural fibers of animal origin.
2. Artificial fibers. Synthetic fibers.
3. Fabric finishing.
4. Weaving interweavings

#### **Standard version of the test**

1. What is the name of the set of operations that results in yarn being produced from fibrous mass?  
A) weaving  
B) twisting  
C) spinning  
D) synthesisext,
2. Fill in the gaps in the text.  
According to finishing and dyeing, yarn is divided into raw, bleached, ..., ... and, ....
3. Specify the yarn that has a core wrapped along the entire length with cotton, wool, flax or chemical fibers  
A) single  
B) twisted  
C) reinforced  
D) twisted  
E) packaged
4. Name a textile product formed by interlacing mutually perpendicular systems of threads.  
A) film  
B) non-woven material  
C) fabric  
D) synthetic padding
5. List the purposes of finishing fabrics  
A) improving properties  
B) testing properties  
C) giving a marketable appearance  
D) refining  
E) dyeing
6. What is the name of the repeating pattern of thread weave?  
A) Binding  
B) Rapport  
C) Weft  
D) Repeat  
E) Overlap
7. Establish a correspondence between the properties of the fabric that cause certain difficulties in processing and the actions taken during processing.  
A) Slip  
1) Increase seam allowances

- B) Cut-through
  - C) Cutting resistance
  - D) Fraying
  - E) Shrinkage
- 2) Fasten
  - 3) Select a needle and thread by number
  - 4) Sharpen scissors
  - 5) Decatize
8. Determine the properties of fabrics that are aimed at maintaining human health.
- A) economic
  - B) technological
  - C) aesthetic
  - D) hygienic
  - E) physical
9. Natural textile fibers of animal origin include:
- A) silk
  - B) linen
  - C) viscose
  - D) wool
10. Cotton fabrics include:
- A) chiffon
  - B) calico
  - C) chintz
  - D) nylon
11. Yellow flame, gray ash, the smell of burnt paper when burning characterize the fiber:
- A) silk
  - B) wool
  - C) cotton
  - D) nylon
12. What is the raw material for obtaining synthetic fibers?
- A) animal wool;
  - B) processed coal, oil and natural gas products;
  - C) plant raw materials
13. Which of the following fibers are synthetic?
- A) wool, silk;
  - B) cotton, flax;
  - C) nylon, lavsan.
14. Fibers of plant origin include:
- A) nylon, lavsan, flax, cotton;
  - B) flax, cotton, hemp, jute;
  - C) cotton, silk, jute, wool.
15. Flax fibers have a length of:
- A) from 50 to 70 mm;
  - B) from 40 to 50 mm;
  - C) from 15 to 40 mm.
16. The strength of cotton depends on:
- A) the degree of maturity;
  - B) the length of the fiber;
  - C) the color of the fibers.

17. What fabrics are mainly used for sewing underwear, summer, home, sportswear?

- A) wool,
- B) linen;
- C) cotton

18. The main properties of fabrics are determined by:

- A) fiber composition, type of weave, finishing;
- B) fiber composition, finishing, purpose;
- C) type of weave, finishing, purpose

### **List of questions for the exam (2 term, Full-time education)**

1. Preliminary information on materials science, historical background.
2. Classification of clothing materials.
3. Classification of fibers.
4. Main characteristics of the properties of fibers and threads.
5. Natural fibers of plant origin: cotton. Properties of cotton fibers.
6. Natural fibers of plant origin: flax. Properties of flax fibers.
7. Natural fibers of plant origin: jute, ramie, kenaf, hemp, abaca, sisal. Properties of fibers.
8. Natural fibers of animal origin: wool, silk. Properties of fibers.
9. Chemical fibers and their properties.
10. Types of textile threads: yarn, complex threads, monofilaments, twisted yarn, twisted complex threads, textured threads.
11. Types of spinning systems.
12. Preparation of threads for weaving, the process of obtaining fabric, diagram of a weaving loom. Types of weaving loom.
13. Finishing of fabrics made from natural fibers of plant and animal origin. 14. Finishing of fabrics from chemical fibers.
15. Characteristics of various methods for determining the fibrous composition of fabrics.
16. Determination of the fibrous composition of fabrics of plant origin.
17. Determination of the fibrous composition of fabrics of animal origin.
18. Determination of the fibrous composition of artificial fabrics.
19. Determination of the fibrous composition of synthetic fabrics.
20. Characteristics of fabrics of simple (main) weaves.
21. Characteristics of fabrics of small-patterned weaves.
22. Characteristics of fabrics of complex weaves.
23. Characteristics of fabrics of large-patterned weaves.
24. Geometrical properties of fabrics.
25. Mechanical properties of fabrics
26. Physical properties of fabric.
27. Wear resistance of fabric.
28. Optical and technological properties of fabric.
29. Obtaining knitwear. Properties of knitted fabrics.
30. Characteristics of knitted fabric weaves.

## IV. LIST OF REFERENCES REQUIRED FOR MASTERING THE DISCIPLINE

### 4.1. Main literature.

1. Technology of production of woven textile materials: a textbook: [16+] / I. V. Krasina, S. V. Ilyushina, A. N. Minyazova, R. R. Mingaliev; Kazan National Research Technological University. - Kazan: Kazan National Research Technological University (KNI-TU), 2019. - 100 p.: ill., table, diagram. - Access mode: by subscription. - URL: <https://biblioclub.ru/index.php?page=book&id=612338> (date of access: 05 April 2024). - Bibliography: p. 86. - ISBN 978-5-7882-2616-3. - Text: electronic.

### 4.2. Additional literature

1. Lobatskaya, E. M. Fabrics and materials for clothing: a tutorial / E. M. Lobatskaya. - Minsk: RIPO, 2020. - 344 p.: ill., table, diagram. - Access mode: by subscription. - URL: <https://biblioclub.ru/index.php?page=book&id=697076> (date of access: 16.01.2025). - Bibliography: pp. 339-340. - ISBN 978-985-7234-56-1. - Text: electronic.

## V. LIST OF RESOURCES OF THE INFORMATION AND TELECOMMUNICATION NETWORK "INTERNET" REQUIRED FOR MASTERING THE DISCIPLINE

№	Link to information resource	Name of the development in electronic form	Availability
1.	<a href="http://edu.ru/">http://edu.ru/</a>	<b>Russian Education: Federal Portal.</b> Includes links to portals and websites of educational institutions; state educational standards; regulatory documents; catalog of excursions and educational programs.	Free access

## VI. MODERN PROFESSIONAL DATABASES AND INFORMATION REFERENCE SYSTEMS

1.	<a href="http://www.biblioclub.ru">http://www.biblioclub.ru</a>	Electronic library system (ELS) University library online	Registration via the university computer. In the future, unlimited individual access is provided from any point where there is access to the Internet.
2.	<a href="https://e.lanbook.com/">https://e.lanbook.com/</a>	Electronic library system (ELS) Lan	Registration via the university computer. In the future, unlimited individual access is provided from any point where there is access to the Internet.



## **VII. LICENSED AND FREELY DISTRIBUTABLE SOFTWARE**

The following licensed and freely distributed software is used in the implementation of the academic discipline:

- Microsoft Windows;
- Microsoft Office;
- LibreOffice and others.

## **VIII. EQUIPMENT AND TECHNICAL TEACHING AIDS REQUIRED FOR THE IMPLEMENTATION OF THE EDUCATIONAL PROCESS IN THE DISCIPLINE**

Classes are held in classrooms equipped with specialized furniture, including stationary or portable technical teaching aids (projector, screen, computer/laptop).

Independent work is carried out in rooms equipped with computers with the ability to connect to the Internet and provide access to the electronic information and educational environment of the university.